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Consistent Earnings Growth and the Credibility of Management Forecasts

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ABSTRACT

This paper examines the relation between a series of past earnings increases and the credibility of voluntary management earnings forecasts. We demonstrate that both analyst forecast revisions and stock price reactions around management earnings forecasts that contain good news are more pronounced when the firm has posted a string of recent earnings increases. These results are consistent with our primary hypothesis that voluntary management earnings forecasts are more believable when they are made by firms with a history of consistent growth in earnings. This effect is more pronounced when firms are not widely followed by analysts. Additional analysis suggests that management forecasts are more accurate relative to ex post realized earnings when made by a firm with consistent growth in prior earnings. The effect of prior earnings growth on the credibility of management earnings forecasts is reduced when the level of net assets suggests a history of prior earnings management.

JEL Classification: M41.

Keywords: Credibility of management forecasts; Voluntary disclosure.

1. Introduction

This paper examines the relation between consistent earnings growth and the credibility of voluntary management earnings forecasts. Specifically, using strings of increasing earnings as our measure of past performance, we demonstrate that earnings forecasts issued by firms with a recent string of increasing earnings are more credible than forecasts issued by firms without a recent string of increasing earnings. Prior studies suggest that the information content of management forecasts is a function of their perceived accuracy (Jennings 1987 and King, et al. 1990). We argue that managers of firms with long strings of increasing earnings generate more accurate forecasts of future profitability relative to managers of firms that have not experienced long strings of increasing earnings. As a result market participants' reactions to management earnings forecasts are more pronounced when preceded by a string of earnings increases.

The empirical observation that many managers focus on creating a series of increasing earnings changes (e.g., Burghstahler and Dichev 1997) has created a growing interest in the rewards to firms that exhibit this pattern. For example, Barth, et al. (1999) find that firms which exhibit a pattern of increasing earnings are priced higher than those firms that do not exhibit such a pattern, even after controlling for growth opportunities and risk. We document an additional benefit that is associated with such a pattern of earnings – voluntary disclosures made by management appear more credible. The expectations adjustment hypothesis, as discussed by Ajinkya and Gift (1984) and King, et al. (1990), suggests that aligning market participants' expectations with management's private information is important to managers, but that providing detailed, quantitative voluntary disclosures is costly due to litigation concerns and proprietary costs. Firms therefore voluntarily release as little information as possible in order to generate the revision in

expectations that they need. One implication of the expectations adjustment hypothesis is that firms facing credibility problems need to supplement management earnings forecasts with the release of more detailed, potentially costly, information (Han and Wild 1991 and Hutton, et al. 2003). If voluntary disclosures made by firms that exhibit long strings of increasing earnings are more credible, these firms may find it less costly to align market participants' expectations with management's private information.

In discussing management communication strategies, Palepu, Healy, and Bernard (2004, p. 13-8) note:

> When is management likely to face credibility problems with investors? There is very little evidence on this question. However, managers of new firms, firms with volatile earnings, firms in financial distress, and firms with poor track records in communicating with investors should expect to find it difficult to be seen as credible reporters.

Our study examines one facet of credibility – the role of volatile earnings. A recent survey by Graham, et al. (2005) finds that 96.9% of surveyed CFOs prefer a smooth earnings path, citing the effect of smooth earnings on perceived risk, the cost of capital, credit ratings, and improving the ability of analysts and investors to predict the future. We argue that firms which post a long series of consecutive earnings increases are viewed by market participants are being more credible reporters – first because they may have superior forecasting ability and second because they have more to lose (in terms of reputation) from issuing a forecast that turns out to be, ex post, inaccurate. A recent publication by Deloitte (2009) makes a similar point, noting "Some companies have such a strong track record of meeting or exceeding investor expectations that the market is willing to accept their story more or less on faith."

To test this research question, we empirically examine the relation between firm's prior performance and the credibility of management earnings forecasts using a sample of

8,335 quantitative annual management earnings forecasts collected by First Call Corporation. Prior research on voluntary disclosure has used two proxies for the credibility of the management earnings forecasts: market returns (e.g., Pownall and Waymire 1989, Pownall, et al. 1993, and Rogers and Stocken 2005) and analyst forecast revisions (e.g., Jennings 1987, and Williams 1996). We use both proxies as measures of credibility. Supplemental analyses examine the ex post accuracy of management earnings forecasts relative to subsequently realized earnings.

Our results are consistent with our primary hypothesis that management earnings forecasts that contain good news are more credible for firms with long patterns of consecutively increasing earnings. Capital market participants react more (both in terms of stock market reactions and analyst forecast revisions) to management forecasts made by firms with long strings of increasing earnings, in essence screening management forecasts based on the length of the series of past earnings increases. This effect varies with analyst following, in that the past series of earnings increases affects credibility only when firms are not widely followed by analysts. Supplemental analysis suggests that forecasts made by firms with long strings of prior earnings increases are also more accurate, where accuracy is measured by a comparison to ex post realized earnings. We also show that the effect of prior earnings increases on the credibility of management earnings forecasts is reduced when the level of net assets suggests a history of prior earnings management.

This study makes two important contributions to the empirical accounting literature. First, to date, there is only limited empirical research identifying factors associated with management credibility. This study examines one such factor, demonstrating an association between credibility of management earnings forecasts and the pattern of prior earnings. Second, this study extends Barth, et al. (1999) by identifying an additional market reward

associated with firms that show a pattern of increasing earnings. Our results suggest firms that can continuously post increasing earnings may face fewer costs in aligning market expectations with management's private information.

The next section develops our empirical predictions. Section 3 discusses our research design and sample selection criteria. Results are presented in section 4 and section 5 concludes.

2. Development of Empirical Predictions

Jennings (1987) argues that investors' belief revision and subsequent reaction to management earnings forecasts depends on (1) the surprise or unexpected component and (2) the believability of the management forecast. The believability of a forecast is in turn a function of management's ability to forecast accurately and management's incentives to issue forecasts that are free from intentional bias. Most prior empirical work on voluntary management earnings forecasts has focused on the extent to which such forecasts are free of intentional bias (e.g., McNichols 1989, Frankel, et al. 1995, and Rogers and Stocken 2005) rather than focusing on the effects of firm performance.[1] In this study we focus on the relation between the credibility of management earnings forecasts for firms with long strings of increasing earnings because we argue that managers of firms that have consistently performed well may have superior ability in

[1] One exception is Baik, et al. (2010) who examine the relation between CEO ability and the frequency, accuracy, and signaling effects of management earnings forecasts. Our study differs from Baik, et al. (2010) in that we focus on the pattern of prior earnings, a firm-level characteristic, rather than the proxies for the talent of an individual CEO. Baik, et al. (2010) focus on the signaling effects of forecasting, as posited by Trueman (1986), while we focus on cross-sectional variation in the credibility of forecasts. We also differ from Baik, et al. (2010) in that we demonstrate how the importance of the pattern of past earnings as a signal of credibility varies with the sign of the earnings news, the level of information asymmetry surrounding the firm, and the extent to which the balance sheet suggests a history of prior earnings management. Two other related papers are Williams (1996) and Hutton and Stocken (2009), who show that credibility of a forecast depends on the accuracy of prior forecasts.

predicting future earnings. This is consistent with intuition given by Demski (1998) in which managers exerting high levels of effort are better in both running the firm and in forecasting future earnings. By smoothing earnings, managers in Demski's (1998) model both demonstrate their ability to predict future performance and reveal their high effort. Xue (2003) also suggests a link between management's earnings smoothing behavior and management's private information about future firm performance.

Prior research on bias in forecasting suggests that managers issuing voluntary disclosures take into account both the potential benefits and the potential costs associated with issuing an intentionally biased forecast. Potential benefits come from employment concerns and equity-contingent wealth. Potential costs arise from loss of reputation and legal concerns. On average these costs are sufficient to deter biased forecasting (McNichols 1989), although particular firms may choose to intentionally bias upwards or downwards based on individual circumstances. Penalties from issuing inaccurate forecasts provide an additional motivation for predicting a link between past earnings growth and the credibility of management earnings forecasts. Anecdotal evidence suggests that firms which experience long strings of earnings growth attract attention in the business press and a wider analyst following. Firms that have experienced a long string of earnings growth have developed a good reputation among capital market participants, and so are particularly concerned about the loss of reputation that would accompany the revelation that a previously released forecast was inaccurate or biased.

Prior research suggests that market participants view the credibility of management forecasts differently based on the sign of the earnings news (e.g., Jennings 1987). Specifically, prior research finds that bad news forecasts are typically taken as credible,

while the credibility of good news forecasts varies with other available information.[2] For example, Hutton, et al. (2003) examine the effect of including verifiable forward looking information with a management earnings forecast, and find that including such information has no effect on the credibility of bad news forecasts. In contrast, good news forecasts are only believed when they are accompanied by verifiable forward looking information. Similarly, Williams (1996) finds that analysts condition their reaction to good news forecasts on the accuracy of prior forecasts more heavily than they condition their reaction to bad news forecasts on the accuracy of prior forecasts. Koch (2006) finds that good news forecasts from financially distressed firms are discounted by analysts, while bad news forecasts are believed. Rogers and Stocken (2005) also find that bad news is viewed as credible, while the market uses other information to filter out predictable bias in good news forecasts. Consistent with these prior findings, we expect that the extent to which the credibility of management forecasts varies with the pattern of past earnings is more pronounced in good news forecasts. In other word, bad news forecasts are assumed by investors to be credible, and so the credibility of bad news forecasts is not expected to depend on past earnings performance.

Some prior empirical research (e.g., Williams 1996) has used analyst forecast revisions as a proxy for the credibility of management earnings forecasts. The motivation

[2] One exception is Kross, et al. (2010), who find that bad news quarterly forecasts are less credible when made by firms that have consistently met or beaten quarterly analyst expectations. They find that firms with a track record of consistently beating analysts' expectations are more likely to guide analysts downward to avoid breaking this consistent record. Analysts begin to react less to this downward guidance, as they learn that managers are consistently guiding them down in order to beat expectations. Our study differs from Kross, et al. (2010) in that we focus on past earnings growth, rather than past ability to meet or beat expectations. We also focus on annual forecasts, which have different properties and objectives than quarterly forecasts. Kross, et al.'s (2010) focus on opportunistic guidance to beat quarterly expectations is quite different from our setting, which leads to a different set of predictions. Prior research suggests that annual forecasts contain a higher proportion of good news relative to quarterly forecasts and we expect annual forecasts to be less related to guiding expectations to meet or beat analyst predictions (which prior research, anecdotal evidence, and the business press suggests to be primarily a phenomenon related to quarterly earnings forecasts).

for this proxy comes from Jennings (1987), who argues that analyst forecasts reflect the beliefs of the investing community and analyst forecast revisions around management earnings forecasts therefore contain information about the extent to which that forecast is viewed as credible. The disadvantage of using analyst forecast revisions in empirical research is that sell-side analysts are known to suffer from a number of biases related to their individual processing abilities and the incentive structure in which they operate.[3] One particular concern for our study is that analyst compensation is tied to forecast accuracy. If firms are able to exert discretion over reported earnings, analysts may take this flexibility into account in generating their prediction of future earnings. The results of Kasznik (1999) suggest that firms which issue overly optimistic management forecasts may later manipulate earnings upward in order to meet that forecast. If analysts anticipate this behavior, then a management earnings forecast issued by a firm that can easily manipulate accruals could be "credible" in the sense that it generates a large revision in analyst forecasts even though that analyst reaction is driven by the anticipation of earnings management rather than by any substantive revision in expected future performance.

The possibility that mangers can manipulate accruals to hit their own forecasts and that analysts could simply revise their own forecasts in anticipation of such manipulation is particularly important to our study because of our focus on firms that have a history of smooth earnings. We argue that sustained earnings increases proxies for superior forecasting ability. If it instead proxies for the ability and or willingness to manipulate accruals then this would affect the interpretations of our results.[4] Due to these concerns, we use share price reactions as an additional proxy for credibility. This proxy has been used to

[3] For a summary of these biases see Francis (1997).

[4] The extent to which the effect of prior earnings growth on the credibility of management earnings forecasts is influenced by concerns about past earnings management is directly examined in section 4.4.

measure the credibility of forecasts in the prior literature as well (e.g., Pownall and Waymire 1989). Assuming that stock price equals the discounted value of expected future dividends, stock market reactions in response to a management earnings forecast are driven by revisions in expected future dividends. Therefore, in contrast to analyst forecasts, it seems unlikely that share prices would move in the direction of anticipated earnings manipulation. If the news component of a management earnings forecast is driven by the anticipation of earnings manipulation rather than any substantive revision in expected future performance then we would expect to find analysts revising their expectations without observing corresponding stock price reactions.

The use of both stock price reactions and analyst forecast revisions to assess the credibility of management earnings forecasts leads to the following two predictions:

H1: Stock price reactions in response to good news forecasts are more pronounced for firms that exhibit a string of past earnings increases than for firms that do not exhibit a string of past earnings increases.

H2: Analyst forecast revisions in response to good news forecasts are more pronounced for firms that exhibit a string of past earnings increases than for firms that do not exhibit a string of past earnings increases.

3. Sample Selection and Design of Empirical Tests

3.1 Sample selection and description

Our sample includes firms with voluntary management forecasts of annual earnings in the First Call Historical Database for the years 1993 to 2004. We restrict our attention to annual forecasts that are either point estimates or range estimates.[5] As in the majority of studies on quantitative management earnings forecasts, we convert a range forecast into a point estimate by taking the midpoint of the range. Forecasts issued on or after the fiscal year-end were eliminated to focus on management forecasts rather than

[5] We exclude minimum forecasts ("EPS will be at least…") and maximum forecasts ("EPS will be less than…"). We also exclude qualitative forecasts that do not explicitly state a per share amount (such as "EPS will be consistent with expectations").

preannouncements of actual earnings.[6] To control for possible sources of management bias, forecasts issued during mergers, bankruptcies, and stock offerings are not included.[7] To mitigate the small denominator problem associated with using price as a deflator, we also exclude firms with pre-release share prices under $2.00. Firms in regulated industries such as utilities, transportation firms, and financial services are also eliminated. We also require CRSP and COMPUSTAT data on earnings, daily returns, and the variables necessary to calculate Altman's [1968] *Z*-score. These sample selection procedures result in a final sample of 8,335 management earnings forecasts. These include multiple observations for some firms, so we follow Peterson (2009) and Gow, et al. (2010) by reporting all regression results using robust *t*-statistics that control for firm clustering effects. All reported *p*-values are two-tailed.

Table 1 presents descriptive statistics of management earnings forecasts for our sample. Approximately 50% of sample firms issue less than four management forecasts during the entire sample period. This is consistent with prior research documenting that few companies issue management forecasts regularly. Table 1, Panel B shows the number of management earnings forecasts issued per year over our sample period. There are fewer observations in the earlier years because First Call was just beginning to compile their historical database. Consistent with prior literature, management forecasts appear to increase dramatically after the implementation of Regulation Fair Disclosure (e.g., Anilowski, et al. 2007). Table 1, Panel C shows that the number of firms declines monotonically as the series of earnings increases becomes longer. Table 1, Panel C also shows that good news forecasts are more frequent than the bad news forecasts. This is

[6] Such preannouncements differ from management earnings forecasts in that while management is still giving a prediction (that may in fact differ from actual realized earnings), preannouncements are made after the end of the fiscal year and so do not require the forecasting of actual economic activity.

[7] We use SDC and CRSP to identify such corporate events.

consistent with prior research that has found that annual forecasts are more likely to be long-horizon, good new forecasts; in contrast to quarterly forecasts which are often used as short-horizon warnings to preempt forthcoming bad earnings news.

3.2 Research design

3.2.1 Measures of credibility of management earnings forecasts

Our two main variables to measure the information content of management earnings forecasts are cumulative abnormal returns (CAR_{it}) and analyst forecast revisions (AFR_{it}). We measure CAR_{it} using 3-day market model adjusted stock returns during the window encompassed by event days (−1, +1), where event day 0 is the management earnings forecast date. We use the CRSP equal-weighted return as the market return and estimate the market model parameters over the 200-day period from event day –210 to event day –11.[8]

When calculating analyst forecast consensus, revisions in analyst forecasts, and the news in management earnings forecasts we use analysts forecasts of annual earnings related to the same fiscal year for which management is issuing a forecast. Consensus analyst forecasts prior to management earnings forecasts for a given firm are calculated as the mean analyst forecast for all analysts reporting a forecast for that firm.[9] Consensus analyst forecasts subsequent to management's earnings forecast are calculated as the mean analyst forecast after the management earnings forecast for only those analysts included in the group composing the prior consensus forecast. Analyst forecast revision (AFR_{it}) is defined as the change between the consensus forecast prior to the management

[8] Using alternative event windows of (-1,0) or (-2,2) or using value-weighted market returns does not qualitatively affect our results. Our results are also robust to using size-adjusted cumulative abnormal returns.

[9] Using the median forecast to calculate the consensus forecast does not qualitatively affect our results.

earnings forecast and the consensus forecast following the management earnings forecast and is calculated as follows:

$$AFR_{it} = \frac{SFAF_{it} - PFAF_{it}}{P_i}$$

where:

$SFAF_{it}$ = consensus analyst forecast subsequent to management's earnings forecast,

$PFAF_{it}$ = consensus analyst forecast prior to management's earnings forecast, and

P_{it} = share price of the firm on the first day of the fiscal year in which the management earnings forecast is made.[10]

3.2.2 Measures of sustained earnings increases

We calculate the length of the string of prior earnings increases ($STRN_{it}$) as the number of consecutive increases in annual earnings (before extraordinary items) that precede the management earnings forecast.[11] As a link to prior research (in particular Barth, et al. 1999) we also divide firms into two groups – those with long strings of prior earnings increases versus those without. We use five years as the cut-off point to identify firms with long strings (the same cut-off as Barth, et al. 1999). $STRN\_D_{it}$ is the dichotomous variable taking the value of one if the number of years of increasing earnings prior to the management forecast is five or more and taking the value of zero otherwise. Tests of H1 and H2 are conducted using both $STRN_{it}$ and $STRN\_D_{it}$.

[10] Forecast revisions and forecast deviations are deflated by a preannouncement price in order to control for size effects in cross-sectional comparisons.

[11] We use COMPUSTAT, rather than First Call, as the source for earnings data in calculating the string of past earnings increases because First Call actual earnings estimates are incomplete prior to 1994.

3.2.3 Measures of forecast news

Based on prior research, we selected several independent variables that potentially influence the market and analyst reactions to the management earnings forecasts. First, we control for the forecast deviation (FD_{it}) that measures the surprise component of the management earnings forecast and is calculated as the difference between the management forecast and the prior consensus analyst forecast (deflated by the share price of the firm on the first day of the fiscal year in which the management earning forecast is made):

$$FD_{it} = \frac{MEF_{it} - PFAF_{it}}{P_i}$$

where:

MEF_{it} = management's EPS forecast for firm *i*,

$PFAF_{it}$ = mean consensus analyst forecast prior to management's earnings forecast, and

P_{it} = share price of the firm on the first day of the fiscal year in which the management earnings forecast is made.

Forecast deviations (FD_{it}) greater than or equal to zero represent "good news" ($GOOD_{it}$), while forecast deviations less than zero represent "bad news" (BAD_{it}).[12]

3.2.4 Regression specifications

To test our hypotheses, we use multiple regression models modified from Williams (1996). Following Jennings' (1987) arguments that investors' belief revision and reaction to management earnings forecasts depend on the unexpected component as well as the believability of the management forecast, we construct a model in which both security

[12] Following Ajinkya, et al. (2005) we treat confirming forecasts as good news forecasts. Clement, et al. (2003) document that significantly positive stock price reactions follow confirming management earnings forecasts. We conduct robustness tests on a sample without confirming forecasts, and our results are not affected by this treatment.

price movements and analyst forecast revisions are functions of the surprise component and the string of past earnings increases. Our focus is not on the length of prior earnings growth as an independent factor; rather our hypotheses relate to the interaction between prior earnings grown and the surprise component in management's forecast. That is, market participants are not reacting to the prior earnings growth alone, but instead are conditioning their reaction to the news in management's forecast on the prior earnings growth. The following pooled cross-sectional regression equations are used to test H1 and H2:

Model [1a]: $$CAR_{it} = \beta_{0a} + \beta_{1a}STRN_{it} + \beta_{2a}FD_{it} + \beta_{3a}FD_{it}\times STRN_{it}\times GOOD_{it} + \beta_{4a}FD_{it}\times STRN_{it}\times BAD_{it} + \beta_{5a}SIZE_{it} + \beta_{6a}FD_{it}\times SIZE_{it} + \beta_{7a}HORIZON_{it} + \beta_{8a}FD_{it}\times HORIZON_{it} + \beta_{9a}POINT_{it} + \beta_{10a}FD_{it}\times POINT_{it} + \beta_{11a}MB_{it} + \beta_{12a}FD_{it}\times MB_{it} + \beta_{13a}FCF_{it} + \beta_{14a}FD_{it}\times FCF_{it} + \beta_{15a}ROA_{it} + \beta_{16a}FD_{it}\times ROA_{it} + \beta_{17a}DISTRESS_{it} + \beta_{18a}FD_{it}\times DISTRESS_{it} + \varepsilon_{it}$$

Model [1b]: $$CAR_{it} = \beta_{0b} + \beta_{1b}STRN\_D_{it} + \beta_{2b}FD_{it} + \beta_{3b}FD_{it}\times STRN\_D_{it}\times GOOD_{it} + \beta_{4b}FD_{it}\times STRN\_D_{it}\times BAD_{it} + \beta_{5b}SIZE_{it} + \beta_{6b}FD_{it}\times SIZE_{it} + \beta_{7b}HORIZON_{it} + \beta_{8b}FD_{it}\times HORIZON_{it} + \beta_{9b}POINT_{it} + \beta_{10b}FD_{it}\times POINT_{it} + \beta_{11b}MB_{it} + \beta_{12b}FD_{it}\times MB_{it} + \beta_{13b}FCF_{it} + \beta_{14b}FD_{it}\times FCF_{it} + \beta_{15b}ROA_{it} + \beta_{16b}FD_{it}\times ROA_{it} + \beta_{17b}DISTRESS_{it} + \beta_{18b}FD_{it}\times DISTRESS_{it} + \varepsilon_{it}$$

Model [2a]: $$AFR_{it} = \gamma_{0a} + \gamma_{1a}STRN_{it} + \gamma_{2a}FD_{it} + \gamma_{3a}FD_{it}\times STRN_{it}\times GOOD_{it} + \gamma_{4a}FD_{it}\times STRN_{it}\times BAD_{it} + \gamma_{5a}SIZE_{it} + \gamma_{6a}FD_{it}\times SIZE_{it} + \gamma_{7a}HORIZON_{it} + \gamma_{8a}FD_{it}\times HORIZON_{it} + \gamma_{9a}POINT_{it} + \gamma_{10a}FD_{it}\times POINT_{it} + \gamma_{11a}MB_{it} + \gamma_{12a}FD_{it}\times MB_{it} + \gamma_{13a}FCF_{it} + \gamma_{14a}FD_{it}\times FCF_{it} + \gamma_{15a}ROA_{it} + \gamma_{16a}FD_{it}\times ROA_{it} + \gamma_{17a}DISTRESS_{it} + \gamma_{18a}FD_{it}\times DISTRESS_{it} + \varepsilon_{it}$$

Model [2b]: $$AFR_{it} = \gamma_{0b} + \gamma_{1b}STRN\_D_{it} + \gamma_{2b}FD_{it} + \gamma_{3b}FD_{it}\times STRN\_D_{it}\times GOOD_{it} + \gamma_{4b}FD_{it}\times STRN\_D_{it}\times BAD_{it} + \gamma_{5b}SIZE_{it} + \gamma_{6b}FD_{it}\times SIZE_{it} + \gamma_{7b}HORIZON_{it} + \gamma_{8b}FD_{it}\times HORIZON_{it} + \gamma_{9b}POINT_{it} + \gamma_{10b}FD_{it}\times POINT_{it} + \gamma_{11b}MB_{it} + \gamma_{12b}FD_{it}\times MB_{it} + \gamma_{13b}FCF_{it} + \gamma_{14b}FD_{it}\times FCF_{it} + \gamma_{15b}ROA_{it} + \gamma_{16b}FD_{it}\times ROA_{it} + \gamma_{17b}DISTRESS_{it} + \gamma_{18b}FD_{it}\times DISTRESS_{it} + \varepsilon_{it}$$

where:

AFR_{it} = consensus analyst forecast subsequent to management's earnings forecast less consensus analyst forecast prior to management's earnings forecast, deflated by prior period price,

CAR_{it} = cumulative abnormal returns for the three-day period beginning a day before the management forecast and ending a day after the management forecast,

FD_{it} = management forecast less the prior consensus analyst forecast, deflated by beginning of year price,

$STRN_{it}$ = number of years of increasing EPS before the management forecast,

$STRN\_D_{it}$ = qualitative variable taking the value of one if years of increasing EPS before the management forecast is five or more and taking zero otherwise,

$GOOD_{it}$ = qualitative variable taking the value of one if management's earnings forecast is greater than or equal to the mean consensus analyst forecast prior to management's earnings forecast, and zero otherwise,

BAD_{it} = qualitative variable taking the value of one if management's earnings forecast is less than the mean consensus analyst forecast prior to management's earnings forecast, and zero otherwise,

$HORIZON_{it}$ = natural logarithm of number of days between management forecast and fiscal period end date,

$POINT_{it}$ = management forecast precision, defined as zero (one) if management's forecast is a range (point) forecast,

$SIZE_{it}$ = natural logarithm of market capitalization of the firm on the first day of the fiscal year in which the management earnings forecast is made,

FCF_{it} = free cash flow, computed as (data13-data15-data16-data128)/data6 from Compustat,

MB_{it} = market-to-book value computed as (data199*data25/(data6-data181)) from Compustat,

ROA_{it} = return on asset computed as data18/data6 from Compustat, and

$DISTRESS_{it}$ = financial distress measure which is zero if Altman's Z-score > 2.6, one if 1.1 < Z-score ≤ 2.6, and two if Z-score ≤ 1.1.

The coefficient β_2 captures extent to which a unit of earnings news generates a price reaction and γ_2 captures extent to which a unit of earnings news generates a revision in the

analysts' consensus forecasts, respectively. A great deal of prior research (beginning with Patel 1976 and Penman 1980) suggests that management earnings forecasts are, on average, credible and should generate both price reactions and analyst forecast revisions. Therefore, we predict that both β_2 and γ_2 should be positive in all regression equations.

To measure cross-sectional variation in the credibility of management forecasts, we interact $STRN_{it}$ (or $STRN\_D_{it}$) with FD_{it}. Further, to test for an asymmetric response between good and bad news forecasts, we disaggregate $FD_{it} \times STRN_{it}$ into two three-way interaction terms ($FD_{it} \times STRN_{it} \times GOOD_{it}$ and $FD_{it} \times STRN_{it} \times BAD_{it}$). The coefficient β_3 (γ_3) reflects the incremental price reaction (analyst revision) in response to good news forecasts that are associated with firms that have a history of prior earnings increases. A positive coefficient on β_3 (γ_3) in a model with $STRN_{it}$ would suggest that price reactions (analysts' responses) to the good news in a management earnings forecast become more pronounced with the number of preceding consecutive years of earnings increases. Similarly, a positive coefficient on β_3 (γ_3) in a model with $STRN\_D_{it}$ would suggest that price reactions (analyst responses) to the news in a management earnings forecast become more pronounced when the firm has experience a long (greater than or equal to five years) string of prior earnings increases. Our main hypothesis suggests that the relation between the credibility of forecasts and prior earnings news varies with the sign of the news (good news versus bad news). This asymmetric response suggests $\beta_3 > 0$ ($\gamma_3 > 0$), but suggests that β_4 (γ_4) should not differ significantly from zero. The use of qualitative variables such as $GOOD_{it}$ and BAD_{it} to separately estimate credibility effects for good and bad news management forecasts is consistent with the model used by Rogers and Stocken (2005).

We control for firm size ($SIZE_{it}$), defined as the log of the market value of common equity at the beginning of the fiscal period. The coefficient of $FD_{it} \times SIZE_{it}$ is expected to be negative, consistent with a negative relation between stock market reactions to earnings news and firm size because alternative information sources reduce and preempt the usefulness of earnings reports for these firms (Atiase 1985; Baginski and Hassell 1997). The coefficient of $FD_{it} \times HORIZON_{it}$ is expected to be negative because long horizon forecasts might be more optimistically biased and thus generate less market and analyst reactions (Johnson, et al. 2001). We control for forecast specificity using $POINT_{it}$ which takes a value of one for point forecasts and zero for range forecast. Pownall, et al. (1993) and Baginski, et al. (1993) document that price reactions to management forecasts are increasing in forecast specificity, which suggests a positive coefficient for $FD_{it} \times POINT_{it}$. We expect firms with high growth opportunities to attract more attention from the capital market and thus forecasts from these firms subjected to greater scrutiny. We therefore expect a positive coefficient on $FD_{it} \times MB_{it}$. Prior research suggests that cash-rich firms are inclined to make investment projects that do not increase owners' wealth (Harford 1999; Bates 2005). These studies argue that agency problems are positively related to the firm's free cash flow (FCF_{it}). We therefore expect a negative coefficient on $FD_{it} \times FCF_{it}$. We control for the effect of financial distress by calculating Altman's [1968] Z-Score, which prior research has found to be negatively related to incidence of future bankruptcy over short horizons. We calculate $DISTRESS_{it}$ as zero if Altman's Z-score > 2.6, one if 1.1 < Z-score ≤ 2.6, and two if Z-score ≤ 1.1. Prior research (e.g., Koch 2006; Rogers and Stocken 2005) finds that management forecasts are less credible when made by firms in financial distress, suggesting a negative coefficient on $FD_{it} \times DISTRESS_{it}$. Finally, patterns of

increasing prior earnings might be associated with profitability, and we control for contemporaneous profitability by including return on assets (ROA_{it}).

4. Results

4.1. Correlation analysis and regression results

Table 2 provides descriptive statistics of treatment variables, conditioned on the pattern of prior earnings. Firms with a long string of prior earnings increases tend to have larger cumulative abnormal returns in response to management forecasts, have smaller absolute forecast errors, are smaller in size, have smaller market-to-book values, have more free cash flows, and are more profitable relative to firms with short strings of prior earnings increases. Means and medians for *AFR* and *CAR* reported in Table 2 appear small because this pooled sample includes both good and bad news forecasts.

Pearson correlation coefficients for our sample are presented in Table 3. These show mixed evidence in support of our hypotheses, although that is not surprising as our hypotheses relate primarily to good news forecasts, and Table 3 presents data pooled across both good and bad news. The correlations among our dependent and independent variables support the use of multiple regression analysis to examine the effect of past earnings patterns on the credibility of management earnings forecasts.

Table 4 presents regression results from estimating equations [1a], [1b], [2a], and [2b]. For all regression results we remove significant outliers determined by absolute values of Cook's distance greater than one (Cook 1977). We present regression results for restricted models without control variables first in Table 4, Panel A. Regression results of the models with various control variables are reported in Table 4, Panel B.

Consistent with the findings of prior research, coefficients for FD_{it} are positive and significant in all specifications, suggesting that the news in management earnings forecasts is, on average, credible in the sense that it generates both analyst forecast revisions and abnormal price movements in the same direction as the news.

Model [1a] examines the effect of prior earnings increases on price responses to management earnings forecasts. In this specification the coefficients β_{3a} and β_{4a} capture the incremental revision in share prices associated with each year of consecutive prior earnings increases to good and bad news forecasts, respectively. β_{3a} is positive and significant in both the restricted model presented in Table 4, Panel A ($\beta_{3a} = 0.895$, $p < 0.01$) and the unrestricted model presented in Table 4, Panel B ($\beta_{3a} = 0.781$, $p < 0.01$). These results suggest that price responses to good news in management earnings forecasts are increasing in the number of consecutive prior earnings increases, consistent with H1. However, β_{4a} is insignificant in both Table 4, Panel A ($\beta_{4a} = 0.017$, $p < 0.47$) and Table 4, Panel B ($\beta_{4a} = 0.022$, $p < 0.39$), suggesting that the stock price responses to bad news forecasts are not affected by recent earnings history. The insignificant coefficients for β_{4a} are consistent with our expectations that the extent to which the credibility of management forecasts varies with the pattern of past earnings is more pronounced in good news forecasts. As discussed earlier, bad news forecasts are assumed by investors to be credible, and so the credibility of bad news forecasts is not expected to vary with past earnings performance.

Model [1b] examines the effect of a long series of earnings increases on price responses to management earnings forecasts. The coefficient β_{3b} captures the incremental market reaction to good news associated with the qualitative variable $STRN\_D_{it}$. β_{3b} is again significant in both the restricted ($\beta_{3b} = 7.384$, $p < 0.01$) and full specification ($\beta_{3b} = 7.310$, $p < 0.01$). These results suggest that price responses to the news in management

earnings forecasts is more pronounced when it is preceded by a long string of consecutive earnings increases, consistent with H1. The coefficient $\beta_{4b,}$ which captures the incremental market reaction to bad news associated with the qualitative variable $STRN\_D_{it}$ is insignificant in both the restricted (β_{4b} = -0.047, $p > 0.5$) and full specification (β_{4b} = 0.023, $p > 0.5$). The lack of significance for bad news forecasts is again consistent with our expectations that bad news is always credible, and so credibility does not vary with additional factors such as past earnings performance.

Model [2a] examines the effect of past earnings increases on analyst forecast revisions in response to management earnings forecasts. Overall, the regression results of both models are consistent with H2. The coefficients of $FD_{it} \times STRN_{it} \times GOOD_{it}$ are significantly positive in both the restricted (γ_{3a} = 0.170, $p < 0.01$) and full model (γ_{3a} = 0.123, $p < 0.01$). The coefficient on $FD_{it} \times STRN_{it} \times BAD_{it}$ is significantly positive in the restricted model (γ_{4a} = 0.019, $p < 0.01$), although this relation becomes insignificant in the full model once additional controls are added (γ_{4a} = -0.001, $p > 0.5$). These results suggest that analysts' reactions to good news in management earnings forecasts are increasing in the number of consecutive prior earnings increases, consistent with H2.

Model [2b] examines the effect of a long series of earnings increases on analyst forecast revisions in response to management earnings forecasts. The coefficient γ_{3b} captures the incremental revision in analysts' forecasts to good news forecasts associated with the qualitative variable $STRN\_D_{it}$. Again γ_{3b} is significantly positive in both the restricted (γ_{3b} = 2.051, $p < 0.01$) and unrestricted model (γ_{3b} = 1.997, $p < 0.01$), which suggests that analysts tend to believe good news in management earnings forecasts more when a management forecast is preceded by a long string of consecutive earnings increases. In contrast, the coefficient γ_{4b}, which captures the incremental revision in analysts' forecasts

in response to bad news forecasts associated with the qualitative variable $STRN\_D_{it}$, is negative in both the restricted (γ_{4b} = -0.086, $p < 0.10$) and unrestricted (γ_{4b} = -0.155, $p < 0.01$) model. This suggests that analysts tend to believe bad news in management earnings forecasts less when a management forecast is preceded by a long string of consecutive earnings increases. While this differs from the results using market reactions, one explanation is that analysts are concerned that they are being guided downward (e.g., Kross, et al. 2010) simply so that mangers can exceed expectations at earnings announcements and that analysts discount such bad news accordingly.

In most specifications, the estimated coefficients of the control variables generally coincide with our predictions.[13] In summary, results from regressions [1a] through [2b] are consistent with our hypotheses that market participants react more strongly to quantitative management earnings forecasts when such forecasts are preceded by a series of earnings increases. This result holds only for the subset of forecasts that contain good news, which is consistent with prior research that has found that bad news is inherently credible, while market participants condition reactions to good news based on other available information. Our results hold using either the number of preceding earnings increases as an explanatory variable or when using an indicator variable to denote firms with long strings of increasing prior earnings. These results also hold after controlling for various factors that might potentially affect the credibility of management earnings forecasts.

4.2. Effect of information asymmetry

In the preceding section we document that market responses to voluntary management earnings forecasts that contain good news are conditioned on the length of

[13] We do not find a support for the link between credibility and financial distress that has been documented in prior research. There are at least two possible explanations for these mixed results. First, prior research by Begley, Ming, and Watts (1997) suggests that the usefulness of Altman's Z-score may be declining in recent years. In addition, Koch (2006) finds that the relation between financial distress and credibility varies with the sign of the earnings news.

consecutive prior earnings growth. Our results are consistent with our prediction that consistent prior earnings growth is interpreted as a signal about the credibility of voluntary disclosures. In this section we examine whether the importance of this signal varies with information asymmetry.

Information asymmetry about a firm is high when managers have a relatively large amount of value-relevant, firm-specific information that is not shared by the market. Investors bear some firm-specific uncertainty until this information is revealed to the market. Firms have lower information asymmetry when they are more closely followed by analysts and the business press, and as a result market participants have more sources of information to draw on in assessing the abilities of management for these firms. Therefore, the importance of this particular signal about management's forecasting accuracy may be attenuated when information asymmetry is low. We conjecture that in an environment where a number of analysts compete against each other, firm-specific information regarding management's forecasting ability can be revealed by various types of private information obtained by these analysts in the process of competition. Consequently, the role of past earnings history to signal the credibility of management forecasts will be mitigated when there is a large number of analysts following the disclosing firm. Therefore, we predict that the effect of strings of earnings growth on market participants' reactions to management earnings forecasts that contain good news is not as pronounced for firms with low information asymmetry. In the discussion that follows, we focus on coefficients related to good news, as prior research and our results presented in section 4.1 suggest that these are the observations in which credibility concerns arise.

To test our conjecture, we measure information asymmetry as the number of analysts following the firm on the day of the management forecast issuance. We divide

firms into two groups ("High Asymmetry" and "Low Asymmetry") using the median number of analysts as the cut-off. For these tests, a high level of analyst following corresponds to a low level of asymmetry. Table 5 reports regression results of Model [1a] through [2b] by the level of information asymmetry. Table 5, Panel A reports results using $STRN_{it}$ as our measure of past earnings. With CAR_{it} as the dependent variable, the coefficient on $FD_{it} \times STRN_{it} \times GOOD_{it}$ is 0.572 ($p < 0.01$) in the Low Asymmetry case, relative to 0.702 ($p < 0.01$) in the High Asymmetry case. With AFR_{it} as the dependent variable, the coefficient on $FD_{it} \times STRN_{it} \times GOOD_{it}$ is 0.005 and insignificant ($p > 0.5$) in the Low Asymmetry case, relative to a significantly positive 0.156 ($p < 0.01$) in the High Asymmetry case. These results are consistent with our conjecture that the association between the credibility of good news forecasts and the pattern of past earnings is larger for the High Asymmetry group relative to the Low Asymmetry group.

Table 5, Panel B reports results using $STRN\_D_{it}$ as our measure of past earnings. With CAR_{it} as the dependent variable, the coefficient on $FD_{it} \times STRN_{it} \times GOOD_{it}$ is insignificant in the Low Asymmetry case ($\gamma = 5.830$, $p < 0.24$), yet significantly positive in the High Asymmetry case ($\gamma = 7.580$, $p < 0.05$). With AFR_{it} as the dependent variable, the coefficient on $FD_{it} \times STRN_{it} \times GOOD_{it}$ is again insignificant in the Low Asymmetry case ($\gamma = 0.090$, $p > 0.5$), yet significantly positive in the High Asymmetry case ($\gamma = 2.154$, $p < 0.10$). These results suggest that the association between the credibility of good news forecasts and the pattern of past earnings exists for the High Asymmetry group but is attenuated in the Low Asymmetry group.

The pattern for bad news is less clear, although this is not surprising given that prior research and the results of section 4.1 suggest that credibility concerns arise primarily in the case of forecasts that contain good news. The negative relation between AFR_{it} and

$FD_{it} \times STRN\_D_{it} \times BAD_{it}$ observed in section 4.1 (in which analysts seem to discount news given by firms with a long string of earnings increases) is insignificant in the Low Asymmetry case ($\gamma = 0.379$, $p < 0.47$) and remains significantly negative in the High Asymmetry case ($\gamma = -0.128$, $p < 0.05$).

Overall, these results are consistent with our conjecture that the association between the credibility of good news forecasts and the pattern of past earnings is more pronounced in the "High Asymmetry" group. We find a weaker association (and in some cases no association) between past earnings patterns and the credibility of good news management forecasts when a disclosing firm has more intensive analyst coverage. Overall, these results are consistent with the prediction that as investors have access to more information, they do not need to use past earnings growth as an indicator of management's forecasting accuracy.

4.3. Forecast accuracy and forecast bias

Our empirical prediction that the credibility of management earnings forecasts is increasing in the string of past earnings growth is predicated on the assumption that forecasts made by such firms are more accurate predictors of actual subsequent performance. In order to provide direct evidence on this issue we also examine how forecast accuracy varies systematically with the length of the prior string of earnings growth. For this comparison of ex post accuracy, we use the actual realized EPS as reported by First Call and calculate management forecast errors (MFE_{it}) as:

$$MFE_{it} = \frac{| AE_{it} - MF_{it} |}{P_i}$$

where:

AE_{it} = actual realized EPS for firm i,
MF_{it} = management's EPS forecast for firm i, and

P_i = share price of the firm on the first day of the fiscal year in which the management earnings forecast is made.

Table 6, Panel A presents evidence on the ex post accuracy of management earnings forecasts conditioned on the length of the preceding string of earnings increases. A visual inspection of table 6, panel A suggest that the mean absolute error tends to decrease with the length of the preceding string of consecutive earnings increases, although this relationship is not monotonic. The mean absolute forecast error for firms without a prior string of earnings increases is 0.0162, while the mean absolute forecast error for firms with a prior string of earnings increases is 0.0093. This difference between the mean absolute errors is significant at the 0.05 level.

We formally test for a relation between the patterns of past earnings and the ex post forecast accuracy by estimating the following pooled cross-sectional regression models:

Model [3a]: $$MFE_{it} = \alpha_{0a} + \alpha_{1a}STRN_{it} + \alpha_{2a}HORIZON_{it} + \alpha_{3a}POINT_{it} + \alpha_{4a}MB_{it} + \alpha_{5a}FCF_{it} + \alpha_{6a}ROA_{it} + \alpha_{7a}DISTRESS_{it} + \varepsilon_{it}$$

Model [3b]: $$MFE_{it} = \alpha_{0b} + \alpha_{1b}STRN\_D_{it} + \alpha_{2b}HORIZON_{it} + \alpha_{3b}POINT_{it} + \alpha_{4b}MB_{it} + \alpha_{5b}FCF_{it} + \alpha_{6b}ROA_{it} + \alpha_{7b}DISTRESS_{it} + \varepsilon_{it}$$

The regression results in Table 6, Panel B show that the coefficients of $STRN_{it}$ and $STRN\_D_{it}$ are significantly negative at the 0.01 level, further confirming the relation observed in Table 6, Panel A. Note that, unlike the tests of ex ante credibility, the effect of past earnings news on ex post forecast credibility does not depend on the type of news (i.e., good vs. bad news). Overall, these results are consistent with our assumption that the accuracy of management earnings forecasts is increasing in the length of consecutive prior earnings increases. However, these results are also consistent with the competing hypothesis that firms which have posted long strings of earnings increases are the ones that have the greatest discretion over reported earnings and are therefore the ones best

able to manage earnings in order to hit their own management earnings forecast. Our results on forecast accuracy must therefore be interpreted with caution.[14]

4.4 Credibility and earnings management

Our last set of tests examines whether the relation between the past pattern of earnings and the credibility of management earnings forecasts varies when using the level of net assets to proxy for prior earnings management. Barton and Simko (2002) use net operating assets relative to sales (*NOA*) as a proxy for past optimistic bias in earnings. To test for the effect of prior bias in earnings, we follow Barton and Simko (2002) by calculating *NOA* as shareholders' equity less cash and marketable securities, plus total debt. We calculate *NOA* using annual data and deflate by total sales to obtain a measure of overstatement in net asset values.[15] Barton and Simko (2002) suggest that a high value of *NOA* therefore reflects a firm that has been aggressive in the past about the application of Generally Accepted Accounting Principles. We partition firms into two groups ("High Net Operating Assets" and "Low Net Operating Assets") based on the prior year's *NOA*, using the median *NOA* as the cut-off. Models [1a] through [2b] are then re-estimated for each subsample, to test how the role of past earnings patterns in the credibility of management earnings forecast varies with the level of net assets.

Table 7, Panel A presents results for each subsample of *NOA* using $STRN_{it}$ to proxy for past earnings patterns. As before, we focus on good news forecasts, as prior research and our prior results suggest that credibility of management forecasts matters primarily when firms issue good news. Using CAR_{it} as the dependent variable we find a

[14] As discussed in section 2, the results regarding market reactions to management earnings forecasts do not suffer from this same caveat because it seem unlikely that prices would move in the direction of, and in response to, anticipated earnings management.

[15] As a robustness test, we use an alternative definition of *NOA* following Penman and Zhang (2002). Our inferences are unaffected by replacing Barton and Simko's (2002) definition of *NOA* with Penman and Zhang's (2002) definition.

larger coefficient on $FD_{it} \times STRN_{it} \times GOOD_{it}$ when *NOA* is low ($\beta = 1.488$, $p < 0.01$) relative to when *NOA* is high ($\beta = 0.320$, $p < 0.10$). Using AFR_{it} as the dependent variable we find very similar coefficients on $FD_{it} \times STRN_{it} \times GOOD_{it}$ when *NOA* is low ($\beta = 0.157$, $p < 0.05$) relative to when *NOA* is high ($\beta = 1.56$, $p < 0.01$). Table 7, Panel B presents results for each subsample of *NOA* using $STRN\_D_{it}$ to proxy for past earnings patterns. Using CAR_{it} as the dependent variable we find a larger coefficient on $FD_{it} \times STRN\_D_{it} \times GOOD_{it}$ when *NOA* is low ($\gamma = 15.948$, $p < 0.01$) relative to when *NOA* is high ($\gamma = 2.068$, $p < 0.01$). Using AFR_{it} as the dependent variable we find a larger coefficient on $FD_{it} \times STRN\_D_{it} \times GOOD_{it}$ when *NOA* is low ($\gamma = 2.085$, $p < 0.01$) relative to when *NOA* is high ($\gamma = 0.778$, $p < 0.10$).

In general, these results suggest that the effect of past earnings is more pronounced for firms with low net operating assets (i.e., the effect is more pronounced when firms do not have a track record of aggressively managing earnings). That is, the incremental credibility associated with management forecasts made by firms with a history of earnings increases is attenuated when the level of net assets suggests that firms have obtained those earnings increases through aggressive financial reporting. Investors may react less to such forecast because earnings obtained through aggressive financial reporting are less value relevant. Analysts may react less to such forecasts because the past history of aggressive reporting constrains the flexibility to continue to optimistically bias earnings, reducing the probability that firms with high *NOA* can manage earnings to hit their own forecasts.

V. Conclusions

This paper examines the relation between the credibility of management forecasts and prior firm performance. Specifically consecutive years of increasing earnings are

chosen to proxy for managements' ability and incentive to forecast accurately. Using a sample of 8,335 management forecasts of annual earnings, we find that good news management earnings forecasts for firms with relatively long strings of increasing earnings are more credible than those for firms with relatively short strings. These results are consistent with the primary hypothesis that voluntary management earnings forecasts are more believable when they are made by firms with long patterns of increasing earnings. Supplemental analysis suggests that this result is driven primarily by firms below the sample median of analyst following. Additional analysis suggests that management earnings forecasts from firms with long strings of consecutive earnings increases are also more accurate relative to ex post realized earnings. Finally, the increased credibility associated with prior earnings increases is attenuated when the level of net assets suggests a history of prior earnings management.

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Table 1
Descriptive statistics for management earnings forecasts

Panel A: Number of firms issuing management earnings forecasts

Number of forecasts	1	2	3	4	5	6
Number of firms	389	229	149	119	108	107
Percentage	25%	15%	10%	8%	7%	7%

Number of forecasts	7	8	9	10	≥ 11	Total
Number of firms	81	64	66	46	210	1568
Percentage	5%	4%	4%	3%	13%	100%

Panel B: Number of management forecasts issued per firm-year

Year	Total number (%) of firms		Total number (%) of forecasts	
	Number	%	Number	%
1993	3	0.08	4	0.05
1994	14	0.39	14	0.17
1995	78	2.15	95	1.14
1996	125	3.45	148	1.78
1997	155	4.28	220	2.64
1998	238	6.57	328	3.94
1999	279	7.70	453	5.43
2000	329	9.08	519	6.23
2001	647	17.86	1,342	16.1
2002	784	21.64	2,064	24.76
2003	859	23.71	2,757	33.08
2004	112	3.09	391	4.69
Total	3,623	100.00	8,335	100.00

Panel C: Management earnings forecasts per length of string of increasing earnings

Number of years of increasing earnings	Number of forecasts	Type of management earnings forecasts news	
		Good news	Bad news
0	3,397	1,769	1,628
1	2,503	1,320	1,183
2	1,325	675	650
3	647	357	290
4	262	136	126
5	116	67	49
6	45	24	21
7	21	11	10
8	11	4	7
9	5	2	3
10	0	0	0
11	3	1	2
Total	8,335	4,366	3,969

Note:
Our sample consists of 8,335 quantitative management earnings forecasts of annual earnings made by 1,837 firms between 1993 and 2004. Only point and range forecasts are included in the sample. We count the number of years of increasing annual earnings before management forecasts and define it as the "string" of increasing earnings. A short (long) string is defined when the length of the string is less than (greater than or equal to) 5. If a management earnings forecast is greater than or equal to the most recent mean analyst forecast prior to the management forecast date, we code the management forecast as good news. Otherwise, we code it as bad news. If management issues a range forecast, we take the mid point of the range as the manager's point estimate. Total number of firms in Panel B is greater than the number of firms in the sample because of duplicate firm observations among different years.

Table 2
Descriptive statistics of treatment variables for short and long string firms

Variable	Short String Firms (N=8134)			Long String Firms (N=201)		
	Mean	Median	Std Dev	Mean	Median	Std Dev
CAR	-0.005	-0.001	0.075	0.002*	0.002*	0.064
AFR	-0.003	0.000	0.023	0.001**	0.000	0.021
ABSFERR	0.016	0.003	0.049	0.009**	0.003*	0.018
GOOD	0.523	1.000	0.499	0.542	1.000	0.499
FD	-0.006	0.000	0.034	-0.005	0.000	0.026
SIZE	7.442	7.309	1.770	6.990***	6.773***	1.236
HORIZON	5.138	5.333	0.764	5.151	5.142	0.576
POINT	0.760	1.000	0.427	0.771	1.000	0.421
MB	2.135	1.571	2.042	1.920	1.429*	1.433
FCF	0.043	0.044	0.083	0.069***	0.056***	0.082
ROA	0.048	0.050	0.129	0.093***	0.073***	0.067
DISTRESS	1.642	2.000	0.746	1.567*	2.000*	0.810

Our sample consists of 8,335 quantitative management earnings forecasts of annual earnings made by 1,837 firms between 1993 and 2004.

CAR = Cumulative abnormal returns over two trading days [-1, +1], where day 0 is the date of management earnings forecasts,

AFR = Consensus analyst forecast subsequent to management's earnings forecast less consensus analyst forecast prior to management's earnings forecast, deflated by prior period price,

ABSFERR = Absolute forecast error of management earnings forecast calculated as the absolute value of (management earnings forecast less actual earnings), deflated by beginning of year price,

GOOD = qualitative variable taking the value of one if management's earnings forecast is greater or equal to the mean consensus analyst forecast prior to management's earnings forecast, and zero otherwise,

BAD = qualitative variable taking the value of one if management's earnings forecast is less than the mean consensus analyst forecast prior to management's earnings forecast, and zero otherwise,

FD = Management forecast less the prior consensus analyst forecast, deflated by beginning of year price,

SIZE = Natural logarithm of market capitalization (shares multiplied by price per share) of the firm on the first day of the fiscal year in which the management earnings forecast is made,

HORIZON = Natural logarithm of number of days between management forecast and fiscal period end date,

POINT = Management forecast precision which is zero (one) if management forecast is range (point) forecast,

MB = Market to book value,

FCF = Free cash flow computed as (data13-data15-data16-data128)/data6 from Compustat,

ROA = Return on asset computed as data18/data6,

DISTRESS = Financial distress measure which is zero if Altman's Z-score > 2.6, one if 1.1 < Z-score ≤ 2.6, and two if Z-score ≤ 1.1.

*, **, *** *p*-value < 10%, *p*-value < 5%, *p*-value < 1% for mean and median difference, respectively, for two-tailed pair-wise tests.

Table 3
Correlations of Study Variables (N=8,335)

	STRN	*STRN_D*	*CAR*	*AFR*	*ABSFERR*	*GOOD*	*FD*	*SIZE*	*HORIZON*	*POINT*	*MB*	*FCF*	*ROA*	*DISTRESS*
STRN		**0.280**	0.017	**0.052**	**-0.054**	0.006	0.005	**-0.054**	-0.017	-0.017	**0.083**	**0.095**	**0.263**	**-0.060**
STRN_D	**0.558**		0.020	0.023	-0.005	0.006	0.014	**-0.040**	-0.015	0.004	-0.021	**0.039**	**0.093**	-0.014
CAR	0.016	0.015		**0.279**	-0.027	**0.225**	**0.263**	-0.016	0.027	**-0.029**	-0.007	-0.008	-0.009	0.003
AFR	**0.039**	0.023	**0.170**		**-0.140**	**0.605**	**0.726**	0.006	-0.009	**-0.061**	**0.048**	0.020	0.011	-0.024
ABSFERR	**-0.030**	-0.022	**-0.081**	**-0.298**		**-0.097**	**-0.076**	**-0.231**	**0.340**	**0.045**	**-0.242**	**-0.180**	**-0.186**	**-0.048**
GOOD	0.005	0.006	**0.233**	**0.288**	**-0.079**		**0.866**	0.003	0.017	**-0.110**	**0.036**	-0.003	0.003	**-0.032**
FD	0.015	0.006	**0.151**	**0.610**	**-0.205**	**0.273**		0.005	**0.046**	**-0.059**	-0.006	-0.026	**-0.038**	-0.027
SIZE	**-0.059**	**-0.039**	-0.014	**0.058**	**-0.105**	0.003	**0.053**		**0.031**	**-0.067**	**0.303**	**0.129**	**0.154**	0.340
HORIZON	-0.006	0.003	**0.038**	0.021	**0.140**	**0.048**	**0.046**	0.020		-0.021	0.018	-0.022	-0.005	-0.024
POINT	-0.011	0.004	-0.022	**-0.033**	-0.011	**-0.110**	**-0.050**	**-0.069**	-0.011		**-0.131**	0.004	**-0.045**	**-0.034**
MB	0.026	-0.016	0.009	0.024	**-0.046**	0.022	**0.040**	**0.255**	0.008	**-0.105**		**0.443**	**0.582**	-0.154
FCF	**0.087**	**0.049**	-0.028	0.006	**-0.080**	-0.004	-0.021	**0.173**	-0.006	0.023	**0.181**		**0.588**	-0.038
ROA	**0.146**	**0.053**	0.006	-0.014	**-0.075**	-0.012	**-0.077**	**0.143**	-0.020	-0.018	**0.144**	**0.546**		-0.100
DISTRESS	**-0.055**	-0.015	-0.002	0.014	-0.022	**-0.033**	0.008	**0.302**	-0.023	**-0.033**	**-0.147**	-0.019	**-0.042**	

Note: Pearson correlations are below the diagonal and Spearman correlations are above the diagonal of the correlation matrix. Correlation coefficients in bold are significant at the 1 percent level. Variable definitions are given in Table 2.

Table 4
Pooled cross-sectional regression analyses on the credibility of management earnings forecasts[a]

Panel A: Restricted Model

Variable	*Expected Sign*	*Dependent Variable*			
		CAR_{it}	AFR_{it}	CAR_{it}	AFR_{it}
$STRN_{it}$	?	0.000	0.000***		
		(0.05)	(2.91)		
$STRN\_D_{it}$	?			-0.000	0.001
				(-0.02)	(0.35)
FD_{it}	+	0.293***	0.396***	0.329***	0.417***
		(9.28)	(50.03)	(13.78)	(69.87)
$FD_{it}\times STRN_{it}\times GOOD_{it}$	+	0.895***	0.170***		
		(6.58)	(5.00)		
$FD_{it}\times STRN_{it}\times BAD_{it}$	?	0.017	0.019***		
		(0.73)	(3.08)		
$FD_{it}\times STRN\_D_{it}\times GOOD_{it}$	+			7.384***	2.051***
				(2.62)	(2.90)
$FD_{it}\times STRN\_D_{it}\times BAD_{it}$	?			-0.047	-0.086*
				(-0.23)	(-1.69)
Intercept	?	-0.004***	-0.001***	-0.003***	-0.000
		(-4.08)	(-3.64)	(-4.02)	(-1.58)
N		8,335	8,335	8,335	8,335
R-squared(%)		2.80	37.5	2.40	37.3

Table 4
Panel B: Full model with control variables

Variable	Expected Sign	Dependent Variable			
		CAR_{it}	AFR_{it}	CAR_{it}	AFR_{it}
$STRN_{it}$	?	-0.000	0.000***		
		(-0.21)	(2.92)		
$STRN\_D_{it}$	?			-0.001	0.000
				(-0.12)	(0.05)
FD_{it}	+	0.453**	0.473***	0.486**	0.477***
		(1.97)	(8.62)	(2.12)	(8.70)
$FD_{it}\times STRN_{it}\times GOOD_{it}$	+	0.781***	0.123***		
		(5.63)	(3.70)		
$FD_{it}\times STRN_{it}\times BAD_{it}$	?	0.022	-0.001		
		(0.86)	(-0.20)		
$FD_{it}\times STRN\_D_{it}\times GOOD_{it}$	+			7.310***	1.997***
				(2.59)	(2.97)
$FD_{it}\times STRN\_D_{it}\times BAD_{it}$	?			0.023	-0.155***
				(0.11)	(-3.15)
$SIZE_{it}$	?	-0.001**	0.001***	-0.001**	0.001***
		(-1.98)	(5.16)	(-2.38)	(4.76)
$FD_{it}\times SIZE_{it}$	−	-0.020	0.043***	-0.021	0.043***
		(-1.22)	(10.69)	(-1.27)	(10.90)
$HORIZON_{it}$	?	0.002**	-0.001***	0.003**	-0.001***
		(2.09)	(-5.04)	(2.38)	(-4.89)
$FD_{it}\times HORIZON_{it}$	−	-0.051*	-0.081***	-0.046	-0.081***
		(-1.72)	(-11.45)	(-1.55)	(-11.48)
$POINT_{it}$	?	-0.002	-0.000	-0.002	-0.000
		(-1.07)	(-0.72)	(-1.21)	(-0.84)
$FD_{it}\times POINT_{it}$	+	-0.039	-0.142***	-0.085	-0.149***
		(-0.46)	(-7.10)	(-1.03)	(-7.54)
MB_{it}	?	0.001*	0.000	0.001*	0.000
		(1.65)	(0.75)	(1.74)	(0.86)
$FD_{it}\times MB_{it}$	+	0.169***	0.109***	0.180***	0.109***
		(4.73)	(12.74)	(5.04)	(12.73)
FCF_{it}	?	-0.041***	0.007**	-0.045***	0.007**
		(-3.40)	(2.54)	(-3.76)	(2.26)
$FD_{it}\times FCF_{it}$	−	-0.905**	-0.079	-1.066**	-0.095
		(-1.97)	(-0.72)	(-2.33)	(-0.87)
ROA_{it}	?	0.033***	-0.005**	0.033***	-0.004**
		(3.62)	(-2.45)	(3.73)	(-1.99)
$FD_{it}\times ROA_{it}$	+	0.116*	0.080***	0.147**	0.081***
		(1.77)	(5.09)	(2.26)	(5.19)
$DISTRESS_{it}$	?	0.001	0.000	0.001	0.000
		(0.69)	(0.65)	(0.81)	(0.65)
$FD_{it}\times DISTRESS_{it}$	−	0.036	0.051***	0.045	0.052***
		(1.00)	(5.88)	(1.25)	(6.02)
Intercept		-0.009	0.001	-0.001	0.000
		(-1.28)	(0.81)	(-0.12)	(0.05)
N		8,335	8,335	8,335	8,335
R-squared(%)		3.40	43.3	3.10	43.3

The *t*-statistics (in parentheses) and are based on standard errors adjusted for heteroskedasticity and firm and year clustering (Peterson 2009; Gow et al. 2010). Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Table 5
Tests for credibility of management earnings forecasts conditioned on information asymmetry

Panel A: Regression analyses using $STRN_{it}$

Variable	Expected Sign	*Dependent Variable = CAR_{it}*				*Dependent Variable = AFR_{it}*			
		Low Asymmetry		High Asymmetry		Low Asymmetry		High Asymmetry	
		Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
$STRN_{it}$	?	0.000	-0.07	0.000	0.29	0.001***	2.98	0.000*	1.72
FD_{it}	+	4.067***	3.92	0.955***	3.34	0.552***	2.45	0.560***	7.71
$FD_{it}\times STRN_{it}\times GOOD_{it}$	+	0.572***	2.58	0.702***	3.73	0.005	0.11	0.156***	3.27
$FD_{it}\times STRN\_D_{it}\times BAD_{it}$	?	-0.098	-1.34	0.051*	1.69	0.102***	6.42	-0.014*	-1.85
$SIZE_{it}$	?	-0.001	-1.21	0.000	-0.41	0.000	0.34	0.001*	1.86
$FD_{it}\times SIZE_{it}$	−	-0.095	-1.49	-0.079***	-3.73	-0.021	-1.55	0.033***	6.22
$HORIZON_{it}$	?	0.000	-0.35	0.005***	2.77	-0.001***	-4.10	-0.001***	-2.64
$FD_{it}\times HORIZON_{it}$	−	-0.594***	-4.65	-0.058*	-1.63	0.006	0.20	-0.087***	-9.65
$POINT_{it}$	?	-0.002	-0.79	-0.002	-0.61	0.000	-0.08	0.000	-0.46
$FD_{it}\times POINT_{it}$	+	0.124	0.66	-0.120	-1.10	0.061	1.49	-0.164***	-5.92
MB_{it}	?	0.001*	1.91	0.000	0.34	0.000	-1.14	0.001**	2.34
$FD_{it}\times MB_{it}$	+	0.312***	3.98	0.132***	2.94	0.063***	3.71	0.116***	10.20
FCF_{it}	?	-0.008	-0.51	-0.074***	-4.08	0.010***	2.97	0.005	1.19
$FD_{it}\times FCF_{it}$	−	-1.852*	-1.74	-0.482	-0.84	-1.552***	-6.74	0.181	1.25
ROA_{it}	?	0.013	1.05	0.050***	3.88	0.000	-0.04	-0.007**	-2.12
$FD_{it}\times ROA_{it}$	+	1.264*	1.81	0.008	0.09	0.902***	5.96	0.049**	2.39
$DISTRESS_{it}$	?	0.004**	2.20	-0.002	-0.91	0.001	1.60	0.000	0.04
$FD_{it}\times DISTRESS_{it}$	−	0.184	1.52	-0.019	-0.44	0.005	0.21	0.047***	4.32
Intercept	?	-0.002	-0.21	-0.020*	-1.74	0.005***	2.64	0.000	0.04
N		4585		3750		4585		3750	
R-squared(%)		5.89		3.80		35.60		47.75	

Table 5

Panel B: Regression analyses using $STRN\_D_{it}$

Variable	Expected Sign	*Dependent Variable = CAR_{it}*				*Dependent Variable = AFR_{it}*			
		Low Asymmetry		High Asymmetry		Low Asymmetry		High Asymmetry	
		Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
$STRN\_D_{it}$	?	0.004	0.44	-0.002	-0.18	0.000	-0.16	0.000	0.08
FD_{it}	+	3.606***	3.51	0.979***	3.44	0.732***	3.30	0.585***	8.10
$FD_{it}\times STRN\_D_{it}\times GOOD_{it}$	+	5.830	1.18	7.580**	2.08	0.090	0.08	2.154*	1.69
$FD_{it}\times STRN\_D_{it}\times BAD_{it}$	?	2.045	0.84	0.180	0.78	0.379	0.72	-0.128**	-2.17
$SIZE_{it}$	?	-0.001	-1.35	-0.001	-0.64	0.000	0.27	0.000	1.42
$FD_{it}\times SIZE_{it}$	−	-0.085	-1.33	-0.081***	-3.86	-0.022	-1.61	0.032***	5.95
$HORIZON_{it}$	?	0.000	-0.14	0.005***	3.02	-0.001***	-4.30	-0.001**	-2.41
$FD_{it}\times HORIZON_{it}$	−	-0.538***	-4.25	-0.049	-1.39	-0.011	-0.39	-0.088***	-9.76
$POINT_{it}$	?	-0.002	-0.80	-0.003	-0.75	0.000	0.34	-0.001	-0.72
$FD_{it}\times POINT_{it}$	+	0.031	0.17	-0.154	-1.43	0.099***	2.49	-0.182***	-6.68
MB_{it}	?	0.001**	1.94	0.001	0.49	0.000	-1.04	0.001***	2.56
$FD_{it}\times MB_{it}$	+	0.321***	4.09	0.148***	3.29	0.063***	3.69	0.117***	10.24
FCF_{it}	?	-0.013	-0.78	-0.077***	-4.28	0.011***	3.13	0.004	0.96
$FD_{it}\times FCF_{it}$	−	-2.240**	-2.14	-0.493	-0.87	-1.663***	-7.34	0.125	0.87
ROA_{it}	?	0.014	1.15	0.052***	4.01	0.001	0.21	-0.006*	-1.74
$FD_{it}\times ROA_{it}$	+	1.100*	1.77	0.024	0.30	1.307***	9.75	0.052***	2.58
$DISTRESS_{it}$	?	0.004**	2.32	-0.001	-0.81	0.000	1.26	0.000	0.12
$FD_{it}\times DISTRESS_{it}$	−	0.240**	2.01	-0.011	-0.26	-0.013	-0.51	0.047***	4.26
Intercept	?	-0.002	-0.26	-0.020	-1.69	0.006***	3.06	0.001	0.40
N		4585		3750		4585		3750	
R-squared(%)		5.38		3.50		35.24		47.54	

The *t*-statistics are based on standard errors adjusted for heteroskedasticity and firm and year clustering (Peterson 2009; Gow et al. 2010). Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Table 6
Tests for ex-post credibility of management earnings forecasts using absolute forecast error

Panel A: Mean absolute forecast error of management earnings forecasts

$STRN_{it}$	N	Mean(absferr)
0	3397	0.0192
1	2503	0.0110
2	1325	0.0186
3	647	0.0176
4	262	0.0111
5	116	0.0106
6	45	0.0100
7	21	0.0062
8	11	0.0031
9	5	0.0041
11	3	0.0028
$STRN\_D_{it}$ =0	8134	0.0162
$STRN\_D_{it}$ =1	201	0.0093
Difference		*p*-value=0.02

Panel B: Regression analyses

Variable	Expected Sign	*Dependent Variable = $ABSFERR_{it}$*			
		$STRN_{it}$		$STRN\_D_{it}$	
		Coef.	t-stat.	Coef.	t-stat.
$STRN_{it}$ *(or* $STRN\_D_{it}$*)*	–	-0.001***	-2.55	-0.007***	-5.09
$SIZE_{it}$	–	-0.003***	-7.97	-0.003***	-7.91
$HORIZON_{it}$	+	0.009***	13.69	0.009***	13.69
$POINT_{it}$	–	-0.002	-1.55	-0.002	-1.52
MB_{it}	–	0.000	-1.25	0.000	-1.33
FCF_{it}	+	-0.024**	-2.05	-0.024**	-2.05
ROA_{it}	–	-0.011	-0.69	-0.013	-0.78
$DISTRESS_{it}$	+	0.000	0.47	0.000	0.52
Intercept		-0.006	-1.56	-0.007**	-1.94
N		8335		8335	
R-squared(%)		32.89		32.73	

The *t*-statistics are based on standard errors adjusted for heteroskedasticity and firm and year clustering (Peterson 2009; Gow et al. 2010). Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Table 7
Tests for credibility of management earnings forecasts conditioned on net operating assets

Panel A: Regression analyses using $STRN_{it}$

Variable	Expected Sign	*Dependent Variable = CAR_{it}*				*Dependent Variable = AFR_{it}*			
		Low Net Operating Asset		High Net Operating Asset		Low Net Operating Asset		High Net Operating Asset	
		Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
$STRN_{it}$	?	-0.001	-0.92	0.001	0.83	0.001***	3.12	0.000*	1.72
FD_{it}	+	0.542	1.53	0.559*	1.73	0.964***	3.87	0.560***	7.71
$FD_{it}\times STRN_{it}\times GOOD_{it}$	+	1.488***	6.21	0.320*	1.91	0.157**	2.04	0.156***	3.27
$FD_{it}\times STRN\_D_{it}\times BAD_{it}$	?	0.084*	1.73	-0.008	-0.26	0.023	0.79	-0.014*	-1.85
$SIZE_{it}$	?	-0.002**	-2.21	0.000	-0.58	0.000***	2.59	0.001*	1.86
$FD_{it}\times SIZE_{it}$	−	-0.108***	-3.50	0.028	1.34	-0.042	-1.46	0.033***	6.22
$HORIZON_{it}$	?	0.004**	2.41	0.001	0.52	-0.001***	-2.88	-0.001***	-2.64
$FD_{it}\times HORIZON_{it}$	−	0.019	0.37	-0.099***	-2.57	-0.068	-1.22	-0.087***	-9.65
$POINT_{it}$	?	-0.003	-1.12	-0.001	-0.45	0.000	-0.52	0.000	-0.46
$FD_{it}\times POINT_{it}$	+	-0.049	-0.34	-0.082	-0.74	-0.281***	-5.40	-0.164***	-5.92
MB_{it}	?	0.001	1.55	0.001	0.70	0.000	0.62	0.001**	2.34
$FD_{it}\times MB_{it}$	+	0.174***	3.85	0.126**	1.95	0.097***	4.68	0.116***	10.20
FCF_{it}	?	-0.064***	-3.57	-0.017	-1.00	0.006**	2.17	0.005	1.19
$FD_{it}\times FCF_{it}$	−	-1.183*	-1.74	-0.910	-1.39	0.236	0.66	0.181	1.25
ROA_{it}	?	0.054***	4.66	-0.013	-0.80	-0.004	-1.23	-0.007**	-2.12
$FD_{it}\times ROA_{it}$	+	0.137	1.48	-0.212	-0.43	0.060	1.15	0.049**	2.39
$DISTRESS_{it}$	?	0.002	1.37	0.000	-0.17	0.001*	1.62	0.000	0.04
$FD_{it}\times DISTRESS_{it}$	−	0.086	1.53	0.031	0.44	0.172**	2.45	0.047***	4.32
Intercept	?	-0.014	-1.32	-0.004	-0.38	0.002	0.62	0.000	0.04
N		4168		4167		4168		4167	
R-squared(%)		3.74		3.52		47.47		45.45	

Table 7

Panel B: Regression analyses using $STRN\_D_{it}$

Variable	Expected Sign	*Dependent Variable = CAR_{it}*				*Dependent Variable = AFR_{it}*			
		Low Net Operating Asset		High Net Operating Asset		Low Net Operating Asset		High Net Operating Asset	
		Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
$STRN\_D_{it}$	?	-0.008	-1.41	0.010*	1.84	0.001	0.50	0.000	0.16
FD_{it}	+	0.549	1.00	0.549***	2.53	0.965	3.75***	0.005	0.03
$FD_{it}\times STRN\_D_{it}\times GOOD_{it}$	+	15.948***	5.65	2.068***	5.11	2.085	2.80***	0.778*	1.91
$FD_{it}\times STRN\_D_{it}\times BAD_{it}$	?	-0.288*	-1.77	1.284	1.61	0.092	0.34	-0.252***	-4.71
$SIZE_{it}$	?	-0.001*	-1.63	-0.002***	-6.11	0.000	2.16**	0.001***	4.62
$FD_{it}\times SIZE_{it}$	−	0.032	1.00	-0.122***	-4.41	-0.042	-1.43	0.094***	5.84
$HORIZON_{it}$	?	0.001	0.32	0.005***	3.02	-0.001	-2.88***	-0.001***	-4.29
$FD_{it}\times HORIZON_{it}$	−	-0.097*	-1.64	0.061*	1.75	-0.072	-1.46	-0.015	-1.16
$POINT_{it}$	?	-0.001	-0.39	-0.004	-0.84	0.000	-0.33	0.000	-0.58
$FD_{it}\times POINT_{it}$	+	-0.120	-0.71	-0.161	-1.32	-0.254	-4.27***	-0.161**	-2.40
MB_{it}	?	0.001	0.50	0.001**	2.41	0.000	0.80	0.000	-0.38
$FD_{it}\times MB_{it}$	+	0.126	0.58	0.189**	2.33	0.103	4.76***	0.077	1.51
FCF_{it}	?	-0.020	-0.67	-0.068	-1.47	0.006	1.97**	0.005	1.13
$FD_{it}\times FCF_{it}$	−	-1.056	-0.94	-1.146	-1.52	0.273	0.77	-0.855***	-2.86
ROA_{it}	?	-0.009	-0.45	0.054***	2.46	-0.003	-1.11	-0.001	-0.29
$FD_{it}\times ROA_{it}$	+	-0.112	-0.18	0.171	1.52	0.058	1.23	1.272***	7.48
$DISTRESS_{it}$	?	0.000	-0.16	0.003	1.01	0.000	1.32	0.000	-0.04
$FD_{it}\times DISTRESS_{it}$	−	0.042	0.26	0.127	1.46	0.171	2.27**	-0.027	-0.64
Intercept	?	-0.003	-0.17	-0.013	-1.04	0.004	1.01	0.001	0.63
N		4168		4167		4168		4167	
R-squared(%)		4.11		3.35		46.86		45.54	

The *t*-statistics are based on standard errors adjusted for heteroskedasticity and firm and year clustering (Peterson 2009; Gow et al. 2010). Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.