

The Effect of Cash Flow Forecasts on Accrual Quality and Benchmark Beating

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Abstract

When analysts provide forecasts of both earnings and operating cash flow, they also implicitly provide a forecast of total operating accruals. We posit that this increases the transparency and the expected costs of accrual manipulations used to manage earnings. As the expected costs of engaging in earnings management through accrual manipulations increase, managements' incentives to do so are expected to decrease. As a consequence, we predict that accrual quality will improve and firms' propensity to meet or beat earnings benchmarks will decline following the provision of cash flow forecasts. The results of our empirical tests support our predictions. We also predict and find that firms turn to other benchmark-beating mechanisms, such as real activities manipulation and earnings guidance, in the face of cash flow forecasts. Our findings are of potential interest to investors and regulators because we identify a relatively low cost, market-driven mechanism that helps curb firms' attempts to manipulate accruals to meet analysts' earnings estimates.

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1. Introduction

When analysts provide forecasts of both earnings and operating cash flow, they also implicitly provide a forecast of total operating accruals. Thus, cash flow forecasts enable parties external to the firm to more readily decompose an earnings surprise into the portion attributable to unexpected cash flows and a portion attributable to abnormal accruals. We posit that cash flow forecasts increase the transparency of accrual manipulations used to manage earnings. As the transparency of opportunistic earnings management increases, so does the likelihood of restatements and regulatory interventions, which in turn, increases the expected costs to the firm and to managers of engaging in opportunistic earnings management. As the expected costs of engaging in earnings management through accrual manipulations increase, managements' incentives to do so are expected to decrease. Thus, we posit that by increasing the transparency of accrual manipulations, analysts' provision of cash flow forecasts serve as an effective earnings management constraint that increases the quality of reported accruals. We also predict that by reducing accrual manipulations, the provision of cash flow forecasts will reduce the likelihood that firms will meet or beat earnings targets. In addition, we hypothesize that when firms' ability to manage earnings through accruals is constrained they are likely to shift to other mechanisms in an effort to achieve earnings benchmarks. Thus, we predict that the incidence of real activities management and expectations management will increase in the presence of cash flow forecasts.

To test these conjectures, we conduct within-firm inter-temporal change tests for firms before and after analysts began providing cash flow forecasts and we benchmark our findings against a control sample. We identify a sample of firm-years for which I/B/E/S provided both earnings and operating cash flow forecasts (treatment sample) and a matched sample (matched on year and factors prior research has shown to be related to analysts' cash flow forecasts) of firm-years without cash flow forecasts (control sample). Our analysis reveals a significant decline in the magnitude of positive, negative and absolute performance-adjusted abnormal accruals, and a better mapping of accruals into cash flows after analysts

begin providing cash flow forecasts compared to the period prior to when those forecasts were first issued. We do not observe a similar increase in accrual quality for the control firms. We also find that after the provision of cash flow forecasts, firms place greater emphasis on some forms of real transaction management and downward earnings guidance in an attempt to beat analysts' earnings expectations. Despite these efforts, we find that firms are less likely to meet earnings targets after analysts begin issuing cash flow forecasts relative to before analysts' provision of cash flow forecasts. We do not observe a similar decline in the tendency to meet or beat earnings expectations for the control firms. Collectively, our inter-temporal findings allow us to draw strong inferences as to the direction of causation, which helps mitigate endogenous self-selection concerns that plague purely cross-sectional research designs. Our results provide evidence that the provision of cash flow forecasts increases the transparency of accrual manipulations and acts as a deterrent to opportunistic earnings management through accruals, thereby enhancing accrual quality.

Finally, we consider two competing explanations for our benchmark beating results. The first is that the issuance of cash flow forecasts portends a decline in economic performance of firms and this is why we observe a decline in the meet or beat tendencies of our treatment sample over time. The second is that once analysts issue cash flow forecasts, firms focus on meeting their cash flow targets at the expense of their earnings targets. We perform a variety of tests and find no evidence that either of these explanations is driving our results.

Our findings contribute to the extant literature in several ways. First, we provide evidence that analysts' cash flow forecasts serve as a deterrent to accrual manipulation, which increases the quality of accruals and reduces firms' tendency to engage in myopic meet or beat behavior that is often value destroying (Jensen, 2005). This finding is of interest to investors and regulators who share an interest in fostering honest, transparent reporting and reducing management actions that lead to costly restatements and regulatory interventions.

Our research also contributes to our understanding of alternative mechanisms for deterring earnings management. Recent research indicates that the Sarbanes-Oxley Act led to improved earnings

quality (Cohen, Dey and Lys, 2008) and that annual audits help curb benchmark-beating behavior (Brown and Pinello, 2007). But these legislative mandates and regulatory monitoring mechanisms are costly to firms and ultimately to shareholders. Analysts' cash flow forecasts, on the other hand, are provided at relatively low cost to investors. Thus, while prior literature demonstrates that costly regulatory mechanisms improve earnings quality, our study identifies a relatively inexpensive provision of information intermediaries that serves to deter earnings management through accruals and positively impacts accrual quality. Prior research contends that cash flow forecasts facilitate market participants' assessment of firm solvency (DeFond and Hung, 2003). Our findings suggest that cash flow forecasts play an even broader role in the financial reporting process by serving as a disciplining mechanism that directly affects managers' opportunistic reporting behavior.

Finally, our findings extend the literature that examines the link between accrual management and beating analyst forecasts. While some studies find little evidence of a link (Dechow, Richardson, Tuna, 2003; Phillips, Pincus and Rego, 2003), other studies find some evidence that accrual manipulation contributes to the observed discontinuity of earnings surprises around zero (Payne and Robb, 2000; Ayers, Jiang and Yeung, 2006). Our study suggests that cash flow forecasts lead to an improvement in earnings quality and to a decrease in the likelihood of meeting analysts' earnings forecasts. Thus, we offer evidence (albeit indirect) that accrual manipulation plays some role in the disproportionate number of firms that report positive earnings surprises.

The remainder of our paper is organized as follows. Section 2 reviews prior literature and develops our hypotheses. Section 3 describes our sample and methodology, and Section 4 presents descriptive statistics and results of our empirical tests. Section 5 considers alternative explanations for our benchmark beating results. Section 6 concludes and offers directions for future research.

2. Prior Research and Hypotheses Development

2.1 The Costs of Accrual Manipulation

Prior research provides compelling evidence that earnings restatements and Securities and Exchange Commission (SEC) Accounting and Auditing Enforcement Releases (AAERs) impose

significant costs on firms' shareholders and on managers responsible for the financial misconduct. Restatements and SEC AAERs are associated with significant declines in firm value (Karpoff, Lee and Martin, 2008a; Feroz, Park and Pastena, 1991; Dechow, Hutton and Sloan, 1996; Beneish, 1999; Palmrose, Richardson and Scholz, 2004), and significant increases in firms' cost of equity (Hribar and Jenkins, 2006) and CEO turnover (Karpoff, Lee and Martin, 2008b; Agrawal and Cooper, 2009).

Karpoff et al., (2008a) estimate that for each dollar that a firm misleadingly inflates its market value through inflated earnings, on average, it loses this dollar plus an additional \$3.08 when the accounting misconduct is revealed through SEC or Department of Justice (DOJ) enforcement actions. They estimate that roughly two-thirds of this loss in value reflects "reputational loss"—the decrease in the present value of the firm's future cash flows that is expected to result as investors, creditors, customers and suppliers change the terms of trade for doing business with the firm. Karpoff et al., conclude that financial misrepresentation, if detected, is a particularly costly activity because it undermines the firm's credibility with these external parties.

In addition to decreases in personal wealth that managers face from lost value in the firm's shares they hold, managers face other personal costs when financial misconduct is revealed. Agrawal and Cooper (2009) find strong evidence of greater turnover of CEOs, CFOs and other top management following financial restatements compared to a sample of control (non-restating) firms from the same industry. Karpoff et al., (2008b) track the fortunes of 2,206 managers identified as responsible parties in 788 SEC and DOJ enforcement actions for financial misrepresentation from 1978 through September 2006 and find that 93% lose their jobs by the end of the regulatory enforcement period. The majority of these managers are explicitly fired. Culpable managers also bear substantial financial losses through fines and restrictions on their future employment. SEC fines of individuals implicated in financial fraud average \$8.3 million and roughly 40% of the executives have been barred from serving as an officer or director of another public company registered with the SEC.

Managers can opportunistically manage earnings either through real transactions management (e.g., cutting back on R&D or advertising expenditures) or through accruals manipulation. While firms

are generally free to engage in real transaction management without attracting intervention of auditors or regulators, firms increase the risk of restatements and SEC investigation when managers engage in accruals manipulation to manage earnings because, ex post, these accrual manipulations may be deemed by regulators to fall outside the boundaries of GAAP. The expected costs of restatements and regulatory intervention, outlined earlier in this section, increase as the visibility of the accrual manipulation becomes more transparent.

2.2 Cash Flow Forecasts and the Transparency of Accrual Manipulations

The dissemination of cash flow forecasts by analysts is a relatively recent phenomenon in the U.S. Forecasts of operating cash flow for U.S. firms began appearing in the I/B/E/S detail files in 1993, and have increased in prevalence over the last decade. For example, we find in untabulated results that the proportion of US firms in I/B/E/S (with data available in COMPUSTAT and CRSP) for which analysts predicted both earnings and operating cash flows was roughly 1% in 1993, 12% in 1999, and 39% in 2003.

Both I/B/E/S documentation and DeFond and Hung (2003) indicate that analysts' cash flow forecasts do not merely represent crude manipulations of earnings, such as EBITDA; rather, they represent relatively sophisticated projections of cash flows from continuing operations. Thus, when analysts forecast both earnings and cash flows, they also implicitly forecast total operating accruals. Given both an earnings and a cash flow forecast, outsiders can readily decompose an earnings surprise into the portion attributable to cash flow and the portion attributable to accruals. Therefore, cash flow forecasts provide regulators and other external parties with a readily available and objective benchmark for assessing abnormal accrual manipulations in either a positive (income-increasing) or negative (income-decreasing) direction.

2.3 Prior Research on the Predictive Ability and Disciplining Implications on Cash Flow Forecasts

Several recent papers investigate the predictive ability and disciplining implications of analyst and management cash flow forecasts. Givoly, Hayn and Lehavy (2009) compare the accuracy of analysts' cash flow and earnings forecasts and find that analysts' cash flow forecasts are less accurate and

of lower quality than earnings forecasts.¹ However, they do not directly test whether the provision of cash flow forecasts improves analysts' ability to forecast earnings (this question is addressed in the Call, Chen and Tong (2008) paper discussed below). Givoly et al. also find that a measure of expected accruals based on the difference between analysts' earnings and cash flow forecasts has very low power in detecting (predicting) earnings management. They interpret this result to imply that cash flow forecasts and implied accrual forecasts are of low quality, and consequently are of marginal value. Note, however, that this test presumes that the provision of cash flow forecasts has no deterrent effect on firms' earnings management activities. If, as we posit, analysts' cash flow forecasts act to deter firms from engaging in earnings management through accruals, then it is not clear that one would expect to find analysts' implied accrual forecasts to be predictive of earnings management. To the contrary, if analysts' cash flow forecasts constrain firms' accrual manipulations as we conjecture, then one would not expect to find analysts' implied accrual forecasts to be predictive of earnings management.

Call, Chen and Tong (2008) investigate whether analysts' earnings forecasts are more accurate when they also issue cash flow forecasts. The authors reason that analysts are more likely to attend to the individual components of earnings (cash flows and accruals) and have a better grasp of the time-series properties of earnings and its components when they forecast both earnings and cash flows. Consistent with their predictions, they find that analysts' earnings forecasts that are accompanied by cash flow forecasts are more accurate than those not accompanied by cash flow forecasts.

Call (2008) posits that when analysts issue cash flow forecasts, they serve an important monitoring role over firms' reported cash flow information, which improves its predictive ability. Consistent with his predictions, Call finds that the ability of reported cash flows to predict future cash flows is greater for firms whose analysts issue cash flow forecasts, and improves when analysts begin forecasting cash flows. Call also finds that firms' abnormal operating cash flows are significantly smaller in the years immediately after analysts' cash flow forecasts are initiated. Although not tested directly, this

¹ In their comparison of the accuracy of analysts' cash flow and earnings forecasts, Givoly et al. (2009) do not fully control for the fact that operating cash flows are inherently more volatile than earnings, and that there is less management guidance for cash flow forecasts compared to earnings forecasts. Both of these factors contribute to higher accuracy of earnings forecasts relative to cash flow forecasts.

finding suggests that analysts' cash flow forecasts deter managers from engaging in earnings management through real activities management in ways that affect cash flows. We take a closer look at this issue later in this paper.

Further evidence that cash flow forecasts act to constrain opportunistic earnings management is provided by Wasley and Wu (2006). They predict that when management issues cash flow forecasts, they precommit to a certain composition of earnings in terms of cash flows versus accruals, thus reducing the degrees of freedom in earnings management. Consistent with this prediction, they find that when managers are managing earnings upward by manipulating discretionary accruals, they are less likely to issue a management cash flow forecast because doing so would draw attention to the upward manipulation in earnings.

2.4 Hypothesis on the Implications of Analysts' Cash Flow Forecasts on Earnings (Accrual) Management

We posit that analysts' provision of operating cash flow forecasts makes manipulation of accruals more transparent, thereby increasing the expected costs to firms and managers of engaging in earnings management through accrual manipulation. As the expected costs of accrual manipulations increase, managements' incentives to do so are expected to decrease. Thus, we posit that by increasing the transparency of accrual manipulations, analysts' provision of cash flow forecasts serve as an effective earnings management constraint that increases the quality of reported accruals. Accordingly, we expect firms for which analysts provide cash flow forecasts to exhibit higher quality accruals (i.e., smaller positive, negative and absolute abnormal accruals and less accrual noise) following the provision of cash flow forecasts relative to before these forecasts were issued. We formalize this hypothesis as H1 (stated in the alternative form):

H1: Earnings management through accruals decreases after the provision of cash flow forecasts

2.3 Cash Flow Forecasts and Firms' Choice of Alternative Benchmark Beating Mechanisms

Prior research suggests that managers have strong incentives to beat earnings benchmarks. A recent survey by Graham, Harvey and Rajgopal (2005) indicates that over 80% of the financial executives

surveyed agreed or strongly agreed that capital market-based incentives are a major reason why their companies try to meet earnings benchmarks. Over 74% of the financial executives surveyed agreed or strongly agreed that “meeting earnings benchmarks helps us convey our future growth prospects to investors.” Consistent with these survey results, Degeorge, Patel, and Zeckhauser (1999) document an “unusual pileup” of observations in the empirical distribution of earnings surprises at and just above zero: too many firms seem to just meet or beat analysts’ earnings forecasts relative to the number of firms that just miss these forecasts. Brown and Caylor (2005) find that: 1) the tendency of firms to avoid reporting negative earnings surprises has been increasing over time, and 2) analysts’ earnings expectations now represent the most important threshold firms seek to exceed.²

A variety of studies have examined whether accrual management is associated with the disproportionate number of reported earnings surprises equal to a few cents per share or less. In general, the findings have been mixed. Some studies (Payne and Robb, 2000; Matsumoto, 2002; Ayers et al., 2006) find that accrual management is related to meeting or beating analysts’ earnings forecasts, while other studies fail to find such an association (Schwartz, 2004; Phillips et al., 2003). We argue that the presence of cash flow forecasts makes accrual manipulations to achieve EPS targets more transparent. This transparency reduces the stock price benefit of an accrual manipulating strategy (Melendrez, Schwartz and Trombley, 2009), and also potentially increases its cost (e.g., through a higher probability of regulatory or stockholder scrutiny). Thus, we contend that analysts’ cash flow forecasts serve to constrain firms in their ability to manage accruals to meet earnings targets.

When firms’ ability to manage earnings through accruals is constrained they are likely to shift to other mechanisms to meet earnings benchmarks. Roychowdhury (2006) finds that firms manipulate real activities, such as cutting discretionary expenditures, raising production levels, or offering excessive discounts to generate higher earnings. Prior research suggests that firms shift to these real activities management techniques to manage earnings when the costs of managing earnings through accruals increases (Cohen, Dey and Lys, 2008; Cohen and Zarowin, 2008). In addition, managers can guide

² Other thresholds investigated in the literature involve avoiding losses and earnings declines – see Burgstahler and Dichev (1997) for example.

analysts' expectations downward in order to meet EPS forecasts (Matsumoto 2002, Bartov et al 2002). If cash flow forecasts constrain accrual management, it is reasonable to expect that firms will turn to these alternative benchmark beating mechanisms in the face of cash flow forecasts. Thus, we predict that the incidence of real activities management and expectations management will increase in the presence of cash flow forecasts. We formalize these hypotheses as H2 and H3 (stated in the alternative form):

H2: Real activities earnings management increases after the provision of cash flow forecasts.

H3: Downward expectations management (guidance) increases after the provision of cash flow forecasts.

These alternative benchmark beating mechanisms are not costless substitutes for accrual management, however. Managing expectations downward can lead to negative stock price reaction as analysts' forecasts are revised accordingly (Stickel, 1991), and may also lead to a potential lack of management credibility with investors in the future. Real transactions management, such as cutting current discretionary expenditures like R&D, can lead to poorer future operating performance (Bhojraj et al., 2009) and adversely affect firm value.

In addition to cost considerations, not all firms will necessarily find these alternative mechanisms for meeting earnings targets equally effective. For example, some firms may have more success than others at guiding analysts' earnings expectations, based either on greater credibility from prior analyst interactions, or because these firms share a greater actual or potential economic bond with analysts and their brokerages (e.g., the firms are net equity issuers – see Richardson, Teoh, and Wysocki, 2004). Finally, some firms may be unable to cut discretionary expenditures in a timely fashion if resource commitments have already taken place. For example, it may be impossible for a firm to meaningfully cut R&D expenditures late in the year to avoid a negative earnings surprise if the majority of its R&D budget has already been expended. In short, even if firms, on average, increase their level of expectations management or cut discretionary spending in the face of cash flow forecasts, such activities are costly. Therefore, they may not serve as perfect substitutes for accrual manipulation to achieve earnings benchmarks. Accordingly, we expect the provision of cash flow forecasts will, on average, serve to

constrain firms' ability to meet earnings targets. We formalize this hypothesis as H4 (stated in the alternative):

H4: The probability of meeting or beating analysts' earnings targets decreases after the provision of cash flow forecasts

3. Sample and Methodology

In this section, we describe our sample and lay out the methodology used to test the hypotheses developed above. Section 3.1 briefly describes our data sources, and section 3.2 provides an overview of our design, along with a detailed description of our tests of H1 through H4. We employ a time-series design with a treatment sample (firms with cash flow forecasts) and a control sample (firms without cash flow forecasts). This design allows us to infer changes in the following characteristics after the issuance of cash flow forecasts: accrual quality (H1); real activities earnings management (H2); downward earnings guidance (H3); and the tendency to meet EPS targets (H4).

3.1 Data

We initially select all annual EPS forecasts for U.S. firms on the I/B/E/S detail file from 1993 to 2004. We use annual data because the majority of cash flow forecasts are provided on an annual basis. Because we use a variety of accounting variables in the regressions that follow, we also eliminate observations lacking necessary data from COMPUSTAT and CRSP. There are 5,237 firm-years with both an EPS forecast and a cash flow per share forecast that meet our data requirements over our sample period compared to 32,308 firm-years with only an EPS forecast.

3.2 Methodology

To test our time-series predictions, we employ the following methodology. For each firm with a cash flow forecast in our sample period, we identify the first year in which analysts' cash flow forecasts appear in the I/B/E/S detail file (the "initial" year). We then select all observations for each firm in the three years prior to this initial year. These observations comprise our pre-cash flow forecast (pre-CF) sub-sample. We also select all available observations for the two years subsequent to this initial year for each firm, with the requirement that cash flow forecasts exist in these subsequent years. Observations for

the initial and subsequent two years for each firm comprise our post-cash flow forecast (post-CF) sub-sample.³

The choice of a 3-year window for the pre-CF and post-CF sub-periods is somewhat arbitrary and reflects a tradeoff between selecting a window long enough to allow firms' earnings management choices to adjust to the implications of cash flow forecasts, yet short enough to avoid picking up other potential economic events common to all sample firms that could impact earnings quality measures. Our pre-CF sub-sample contains 3,965 observations, with the median (and mode) number of observations per firm equaling three. Our post-CF sub-sample contains 3,266 observations, with the median (and mode) number of observations per firm equaling two. Together, these 7,231 observations comprise our "treatment" sample.

We also utilize a control sample to help ensure the inter-temporal patterns we uncover are not common to all firms over the sample period. Thus, we seek a sample of firms for which analysts do not forecast cash flows that are similar to firms for which analysts do forecast cash flows. To accomplish this, we use a propensity-score matching procedure (Rosenbaum, 2002; Rosenbaum and Rubin, 1983; Armstrong, Jagolinzer and Larcker, 2009; Gassen and Skaife, 2009). For each "initial" firm-year in our treatment sample described above, we select a matching firm (without a cash flow forecast) in the same year that has the closest "propensity score". This propensity score is the predicted value from a logit regression of the incidence of cash flow forecasts on the determinants identified by DeFond and Hung (2003) (See Appendix A).⁴ We then look 3 years forward and back to construct pseudo pre-CF and post-CF periods for each control firm. Although control firms have no true "event year" like our treatment firms, this process yields a control sample with pre-CF and post-CF periods that have a similar dispersion in calendar time to the periods that comprise our treatment sample.

³ DeFond and Hung (2003) indicate that I/B/E/S attempts to distribute all cash flow forecasts received from contributing analysts to its clients. However, it is possible that the year in which the first cash flow forecast for a given firm appears in the I/B/E/S tapes may not necessarily correspond to the first year a particular analyst included a cash flow forecast in a research report for that firm. Even so, dissemination of cash flow forecasts by I/B/E/S certainly makes them more public and should have an effect on market expectations. In any event, if our methodology fails to accurately identify the period before and after market participants obtain cash flow forecast information, this should bias against findings results consistent with our predictions.

⁴ Our results are inferentially similar if we simply select matching firms on the basis of size and industry.

To maintain the statistical independence of our tests, we allow a matching firm-year to be used only once. If a matching firm-year is the best match (based on propensity score and year) for more than one cash flow forecast firm-year, we break the tie by selecting the match with the smallest absolute difference in propensity score. In addition, matched firms are only retained if they do not have a cash flow forecast in either of the two years after the initial matching year. Our control sample consists of 4,920 firm-years, with 2,126 observations in the pre-CF sub-sample, and 2,794 observations in the post-CF sub-sample.

3.2.1 Accrual Quality Tests

We test the prediction that cash flow forecasts deter accrual manipulation (H1) by examining inter-temporal shifts in two measures of accrual quality. We employ more than one measure because little consensus exists as to which accrual quality metric is preferable. Our first measure of accrual quality is abnormal accruals as defined by the forward-looking, modified Jones model (Dechow, Richardson, and Tuna, 2003). We estimate the following model by year and 2-digit SIC code, for all observations on COMPUSTAT from 1993-2004:

$$TotalAccruals_{it} = \alpha + \beta_1((1+k)\Delta Sales_{it} - \Delta Receivables_{it}) + \beta_2 PPE_{it} + \beta_3 TotalAccruals_{it-1} + \beta_4 SalesGrowth_{it+1} + \varepsilon_{it} \quad (1)$$

All variables are scaled by average total assets, except sales growth which is scaled by lagged sales (see Dechow et al. 2003 for further estimation details). Residuals from equation (1) serve as our measure of abnormal accruals for each firm-year in our sample.

We test for temporal shifts in average abnormal accruals by pooling together our treatment and control samples and estimating the following regression:

$$AbnAcc = \alpha + \beta_1 Treat + \beta_2 Post_CF + \beta_3 Post_CF * Treat + \beta_4 ROA + \beta_5 ROA * Treat + \varepsilon \quad (2)$$

where *AbnAcc* is either the positive, negative, or the absolute value of abnormal accruals. *Treat* is an indicator variable set to 1 if the observation belongs to the treatment sample, and zero otherwise. *Post_CF* is an indicator variable set to 1 if an observation belongs to the post-CF forecast period in either sample,

and zero if the observation falls in the pre-CF forecast period. *ROA* is income before extraordinary items scaled by average total assets. We include *ROA* in the regression to control for differences in performance across the two samples because prior research documents a relation between abnormal accruals and performance (e.g., Dechow, Sloan, and Sweeney, 1995). Additionally, Kothari, Leone, and Wasley (2005) offer evidence that controlling for *ROA* reduces the probability of Type I error in earnings management studies where performance differences are not part of the hypotheses being tested.

Our interest in equation (2) centers on β_2 and β_3 . $\beta_2 + \beta_3$ (β_2) measures the incremental change in abnormal accruals for the treatment (control) sample in the post-CF forecast period relative to the pre-CF forecast period. Therefore, β_3 is the incremental shift in abnormal accruals unique to treatment firms. Consistent with our conjecture that the provision of cash flow forecast will deter both income-increasing and income-decreasing earnings management, we expect β_3 and $\beta_2 + \beta_3$ to be negative for positive and absolute values of abnormal accruals, and positive for negative abnormal accruals for the treatment sample. That is, we expect the average magnitude of positive, negative and absolute value of abnormal accruals to become smaller if the provision of cash flow forecasts constrains managers opportunistic accruals manipulations.

Our second measure of accrual manipulation involves a measure of accrual noise in the spirit of Dechow and Dichev (2002). Within both our treatment and control samples, we estimate the following regression separately for the pre-CF and post-CF periods:

$$Accruals_{it} = \alpha + \beta_1 CashFlow_{it-1} + \beta_2 CashFlow_{it} + \beta_3 CashFlow_{it+1} + \varepsilon_{it} \quad (3)$$

All variables are scaled by average total assets.

We compute the difference in the estimate of overall residual variance, $s^2(\varepsilon)$, from equation (3) for the pre-CF and post-CF periods for both our treatment and control samples. Higher quality accruals are expected to map better into past, present and future cash flows. Thus, observations with noisier (lower quality) accruals will exhibit higher residual variances, $s^2(\varepsilon)$ from equation (3). If cash flow forecasts deter opportunistic earnings management, we expect $s^2(\varepsilon)$ to be smaller in the post-CF period relative to the pre-CF period for treatment firms. We make no predictions relative to the change in $s^2(\varepsilon)$ for control

firms. We test the statistical significance of differences in estimates of residual variance using an F-test described in the Appendix B.

3.2.2 Testing for Shifts in Real Activities Management

To test the prediction that the use of alternative benchmark-beating mechanisms increases after the provision of cash flow forecasts, we first examine whether firms exhibit greater evidence of managing earnings through real activities manipulation after analysts begin providing cash flow forecasts. Following Roychowdury (2006), we measure real activities manipulation as abnormal levels of discretionary expenditures, production, and cash flows from operations. We estimate abnormal discretionary expenditures (AbnDisc) as the residuals from the following regression estimated by year and 2-digit SIC code, for all observations on COMPUSTAT from 1993-2004:

$$Disc_{it} = \alpha \left(\frac{1}{Assets_{i,t-1}} \right) + \beta_1 Sales_{it} + \varepsilon_{it} \quad (4)$$

All variables are scaled by lagged total assets. We measure discretionary expenses as R&D plus advertising plus SG&A. H2 predicts that discretionary expenditures of treatment firms should be lower after the provision of cash flow forecasts. Thus, we expect AbnDisc to be more negative in the post-CF forecast period compared to the pre-CF period for our treatment firms. We make no prediction for our control firms.

We estimate abnormal production (AbnProd) as the residuals from the following regression estimated for the COMPUSTAT population by year and two digit industry:

$$Prod_{it} = \alpha \left(\frac{1}{Assets_{i,t-1}} \right) + \beta_1 Sales_{it} + \beta_2 \Delta Sales_{it} + \beta_3 \Delta Sales_{i,t-1} + \varepsilon_{it} \quad (5)$$

Production costs equal cost of goods sold plus the change in inventory. Following the arguments in Roychowdury (2006), H2 predicts that abnormal production will be higher after the provision of cash flow forecasts as firms try to increase earnings by allocating a larger portion of fixed overhead costs to over-produced units in inventory. Thus, we expect AbnProd to be more positive in the post-CF forecast period compared to the pre-CF period for our treatment firms. We make no prediction for our control firms.

We estimate abnormal operating cash flows (AbnCFO) as the residual from the following regression estimated by year and two digit industry:

$$CFO_{it} = \alpha \left(\frac{1}{Assets_{i,t-1}} \right) + \beta_1 Sales_{it} + \beta_2 Sales_{i,t-1} + \varepsilon_{it} \quad (6)$$

The logic behind this specification is that firms may try to boost sales and earnings by offering higher discounts to customers or by channel stuffing near the end of the year. However, these real transaction management actions will lower the amount of cash collected per dollar of sales in the current period. This is expected to result in negative abnormal cash flows in equation (6). To avoid the offsetting effects that changes in discretionary expenditures can have on abnormal CFO (Cohen and Zarowin 2008), we add discretionary expenditures to cash flow from operations before estimating equation (6). H2 predicts that abnormal cash flows of treatment firms should be lower after the provision of cash flow forecasts compared to the pre-CF period as firms try to ease credit terms and offer discounts to generate higher sales and profits. We make no prediction for our control firms.

3.2.3 Testing for Shifts in Expectations Management

To estimate downward expectations management, we follow the methodology of Matsumoto (2002). We estimate a time-series model of EPS changes (adapted for annual data) to assess the extent to which analysts forecasts for a given firm-year are lower than expected. Specifically, we estimate the following regression using all available data in I/B/E/S and CRSP from 1990-2004:

$$\Delta EPS_{it} = \alpha + \beta_{1t} \Delta EPS_{it-1} + \beta_{2t} Cumret_{it} + \varepsilon_{it} \quad (7)$$

where Cumret is the buy-and-hold, market adjusted return for firm i, cumulated beginning the month after the earnings announcement for time t-1 and ending the month before the earnings announcement for time t. All ΔEPS variables are scaled by lagged stock price. Equation (7) is an attempt to model the current change in EPS as a function of the last year's change in EPS plus current year news imbedded in stock returns. We estimate equation (7) annually and use the coefficient estimates to generate the expected change in EPS for the current year for all observations with available data in both treatment and control samples. We then add this expected change to the prior year EPS to obtain the "expected" forecast of

current EPS. We create a dummy variable for downward expectations management, *DOWN*, equal to 1 if the last actual forecast of EPS prior to the earnings announcement date is less than the “expected” forecast, and zero otherwise.

To test whether analysts provision of cash flow forecasts increases firms’ propensity to engage in downward expectations management (H3) we estimate the following logistic regression model:

$$\text{Pr ob}(\text{DOWN} = 1) = \alpha + \beta_1 \text{Post_CF} + \beta_2 \text{Size} + \beta_3 \text{MTB} + \beta_4 \text{RD} + \beta_5 \text{Loss} + \beta_6 \text{Litigation} + \beta_7 \text{Labor} + \beta_8 \text{Issue} + \beta_9 \text{Relevance} + \varepsilon \quad (8)$$

POST_CF is set equal to 1 if the observation comes from the post-CF period and zero otherwise. H3 predicts that as firms’ ability to manage earnings upward through accruals becomes more constrained following the provision of cash flow forecasts, their propensity to guide analysts’ earnings expectations downward is likely to increase. Accordingly, we expect β_1 to be positive for the treatment sample. We make no prediction for the control sample. The remaining variables are controls based upon the findings of Masumoto (2002) and are defined in detail in the table footnotes. Firms with higher market values (*Size*), market-to-book ratios (*MTB*), R&D intensity (*RD*), higher litigation risk (*Litigation*), higher labor intensity (*labor*), and greater value relevance of earnings (*Relevance*) have greater incentives to meet earnings targets, so we expect these characteristics to be positively associated with downward guidance. Firms with losses (*Loss*) have less value relevant earnings (i.e., leading to less incentive to manage downward), but also have poor prospects (which could lead to lower expectations), so we do not make a prediction for the sign on this variable. Finally, we augment the variables from Matsumoto with a dummy variable for equity issuance (*Issue*), given the findings of Richardson et al (2004), who link expectation walk-downs to equity issuances. We expect a positive loading on this variable. To avoid cumbersome interactions, we estimate equation (8) separately for our treatment and control samples.

3.2.4 Linking Changes in Accruals Management to Alternative Benchmark Beating Mechanisms

In an effort to more directly link changes in discretionary accruals following the provision of cash flow forecasts to increases in real activities management and earnings guidance, we estimate the following cross-sectional logit model for treatment firms:

$$\begin{aligned} \text{Pr ob}(CUT_ACCRUALS = 1) = & \alpha + \beta_1 \text{AbnDisc} + \beta_2 \text{Abn Pr od} + \beta_3 \text{Abn.CFO} \\ & + \beta_4 \text{Expectatio ns_Mgmt} + \varepsilon \end{aligned} \quad (9)$$

CUT ACCRUALS is a dummy variable equal to 1 if a firm cuts (reduces) its average level of positive abnormal accruals from the pre-CF to the post-CF period . All other variables are as previously defined. This logit model is estimated across treatment firms in the post-CF period (after the issuance of cash flow forecasts). We expect firms that reduce their income-increasing abnormal accruals following the provision of cash flow forecasts to have lower (more negative) abnormal discretionary expenditures and abnormal operating cash flows, higher abnormal production and are more likely to engage in downward expectations management. Accordingly, we expect β_1 and β_3 to be negative and β_2 and β_4 to be positive.

3.2.5 Testing for Shifts in Benchmark Beating

Finally, to test our prediction involving the incidence of benchmark beating following the provision of cash flow forecasts (H4), we use logistic regression to estimate the probability that a firm will meet or beat analysts' earnings expectations, given a vector of explanatory variables. Our dependent variable, meet or beat (*MB*), is a dummy variable equal to 1 if the firm's reported earnings equals or exceeds analysts' earnings forecasts (i.e., EPS surprise is zero or positive), and zero otherwise (i.e., EPS surprise is negative). We define earnings surprises as actual earnings per I/B/E/S less the last available analyst forecast of earnings prior to the annual earnings announcement date. Again, to avoid cumbersome interactions, we estimate our logistic regression separately for our treatment and controls samples. Our variable of interest, post-cash flow forecast period (*POST_CF*), is a dummy variable equal to 1 if the firm-year in question falls in the post-CF period, and zero otherwise. We also include a set of control variables (explained in more detail below) as covariates. Specifically we estimate:

$$\begin{aligned} \text{Pr ob}(MB = 1) = & \alpha + \beta_1 \text{POST_CF} + \beta_2 \text{CFO} + \beta_3 \text{ACC} + \beta_4 \text{CAPINT} + \beta_5 \text{ALTZ} + \beta_6 \text{CHOICE} + \beta_7 \text{SIZE} + \\ & + \beta_8 \text{BLOAT} + \beta_9 \text{SHARES} + \beta_{10} \text{MTB} + \beta_{11} \text{FOLLOW} + \beta_{12} \text{PMB} + \beta_{13} \text{REVDOWN} + \beta_{14} \text{WRITE} + \beta_{15} \text{LOSS} \\ & + \beta_{16} \text{EARNNGROW} + \varepsilon \end{aligned} \quad (10)$$

The definitions and data sources for all variables used to estimate equation (10) are provided in Appendix C. Estimates from equation (10) allow us to assess the effect of cash flow forecasts on the probability that a firm will meet or beat analysts' earnings forecasts (i.e., zero or positive forecast error) versus the alternative of missing analysts' forecasts (i.e., negative forecast error). H4 predicts that the coefficient on *Post_CF* will be negative for our treatment sample. We make no predictions for our control sample.

Our vector of controls includes variables designed to predict whether firms will meet or beat their earnings targets or variables that are known to be associated with the provision of cash flow forecasts. We include cash flow from operations (*CFO*) because this is a variable that prior research (Phillips et al., 2003; Ayers et al., 2006) has utilized as a measure of performance to help explain why firms meet their earnings targets.⁵ We also include five of the economic determinants of cash flow forecast provision identified by DeFond and Hung (2003): 1) accruals (*ACC*), 2) capital intensity (*CAPINT*), 3) heterogeneity of accounting choices (*CHOICE*), 4) Altman's Z score (*ALTZ*) and 5) market value (*SIZE*) [see Appendix A].⁶ We include these controls to guard against the possibility that shifts in these variables may be correlated with firms' tendencies to meet or beat analysts' forecasts (*MB*). Firms in poor financial condition are expected to have a harder time meeting earnings expectations relative to other firms. Thus, we expect a positive loading on Altman's Z-Score (*ALTZ*).⁷ Prior research (Barton and Simko 2002, Matsumoto 2002) has shown that *SIZE* is positively related to meeting earnings targets, so we expect a positive loading on this variable. We do not predict the signs on the remaining determinants of cash flow forecast provision.

⁵ Phillips et al. (2003) and Ayers et al. (2006) actually use the change in cash flows as a RHS variable. We use the level of cash flow because the distribution of EPS surprises is constructed using the level of net earnings. Our findings are qualitatively similar if we use changes in CFO rather than levels.

⁶ Unlike DeFond and Hung (2003), who use the absolute value of accruals, we use the signed value of accruals in our regressions because, together with CFO, this variable constitutes ROA, a basic performance control. Inferences are identical if we use the unsigned value of accruals. We also do not include the sixth determinant identified by DeFond and Hung, earnings volatility, because this is likely a stable characteristic given our relatively short pre- and post-CF periods and we have limited annual time-series observations in each sub-period with which to estimate this measure.

⁷ Lower Altman's Z scores indicate poorer financial health.

We also include additional control variables based on the findings of Barton and Simko (2002) that firms with “bloated” balance sheets (history of positive cumulative accruals) may be less able to manage accruals upward to meet current earnings targets. Bloat is defined as net operating assets (essentially total assets less cash) scaled by sales. Firms with a large number of shares outstanding, all else equal, will have to engage in a larger dollar amount of earnings management to generate a one penny increase in EPS. As a result, we include both net asset bloat (*BLOAT*) and the average number of shares outstanding (*SHARES*) in equation (10) and we expect the coefficients on these variables to be negative.

Firms with high growth prospects (high market-to-book (*MTB*) ratio) face greater pressure to meet earnings targets (Skinner and Sloan, 2002) as do firms with a large analyst following (Barton and Simko, 2002). Therefore, we include the *MTB* ratio and the number of analysts following a firm in a given year (*FOLLOW*) in equation (10). We expect the coefficients on *MTB* and *FOLLOW* to be positive. Barton and Simko (2002) also demonstrate that firms that meet earnings targets in the prior period are more likely to do so in the current period, so we include a dummy variable (*PMB*) to capture this effect and expect this variable to be positively related to *MB*.

Both Matsumoto (2002) and Bartov et al (2002) offer evidence that firms manage expectations to “talk-down” analysts in order to meet earnings forecasts. Accordingly, we create a dummy variable, *REVDOWN*, to indicate whether analysts’ forecasts have been revised downward during the year. *REVDOWN* is equal to 1 if the last forecast of annual EPS prior to the announcement date is less than the first forecast for that year. Because expectations management is a mechanism for avoiding negative earnings surprises, one might expect *REVDOWN* to be positively related to *MB*. However, downward revisions may also be a sign of bad news for the period and may actually be negatively related to *MB* (Barton and Simko, 2002). Thus, we do not predict the sign of the coefficient on this variable.

Finally, a primary concern when testing for shifts in benchmark beating over time is that shifts in performance before and after the provision of cash flow forecasts may explain firms’ propensities to beat earnings targets. Because we include both *CFO* and *ACC* in equation (10), we effectively control for differences in ROA. However, we also add the following performance-related dummy variables:

WRITEOFF, equal to 1 if the firm had asset write downs during the year, and zero otherwise. *LOSS* is set equal to 1 if the firm incurred a loss for the year, and zero otherwise. *EARNGROW* is set equal to 1 if earnings this year grew from last year, and zero otherwise. We expect *WRITEOFF* and *LOSS* to be negatively related to *MB*, while we expect a positive relation between *MB* and *EARNGROW*. In addition to the controls discussed above, we also include year and industry dummies in equation (10) to control for year and industry effects.

4. Results

4.1 Descriptive Statistics

Table 1 presents descriptive statistics for our cash flow forecast and matched control samples. Panel A presents descriptives for firms with cash flow forecasts, while panel B summarizes data for control firms. To reduce the influence of outliers, all continuous variables have been winzorized at the 1st and 99th percentiles of their respective distributions. Table 1 indicates that firms with cash flow forecasts are larger and have higher Altman Z-scores (better financial health) than our matched firms. However, they have lower capital intensity and total accruals.⁸ Interestingly, the additional control variables not considered “determinants” of cash flow forecast provision are significantly different across samples as well. Firms with cash flow forecasts have higher operating cash flow, higher market-to-book ratios, more shares outstanding, and larger analyst following, relative to their matched counterparts. Firms with cash flow forecasts also exhibit a higher incidence of current and prior meet or beat activity. Finally, firms with cash flow forecasts have a higher (lower) incidence of asset write offs (losses), and a higher incidence of positive earnings growth.

Panel C contains mean values of the variables in panel A for the pre-CF and post-CF periods for firms with cash flow forecasts. We present both two-sample and paired t-tests. There is some evidence of a decline in meet-or-beat activity (two-sample t-stat=-3.13), consistent with H4. One immediate

⁸ Though our matching procedure helps neutralize differences in total “propensity scores” across samples (see Appendix A), it does not ensure there are no differences in the average values of the individual variables that determine the propensity score. For example, a treatment firm could be matched with smaller, more capital intensive firm. The differences in size and capital intensity have offsetting effects on the propensity score. Thus, the propensity scores between the two firms may be quite similar, but the individual variables need not be.

concern is that cash flow forecasts are associated with a decline in economic performance, which could affect meet-or-beat tendencies. However, we observe steady to slightly increasing operating cash flows, which mitigates concern that a deterioration in cash flows prompts analysts to begin providing cash flow forecasts. There is no significant change in total accrual levels. We do, however, observe decreases in Altman's Z-score and the market-to-book ratio.⁹ On the other hand, the incidence of earnings growth increases. Overall, there does not appear to be a clear pattern with respect to firm performance after the provision of cash flow forecasts for our treatment firms. Nevertheless, we control for firm performance in both our accrual tests and our meet-or-beat analysis.

4.2 Results of Accrual Tests

The results of our accrual quality tests are reported in Table 2. Panel A presents estimates of the average changes in the magnitude of positive, negative, and the absolute value of abnormal accruals moving from the pre-CF period to the post-CF period for our treatment and control samples. Given the time-series nature of the data, we cluster standard errors at the firm level to control for autocorrelation. For positive abnormal accruals, $\beta_2 + \beta_3 = -0.010$ and is significantly different from zero ($p < 0.01$), which indicates that treatment firms experience a significant decline in income-increasing abnormal accruals after the provision of cash flow forecasts. β_2 is 0.002 and insignificantly different from zero, indicating that control firms do not exhibit a similar decline in upward accrual management in the post-CF period. The difference between treatment and control samples in these changes in positive abnormal accruals (β_3) is 0.012, which is significant at $p < 0.05$.

We posit in section 2.4 that the provision of cash flow forecasts may deter downward earnings management as well as upward earnings management. Panel A of Table 2 provides some weak evidence consistent with this conjecture. The average magnitude of income-decreasing abnormal accruals among treatment firms is smaller (i.e., less negative) after the issuance of cash flow forecasts relative to before the provision of cash flow forecasts as $\beta_2 + \beta_3 = 0.009$, which is marginally significant at $p < 0.10$ (one-sided). While the temporal decline in the magnitude of negative abnormal accruals for control firms is

⁹ In untabulated analysis, we also find similar declines in these variables for our control sample, so these shifts do not appear to be unique to firms with cash flow forecasts over the sample period.

larger in magnitude ($\beta_2 = 0.014$), this change is insignificantly different from zero (two-sided test). The difference in the changes in income-decreasing abnormal accruals across samples (β_3) is insignificant. We see a similar pattern with the absolute value of abnormal accruals. Treatment firms experience a significant decline in absolute abnormal accruals after the provision of cash flow forecasts ($\beta_2 + \beta_3 = -0.009$, significant at $p < 0.01$), while the decline for control firms (β_2) is insignificant. However, we cannot reject the null that the difference across samples in shifts in the absolute value of abnormal accruals, β_3 , is zero.¹⁰ Overall, the results in Panel A of Table 2 provide strong evidence that the provision of cash flow forecasts deters income-increasing earnings management, while the evidence with respect to income-decreasing earnings management is somewhat mixed.

Panel B of Table 2 reports our second accrual quality test. Treatment firms exhibit significantly less accrual noise after the provision of cash flow forecasts compared to the pre-CF period (change in $s^2(\varepsilon) = -0.006$, significant at $p < 0.01$) consistent with an increase in accrual quality. We do not observe a similar pattern for control firms. In fact, their accrual quality actually deteriorates over time (the change in $s^2(\varepsilon) = 0.003$, which is significantly different from zero at $p < 0.01$).

In summary, our accrual tests broadly support H1 - our prediction that the provision of cash flow forecasts acts to deter earnings management through accrual manipulation. We observe significant declines in the magnitude of income-increasing, income-decreasing, and unsigned abnormal accruals, along with a decline in accrual noise after the provision of cash flow forecasts among our treatment firms. We do not observe similarly significant patterns among our control firms.

4.3 Results of Real Activities Management and Downward Earnings Guidance

Table 3 presents our tests of H2 – the prediction that the use of real activities management to increase earnings is likely to increase after the provision of cash flow forecasts. Consistent with our prediction, in panel A we observe strong evidence that average abnormal discretionary expenditures decline after the provision of cash flow forecasts among our treatment firms (p -value < 0.01). We do not

¹⁰ This result is attributable to our abnormal accrual estimates being more precise in our treatment sample. In separate regressions within our treatment and control samples, the standard error for the *Post_CF* estimate in our control sample is more than 60% larger the standard error in our treatment sample. This is consistent with the increased accrual “noisiness” in our control firms that we document in Panel B of Table 2.

observe a significant decline for control firms, and the difference across the two samples is significant (p -value $<.05$). For abnormal production, we do not observe a significant increase among our treatment or control firms. One explanation is that over-production increases inventory accruals, which is not a desirable outcome for a firm facing an implicit accrual forecast. Finally, we find a significant decline in average abnormal CFO among treatment firms after the provision of cash flow forecasts (p -value $<.01$), but we also observe a significant decline for control firms as well (p -value $<.05$). The difference is not significant across samples, so we are unable to conclude that the decrease in abnormal CFO is unique to treatment firms. Overall, the real activities tests in panel A provide modest support for H2.

Table 4 provides evidence on downward expectations management. The variable of interest in Table 4 is the coefficient on *POST_CF*, which measures the change in the probability of expectations management from the pre-CF period to the post-CF period. H3 predicts that this coefficient will be positive for our treatment sample. Consistent with this prediction, we observe a significant increase in the probability of downward expectations management after the provision of cash flow forecasts for our treatment firms (p -value $<.05$). We do not observe a similar increase for control firms, and the difference across samples is significant (p -value $<.05$). Thus, the probability of downward expectations management increases among treatment firms after the provision of cash flow forecasts, consistent with H3.

4.4 Results Linking Changes in Discretionary Accruals to Alternative Benchmark Beating Mechanisms

In this section we examine more directly whether firms trade-off real activities management and downward earnings guidance for accruals management following the provision of cash flow forecasts. Specifically, we conduct a “micro-level” analysis to ascertain whether the overall patterns we document in Tables 3 and 4 manifest themselves as cross-sectional tradeoffs at the firm level. That is, are firms that reduce accrual management more likely to use alternative benchmark beating mechanisms after the issuance of cash flow forecasts?

Table 5 contains the results of our “micro-level” analysis among treatment firms. We create a dummy variable equal to one if a firm cuts its average level of positive abnormal accruals from the pre-CF to the post-CF period, zero otherwise. We then use a logit model to estimate the relationship between

this choice and firms' real activities and expectations management after the provision of cash flow forecasts. The results indicate firms that cut their abnormal accruals in the post-CF period have lower discretionary expenditures (p-value <.01) and are more likely to have managed expectations downward (p-value<.01). Not surprisingly given our results in Table 3, we find little effect for abnormal production. Interestingly, though, we find firms that cut their abnormal accruals actually have higher abnormal cash flows in the post-CF period (p-value <.01), inconsistent with the findings in Table 3. Part of this effect could be driven by firms' attempts to manage cash flows after the provision of cash flow forecasts. Or, this effect could be driven by choices to cut costs not classified as "discretionary" in nature.¹¹ In sum, the "micro-level" results in Table 5 provide modest evidence consistent with tradeoffs at the firm level between changes in accrual management and shifts to alternative mechanisms to achieve earnings benchmarks in the post-CF period.

Finally, Table 6 presents our test of H4. We use the logistic model in equation (10) to test whether there is an overall decrease in the probability of meeting or beating earnings forecasts after the provision of cash flow forecasts. We estimate separate regressions for our treatment and control samples.¹² For our treatment sample, the coefficient on the cash flow forecast dummy variable (*POST_CF*) is negative and significant (p<0.01), as predicted. Treatment firms exhibit a lower probability of meeting or beating analysts' earnings forecasts after the provision of cash flow forecasts. For our control sample, the coefficient on the *POST_CF* variable is slightly positive and insignificantly different from zero. A test of the equality of the β_1 coefficient across our treatment and control samples (reported at the bottom of Table 6) is rejected at p<0.01. Thus, firms with cash flow forecasts exhibit a significantly greater decline in the tendency to meet or beat analysts' earnings forecasts after the provision of cash flow forecasts as compared to the control firms without cash flow forecasts. The loadings on the control variables are generally consistent with expectations across samples, except *CFO*

¹¹ Still another, more mechanical, possibility looms large. There is a very strong negative relationship between accruals and cash flows at the firm level (Dechow 1994, Sloan 1996, Dechow and Dichev 2002). Our results for the positive relation between declining abnormal accruals and higher abnormal cash flows could be driven by this effect.

¹² Due to the time-series nature of the data, we estimate a clustered logistic regression to allow the disturbances to be correlated within firms over time [Liang and Zeger (1986)]. Results are inferentially similar if we estimate a standard logistic regression.

and *ACC* are insignificant for our control sample. Further investigation (untabulated) reveals that our *LOSS* and *EARNNGROW* variables completely absorb the explanatory power of cash flows and accruals (*ROA*) in predicting meet-or-beat activity (*MB*) for this sample.

To shed some light on the economic significance of our findings, we calculate the marginal effect of the *POST_CF* variable, which is akin to a slope coefficient in a linear regression (Agresti 2002, Chapter 5). We calculate the marginal effect as the change in the probability that $MB=1$ given a change in the *POST_CF* variable from 0 to 1, holding all other variables constant at their mean values. In untabulated analysis, we find the marginal effect of *POST_CF* is roughly -0.05, which implies that firms face a probability of meeting earnings expectations that is 5 percentage points lower after the issuance of cash flow forecasts. Overall, our benchmark beating tests support H4.

We also conduct a “micro-level” analysis for our meet-or-beat tests, similar to the tests reported in Table 5 on whether firms trade-off accruals management for alternative benchmark-beating mechanisms. In Table 7 we estimate a logit regression with *MB* as the dependent variable and the level of various benchmark beating mechanisms after the provision of cash flow forecasts as explanatory variables. These mechanisms include abnormal accruals, our real activities management estimates, and our indicator for downward expectations management. Our goal is to test the conjecture that firms that use these mechanisms increase their likelihood of beating earnings targets after the provision of cash flow forecasts. In general, the evidence in Table 7 supports this conjecture. Firms with higher abnormal accruals, lower discretionary expenditures, and those that manage expectations downward are more likely to meet earnings targets. As in Tables 3 and 5 we find no results for abnormal production. Similar to Table 5, there is a positive relationship between abnormal cash flow and *MB* ($p\text{-value} < .01$), inconsistent with the use of channel stuffing or excessive discounts to meet earnings targets. However, this relation is consistent with the simple notion that higher cash flows often results in higher earnings, and thus a higher probability of meeting EPS targets.

In summary, our empirical tests support H1 through H4. At the “macro” level, we observe an increase in accrual quality and a significant decline in positive abnormal accruals after the issuance of

cash flow forecasts. We also observe accompanying cuts in discretionary expenditures and an increase in the use of downward expectations management. We find weaker evidence of increased channel stuffing and excessive discounts, and no evidence of increased abnormal production. Finally, we show that the probability of meeting or beating earnings targets declines, on average, after the provision of cash flow forecasts. At the “micro” level, we find evidence that firms that cut their income-increasing abnormal accruals after the issuance of cash flow forecasts have lower discretionary expenditures and a higher incidence of downward expectations management, and that use of these alternative mechanisms increases meet-or-beat probabilities at the firm level.

5. Alternative Explanations

One competing explanation for our benchmark beating results is that the issuance of cash flow forecasts by analysts portends deterioration in a firm’s performance in the future. That is, as market participants become concerned about a firm’s viability or solvency, they demand forecasts of operating cash flow. As a result, the patterns we observe related to meeting earnings expectations may simply be a manifestation of economic decline. However, the descriptive statistics in Table 1 indicate steady to slightly increasing cash flows and an increasing incidence of earnings growth after the provision of cash flows, which is inconsistent with a widespread deterioration in financial performance. In addition, we include a variety of performance-related variables in our tests. We use performance-adjusted abnormal accruals in our accrual tests and we control for ROA (CFO + accruals), Altman’s Z, asset write-offs, losses, earnings growth, and analysts’ downward forecast revisions in our meet-or-beat tests.

Another competing explanation for our findings is that once analysts start forecasting operating cash flow, meeting earnings targets becomes less important, and firms face a tradeoff between the two. We investigate this possibility in Table 8. Panel A presents a 2 x 2 contingency table that contains the incidence of meeting or beating cash flow and earnings forecasts in the post-CF period. Earnings and forecast data are obtained from I/B/E/S. If the actual value of cash flows is missing in I/B/E/S, we use actual operating cash flow per COMPUSTAT, adjusted for extraordinary items and stated on a per-share basis. Panel A reveals two interesting patterns. First, firms are most likely to beat both forecasts,

followed by cases where firms meet earnings targets but miss cash flow targets. Cases where firms meet cash flow targets but miss earnings targets are the most rare in our sample (16% of observations). Second, inconsistent with the idea of a tradeoff, inspection of the rows and columns indicates a positive relation between meeting both forecasts. For example, the probability of beating the earnings target conditional on beating the cash flow target is .70 $[\frac{.374}{.374+.160}]$, while this probability falls to .62 conditional on missing the cash flow target $[\frac{.29}{.29+.175}]$. A chi-square test strongly rejects independence between the two benchmarks (p-value<.01).

In panel B, we test tradeoff effects directly. We estimate the full logit model in Table 6 among treatment firms after the provision of cash flow forecasts, except we insert a dummy variable equal to one if a firm meets or beats its cash flow target. To save space, we do not table results for control variables, but we note they are quite similar to those in Table 6. Panel B indicates a strong positive relationship between meeting cash flow targets and meeting earnings targets (p-value <.01). This is not too surprising, given that many actions that boost cash flows (e.g., cutting expenses or increasing sales) also boost income.

Finally, in Panel C we conduct the most direct test of the conjecture that firms' focus on meeting cash flow forecasts at the expense of meeting earnings forecasts as a competing explanation for our results. We use our treatment sample to measure a firm's average value for the meet-or-beat (MB) variable in the pre-CF and post-CF periods and classify firms into two groups: those with a decreased tendency and those with an equal or increased tendency to meet EPS targets in the post-CF period. We then measure the difference in their tendency to meet cash flow targets in the post-CF period. If a focus on cash flow targets explains why some firms begin to miss EPS targets in the post period, we expect these firms to exhibit a greater propensity to meet cash flow targets. We find just the opposite. Firms with a decreased tendency to meet earnings targets exhibit a *lower* tendency to meet cash flow targets (p<0.05) after the provision of CF forecasts. Overall, we find no evidence to suggest our results are driven by managers shifting their focus to meeting or beating cash flow targets at the expense of earnings targets.

6. Conclusion and Directions for Future Research

When analysts forecast both operating cash flow and earnings, they also implicitly provide a forecast of operating accruals. Thus, cash flow forecasts enable investors and regulators to decompose an earnings surprise into the portion attributable to cash flow and the portion attributable to accruals. We posit that cash flow forecasts make accrual manipulations to manage earnings more transparent, which increases the expected costs to firms and managers of engaging in opportunistic earnings management through accrual manipulations. Accordingly, we predict that the provision of cash flow forecasts deters firms from engaging in accrual manipulation to manage earnings. As a consequence, we predict that accrual quality will improve and firms' propensity to meet or beat earnings benchmarks will decline following the provision of cash flow forecasts.

Overall, the evidence broadly supports our predictions. Using inter-temporal change analysis, we find that accrual quality improves, and the probability of meeting earnings targets declines, after analysts begin issuing cash flow forecasts. Tests using a propensity-score matched control sample do not reveal similarly significant patterns in accrual quality or benchmark beating. In supplementary tests, we find some evidence that firms turn to other benchmark-beating mechanisms, such as real activities manipulation and earnings guidance, in the face of cash flow forecasts. Our findings are of potential interest to investors and regulators because we identify a relatively low cost, market-driven mechanism that helps curb firms' attempts to manipulate accruals to meet analysts' earnings estimates.

We offer several avenues for further research. First, the present study investigates the role of cash flow forecasts as a deterrent to avoiding negative earnings surprises. Future research could examine whether cash flow forecasts deter attempts by firms to avoid earnings declines or losses--two other thresholds that have been examined in the literature. Second, examining whether other multiple analyst forecasts (e.g., earnings and revenues) constrain earnings management in other ways is an interesting area for future research. For example, does analyst provision of both sales and earnings forecasts deter firms from attempting to manage earnings through revenues (e.g., engaging in channel stuffing)? Third, we do

not contend that all firms will be deterred from benchmark-beating by cash flow forecasts. Some firms may substitute other mechanisms for avoiding negative earnings surprises, such as guiding analysts' earnings forecasts or manipulating real activities (see Section 5). Presumably, the cost and effectiveness of these other mechanisms vary cross-sectionally, and one might conjecture these differences help explain why some firms are more likely to meet analysts' earnings forecasts in the presence of cash flow forecasts than other firms. Future research could test the validity of this conjecture. Finally, cash flow forecasts allow investors to easily measure "unexpected accruals." Another fruitful area of research would be to examine the degree to which "unexpected accruals" based on analysts' cash flow and earnings forecasts correspond to measures of "abnormal accruals" from extant Jones-based models.

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Appendix A

DeFond and Hung (2003) identify six determinants of analyst cash flow forecast provision: 1) magnitude of accruals, 2) earnings volatility, 3) accounting choice heterogeneity, 4) Altman's Z score, 5) capital intensity, and 6) market value of equity. They argue investors have a greater demand for cash flow information when accruals are large, when earnings are volatile, when the firm is distressed, and when a firm's accounting choices (e.g., LIFO/FIFO) differ from the industry norm. In addition, firms with high capital intensity require large operating cash flows to fund maintenance and capital investment, creating demand for cash flow projections. Finally, larger firms face more capital market scrutiny, creating a demand for additional financial information like operating cash flow forecasts.

We use a propensity-score matching procedure (Rosenbaum, 2002; Rosenbaum and Rubin, 1983) to select our control sample. For each initial year of cash flow forecast provision for our treatment firms (i.e., those with cash flow forecasts), we select a matching firm without a cash flow forecast from the same year that has the closest "propensity score." This propensity score is the predicted probability of a cash flow forecast from the following logit model proposed by Defond and Hung (2003):

$$Prob(Cashflow\ Forecast = 1) = \alpha + \beta_1 Accruals + \beta_2 Earnings\ Volatility + \beta_3 Accounting\ Choice + \beta_4 Altman'sZ + \beta_5 Capital\ Intensity + \beta_6 MVE + \varepsilon$$

We estimate the logit model on a pooled basis across all firms in the COMPUSTAT/IBES universe with available data from 1993-2004. See DeFond and Hung (2003) for detailed variable definitions. We make one slight modification to the specification in DeFond and Hung (2003). We use the signed value of accruals instead of the absolute value because, despite our matching procedure, we still want to control for differences in performance

in many of our tests. Using the unsigned value of accruals makes the most sense from this perspective. Estimates from the model are as follows:

	Estimate	t-stat	p-value
Intercept	-7.454	-83.31	<.01
Accruals	0.838	11.52	<.01
Earnings Volatility	0.019	8.91	<.01
Accounting Choice	1.267	11.00	<.01
Altman's Z	-0.057	-19.51	<.01
Capital Intensity	0.323	33.67	<.01
MVE	0.939	74.55	<.01
Pseudo R-square	0.44		

All determinants are significant and are of the proper sign. The average propensity score for our treatment (matched) sample is .324 (.325), and the difference in means is not statistically different from zero.

Appendix B

Testing the equality of residual variance across regression equations

We are interested in whether the residual variance, σ^2 , is different across two regression equations, which we label regression 1 and 2 for convenience. There are K covariates and the sample sizes are N_1 and N_2 . We calculate a test statistic, t , equal to the ratio of the two sample residual variance estimates (i.e., $t = s_1 / s_2$, where $s_i = (1/N_i - k) * e_i' e_i$). This is simply a Goldfeld-Quandt (1965) statistic, though we are testing heteroskedasticity across (not within) regression equations. Under the null hypothesis, $\sigma_1^2 = \sigma_2^2 = \sigma^2$, $t \sim^a F(N_1-k, N_2-k)$.

To see why, note that if the disturbances are independent and normally distributed, then $(N_i - k) * (s_i / \sigma_i^2) \sim \chi^2(N_i - k)$. See DeGroot and Schervish (2002, Section 7.3) for a proof of this result. If the disturbances are not normally distributed, then $(N_i - k) * (s_i / \sigma_i^2) \sim^a \chi^2(N_i - k)$ as N_i gets large due to the central limit theorem. The test statistic t represents the ratio of two independent, (asymptotically-distributed) chi-squared random variables, each divided by their degrees of freedom. Under the null hypothesis, the σ^2 terms cancel out, and t is distributed asymptotically F by the definition of the F distribution. Sufficient deviation in t from 1 leads to rejection of the null hypothesis.

A critical assumption in the preceding analysis involves independence in the residuals. The sample residual variances reported in the paper are based on OLS estimation, which assumes the theoretical residuals are uncorrelated. Since our regressions include multiple observations for the same firms over time, this assumption may be violated. If the residuals are serially correlated, then the distributional properties of our test statistic derived above may not hold. We attempt to mitigate this concern as follows. We allow residuals within (but not across) firms to be correlated over time and use generalized least squares (GLS) to incorporate this covariance structure into the parameter estimates in equation (3). GLS essentially transforms the theoretical disturbance vector to remove the hypothesized correlation between residuals. We then use the GLS-based residuals to construct our test statistic t .

Inferences using the GLS-based residuals are identical to those reported in the paper.

Appendix C

Variable Definitions

Variable	Name	Definition and Data Source
Dependent Variable:		
Meet or Beat	MB	1 if the observation is on the “meet” side of the earnings surprise distribution and 0 otherwise. Earnings surprises are measured as the difference between reported EPS per I/B/E/S and the last available forecast in I/B/E/S prior to the earnings announcement
Explanatory Variables:		
<u>Control Variables</u>		
Cash Flow From Operations	CFO	Cash flow from continuing operations per COMPUSTAT (data308-data124), scaled by lagged total assets (data6)
Total Accruals	ACC	Total accruals (data123-data308+data124) per COMPUSTAT divided by lagged total assets (data6)
Capital Intensity	CAPINT	Gross PP&E (data7) divided by total net sales (data12) per COMPUSTAT
Altman’s Z-Score	ALTZ	Following Altman (1968), the Z score equals $1.2(\text{Net working capital}[\text{data4}-\text{data5}]/\text{Total assets}[\text{data6}]) + 1.4(\text{Retained earnings}[\text{data36}]/\text{Total assets}) + 3.3(\text{Earnings before interest and taxes}[\text{data178}]/\text{Total assets}) + 0.6(\text{Market value of equity}[\text{data25}*\text{data199}]/\text{Book value of liabilities}[\text{data181}]) + 1.0(\text{Sales}[\text{data12}]/\text{Total assets})$. All data is from COMPUSTAT.
Accounting Choice Heterogeneity	CHOICE	An index from 0 to 1 that captures the extent to which a firm's accounting choices in certain areas differ from the industry norm. For details of this variable definition, please see DeFond and Hung (2003).
Size	SIZE	$\log(\text{Market value of equity}[\text{data25}*\text{data199}])$
Market-to-Book	MTB	Market value of equity (as defined above) divided by book value of equity per COMPUSTAT (data216).
Net Asset Bloat	BLOAT	Following Barton and Simko (2002) bloat is the lagged value of book equity (data216) per COMPUSTAT plus debt (data9 and data34), minus cash (data1), scaled by sales.
# of Shares O/S Analyst Following	SHARES FOLLOW	# of shares used to calculate EPS (data54) in COMPUSTAT # of individual analysts per the I/B/E/S detail file issuing EPS forecasts for the firm-year in question
Prior Meet or Beat	PMB	1 if the firm-year in question reported a positive earnings surprise in the previous year and 0 otherwise
Downward Revision	REVDOWN	1 if the last available forecast of current-year EPS per I/B/E/S was less than the first forecast of current-year EPS and 0 otherwise.
Asset Writeoffs	WRITE	Following Elliot & Hanna (1996), this is a dummy variable set to 1 if special items (data17) in COMPUSTAT is negative and 0 otherwise.
Loss Incidence	LOSS	Dummy variable set to 1 if income (data123) in COMPUSTAT is negative and 0 otherwise
Earnings Growth	EARNGROW	Dummy variable set to 1 if change in income (data123) in COMPUSTAT is positive and 0 otherwise

Table 1

Descriptive Statistics for Firms with and without Cash Flow Forecasts

Panel A: Firms with Cash Flow Forecasts

Variable	Mean	Median	Std Dev.	Q1	Q3
MB	0.683 ***	1.000	0.465	0.000	1.000
CFO	0.101 ***	0.102 ***	0.147	0.046	0.166
SIZE	7.034 ***	6.928 ***	1.643	5.947	8.104
CAPINT	1.082 **	0.491 ***	1.544	0.257	1.177
ACC	-0.081 ***	-0.062 ***	0.122	-0.114	-0.024
ALTZ	5.489 ***	3.207 ***	7.531	1.778	5.987
CHOICE	0.151	0.200 *	0.156	0.000	0.250
MTB	3.595 ***	2.410 ***	4.713	1.481	4.148
BLOAT	1.165 ***	0.661 ***	1.633	0.370	1.266
SHARES	137.386 ***	46.499 ***	287.423	23.301	117.738
FOLLOW	12.116 ***	10.000 ***	8.969	5.000	17.000
PMB	0.643 ***	1.000	0.479	0.000	1.000
REVDOWN	0.538	1.000	0.499	0.000	1.000
WRITEOFF	0.432 ***	0.000	0.495	0.000	1.000
LOSS	0.247 ***	0.000	0.431	0.000	0.000
EARNGROW	0.618 ***	1.000	0.486	0.000	1.000

, * Indicates significantly different from the matched sample below at 5% and 1%.

Panel B: Firms without Cash Flow Forecasts

Variable	Mean	Median	Std Dev.	Q1	Q3
MB	0.633	1.000	0.482	0.000	1.000
CFO	0.027	0.068	0.243	0.002	0.135
SIZE	6.167	6.183	1.411	5.199	7.039
CAPINT	1.233	0.342	3.962	0.143	0.817
ACC	-0.069	-0.048	0.154	-0.105	-0.010
ALTZ	4.930	2.846	8.241	1.163	5.355
CHOICE	0.153	0.250	0.159	0.000	0.250
MTB	3.052	2.026	3.946	1.286	3.468
BLOAT	1.528	0.627	3.497	0.340	1.233
SHARES	49.195	27.909	77.472	14.718	50.430
FOLLOW	7.380	5.000	6.518	3.000	10.000
PMB	0.601	1.000	0.490	0.000	1.000
REVDOWN	0.539	1.000	0.499	0.000	1.000
WRITEOFF	0.402	0.000	0.490	0.000	1.000
LOSS	0.295	0.000	0.456	0.000	1.000
EARNGROW	0.588	1.000	0.492	0.000	1.000

Table 1, Cont.

Panel C: Firms with Cash Flow Forecasts—Comparison of Pre-CF and Post-CF Forecast Period

Variable	Pre	Post	Diff.	t-stat	paired t-stat
MB	0.699	0.664	-0.034	-3.13 ***	-1.28
CFO	0.098	0.105	0.007	1.88 *	1.05
SIZE	6.965	7.118	0.153	3.95 ***	6.65 ***
CAPINT	0.970	1.218	0.248	6.80 ***	0.24
ACC	-0.079	-0.082	-0.003	-1.01	0.27
ALTZ	6.218	4.602	-1.616	-9.13 ***	-7.51 ***
CHOICE	0.151	0.151	0.000	0.00	-5.32 ***
MTB	3.934	3.183	-0.751	-6.76 ***	-7.16 ***
BLOAT	1.051	1.304	0.253	6.59 ***	2.93 **
SHARES	117.748	161.237	43.489	6.42 ***	10.55 ***
FOLLOW	11.513	12.848	1.335	6.32 ***	11.93 ***
PMB	0.637	0.649	0.013	1.11	3.8 ***
REVDOWN	0.542	0.532	-0.010	-0.86	-0.3
WRITEOFF	0.413	0.455	0.042	3.60 ***	6.04 ***
LOSS	0.243	0.250	0.007	0.71	0.78
EARNGROW	0.605	0.633	0.028	2.43 **	3.47 ***

This table provides descriptive statistics for the cash flow forecast (“treatment”) and non-cash flow forecast (“control”) samples. For the treatment sample, we select all annual EPS forecasts for U.S. firms on the I/B/E/S detail file from 1993 to 2004, and retain observations with available data in COMPUSTAT. For each firm with a cash flow forecast in our sample, we identify the first year in which analysts start forecasting cash flows (the “initial” year). We then select all available observations for each firm in the three years prior to this initial year. These observations comprise our “pre” sub-sample. We also select all available observations for the two years subsequent to this initial year for each firm, with the requirement that cash flow forecasts exist in these subsequent years. Observations for the initial and subsequent years for each firm comprise our “post” sub-sample. To construct our control sample, we do the following. For each “initial” firm-year in our treatment sample described above, we select a matching firm (without a cash flow forecast) in the same year that has the closest “propensity score.” This propensity score is the predicted value from a logit regression of the incidence of cash flow forecasts on the determinants identified by DeFond and Hung (2003). We then look 3 years forward and back to construct pseudo “pre” and “post” periods for each control firm. This process yields a control sample with “pre” and “post” periods that have a similar dispersion in calendar time to the periods in our treatment sample. Continuous variables have been winsorized at the 1st and 99th percentile of the distributions. See Appendix B for variable definitions.

Table 2
Time-Series Changes in Average Abnormal Accruals and Earnings Quality

Panel A: Mean differences in abnormal accruals

$$AbnAcc = \alpha + \beta_1 Treat + \beta_2 Post_CF + \beta_3 Post_CF * Treat + \beta_4 ROA + \beta_5 ROA * Treat + \varepsilon$$

	<i>Dependent Variable: Positive Abnormal Accruals</i>			<i>Dependent Variable: Negative Abnormal Accruals</i>			<i>Dependent Variable: Abs. Value of Abnormal Accruals</i>		
	Pred. Sign	Estimate	t-stat	Pred. Sign	Estimate	t-stat	Pred. Sign	Estimate	t-stat
α Intercept	?	0.087 ***	27.16	?	-0.108 ***	-14.1	?	0.096 ***	23.93
β_1 Treat	?	-0.021 ***	-5.44	?	0.034 ***	3.73	?	-0.019 ***	-3.67
β_2 Post_CF	?	0.002	0.45	?	0.014	1.52	?	-0.004	-0.84
β_3 Post_CF*Treat	-	-0.012 **	-2.32	+	-0.005	-0.46	-	-0.005	-0.86
β_4 ROA	?	-0.270 ***	-7.37	?	0.175 ***	4.5	?	-0.217 ***	-7.45
β_5 ROA*Treat	?	0.247 ***	6.10	?	0.227 ***	3.31	?	-0.052	-1.06
Test: $\beta_2 + \beta_3 = 0$	-	-0.010 ***	4.77	+	0.009 *	1.33	-	-0.009 ***	3.00

Panel B: Mean differences in accrual quality

		Before first cash flow forecast	After first cash flow forecast	Diff.
s^2	Treatment	0.023	0.017	-0.006 ***
s^2	Control	0.028	0.031	0.003 **

*, **, *** indicates significance at the 10%, 5%, and 1% levels

This table presents differences in: 1) average levels of positive, negative, and absolute abnormal accruals, and 2) earnings quality, measured as the residual variance from a regression of accruals on temporally-adjacent cash flows across our treatment and control samples. See Table 1 for details as to the construction of these samples. In Panel A, abnormal accruals

are the residuals from the following regression (estimated by year and 2-digit SIC): $TotalAccruals_{it} = \alpha + \beta_1 ((1+k)\Delta Sales_{it} - \Delta Receivables_{it}) + \beta_2 PPE_{it} + \beta_3 Total Accruals_{t-1} + \beta_4 Sales Growth_{t+1}$ (see Dechow et al. 2003 for further estimation details). *Treat* is an indicator variable set to 1 if the observation belongs to the treatment sample, *Post_CF* is an indicator variable set to 1 if an observation belongs to the “after” period in either sample, and *ROA* is income before extraordinary items scaled by average total assets. Standard errors are clustered at the firm level to control for autocorrelation. In Panel B, accrual quality is the estimated residual variance (s^2) from the following regression: $Total Accruals_t = \alpha + \beta_1 Cash Flow_{t-1} + \beta_2 Cash Flow_t + \beta_3 Cash Flow_{t+1}$. The significance of the difference in s^2 across samples is tested using an F-test described in Appendix A. All p-values are two-sided, where directional differences are predicted.

Table 3
Changes in Real Activities Management After the Issuance of Cash Flow Forecasts

Abnormal discretionary expenditures							
	Treatment				Control		
	pre	post	diff		pre	post	diff
Mean	-0.040	-0.075	-0.035	***	0.076	0.068	-0.008
t-stat	-5.97	-15.06	-4.16		8.88	11.14	-0.73
Treatment Change - Control Change					-0.027		
t-stat					-2.13 **		
Abnormal production							
	Treatment				Control		
	pre	post	diff		pre	post	diff
Mean	-0.053	-0.05	0.003		-0.007	-0.002	0.005
t-stat	-11.69	-13.4	0.42		-1.38	-0.58	0.71
Treatment Change - Control Change					-0.002		
t-stat					-0.27		
Abnormal cash flows							
	Treatment				Control		
	pre	post	diff		pre	post	diff
Mean	0.051	0.028	-0.023		0.069	0.051	-0.018
t-stat	9.45	6.03	-3.27	***	10.84	11.29	-2.35 **
Treatment Change - Control Change					-0.005		
t-stat					-0.58		

Estimates of real activity management are obtained as set forth in Roychowdhury (2006). Abnormal discretionary expenditures are estimated as the residuals from a regression, by industry and year, of R&D, advertising, and SG&A on current sales. Abnormal production is estimated as the residual from a regression, by industry and year, of COGS plus the change in inventory on current sales and current and lagged changes in sales. Abnormal CFO is estimated as the residual from a regression, by industry and year, of COGS plus the change in inventory on current and lagged sales. All variables are scaled by lagged total assets. See Roychowdhury (2006) for further estimation details.

Table 4

Changes in Downward Expectations Management After the Issuance of Cash Flow Forecasts

$$\text{Prob}(\text{DOWN} = 1) = \alpha + \beta_1 \text{Post_CF} + \beta_2 \text{Size} + \beta_3 \text{MTB} + \beta_4 \text{RD} + \beta_5 \text{Loss} + \beta_6 \text{Litigation} + \beta_7 \text{Labor} + \beta_8 \text{Issue} + \beta_9 \text{Relevance} + \varepsilon$$

	Treatment			Control		
	Pred. Sign	Estimate	t-stat	Pred. Sign	Estimate	t-stat
Intercept	?	-0.636 ***	-4.24	?	-0.725 ***	3.73
Post_CF	+	0.099 **	1.90	?	-0.036	0.54
Size	+	0.125 ***	6.82	+	0.167 ***	6.29
MTB	+	0.031 ***	3.98	+	0.041 ***	3.99
RD	+	-0.665 **	-2.03	+	-0.956 ***	3.63
Loss	?	0.260 ***	3.61	?	0.419 ***	4.88
Litigation	+	-0.176 ***	-2.81	+	-0.220 ***	2.89
Labor	+	-0.009	-0.13	+	-0.127	1.49
Issue	+	0.215 ***	3.07	+	0.086	1.02
Relevance	+	-0.026 **	-2.37	+	0.003	0.20
<i>Test</i> : $\beta_{1\text{treatment}} = \beta_{1\text{control}}$		0.135 **	1.70			

*, **, *** indicates significance at the 10%, 5%, and 1% levels

Following Matsumoto (2002) we estimate the expected change in EPS by regressing EPS changes on cumulative stock returns and lagged EPS changes each year. We then add this expected change to prior year EPS to obtain the “expected” forecast of current EPS. If the most recent actual forecast of current EPS is less than this “expected” forecast, we consider expectations to have been managed downward. We create a binary variable, DOWN, equal to 1 if expectations have been managed down and 0 otherwise. We then use a logistic regression to estimate the effect of cash flow forecasts on the probability that DOWN=1. *Post_CF* is an indicator variable set to 1 if an observation belongs to the “post” period in either the treatment or control samples (see Table 1). R&D intensity (RD) is a R&D expense scaled by lagged total assets. Litigation risk is a dummy variable equal to 1 if a firm is in industries prone to litigation as identified by Matsumoto (2002). Labor intensity (Labor) is equal to 1 minus capital intensity. Equity issue (Issue) is a dummy variable equal to 1 if the firm issued equity during the year and zero otherwise. Value relevance (Relevance) is the annual decile rank of the r-square from industry-year regressions of returns on earnings. See Matsumoto (2002) for further estimation details. All other variables are defined in Appendix C. We estimate a clustered logistic regression to allow for autocorrelation within firms over time. All significance levels are two-sided, except where directional differences are expected.

Table 5
 Cross-Sectional Relation between Cuts in Abnormal Accruals and Alternative Benchmark
 Beating Mechanisms

$$Pr ob(CUT ACCRUALS = 1) = \alpha + \beta_1 AbnDisc + \beta_2 Abn Pr od + \beta_3 Abn.CFO + \beta_4 Expectatio ns Mgmt + \varepsilon$$

	Predicted		
	Sign	Parameter	t-stat
Intercept		-0.588	8.14 ***
AbnDisc	-	-1.010	-3.96 ***
AbnProd	+	0.280	0.81
AbnCFO	-	1.170	3.31 ***
Expectations Mgmt	+	0.240	2.93 ***

*, **, *** indicates significance at the 10%, 5%, and 1% levels

CUT ACCRUALS is a dummy variable equal to 1 if a firm cut its average level of positive abnormal accruals from the pre to the post period (see Table 1). Abnormal discretionary expenditures (AbnDisc), production (AbnProd), and cash flows (AbnCFO) are defined in Table 3. The regression is estimated among treatment firms in the post period (after the issuance of cash flow forecasts). Standard errors are clustered by firm.

Table 6
Time-Series Effect of the Issuance of Cash Flow Forecasts on the
Probability of Meeting or Beating Analysts' Earnings Forecasts

$$\text{Pr } ob(MB = 1) = \alpha + \beta_1 \text{POST_CF} + \beta_2 \text{CFO} + \beta_3 \text{ACC} + \beta_4 \text{CAPINT} + \beta_5 \text{ALTZ} + \beta_6 \text{CHOICE} + \beta_7 \text{SIZE} + \beta_8 \text{BLOAT} + \beta_9 \text{SHARES} + \beta_{10} \text{MTB} + \beta_{11} \text{FOLLOW} + \beta_{12} \text{PMB} + \beta_{13} \text{REVDOWN} + \beta_{14} \text{WRITE} + \beta_{15} \text{LOSS} + \beta_{16} \text{EARNGROW} + \varepsilon$$

Variables	Treatment Sample			Control Sample		
	Predicted Sign	Coefficient	t-stat	Predicted Sign	Coefficient	t-stat
Variable of Interest:						
Post_CF	–	-0.216 ***	-3.38	?	0.019	0.25
Control Variables						
CFO	+	0.495 **	2.06	+	-0.011	0.07
ACC	+	0.561 **	2.18	+	-0.016	0.07
CAPINT	?	-0.039	-1.52	?	0.010	0.98
ALTZ	+	0.008 **	1.86	+	0.003	0.67
CHOICE	?	-0.052	-0.27	?	-0.163	0.72
SIZE	+	0.051 **	1.81	+	0.095 ***	2.62
BLOAT	-	-0.005	-0.28	-	0.018	1.64
SHARES	-	-0.001 ***	-3.07	-	0.000	0.58
MTB	+	0.003	0.43	+	0.010	1.05
FOLLOW	+	0.022 ***	5.02	+	0.012 *	1.67
PMB	+	0.458 ***	8.41	+	0.919 ***	13.70
REVDOWN	?	0.096	1.61	?	0.002	0.04
WRITE	-	-0.127 **	-2.16	-	0.019	0.26
LOSS	-	-0.218 ***	-2.52	-	-0.441 ***	4.47
EARNGROW	+	0.374 ***	5.87	+	0.605 ***	8.23
<i>Test: $\beta_{1\text{treatment}} = \beta_{1\text{control}}$</i>		-0.235 ***	2.56			
Industry & Year Dummies		Included		Included		
N		7,231		4,920		

*, **, *** indicates significance at the 10%, 5%, and 1% levels

See Appendix C for variable definitions. The logit regression is estimated separately using our treatment and control samples (see Table 1 for sample construction). *Post_CF* is an indicator variable set to 1 if an observation belongs to the “after” period in either sample. To avoid inflated test statistics due to potential autocorrelation in the data, we estimate a clustered logistic regression. Results are similar if we use a standard logistic regression instead. All significance levels are based on one-tailed probabilities if a directional prediction is offered, and are based on two-tailed probabilities otherwise.

Table 7
Effects of Alternative Benchmark Beating Mechanisms on Meet or Beat Probability

$$Pr ob(MB = 1) = F(\alpha + \beta_1 (Abn. Accruals) + \beta_2 (Abn. Disc. Expend) + \beta_3 (Abn. Production) + \beta_4 (Abn. CFO) + \beta_5 (Expectations Mgmt) + \varepsilon)$$

	Predicted			
	Sign	Parameter	t-stat	
Intercept		-0.588	8.14	***
AbnDisc	-	-1.010	-3.96	***
AbnProd	+	0.280	0.81	
AbnCFO	-	1.170	3.31	***
Expectations Mgmt	+	0.240	2.93	**

*, **, *** indicates significance at the 10%, 5%, and 1% levels

MB is defined in Appendix C and abnormal accruals are defined in Table 2. All other variables are defined in Table 3. The regression is estimated among treatment firms in the post period (after the issuance of cash flow forecasts). Standard errors are clustered by firm.

Table 8
Tradeoffs Between Meeting Cash Flow Forecasts and Earnings Forecasts

Panel A: Incidence of meeting or missing cash flow and earnings forecasts

		Earnings Forecast		Total
		MB	Miss	
Cash Flow Forecast	MB	0.374	0.160	0.534
	Miss	0.290	0.175	0.466
	Total	0.664	0.336	
	χ^2 stat	21.62 ***		

Panel B: Association between meeting earnings forecasts and cash flow forecasts after first cash flow forecast

$$\text{Prob}(MB = 1) = \alpha + \beta_1(\text{CashBeat}) + \beta' \text{Controls} + \varepsilon$$

	Treatment		
	Pred. Sign	Estimate	t-stat
Intercept	?	-0.758	0.13
CashBeat	?	0.294 ***	3.55

Panel C: Association between meeting cash flow targets and the change in tendency to meet EPS forecasts (MB) after first cash flow forecast

	% of observations where firm met cash flow forecast	N
Firms with decreased tendency to MB	0.4949	1184
Firms with equal or increased tendency to MB	0.5415	2347
	Diff	0.05
	p-value	<.01

Panel A presents a 2 x 2 contingency table for missing or meeting/beating earnings and cash flow forecasts among treatment firms in the post period (see Table 1). Earnings and forecast data are obtained from I/B/E/S. If the actual value of cash flows is missing in I/B/E/S, we use actual operating cash flow per COMPUSTAT, adjusted for extraordinary items and stated on a per-share basis. In panel B, we estimate the logit regression from Table 5 among treatment firms in the post period, except we insert a dummy variable equal to 1 if the firm met or exceeded its cash flow target. Loadings on control variables are not tabled to save space. In Panel C, we measure a treatment firm's average value for the earnings meet or beat variable in the "pre" and "post" samples and classify firms into two groups: those with a decreased tendency and those with an equal or increased tendency to meet or beat. We then examine their incidence of meeting or beating cash flow targets.