Differential Cash versus Accrual Persistence and Performance Target Setting

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May 2017

Abstract

We examine the extent to which the differential persistence of cash flows over accruals for future earnings is incorporated in setting performance targets in executives' bonus plans and assess the implications of such targets for managerial incentives. Using target and actual compensation earnings disclosed in proxy statements for 750 largest U.S. public companies, we find that although revision of next year's earnings target is more sensitive to current operating cash flows than to accruals, target revision does not fully incorporate the higher persistence of cash flows. As a result, firms with higher percentage of current earnings performance in cash flows are more likely to achieve performance targets next year. Further analyses show that such incomplete incorporation of the differential persistence in target setting is explained both by the underestimation of the higher persistence of cash flows in target setting process and by intentional contract design to reward CEOs who deliver higher percentage of operating cash flows with a larger slack and to further limit ratcheting effect that sacrifices cash flows.

Keywords: target revision; target achievability; persistence; accruals; operating cash flows

1. Introduction

Performance target setting comprises a key component of management control and incentive systems (Merchant and Van der Stede, 2007), as performance targets not only determine resource allocation and coordination within the firm (Leone and Rock, 2002) but also create necessary incentives for managers to increase firm value (Indjejikian and Nanda, 2002). Despite of its importance, investigation of how firms set performance targets is limited due to the lack of observation on performance targets (Indjejikian et al. 2014a). Existing studies, using proprietary survey data or data from single organizations, suggest that firms use past performance in target revision to adjust for fundamental shift in productivity (i.e. "target ratcheting") (Leone and Rock 2002; Bouwens and Kroos 2011), but at the same time commit to deemphasize past performance to prevent managers from withholding effort to avoid higher future targets (i.e. "the ratcheting effect") (e.g. Indjejikian et al. 2014b; Aranda et al. 2014; Bol and Lill 2015).[1] In this study, we provide evidence on the differential use of current accrual vs. cash flow performance in setting future target, based on publicly disclosed performance targets in executive compensation of large U.S. public companies. We aim to provide further insights into the efficient use of information in target setting and its implications on managers' incentives in generating different types of performances.

Our focus on accruals vs. cash flows performance is motivated by their different implications on value creation and managerial ability. These fundamental differences would lead to differential use of accruals vs. cash flows in the revision of future performance target and would also suggest their different relations with future target difficulty. First, compared with

[1] Following the literature (Indjejikian et al., 2014b), we use the term "target ratcheting" to refer to target revisions based on past performance. If such revisions also reduce the likelihood of achieving the revised targets, managers have incentives to withhold effort, which is referred to as the "ratcheting effect".

cash flows, accruals are more likely to represent increased investment in working capitals with diminishing rate of returns (Fairfield et al. 2003) and accrual reporting involves more inaccurate estimations that tend to reverse in the future (Xie 2001; Richardson et al. 2005, 2006). As a result, cash flow performance is a better indicator of fundamental shifts in productivity than accrual performance. Because the purpose of target revision is to adjust for fundamental shifts in productivity, we expect target revision to be more sensitive to cash flow performance than to accrual performance.

It is uncertain, however, whether target revision fully incorporates the difference in persistence between accrual vs. cash flows. Prior studies document that investors and possibly managers are unable to fully anticipate the higher persistence of cash flows (Sloan 1996; Xie 2001; Richardson et al. 2005, 2006; Gong et al. 2009; Zhu 2016). If participants in target setting suffer from similar bias, target revision will only partially incorporate the differential persistence, leaving future target difficulty to be negatively correlated with cash flows, when holding earnings level constant.

The lower target difficulty associated with cash flow performance could also reflect boards' intention to reward managers who deliver larger portion of performance in cash flows. Because cash flows involve less reporting and investment discretion, they likely better reflect managerial ability in generating long-term economic value than accrual performance. In addition, managers may lower current performance in response to target ratcheting. It would be more costly to the firm if such ratcheting effect involves real economic activities (such as withholding effort) that sacrifice cash flows (Bouwens and Kroos, 2011) than if only involves accrual manipulation (Murphy, 2000; Leone and Rock, 2002). The lower target difficulty associated with

higher cash flows incentivize managers to direct effort in generating cash flows and future limit any ratcheting effect involving cash flows.

To empirically examine the use of cash vs. accrual performance in target setting, we focus on earnings-based performance targets in CEO's annual incentive plans for the largest 750 U.S. public companies of each year covered by Incentive Lab.[2] We supplement performance targets from Incentive Lab with actual earnings used for determining compensation (compensation earnings hereafter) collected from firms' proxy statements. Our sample consists of 1,875 firm-year observations from 2006 to 2014 with target and actual earnings over adjacent years.

Using our sample, we first confirm that operating cash flows demonstrate higher persistence into future compensation earnings than operating accruals. Regarding target revision, we do find a positive association between the target revision and current operating cash flows, holding current earnings level constant, suggesting the incorporation of cash flows' higher persistence in target setting. However, the revision regarding the differential persistence is incomplete. In fact, target revision only incorporates around 35 percent of the higher persistence of cash flows. As a result, we observe current operating cash flows is associated with higher target achievability (lower target difficulty) of next year. Holding earnings performance constant, a one-standard deviation increase in cash flow performance this year increases the likelihood of meeting or beating next year's target by 34.5 percent.

We further investigate whether the lower target difficulty associated with higher cash flow performance relative to accruals is due to target setters' unintentional underestimation of

[2] Earnings-based performance measures include EPS, Earnings, and Operating Income.

the relative persistence of cash flows (i.e. bias explanation), or their contractual consideration to reward managers' cash generating ability and further limit any ratcheting effect that sacrifice cash flows (i.e. efficient contracting explanation). We find supporting evidence to both explanations. First, we find that adding analyst forecast error as an additional explanatory variable when examining target achievability decreases the positive relation between target achievability and cash flows by around 60%, consistent with target setting shares market's bias regarding cash flow persistence.[3] However, the positive relation, especially for firms with higher-than-average cash flows, remains economically and statistically significant.

Second, consistent with boards considering cash flow performance as a better signal for managerial ability or effort, we find that the positive relation between target achievability and cash flow performance is stronger when cash flows have a larger incremental stewardship role to earnings (Natarajan 1996) and when earnings are more volatile than cash flows. In addition, we also find evidence that the remaining positive relation is stronger when firms are at greater needs of cash flows to support capital expenditure, or when firms are refraining from risky investment. Such evidence is consistent with boards incentivizing cash generating activities and further limit ratcheting effect sacrificing cash flows. Collectively, our evidence suggests the lower future target difficulty associated with higher cash flow performance is also attributable to boards' efficient contracting considerations.

In additional analyses, we find that firms who provide larger slack for high cash performance relative to accruals demonstrate less output constraints that sacrifice cash flows. Specifically, we find that the serial correlation of cash performance between the first and last two

[3] Analyst forecast error and management forecast error, among firms issuing guidance at the beginning of the year, are 94% correlated.

quarters is higher (i.e. less ratcheting effect involving cash flows) when cash flows are more likely to signal managerial ability or effort and when future capital expenditures are more intensive, consistent with managers responding to the higher additional slack for cash flows under these circumstances. In contrast, we find no or the opposite variation of ratcheting effect involving accruals under the same circumstances. Such finding demonstrates the impact of the differential treatment of cash vs. accrual performance in target setting on managers' choice of constraining output through real activities involving cash flows vs. through accounting manipulation involving only accruals. .

Our study makes several contributions to the literature. First, our study extends the understanding of performance target setting, an important budget and control system widely used by many organizations. Utilizing large-scale earnings performance target data for top U.S. executives, we show that target revision process incorporates the differential persistence of cash vs. accrual performance, suggesting a higher level of efficiency in the adjustment for fundamental shifts in profitability than adjustment using earnings performance alone documented in the target ratcheting literature (Indjejikian et al. 2014a). We also extend recent findings on boards' commitment not to fully use past information in target adjustment by showing that such commitment is stronger for the cash component, which is more likely to represent managerial ability or effort and more costly to firm value if sacrificed in the ratcheting effect.

Second, our study connects the literature of accruals anomaly in valuation with the literature of target setting in compensation design. A rich line of studies has documented that the capital market fails to fully understand the lower persistence of accruals (Sloan, 1996; Bradshaw et al. 2001; Zhu, 2016) in earning prediction and investment decisions. Different from the valuation perspective, we examine the consideration of differential persistence of accrual and

cash performance in setting internal performance targets. We find that, similar to external investors, participants in performance target setting fail to fully understand the higher persistence of cash flows and such bias has a significant impact on budgetary slack. Our finding suggests that the inefficiency in understanding the differential persistence of earnings components exist not only in equity valuation, but also in internal budget and control process.

Finally, our study complements prior research examining the relation between compensation and earnings persistence through pay-performance sensitivity (Baber et al. 1998; Banker et al. 2009; Carter and Lynch 2012; Hudson et al. 2012) or the exclusion in compensation earnings (Potepa 2015; Curtis et al. 2015; Dechow et al. 1994). Different from this line of research where concurrent pay and performance relation is examined, our study explores an alternative mechanism through which performance affects compensation and incentive: how current cash vs. accrual performance affect future performance targets. Distinct from prior findings that executive compensations are equally sensitive to concurrent operating cash flows and working capital accruals (Kumar et al 1993; Natarajan 1996), we find that operating cash flows and working capital accruals are used differently when setting future performance target.

The rest of our paper is organized as follows: Section 2 reviews related literature and develops hypotheses, Section 3 explains research design, Section 4 describes sample selection, Section 5 presents and discusses empirical results, and Section 6 concludes.

2. Related literature and hypothesis development

2.1. Target revision and differential persistence of accruals versus cash flows

Setting performance target is one of the key decisions in designing managers' compensation. The process of performance target setting encourages information sharing and

coordinates budgeting throughout the organization (e.g. Leone and Rock 2002). A reasonable performance target provides management with incentives to exert a desired level of effort. Incentives provided by performance targets are especially important for young and lower level executives who don't have significant equity holdings (Guay et al. 2016).

Prior empirical studies document the common practice of "target ratcheting": current performance is used as the basis for determining future targets (Leone and Rock 2002; Anderson et al. 2010; Bouwens and Kroos 2011; Kim and Yang 2012). These studies show that upward target revisions are more likely to happen if current performance exceeds current target. The economic rationale behind such target ratcheting is to adjust for expected fundamental changes in future performance that are unrelated to managers' ability or efforts, e.g. changes caused by fundamental shifts in productivity of capital and labor or in firms' economic capacity (Weitzman, 1980; Laffont and Tirole, 1988). Recent development in target setting literature provides support to the above rationale. For instance, Bol and Lill (2015) find that target ratcheting is stronger when earnings volatility is lower, and they argue that low performance volatility represents situations where target deviation is more likely to result from fundamental shifts in productivity instead of transitory shocks to profitability.

We expect cash and accrual performance to be used differently in revising future target due to their differential reflections of fundamental shifts in productivity. Since Sloan (1996), numerous studies document that cash flows are more persistent into future earnings than accruals. The literature offers two explanations for this finding. Xie (2001) and Richardson et al. (2005, 2006) provide evidence showing that the lower persistence of accruals is due to low reliability in accrual estimation. Such reporting errors in accruals reduce accruals' ability to signal fundamental productivity change. On the other hand, Fairfield et al. (2003) argue that the lower

persistence of accruals is due to the declining marginal rate of returns to increased working capital investments represented by accruals. When accruals reflect investment activity, instead of economic performance, they are again less likely to represent a fundamental change in productivity compared with cash flows performance. To the extent that participants in the target setting process understand the differential persistence of cash flows versus accruals and attribute it to their differential reflection of fundamental changes in productivity, we expect target revision to be more sensitive to cash performance than to accrual performance.

Prior literature also provides limited evidence suggesting that participants in target setting, at least to some extent, understands the differential persistence of accruals versus cash flows. For example, Beneish and Vargus (2002) and Battalio et al. (2012) find that executives and sophisticated investors show understanding of the differential persistence through trade initiations. Furthermore, several studies show that boards consider the persistence of accounting performance when defining compensation earnings. Baber et al. (1998) show that the sensitivity of compensation to earnings varies directly with earnings persistence. Banker et al. (2009) document a positive relation between value-relevance of earnings and cash flows and their pay-performance sensitivity. Curtis et al. (2015) along with earlier studies (Dechow et al. 1994 and Gaver and Gaver, 1998) suggest that less persistent items, such as special items and other firm-specific items, are often excluded from compensation earnings. Given the above evidence, we expect target revision to incorporate, at least to some extent, the differential persistence of accruals versus cash flows.

H1: Target revision is positively associated with operating cash flows, when holding earnings constant.

Our prediction in hypothesis *H1* seems contradictory to the finding in several prior studies that cash compensation is equally sensitive to concurrent operating cash flows and working capital accruals (Kumar et al. 1993; Natarajan 1996).[4] Their finding implies that operating cash flows and working capital accruals are included in compensation earnings to a similar extent. Their findings may suggest that participants in target setting process do not recognize the differential persistence between cash flows and working capital accruals. Alternatively, definitions of compensation earnings may not reflect boards' understanding of the differential persistence between cash flows and accruals, because exclusions from compensation earnings are predominantly based on types of earnings items, such as special items or R&D expenses, which include both accruals and cash flows. Target revision, however, allows for continuous adjustment and therefore is more likely to incorporate the differential persistence between cash flows and working capital accruals.

2.2 Target achievability and differential persistence of accruals versus cash flows

If target revision doesn't fully incorporate information in past performance, future target achievability becomes predictable using past performance. Findings from several studies suggest that current target deviation predicts future target achievability (i.e. future target difficulty). Indjejikian and Nanda (2002) and Indjejikian and Matějka (2006) find that abnormal bonus and the achievability of business unit managers' performance targets, is serially correlated. Indjejikian et al. (2014a) and Choi, Kim and Merchant (2012) show that managers who meet or beat performance targets tend to repeatedly meet or beat targets, while managers who fail to meet the targets are more likely to miss the targets in the next period. The serial correlation in target

[4] As explained in section 3, when testing hypothesis H1, we define earnings as compensation earnings. As compensation earnings often exclude non-working-capital accruals (Potepa, 2015), our hypothesis H1 effectively compares operating cash flows and working capital accruals in target revision.

achievability suggests that target revision ratchets upon past performance, but doesn't fully exploit past performance information. Indjejikian et al. (2014a) and Bol and Lill (2015) argue that boards reward high performing managers with larger slack (i.e. higher target achievability) to compensate for their superior ability or extra effort. Such commitment to not fully exploit past performance information potentially limit "the ratcheting effect" – managers withholding effort to lower current performance in order to have more achievable future targets (Baron and Besanko 1984; Laffont and Tirole 1993).

We expect that target revision doesn't fully incorporate the differential persistence of cash flow vs. accruals. Both cognitive bias and efficient contracting considerations could lead to such incomplete incorporation of the differential persistence of cash vs. accrual performance. First, participants in the target setting process may fail to fully anticipate the differential persistence of accruals versus cash flows.[5] Prior studies provide ample evidence that equity investors overestimate the persistence of accruals (Sloan 1996; Xie 2001; Richardson et al. 2005; Hirshleifer and Teoh 2003; Zhu 2016). Bradshaw et al. (2001) show that even analysts and auditors do not fully understand the differential persistence of accruals. In addition, Gong et al. (2009) document that management earnings guidance for next year is overly optimistic when current year's accruals are abnormally high, suggesting that higher accruals may reflect managerial optimism. If in the target setting process, the board, executives, and compensation consultants suffer from similar cognitive biases as documented in prior studies, target revision will fail to fully incorporate the differential persistence, leading to positive association between future target achievability and current cash flow performance holding earnings constant.

[5] It is worth noting that this cognitive bias explanation does not depend on any assumption of the underlying cause of the differential persistence of accruals versus cash flows.

The incomplete incorporation of the higher persistence of cash flows could also reflect boards' efficient contracting considerations. Because of the higher persistence of cash performance, boards may deem managers who deliver higher operating cash flows, given the same earnings performance, as managers with superior ability or extra level of effort. As a result, boards may commit to deemphasize cash flows' higher persistence in target revision to reward managers who generate higher cash flows with additional budgetary slack.

Boards' commitment not to fully incorporate the higher persistence of cash flows in target revision could also result from the consideration of costs associated with the ratcheting effect. In response to target ratcheting on current performance, agents may try to lower their current performance either through underestimating accruals or withholding efforts in generating real economic benefits. Murphy (2000) and Leone and Rock (2002) document evidence of managers engaging in accrual manipulation to lower their performance. Bouwens and Kroos (2011), on the other hand, document evidence of store managers withholding effort in sales generation during the last quarter when facing better than expected sales from the first three quarters. Ratcheting effect involves withholding efforts that sacrifice cash flows is arguably always more costly than ratcheting effect that involves only underestimating accruals, because accrual estimations can be reversed subsequently at the managers' discretion but it is uncertain whether real economic benefit given up this period can be recouped in the future. Guay et al. (2016) find that performance targets serve internal budgeting purpose and tend to be used for the whole management team. For lower level executives or managers who are unable to engage in accounting manipulation, they must resort to manipulating their effort in generating real economic benefit in response to target ratcheting. Considering the higher cost associated with

ratcheting effects that sacrifice cash flows, boards may choose to grant higher slack (lower target difficulty) to high cash performance than to accrual performance.

Based on the above reasoning, we expect to observe a positive association between future target achievability and operating cash flows.

H2: Future target achievability is positively associated with operating cash flows, when holding earnings constant.

3. Research design

3.1. Differential persistence of accruals versus cash flows in predicting future compensation earnings

We start our empirical analysis by examining whether accrual and cash flows in compensation earnings exhibit similar differential persistence as in GAAP earnings. Although prior literature has shown that operating cash flows are more persistent into future GAAP earnings than accruals (e.g. Sloan, 1996), compensation earnings exclude many transitory items from its definition (e.g. Curtis et al., 2015; Dechow et al. 1994; Potepa, 2015). It is possible that such exclusions contain different portions of accruals vs. cash flows, and thus whether cash flows demonstrate a higher persistence into future compensation earnings becomes uncertain. Using compensation earnings collected from firms' proxy statement, we estimate the following regression commonly used in prior literature on earnings persistence:[6]

$$EARN_{t+1} = \alpha + \beta_1 * EARN_t + \beta_2 * CFO_t + \beta_3 * EXL_t + \varepsilon_t \qquad (1)$$

[6] See Dechow et al. (2010) for a review of literature on earnings persistence.

, where $EARN_t$ represents earnings used to determine CEO's annual cash bonus, CFO_t represents the operating cash flow and EXL_t represents the portion of GAAP earnings excluded from $EARN_t$ (Please refer to Appendix A for variable definitions).[7] As firms do not separate the accrual and cash flow component of compensation earnings in their disclosure, we use the operating cash flows of GAAP earnings as the proxy for the cash flow component of compensation earnings.[8] While we acknowledge that some items of operating cash flows in GAAP earnings might be excluded from compensation earnings, we do not expect such measurement error to introduce systematic bias to our inferences. To alleviate the impact of such measurement error, we control for the excluded portion of GAAP earnings (EXL_t) in regression (1).

Coefficient β_2 in regression (1) captures the differential persistence between the accrual and cash flow component of compensation earnings. A positive (negative) β_2 implies that the cash flows component is more (less) persistent than the accrual component in predicting future compensation earnings.

3.2. Target revision and cash vs. accrual performance (Test of *H1*)

To test hypothesis *H1* on the relationship between target revision and the higher persistence of cash flows, we estimate the following regression widely used in the ratcheting literature (e.g. Indjejikian et al. 2014a; Kim and Shin, 2016):

[7] Starting from fiscal year 2006, annual bonus is often referred to as annual non-equity incentives in the proxy statements. We use annual bonus and annual non-equity incentive interchangeably.

[8] An alternative approach is to define the accrual component of compensation earnings using the accrual components of GAAP earnings. We do not take this approach as prior studies show that firms' choice to exclude special items, most of which are accruals, from compensation earnings varies significantly across firms (Curtis et al., 2015) and across time (Potepa, 2015). Given such diverse practices, we cannot come up with a reasonable proxy for the accrual component of compensation earnings using information on financial statements.

$$REV_{t+1} = \alpha + \beta_0 * TARGET_t + \beta_1 * DEV\_P_t + \beta_2 * DEV\_N_t + \beta_3 * CFO_t + \beta_4 * EXL_t + \sum_i \gamma_i * Control_i + \varepsilon_t \quad (2)$$

, where REV_{t+1} represents revision of earnings target from year t to t+1, $TARGET_t$ represents earnings target used to determine CEO's annual bonus of year t, DEV_P_t represents target deviation when it is positive ($EARN_t - TARGET_t > 0$), and DEV_N_t represents target deviation when it is negative ($EARN_t - TARGET_t < 0$). Coefficients before DEV_P_t and DEV_N_t capture the extent to which current performance is used to set future performance target (target ratcheting). The presence of $TARGET_t$ allows target revision to react differently to $EARN_t$ than to target deviations.

Our main variable of interest CFO_t in regression (2) captures the incremental role of cash flows in target revision, given the presence of current year's target and earnings performance (presented as target and target deviation in the regression). Hypothesis *H1* predicts a positive coefficient β_3 in regression (2). A positive β_3 implies that target of next year is revised upward by a larger amount when current year's cash flows are higher, holding current year's target and earnings performance constant.

Regarding other explanatory variables, the difference between coefficients on DEV_P_t and DEV_N_t (β_1 vs β_2) captures the asymmetry in target ratcheting (Bouwens and Kroos, 2011; Leone and Rock, 2002). In variations of regression (2), we also allow CFO_t to have a piece-wise linear relationship with target revision as DEV_t. That is, we allow the coefficient on CFO_t to differ between higher-than-average region (CFO_H_t) and lower-than-average region (CFO_L_t).[9] Other than current target deviation, we also control for other determinants of target revision

[9] As firms do not set target for the cash flows component of earnings or do not disclose such target even if it exists, we choose the cross-sectional mean as the cut-off point for the piece-wise linear relationship.

documented in prior literature: an dummy variable indicating whether the firm's ROA is higher than industry-size peers – RTP_t (Aranda et al., 2014; Indjejikian et al., 2014a), sales growth – SG_t (Kim and Shin, 2016), and the inverse of lagged total assets per share that is used to scale other variables in the regressions - $INVS_t$.

3.3. Target achievability and the differential persistence of cash flows (Test of H2)

To test hypothesis *H2* on the relationship between target achievability and cash flow vs. accrual performance, we modify regression (2) to replace its dependent variable with target deviation of next year (DEV_{t+1}).

$$DEV_{t+1} = \alpha + \beta_0 * TARGET_t + \beta_1 * DEV\_P_t + \beta_2 * DEV\_N_t + \beta_3 * CFO_t + \beta_4 * EXL_t + \sum_i \gamma_i * Control_i + \varepsilon_t \quad (3)$$

Our main variable of interest in regression (3) is CFO_t. If the higher persistence of cash flow performance isn't fully incorporated in target revision, we expect to observe a positive coefficient β_3 on CFO_t in regression (3) as predicted in hypothesis *H2*. We also expect a positive serial correlation of target achievability, i.e. positive β_1 and β_2, given prior evidence on the stickiness of target difficulty (Indjejikian and Nanda, 2002; Indjejikian and Matějka, 2006).

4. Sample selection and descriptive statistics

4.1. Sample selection

To test hypotheses *H1* and *H2*, we collect performance targets from Incentive Lab, but corresponding actual compensation earnings directly from companies' proxy statement, because Incentive Lab doesn't provide actual performance used for compensation evaluation purpose, and compensation earnings are often different from GAAP earnings or IBES earnings. We focus

on annual cash bonus, as performance targets in these grants are revised annually and there is no explicit agreement on how past performance information will be incorporated in the target revision process. This provides us with a rich setting to study how past accrual and cash performance affect target setting differently. We define earnings broadly to include performance metrics in the form of EPS, Earnings, and Operating Income in Incentive Lab,[10] and we restrict our sample to earnings targets expressed on per-share basis or in total dollar amount.[11] We also restrict our sample to the largest 750 firms in terms of average November market capitalization each year.[12]

Table 1 Panel A describes our sample selection. We start with 2,731 non-financial (SIC 6000 – 6999) and non-utility (SIC 4900 – 4999) firm-years in Incentive Lab using earnings targets in annual cash bonus plans after Dec 15, 2006[13], when the disclosure of details in executive compensation first became mandatory (SEC 2006). After further requiring non-missing values for target and actual compensation earnings of both current and the subsequent year, we are left with 1,764 firm-year observations. Since the largest 750 firms in Incentive Lab

[10] Other earnings-based performance metrics in Incentive Lab include EBT, EBIT, EBITDA, ROA, ROE, and ROIC. We do not include EBT, EBIT, and EBITDA in our sample as the cash flow component of them is not comparable to that of earnings and operating income. We do not include ROA, ROE, and ROIC as our reading of proxy statements indicates that the denominators in these metrics are defined in a variety of ways by firms and there is no clear method to calculate these denominators using Compustat data.

[11] We do not include targets expressed as a growth rate or on margin basis, as the base for the growth rate or margin is not adequately disclosed by the firm or collected in Incentive Lab. This observation is also noted in Guay et al. (2016).

[12] According to Incentive Lab, "coverage for the ISS Incentive Lab universe is determined by the largest 750 US public companies each year from 1998 to present. To define the top 750 companies by size (market cap) each year, we calculate an average market capitalization for November to avoid measuring size on a single day such as year-end. We also include all S&P 500 companies, regardless of whether they are in the top 750 or not (there are a few companies that are outside the 750 each year). And for new entrants to the universe we backfill to 1998 (or to IPO date if later), and also continue to track those companies even if they fall out of top 750 to have a complete time series. We also keep any companies that get acquired, go out of business, etc. in the database." Back-filing may work against finding higher persistence of cash flows than accruals if the new entrants to the Incentive Lab universe are those that have invested aggressively in the past and at same time have performed well.

[13] We exclude financial and utility firms from our sample following prior studies on earnings persistence, as the definition of cash flows in these firms is quite different.

cover the majority of firms in S&P 500 and 400 Indices, we take additional efforts to collect earnings targets and actual compensation earnings in the cash bonus plan for firms in the S&P 500 and 400 indices but not covered in Incentive Lab.[14] We add 111 firm-years with necessary data to our sample through these efforts. Our final sample includes 1,875 firm-year observations for 437 unique firms.

Panel B of Table 1 presents the number of firms in our sample by fiscal years. Our sample size increases over time from 2006 to 2013, suggesting either increased use of earnings based metrics in annual bonus plan or improved compliance with the mandated compensation disclosure regulation introduced by SEC in 2006.[15][16] The number of firms in 2014 is lower than that in 2013, as our hand-collection of actual compensation earnings starts in the summer of 2016 and fiscal year 2015 proxy statements for some firms are not published yet by that time.[17] Panel B also presents the number of firm-year observations by the definitions of compensation earnings. EPS is the most commonly used earnings metric, followed by operating income and earnings. The relative frequencies of these earnings metrics in our sample are very similar to those documented in samples collected independently by Huang et al. (2013) and Curtis et al. (2015).

[14] Because the largest 750 firms in Incentive Lab cover the majority of firms in S&P 500 and 400 Indices, we take additional efforts to collect earnings targets and actual compensation earnings for firms in the S&P 500 and 400 indices but not covered in Incentive Lab. We rely on Execucomp to identify historical members of S&P 500 and 400 indices.

[15] Robinson et al. (2011) documents that a large percentage of firms do not comply with the regulation of expanded compensation disclosure in their 2007 proxy statements.

[16] The increase in sample size over time cannot be explained by an increase in Incentive Lab's coverage, as we restrict our sample to the largest 750 firms in Incentive Lab each year.

[17] Notice that we need both fiscal year 2014 and fiscal year 2015 target and actual compensation earnings to estimate regressions (2) and (3).

4.2. Descriptive statistics

Table 2 Panel A presents descriptive statistics for variables used in our analysis. We winsorize all non-indicator variables at 2% and 98% percentiles. Mean compensation earnings ($EARN_t$), expressed as a percentage of lagged total assets, is 11.0%. The mean difference between compensation earnings and GAAP earnings (EXL_t) is 2.7%, suggesting that on average firms exclude negative items when evaluating CEO's performance. Prior research suggests that these excluded negative items are most likely value irrelevant or not controllable by CEOs (e.g. Dechow et al. 1994; Gaver and Gaver, 1998; Potepa, 2015). The mean target deviation (DEV_t) is only 0.4%, compared with 11.0% for $EARN_t$, indicating that on average the performance target is binding and providing incentives for managers. However, the standard deviation of target deviation (2.0%) is relatively large compared with that of $EARN_t$ (6.9%), suggesting significant variation in target achievability.

Turning to our dependent variables of interest, earnings target (REV_{t+1}) on average is revised upward by 1.3% over the next year. Since current year's performance deviation (DEV_t) is on average positive, the average upward target revision is consistent with target ratcheting. Despite of upward target revision, 62.8% of our sample are able to achieve the target ($MEET_{t+1}$) and the average firm beats the target by 0.2% (DEV_{t+1}). Our independent variable of interest, cash flows (CFO_t) has a mean value of 13.3%, which is higher than the mean of $EARN_t$, suggesting average accruals to be income decreasing. Regarding control variables, 56.1% of our sample firms are more profitable than their industry-size peers (RTP_t). In addition, our sample firms are on average growing in revenue (SG_t).

Table 2 Panel B presents the mean values of main dependent and independent variables by performance metrics. There are noticeable variations in mean values of dependent variables

REV_{t+1}, DEV_{t+1} and MEE_{t+1}, but not in the mean values of independent variables of interest DEV_t and CFO_t. Nevertheless, we include metric-year fixed effects in all regressions.

Table 2 Panel C presents correlations among variables. Consistent with prior findings in target ratcheting literature, there is a positive correlation between DEV_t and REV_{t+1}. Also consistent with Indjejikian and Nanda (2002) and Indjejikian and Matějka (2006), we observe a positive serial correlation between DEV_t and DEV_{t+1}. The coexistence of target ratcheting and a positive serial correlation of target deviation can be explained by firms' commitment not to use all past information about managers' productivity in revising targets in a way that would limit managers' rent or increase required managerial effort (Indjijikan et al., 2014a; Bol and Lill, 2015).

Turning to our variable of interest CFO_t, it is positively correlated with both REV_{t+1} and DEV_{t+1}, which seems to suggest that firms do consider cash flows when revising targets but the incorporation of cash flows information is incomplete. However, it is worth noting that we are interested in the incremental impact of CFO_t on target setting in addition to earnings performance, therefore we will examine whether CFO_t continue to be positively associated with REV_{t+1} and DEV_{t+1} after controlling for current earnings target and target deviation in regression analysis.

5. Empirical results

5.1. Differential persistence between cash flows and accruals

Table 3 reports the differential persistence between cash flows and accruals in predicting next year's compensation earnings ($EARN_{t+1}$). Column 1 shows that the cash flow component is more persistent than the accrual component, as indicated by the coefficient of 0.108 (t = 2.59) on

CFO_t when holding $EARN_t$ constant. This finding suggests that for firms with the same compensation earnings, those with higher cash flows by one-standard deviation (i.e. 7.2%) will have higher compensation earnings over the next year by 0.8% (= 0.108*7.2%), which accounts for around 10% of the standard deviation of compensation earnings. The economic magnitude of this differential persistence is smaller than that observed between operating cash flows and working capital accruals in Dechow and Ge (2006), suggesting that a portion of less persistent working capital accruals are excluded from compensation earnings.

In column 2, we introduce piece-wise linear relationships of $EARN_t$, CFO_t, and EXL_t into model (1) by separating these variables into higher-than-average region and lower-than-average region.[18] We find high earnings performance ($EARN\_H_t$) is relatively more persistent than low earnings performance ($EARN\_L_t$). The lower persistence of low earnings performance can be explained by the liquidation option of firms with bad performance (Hayn, 1995) or a stronger motivation of CEOs to increase future performance.[19] In contrast, we find above-average cash flows (CFO_H_t) and below-average cash flows (CFO_L_t) are equally associated with future earnings.

In summary, we find that the higher persistence of cash flows documented for valuation earnings (e.g. Sloan, 1996) extends to compensation earnings. The higher persistence of cash flows implies that if revision of next year's earnings target does not fully incorporate such differential persistence, firms with higher cash flows are more likely to meet or beat earnings target in the future.

[18] Notice that cross-sectional means of these variables are calculated separately for each fiscal year.

[19] Differentiating these two explanation is beyond the scope of our study.

5.2. Target revision and cash vs. accrual performance

Table 4 presents results for testing hypothesis *H1*. Column 1 shows that target revision (REV_{t+1}) is positively associated with CFO_t, after controlling for other determinants examined in prior studies. Specifically, when CFO_t increases by one standard deviation, earnings target of next year is revised upward by 0.2% (= 0.033*7.2%). As coefficient 0.033 before CFO_t is much smaller than the higher persistence of cash flows (0.108) documented in Column 1 of Table 3, we predict target revision to have only partially incorporated the higher persistence of cash.[20] We test this prediction later in hypothesis *H3*. In column 2, we further separate CFO_t into CFO_H_t and CFO_L_t. We find that target revision only reacts to CFO_H_t, but not to CFO_L_t. This finding suggests that boards revise target upward when cash performance is high, but do not revise the target downward when cash performance is low. However, the difference between the coefficient before CFO_H_t and that before CFO_L_t is not statistically significant

Table 4 also confirms the phenomenon of target ratcheting widely documented in the literature, as indicated by the positive coefficients on DEV_P_t and DEV_N_t. Such finding is consistent with compensation committee revising future targets when fundamental shifts in the productivity of capital and labor lead to deviation of performance from target (e.g. Indjejikian et al. 2014b). Column 1 of Table 4 also shows that target revision reacts more strongly to DEV_N_t than to DEV_P_t. This form of asymmetric target ratcheting is also observed in Bol and Lill (2015) and Armstrong et al. (2017), but the opposite asymmetry is observed in Leone and Rock (2002), Bouwens and Kroos (2011), and Aranda et al. (2014). The mixed evidence on the form of asymmetric target ratcheting is likely due to the difference in the sample composition of well-

[20] Given the difference in specification between model (1) and (2), coefficient before *CFO* is likely to be different even when target revision fully incorporates the differential persistence of cash flows.

performing firms. As Indjejikian et al. (2014a) shows in their Table 5, target revision reacts more strongly to DEV_N_t among well-performing firms but more strongly to DEV_P_t among badly-performing firms. Since our sample are drawn from the largest 750 public firms on the market each year, our sample is likely to include more well-performing firms, leading to a stronger target revision in response to negative target deviation.

Unlike Aranda et al. (2014), we do not find target revision to be associated with the indicator variable of relative earnings performance (RTP_t). Untabulated results show that RTP_t is not associated with $EARN_{t+1}$ in regressions of Table 3, which could explain the lack of an association between RTP_t and REV_{t+1} in our sample. We also follow Indjejikian et al. (2014a) to examine whether the magnitude of target ratcheting is associated with relative performance by add interaction terms $DEV\_P_t*RTP_t$ and $DEV\_N_t*RTP_t$ in column 2 of Table 4. We find a significant positive coefficient of 0.395 (untabulated) on $DEV\_N_t*RTP_t$, consistent with the observation in Indjejikian et al. (2014a) that high-profitability firms are more likely to decrease earnings targets when their managers fail to meet prior-year targets. Finally, we find target revision to be positively associated with sales growth (SG_t), consistent with the explanation that target revision attempts to screen out structural changes in firms' profitability.

In summary, our evidence indicates that the differential persistence of cash flows is considered during the target revision process. Next, we examine whether the higher persistence of cash flows is fully incorporated in target revision.

5.3. Target achievability and cash vs. accrual performance

Table 5 presents results of testing hypothesis *H2*. Our main measure of target achievability is target deviation of next year (DEV_{t+1}). Column 1 shows that CFO_t is

significantly positively associated with DEV_{t+1}, indicating that firms with higher CFO_t are able to exceed target of next year by a larger amount. Specifically, when CFO_t increases by one standard deviation (7.2%), DEV_{t+1} would be higher by 0.43% (= 0.06*7.2%). For a hypothetical firm with average firm size and average bonus delta in our sample, such increase in DEV_{t+1} implies an increase of $811,309 cash bonus when CFO_t increases by one standard deviation.[21] Such impact on CEO's cash bonus incentive is economically significant, considering that the mean salary for CEOs in our sample is $1,007,735 and the mean total annual compensation is $8,126,874. Comparing coefficients before CFO_t in Table 4 and Table 5 suggests that target revision incorporates around 35% (= 0.33/(0.33 + 0.60)) of the higher persistence of cash flows. Column 2 further shows that the positive association between CFO_t and DEV_{t+1} exists among both firms with higher-than-average cash flows ($CFO\_H_t > 0$) and those with lower-than-average cash flows ($CFO\_L_t < 0$).[22]

Turning to control variables, we find a positive serial correlation of target deviations, similar to that observed in Indjejikian and Nanda (2002) and Indjejikian and Matějka (2006), consistent with past performance not being fully used in target revision. We also notice an asymmetry in the serial correlation between DEV_P_t and DEV_N_t. Serial correlation is 0.393 for DEV_P_t, but only 0.030 for DEV_N_t in column 1. This asymmetry possibly indicates that for firms included in our sample, the positive deviation is considered to be more reflective of CEO's

[21] We follow Guay et al. (2016) to define bonus delta as dollars of bonus for $1 million increase of compensation earnings. In our sample, mean (median) bonus delta is $ 18,821 (9,862) for compensation earnings ranging from target to maximum and $ 14,579 (7,472) for earnings ranging from threshold to target. In our calculation, we take the average delta of these two regions, i.e. mean (median) delta of $16,700 (8,667). The mean (median) lagged total assets is $11,298 (4,622) millions. Given these estimates, a 0.43% increase in target deviation would lead to $811,309 increase in annual bonus for a firm with average size and average bonus delta, and $172,253 increase in annual bonus for a firm with median size and median bonus delta. Specifically, $811,309 = 0.43%*11,298*16,700.

[22] The difference between the coefficient before *CFO_H* and that before *CFO_L* is not statistically significant.

superior abilities or efforts than the negative deviation to be reflective of inferior abilities or efforts. Other control variables in the regression models are generally uncorrelated with DEV_{t+1}.

The last two columns of Table 5 report results of measuring target achievability by the indicator variable of meeting or beating the target ($MEET_{t+1}$). Consistent with the deviation results, we observe a positive association between CFO_t and $MEET_{t+1}$ after controlling for other determinants of target achievability. The coefficient on CFO_t implies that a one-standard deviation increase in CFO_t increases the likelihood of meeting or beating next year's target by 34.5% (= exp(4.121*7.2%) – 1). In column 4, we further separate CFO_t into CFO_H_t and CFO_L_t. Unlike column 2, we find the association between CFO_t and $MEET_{t+1}$ to be statistically significant for CFO_L_t but not for CFO_H_t. One potential explanation is that the dummy variable $MEET_{t+1}$ does not capture the variation of positive DEV_{t+1} with higher-than-average cash flows, given that around 60% of firms meet their earnings target in year t+1.

In summary, we find a strong positive association between current year's cash flows and next year's target achievability, indicating that target revision does not fully incorporate the differential persistence of cash flow vs. accrual performance.

5.4. Explanations for the positive association between target achievability and cash flow performance

Section 2.2 proposes two broad explanations for the positive association between cash flows and target achievability documented in Table 5: the bias explanation and the efficient contracting explanation. Under the first explanation, this positive association results from cognitive bias of target setting participants in predicting future earnings. Under the second explanation, this positive association results from boards' commitment not to fully incorporate

the higher persistence of cash flows in target revision. Such commitment intends to reward CEOs who deliver higher cash-flows-based earnings with a larger budgetary slack and to limit ratcheting effect involving cash flows. We test these two explanations in this section.

5.4.1. Cognitive bias

To test the cognitive bias explanation, we use errors in analysts' consensus forecasts made at the beginning of year *t+1* (AFE_{t+1}) to capture biases in boards' expectation of year *t+1* compensation earnings. Because analysts issue earnings forecasts to aid investors' valuation, therefore they lack incentive to intentionally leave slacks in their forecasts for efficient contracting purpose. Prior studies show that compensation committees use analysts' forecast as an input when setting earnings targets (Choi et al. 2016). Consequently, we expect bias in analysts' expectation of future earnings to spillover to boards of directors.[23]

Table 6 Panel A examines the role of AFE_{t+1} to explain the positive association between CFO_t and DEV_{t+1} in our full sample. Column 1 and 2 report the relationship between AFE_{t+1} and CFO_t. Consistent with Bradshaw et al. (2001), we find a positive association between AFE_{t+1} and CFO_t in column 1, after controlling for DEV_t. That is, analyst forecast is more optimistically biased among firms with low CFO_t (i.e. high accruals). Furthermore, column 2 shows that this positive relationship is stronger among firms with lower-than-average cash flows ($CFO\_L_t < 0$). That is, firms with low CFO_t (i.e. high accruals) have more upward biased forecasts than firms

[23] Using AFE_{t+1} to measure board's earnings expectation bias implicitly assumes unbiased expectation of the difference between compensation earnings and I/B/E/S earnings. Violation of this assumption may understate or overstate the role of cognitive bias as the explanation for the positive relation between target achievability and cash flows.

with average CFO_t, but firms with high CFO_t (i.e. low accruals) only have slightly more downward biased forecasts than firms with average CFO_t.[24]

Given the positive association between AFE_{t+1} and CFO_t, we turn to examine the extent to which AFE_{t+1} can explain the positive association between CFO_t and DEV_{t+1} documented in Table 5. To do so, we add AFE_{t+1} as an additional explanatory variable in the regression explaining DEV_{t+1}.[25] Column 3 of Table 6 reports results of this regression. We continue to observe a significant positive coefficient on CFO_t. However, the magnitude of the coefficient drops from 0.060 in column 1 of Table 5 to 0.025 in column 3 of Table 6, suggesting that bias in earnings expectation explains around 60% (= 1 – 0.025/0.060) of the relationship between CFO_t and DEV_{t+1}. Furthermore, column 4 of Table 6 shows that bias in earnings expectation completely explains the positive association between CFO_L_t and DEV_{t+1}, and a small portion of the positive association between CFO_H_t and DEV_{t+1}. To see this, notice that coefficient on CFO_L_t drops from 0.045 in column 2 of Table 5 to -0.002 in column 4 of Table 6, and the coefficient on CFO_H_t only decreases from 0.070 to 0.045. In columns 5 and 6, we repeat the same regressions in columns 3 and 4 by replacing the dependent variable DEV_{t+1} – ex post target deviation – with a measure of ex ante budgetary slack – $SLACKAF_{t+1,}$ defined as DEV_{t+1} minus AFE_{t+1}. Ex ante budgetary slack attempts to capture the deviation of target from earnings expectation and thus excludes the influence of cognitive bias on target setting. Results using

[24] Such piece-wise linear relationship is specific to our sample, as Bradshaw et al. (2001) document a linear relationship between forecast error and accruals in their sample. In untabulated results, we replace independent variables *DEV_P* and *DEV_N* in column 2 of Table 6 with positive and negative forecast error of year t, we continue to observe this piece-wise linear relationship. This result suggests that the piece-wise linear relationship is not driven by the definition of compensation earnings.

[25] Adding AFE_{t+1} as an additional control variable in the regression can also control for the portion of expectation bias of the difference between compensation earnings and I/B/E/S earnings that is correlated with forecast error.

$SLACKAF_{t+1}$ as dependent variables are qualitatively similarly to those using DEV_{t+1} as the dependent variable. Thus, our main inferences remain unchanged.

Next, we repeat the above analysis in a subsample without annual horizon management guidance. Martin et al. (2017) shows that managers strategically issue pessimistic guidance in order to influence future performance target. If analyst forecasts are influenced by management guidance, what we observe in Table 6 Panel A may not reflect cognitive bias regarding cash flow persistence, but rather managers' strategic guide-down behavior which could be more intensive when cash flows is higher. To control for the influence of managers' strategic guidance, Table 6 Panel B repeats the same set of analyses in Panel A among the subsample of observations without annual horizon management guidance issued before the grant of bonus plan. Column 0A and 0B show that the association between CFO_t and DEV_{t+1} in this subsample is very similar to that observed in Table 5 for the full sample. Column 1 and 2 show that in this subsample, only CFO_L_t is positively associated with AFE_{t+1}, but CFO_H_t is not. That is, firms with low CFO_t (i.e. high accruals) have more optimistically biased forecasts than firms with average CFO_t, but firms with high CFO_t do not have more pessimistically biased forecasts than firms with average CFO_t. Given this non-linear relationship between AFE_{t+1} and CFO_t, it is not surprising to find in column 4 that controlling for AFE_{t+1} completely explains the positive association between CFO_L_t and DEV_{t+1}, but does not explain the positive association between CFO_H_t and DEV_{t+1}. In columns 5 and 6, we repeat the same regressions in columns 3 and 4 by replacing the dependent variable DEV_{t+1} – ex post target deviation – with our measure of ex ante budgetary slack – $SLACKAF_{t+1}$. Our main inferences remain identical.

In summary, we show that bias regarding cash flow persistence in boards' earnings expectation explains a significant portion of the positive association between target achievability

and the differential persistence of cash flows. However, there remains a significant positive relationship between CFO_H_t and DEV_{t+1}, especially among firms without issuing annual horizon guidance before bonus grant date. It is also worth noting that if AFE_{t+1} includes a portion of budgetary slack that is positively associated with CFO_t, our research design may have overstated the importance of cognitive bias in explaining the positive association between target achievability and the differential persistence of cash flows.

5.4.2. Efficient contracting

As the cognitive bias explanation does not fully explain the positive association between cash flows and target achievability, we next examine whether boards' commitment to not fully incorporate the higher persistence of cash flows in target setting explains the remaining positive association. As explained earlier, such commitment is used to reward managers of superior ability/effort and to limit ratcheting effect involving cash flows. If such efficient contracting consideration explains the incomplete use of cash flow information, we expect the positive association between higher-than-average cash flows and target achievability to be more prominent when (i) higher cash flows are better indication of superior managerial abilities or efforts; and (ii) ratcheting effect involving cash flows is more costly. We use the following cross-sectional variations as proxies for these conditions.

(a) Relative stewardship role of cash flows

When cash flows is incrementally more reflective of managerial efforts or ability, we expect boards to be more willing to reward CEOs with higher than average cash flows with a larger slack. We follow Natarajan (1996) to measure the relative stewardship role of cash flows

compared with earnings (*RSV*).[26] To test our prediction, we interact the relative stewardship value of cash flows with all explanatory variables in regression (3).[27] Column 1 of Table 7 Panel A presents results for this regression. Consistent with our prediction, we find a significantly positive coefficient 0.062 (t = 2.83) before the interaction term CFO_H_t* RSV_t.[28]

(b) Relative variation of earnings

When earnings are more volatile compared with cash flows, we expect cash flows to be a more credible signal of superior managerial efforts than accruals. Accordingly, we expect a stronger positive association between CFO_H_t and DEV_{t+1} among firms with larger earnings volatility compared with cash flows. We measure the relative volatility of earnings in two ways: the relative standard deviation of earnings to cash flows over past five years (*RSTD*) and the ratio of absolute change in earnings to that of cash flows (*RMAG*). Column 2 and 3 of Table 7 Panel A present results for these two interaction variables. Consistent with our prediction, we find significantly positive coefficients 0.153 (t = 2.23) before CFO_H_t*$RSTD_t$ and 0.054 (t = 1.90) before CFO_H_t*$RMAG_t$.

(c) Capital investment

Operating cash flows provide internal funding for capital investment. When firms need to invest heavily in capitals, managers' constraint of effort in generating cash flows in the current period to get more achievable targets for the next period becomes very costly. As a result, boards are more concerned about such ratcheting effect involving cash flows when capital investment is

[26] To accommodate negative estimates of the stewardship value of cash flows, we modify the equation of relative stewardship value for cash flows in Natarajan (1996) to be [SV(cash flows) – SV(earnings)]/|SV(cash flows)| following Nwaeze et al. (2006).

[27] We take the logarithm transformation of the partition variables in Table 7 to reduce the impact of potential outliers in these variables. Under this transformation, the lowest value of a variable in our sample is 0.

[28] In untabulated results, we also use the relative standard deviation of cash flows to earnings as the proxy for the relative stewardship role of cash flows, and reach a similar inference.

more intensive. Accordingly, we expect the commitment to incomplete use of cash flows information to be stronger among these firms. We test this prediction by interacting capital investment of year t+1 $CAPINV_{t+1}$ with all explanatory variables in regression (3). Column 4 of table 7 reports the results. Consistent with our prediction, we find a significantly positive coefficient 0.472 (t = 2.37) before CFO_H_t*$CAPINV_{t+1}$, indicating a stronger positive association between CFO_H_t and DEV_{t+1} when firms invest more on capital expenditures.

(d) Stock-based incentives

CEO's compensation package includes both short-term cash bonus and long-term incentives such stock units and stock options. Incentives provided by CEOs' stock and option holdings could affect boards' decision on budgetary slack. As discussed earlier, boards commit not to fully use past information in exchange of managers' agreement to not withhold efforts under good performance. When CEOs have stronger incentives to increase share price (i.e. larger portfolio delta), the likelihood of CEOs to withhold effort decreases. Consequently, there is attenuated need for the use of commitment to alleviate the ratcheting effect. We predict that the positive association between CFO_H_t and DEV_{t+1} becomes weaker among CEOs with a higher stock/option portfolio delta. We follow Core and Guay (2002) and Coles et al. (2006) to measure portfolio delta and normalize it by CEOs' salary. Consistent with our prediction, we find a weak negative coefficient -0.047 (t = -1.77) before CFO_H_t*$DELTA_t$ in column 5 of Panel A, indicating a weaker positive association between CFO_H_t and DEV_{t+1} when CEOs have larger portfolio delta.

It is also widely documented that CEOs with stock/option portfolio that is more sensitive to share price volatility (i.e. portfolio vega) are more likely to invest in risker projects (e.g. Coles et al. 2006). Assuming CEOs' portfolio vega reflects shareholders' demand for managers' risk-

taking, we expect boards to reward cash flows performance incrementally to a lesser degree because accruals represent risk-taking investment in working capital. In other words, when CEOs' portfolio vega is high, risk-taking is important to firm value and thus ratcheting effect involving accruals become more costly. Consequently, we predict a weaker positive association between CFO_H_t and DEV_{t+1} among CEOs with a larger portfolio vega. We again follow Core and Guay (2002) and Coles et al. (2006) to measure portfolio vega and normalize it by CEOs' salary. Consistent with our prediction, we find a significantly negative coefficient -2.52 (t = -2.70) before $CFO\_H_t*VEGA_t$ in column (6) of Panel A, indicating relatively less slack for high cash flows performance when CEOs are more incentivized to take risk. Meanwhile, we also find a significant positive coefficient 1.097 (t = 2.76) before $DEV\_P_t*VEGA_t$ in column (6), suggesting more slack for high accruals performance when risk-taking is more important.[29]

In Panel B of Table 7, we repeat the same analyses in Panel A by replacing the dependent variable DEV_{t+1} – ex post target deviation – with a measure of ex ante budgetary slack – $SLACKAF_{t+1}$. Our main inferences remain unchanged. In summary, the collective evidence above supports the efficient contracting explanation for the positive association between the differential persistence of cash flows and target achievability.

5.5. Ratcheting effect sacrificing cash flows

So far, we have documented that target revision doesn't completely incorporate the differential persistence of cash flows vs. accruals, resulting in managers' with higher percentage of cash flows in earnings performances being rewarded with larger slack in future targets. In this

[29] In column 6 of Table 7 Panel A, we also find a marginally significantly positive coefficient 0.155 (t = 1.71) before $CFO\_L_t*VEGA_t$, indicating that CEOs have less budgetary slack when generating negative cash earnings when they have larger vega. One potential explanation is that shareholders are concerned with negative operating cash flows when firms are taking more risk. As a result, they punish CEOs with more difficult earnings target when they deliver below average cash flows.

section, we examine the implication of such contractual feature on managers' behavior. We expect that managers are less likely to constrain their efforts on generating cash income when cash flow performance is more positively related to future target achievability. Empirically, this would manifest as consistent cross-sectional variations between managers' tendency to withhold effort of generating cash income and the degree to which cash performance is associated with slack in future targets. To test this prediction, we examine how cash-flows-based output restriction varies with variables found to explain the incomplete use of cash flows information in Table 7.

Following prior literature (Bouwens and Kroos, 2011; Bol and Lill, 2015), we use the lack of positive serial correlation between current and prior period cash flows to proxy for output restriction, assuming persistent efforts to generate cash performance leading to positively correlated cash flows. Since our interest is on the relative persistence of cash flows versus accruals, we control for the level of earnings when examining the serial correlation of operating cash flows. In addition, as restricting operating cash flows is likely to involve real activities management, we expect such effort restriction to occur relatively earlier than restriction of accrual estimation. Consequently, we examine at the correlation between operating cash flows of the first two quarters of year t+1 and that of the last two quarters of year t+1, while holding earnings of the first two quarters constant. That is, we estimate the following regression:

$$CFO_{t+1(q3,q4)} = \alpha + \beta_0 * EARN\_H_{t+1(q1,q2)} + \beta_1 * EARN\_L_{t+1(q1,q2)} + \beta_2 * CFO\_H_{t+1(q1,q2)} + \beta_3 * CFO\_L_{t+1(q1,q2)} + \theta * CSVAR + \gamma_0 * EARN\_H_{t+1(q1,q2)} * CSVAR + \gamma_1 * EARN\_L_{t+1(q1,q2)} * CSVAR + \gamma_2 * CFO\_H_{t+1(q1,q2)} * CSVAR + \gamma_3 * CFO\_L_{t+1(q1,q2)} * CSVAR + \varepsilon_t \quad (4)$$

, where $CFO_{t+1(q1,q2)}$ represents operating cash flows of the first two quarters of year t+1, $CFO\_H_{t+1(q1,q2)}$ equals $CFO_{t+1(q1,q2)}$ when $CFO_{t+1(q1,q2)}$ is above cross-sectional average and 0 otherwise, and *CSVAR* represents partition variables examined in Table 7. We separate $CFO_{t+1(q1,q2)}$ into above and below average portions as cash flow restriction is likely to occur only when it is better than average, according to the asymmetric relationship between future target slack and cash performance. Consequently, we focus on coefficient γ_2 in regression model (4). A positive (negative) γ_2 indicates less (more) restriction on generating cash-flow-based earnings. Admittedly, effort constraint is difficulty to measure, and thus our research design may not be powerful enough to capture output restriction related to operating cash flows.

Column 0 of Table 8 Panel A reports regression results of model (4) when interaction terms are not present. When holding earnings constant, we find neither $CFO\_H_{t+1(q1,q2)}$ nor $CFO\_L_{t+1(q1,q2)}$ to be positively correlated with $CFO_{t+1(q3,q4)}$. This finding suggests that the serial correlation of operating cash flows when holding earnings constant reflects other economic activities beyond managers' efforts to generate positive operating cash flows. Columns 1 to 7 present regression results of model (4) for different interaction variables examined in Table 7. We find that the interaction term of $CFO\_H_{t+1(q1,q2)}$*$CSVAR$ is significantly positive for *RSTD*, *RMAG*, and $INVEST_{t+1}$. These positive interaction effects suggest that output restriction of cash performance is less likely when cash flows better signals for managers' ability or efforts relative to earnings or when firms need to make more capital investment, where cash performance is found to be rewarded with higher slack in future target relative to accruals in Table 7.

As a placebo test, we re-estimate regressions in Panel A by replacing quarterly operating cash flows with accruals. That is, we examine how restriction of accrual-based performance varies with interaction variables examined in Table 7. Table 8 Panel B presents these results. We

do not find the interaction term of $ACC\_H_{t+1(q1,q2)}$*$CSVAR$ to be significantly positive for *RSTD*, *RMAG*, and $INVEST_{t+1}$ as in Panel A. These results suggest that CEOs do not constrain accrual performance like cash performance when cash performance is found to be rewarded with higher slack in future target relative to accruals.

In summary, we find weak evidence supporting that when firms do not fully incorporate the higher persistence of cash flows in setting performance targets and thus reward cash performance with larger slack relative to accruals, managers are less likely to constrain efforts in generating cash earnings relative to accrual earnings.

5.6. Additional analysis

5.6.1. Presence of cash flows target in bonus plan

In our sample, 29% of firm-years also use cash-flows-based target in their bonus plan.[30] The presence of a cash flow target in the bonus plan may indicate that earnings is a noisier signal of managerial effort. If so, boards may view current year's positive earnings target deviation as less reflective of superior skills or efforts among these firms, and consequently reward these managers with lower budgetary slack on earnings in the future. Consequently, we predict a weaker positive association between positive target deviation and next year's target achievability. Consistent with our prediction, we find a significantly negative coefficient -0.240 (t = -2.12) before DEV_P_t*$WCFOT_t$ in explaining DEV_{t+1} in Table 9.

We further examine how the presence of cash flows target in the bonus plan influences the additional budgetary slack associated with the cash flow portion of earnings performance. We do not have an ex ante prediction. On the one hand, the presence of cash flows target in the

[30] Cash flows are generally defined as operating cash flows or free cash flows in our sample.

bonus plan may indicate that cash flow portion of earnings performance is more reflective of managerial efforts in these firms, predicting more incremental slack associated with operating cash flows among these firms. On the other hand, setting cash flows target directly in the bonus plan provides an alternative tool for boards to reward managers who generate higher cash flow performance, predicting less incremental slack associated with operating cash flows. In Table 9, we find $CFO\_H_t*WCFOT_t$ to be insignificant in explaining DEV_{t+1}. This finding suggests that boards reward additional budgetary slack associated with higher percentage of operating cash flows in earnings even when cash flow itself is a performance target in the bonus plan.

5.6.2. Median regression

To examine whether our main results are driven by potential outliers, we re-estimate regressions (2) and (3) using median regressions instead of OLS regressions. The first two columns in Table 10 presents results for regression (2) and the last two columns for regression (3). We continue to observe a positive association between cash flows and target revision, when holding current year's deviation constant. Also similar to the results from OLS regressions, such positive association is only present among firms with higher-than-average cash flows. Turning to target achievability, we again observe a significantly positive association between CFO_t and DEV_{t+1} in the median regression, which is also found to be much stronger among firms with higher-than-average cash flows. Different from the OLS results, we do not find the positive association between CFO_L_t and DEV_{t+1} to be significant in median regression. This finding suggests that bias in earnings expectation associated with lower-than-average CFO_t may be present in a small subset of observations.

5.6.3. Analysis using accruals

Finally, we repeat our main analysis using the accrual component of compensation earnings instead of cash flows. We define accrual component of compensation earnings as the difference between compensation earnings and cash flows (CFO_t). In a modified regression that replaces CFO_t with ACC_t in column 1 of Table 4, we find a negative coefficient of -0.025 (t = -1.54) on ACC_t, suggesting that compensation committees revise earnings target downward for firms with higher accruals, when holding earnings constant. In a modified regression that replaces CFO_t with ACC_t in column 1 of table 5, we again find a significantly negative coefficient of -0.044 (t = -2.76) on ACC_t, suggesting that firms with higher ACC_t are facing more difficult to achieve targets over the next year. These inferences are identical to those obtained above from using CFO_t to examine the differential persistence. However, the magnitude and the statistical significance of the coefficients on ACC_t in these regression are smaller than those on CFO_t in regressions (2) and (3). This is not surprising given that ACC_t is implied by the difference compensation earnings and cash flows.

6. Conclusion

Setting performance targets is an important topic in managerial control and incentive design (Indjejikian et al. 2014a). Existing literature to date has largely focused on target ratcheting, which refers to the pervasive practice of setting current targets based on prior actual performance. Motivated by prior finding of the differential persistence between accrual and cash flow components of earnings (Sloan, 1996), we extend the target ratcheting literature by examining the extent to which target revision incorporates such differential persistence of earnings components. It is important to consider the differential persistence between accruals and cash flows, as the underlying sources of the higher persistence of cash flows have different

implications on the extent to which such differential persistence should be incorporated in target revision or budgetary slack.

Our empirical results show that firms do revise earnings target upward when cash flows are higher than average, after controlling for earnings constant. However, the target revision is incomplete such that firms with cash flows higher (lower) than average are associated with higher (lower) deviation from targets over the next year, i.e. less (more) difficult earnings targets. Such incomplete use of cash flows information in target revision is due to both boards' cognitive bias in predicting future earnings and its commitment to reward superior CEOs with a larger budgetary slack or to limit ratcheting effect involving operating cash flows. Our evidence sheds new light on the target setting process and provides additional support for the use of commitment to solve dynamic incentive problem (Indjejikian et al. 2014a, b).

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Appendix A: Variable definition

Variable*	Definition
$EARN_{t+1}$	Actual EPS used for CEO's annual non-equity incentive compensation of year t+1, scaled by total assets per share of year t-1. For firms using EPS as the earnings-based performance metric in the non-equity incentive plans, actual EPS is defined as the actual amount of EPS disclosed in the proxy statements. For firms using Earnings and Operating Income as the earnings-based performance metric in the non-equity incentive plans, actual EPS is defined as the actual amount disclosed in the proxy statements for these metrics divided by the number of shares outstanding used to calculate diluted EPS (Compustat *cshfd*).
$TARGET_{t+1}$	Target EPS used for CEO's annual non-equity incentive compensation of year t+1, scaled by total assets per share of year t-1. For firms using EPS as the earnings-based performance metric in the non-equity incentive plans, target EPS is defined as the target amount of EPS disclosed in the proxy statements. For firms using Earnings and Operating Income as the earnings-based performance metric in the non-equity incentive plans, target EPS is defined as the target amount disclosed in the proxy statements for these metrics divided by the number of shares outstanding used to calculate diluted EPS (Compustat *cshfd*).
REV_{t+1}	Target revision of year t+1 is defined as target EPS of year t+1 ($TARGET_{t+1}$) minus target EPS of year t ($TARGET_t$).
DEV_{t+1}	Target deviation of year t+1 is defined as actual EPS of year t+1 ($EARN_{t+1}$) minus the target EPS of year t+1 ($TARGET_{t+1}$).
$MEET_{t+1}$	An indicator variable that equals 1 if the actual EPS ($EARN_{t+1}$) is equal to or larger than the target EPS ($TARGET_{t+1}$).
EARN	Actual EPS used for CEO's annual non-equity incentive compensation of year t, scaled by total assets per share of year t-1.
EARN_H	Higher-than-average earnings is defined as Max(EARN – cross-sectional mean, 0), where cross-sectional mean is the average of EARN calculated for each fiscal year.
EARN_L	Lower-than-average earnings is defined as Min(EARN – cross-sectional mean, 0), where cross-sectional mean is the average of EARN calculated for each fiscal year.
TARGET	Target EPS used for CEO's annual non-equity incentive compensation of year t, scaled by total assets per share of year t-1.
DEV	Target deviation of year t is defined as actual EPS of year t+1 ($EARN_t$) minus the target EPS of year t ($TARGET_t$).
DEV_P	Positive target deviation is defined as Max(DEV,0).
DEV_N	Negative target deviation is defined as Min(DEV,0).
CFO	Operating cash flows (Compustat oancf) per share of year t, scaled by total assets per share of year t-1.
CFO_H	Higher-than-average operating cash flows per share is defined as Max(CFO – cross-sectional mean, 0), where cross-sectional mean is the average of CFO calculated for each fiscal year.
CFO_L	Lower-than-average operating cash flows per share is defined as Min(CFO – cross-sectional mean, 0), where cross-sectional mean is the average of CFO calculated for each fiscal year.
ACC	Operating accruals per share, scaled by lagged total assets per share, is defined as actual EPS used for CEO's annual non-equity incentive compensation (EARN) minus operating cash flows per share (CFO).
EXL	Excluded earnings per share is defined as GAAP diluted EPS (Compustat epsfi)

	minus actual EPS used for CEO's annual non-equity incentive compensation, scaled by total assets per share of year t-1.
EXL_H	Higher-than-average excluded earnings per share is defined as Max(EXL – cross-sectional mean, 0), where cross-sectional mean is calculated in the same way as that in CFO_H.
EXL_L	Lower-than-average excluded earnings per share is defined as Min(EXL – cross-sectional mean, 0), where cross-sectional mean is calculated in the same way as that in CFO_H.
RTP	An indicator variable that equals 1 if IBES actual EPS is larger than the average IBES actual EPS of peer firms. Following Albuquerque (2009), the average IBES actual EPS of peer firms is calculated as follows: First we form an annual portfolio based on 2-digit SIC codes using all the firms in Compustat and CRSP. Second, within an industry, firms are sorted based on their size quartiles. Third, we match each firm with an industry-size peer portfolio. When we match each firm with the industry-size peer portfolio, we exclude the firm in question from the portfolio. Then, the average IBES actual EPS is calculated for each of these industry-size matched portfolios.
SG	Sales growth is defined as the growth rate of sales (Compustat sale) from year t-1 to year t.
INVS	Inverse of total assets per share of year t-1.
AFE_{t+1}	Analysts' forecast error of year t+1 earnings is defined as IBES actual EPS of year t+1 minus the first consensus EPS forecast after the approval of bonus plan for year t+1. When bonus plan is approved before the announcement of year t earnings or the bonus plan approval date is missing in Incentive Lab, we take the first consensus after the announcement of year t earnings.
$SLACKAF_{t+1}$	Ex ante budgetary slack based on analyst forecast is defined as DEV_{t+1} minus AFE_{t+1}.
MFE_{t+1}	Management forecast error of year t+1 earnings is defined as IBES actual EPS of year t+1 minus the last annual horizon management forecast the approval of bonus plan for year t+1. When bonus plan approval date is missing in Incentive Lab, we take the last management forecast in the first fiscal quarter of year t+1.
$SLACKMF_{t+1}$	Ex ante budgetary slack based on management forecast is defined as DEV_{t+1} minus MFE_{t+1}.
RSV	The relative stewardship value of cash flows to earnings is defined as [SV(cash flows) – SV(earnings)]/|SV(earnings)| following Natarajan (1996) (Please refer to this study for the definition of stewardship value function SV(·)). To calculate the stewardship values, cash flows is defined as operating cash flows (Compustat oancf) and earnings is defined as IBES actual earnings (IBES actual EPS * cshfd).
RSTD	The relative standard deviation of earnings is defined as the ratio of earnings standard deviation (IBES actual EPS*cshfd/lagged at) to the cash flows standard deviation (Compustat oancf/lagged at). Standard deviation is calculated over the most recent five years.
RMAG	The relative magnitude of earnings change is defined as the ratio of the magnitude of earnings change (annual change in IBES actual EPS) to the magnitude of cash flows change (annual change in Compustat oancf/cshfd).
$INVEST_{t+1}$	Capital expenditure over year t+1 is calculated as Compustat capx+aqc, scaled by average total assets.
DELTA	Dollar change in CEO's stock and option holdings associated with a 1% change in the firm's stock price (in $000s) at the end of year t, scaled by CEO's salary in year t.

VEGA	Dollar change in CEO's stock and option holdings associated with a 1% change in the standard deviation of the firm's returns (in $000s) at the end of year t, scaled by CEO's salary in year t.
POWER	CEO power index is constructed using Execucomp data by giving the CEO one point for being the chair of the board and two points for being the chair of the board and also the president of the company (Adams et al. 2005; Morse et al. 2011).
$EARN\_H_{t+1(q1,q2)}$	Higher-than-average earnings of the first two quarters of year t+1 is defined in the same way as CFO_H. We measure quarterly earnings with I/B/E/S actual EPS.
$EARN\_L_{t+1(q1,q2)}$	Lower-than-average earnings of the first two quarters of year t+1 is defined in the same way as CFO_L. We measure quarterly earnings with I/B/E/S actual EPS.
$CFO\_H_{t+1(q1,q2)}$	Higher-than-average operating cash flows of the first two quarters of year t+1 is defined in the same way as CFO_H.
$CFO\_L_{t+1(q1,q2)}$	Lower-than-average operating cash flows of the first two quarters of year t+1 is defined in the same way as CFO_L.
$ACC\_H_{t+1(q1,q2)}$	Higher-than-average accruals of the first two quarters of year t+1 is defined in the same way as CFO_H. Quarterly accruals is defined as quarterly IBES earnings minus quarterly operating cash flows.
$ACC\_L_{t+1(q1,q2)}$	Lower-than-average accruals of the first two quarters of year t+1 is defined in the same way as CFO_L.
* When subscript is omitted, the variable is measured for fiscal year t.	

Table 1: Sample construction

This table presents the sample selection (Panel A) and the number of observations for each fiscal year and earnings-based performance metric (Panel B). Fiscal year is defined by Incentive Lab. The sample includes 1,875 firm-years from 2006 to 2014. Please refer to Appendix A for variable definitions.

Panel A: Sample selection

	# Obs.
Unique firm-year observations in Incentive Lab that satisfies the following data requirements: non-financial (SIC 6000-6999) and non-utilities (SIC 4900-4999) firms; using at least one earnings-based performance metric to evaluate CEO's performance in annual cash incentive plan*; fiscal years ending after Dec 15, 2006; non-missing values for operating cash flows (*CFO*) and lagged total asset per share; average market capitalization (CRSP *PRC***SHROUT*) during November of each fiscal year is among the largest 750 firms covered by Incentive Lab.	2,731
Both earnings target and actual earnings used to determine annual cash incentive payout for the firm-year are disclosed in proxy statements.	2,368
Both earnings target and actual earnings used to determine annual cash incentive payout for the subsequent firm-year are disclosed in proxy statements.	1,764
Supplementing data of firm-year observations in S&P 500 and 400 indices that satisfy the above data requirement.	111
	1,875
# Unique firms = 437	

Panel B: Sample distribution

Fiscal year	# Obs.	Earnings-based performance metric	# Obs.
2006	70	EPS	1,072
2007	146	Earnings	275
2008	185	Operating Income	528
2009	226		
2010	249		
2011	258		
2012	260		
2013	267		
2014	214		

* Earnings-based performance metrics include EPS, Earnings, and Operating Income defined in Incentive Lab. When a firm-year uses multiple metrics, we choose the metric with the highest priority following the order of EPS, Earnings, and Operating Income.

Table 2: Descriptive statistics

This table presents the summary statistics of variables for the full sample (Panel A) and for subsamples of different earnings-based performance metrics used in annual cash bonus plan (Panel B). The sample includes 1,875 firm-years from 2006 to 2014. Please refer to Appendix A for variable definitions.

*** significant at 1% (two-tailed) level; ** significant at 5% (two-tailed) level; * significant at 10% (two-tailed) level

Panel A: Descriptive statistics for the full sample

Variable	N	MEAN	STD	Q1	MEDIAN	Q3
$EARN_{t+1}$	1,875	0.121	0.083	0.066	0.104	0.152
REV_{t+1}	1,875	0.013	0.029	0.000	0.010	0.023
DEV_{t+1}	1,875	0.002	0.021	-0.004	0.002	0.009
$MEET_{t+1}$	1,875	0.628	0.483	0.000	1.000	1.000
EARN	1,875	0.110	0.069	0.062	0.096	0.137
TARGET	1,875	0.106	0.064	0.060	0.093	0.134
DEV	1,875	0.004	0.020	-0.003	0.003	0.010
CFO	1,875	0.133	0.072	0.083	0.121	0.167
EXL	1,875	-0.027	0.043	-0.047	-0.010	0.000
RTP	1,800	0.561	0.496	0.000	1.000	1.000
SG	1,875	0.077	0.137	0.006	0.065	0.136
INVS	1,875	0.042	0.031	0.020	0.031	0.052
AFE_{t+1}	1,871	0.001	0.015	-0.004	0.001	0.007
$SLACKAF_{t+1}$	1,871	0.001	0.014	-0.003	0.001	0.005
MFE_{t+1}	1,123	0.003	0.013	-0.002	0.002	0.007
$SLACKMF_{t+1}$	1,123	-0.001	0.009	-0.003	0.000	0.002
RSV	1,627	1.894	4.790	-0.840	0.252	2.522
RSTD	1,780	0.735	0.446	0.402	0.648	0.942
RMAG	1,854	1.413	2.770	0.210	0.520	1.161
$INVEST_{t+1}$	1,874	0.076	0.074	0.031	0.053	0.093
POWER	1,776	0.943	0.806	0.000	1.000	2.000
DELTA	1,707	0.876	1.659	0.191	0.397	0.815
VEGA	1,717	0.215	0.200	0.067	0.160	0.307

Panel B: Descriptive statistics for subsamples of different earnings metrics

Variable	EPS	Earnings	Operating Income
REV_{t+1}	0.011	0.012	0.018
DEV_{t+1}	0.003	0.005	-0.002
$MEET_{t+1}$	0.682	0.629	0.519
DEV	0.004	0.006	0.003
CFO	0.132	0.135	0.134

Table 2 (continued.)

Panel C: Correlation coefficients (Pearson/Spearman correlations above/below the diagonal)

	REV_{t+1}	DEV_{t+1}	$MEET_{t+1}$	TARGET	DEV	CFO	EXL	RTP	SG	AFE_{t+1}	$SLACKAF_{t+1}$	MFE_{t+1}	$SLACKMF_{t+1}$
REV_{t+1}		0.13***	0.08***	0.27***	0.63***	0.32***	-0.01	0.23***	0.40***	0.17***	-0.01	0.24***	-0.08***
DEV_{t+1}	0.14***		0.64***	-0.01	0.30***	0.13***	0.00	0.02	0.06**	0.72***	0.62***	0.75***	0.56***
$MEET_{t+1}$	0.08***	0.84***		-0.06***	0.21***	0.06**	0.03	0.01	-0.01	0.60***	0.43***	0.62***	0.37***
TARGET	0.22***	-0.03	-0.08***		0.03	0.64***	-0.31***	0.60***	0.20***	0.01	-0.06***	0.06**	-0.14***
DEV	0.64***	0.29***	0.18***	0.10***		0.25***	-0.09***	0.21***	0.38***	0.14***	0.25***	0.24***	0.08***
CFO	0.36***	0.17***	0.07***	0.70***	0.32***		-0.11***	0.51***	0.21***	0.13***	0.09***	0.25***	-0.08***
EXL	-0.12***	0.02	0.05**	-0.41***	0.02	0.00		-0.04	-0.09***	0.00	0.05**	-0.01	0.06**
RTP	0.26***	0.03	0.01	0.53***	0.19***	0.56***	-0.01		0.19***	0.04*	-0.01	0.09***	-0.10***
SG	0.45***	0.04*	-0.03	0.19***	0.37***	0.21***	0.01	0.22***		0.02	0.03	0.07**	-0.02
AFE_{t+1}	0.18***	0.72***	0.51***	0.02	0.18***	0.12***	0.00	0.03	0.01		-0.02	0.94***	0.01
$SLACKAF_{t+1}$	-0.02	0.54***	0.37***	-0.05**	0.21***	0.04*	0.01	-0.01	0.05**	-0.02		0.07**	0.89***
MFE_{t+1}	0.30***	0.77***	0.53***	0.10***	0.26***	0.18***	-0.02	0.08***	0.08***	0.94***	0.07**		-0.04
$SLACKMF_{t+1}$	-0.16***	0.44***	0.34***	-0.19***	0.14***	-0.08**	0.14***	-0.10***	-0.05*	-0.04	0.88***	-0.07**	

Table 3: Differential persistence of accruals and cash flows
This table presents the differential persistence of accruals and operating cash flows into future compensation earnings. It reports the results for regressions that predict subsequent year's earnings ($EARN_{t+1}$) with current year's earnings and operating cash flows. All regressions include industry fixed effects and metric-year fixed effects, where earnings metrics include EPS, Earnings, and Operating Income. *T*-statistics are based on standard errors clustered by firms. The sample includes 1,875 firm-years from 2006 to 2014. Please refer to Appendix A for variable definitions.

*** significant at 1% (two-tailed) level; ** significant at 5% (two-tailed) level; * significant at 10% (two-tailed) level

Variable		$EARN_{t+1}$	$EARN_{t+1}$
EARN		0.960***	
		21.35	
EARN_H			0.996***
			17.03
EARN_L			0.881***
			18.18
CFO		0.108***	
		2.59	
CFO_H			0.111**
			2.04
CFO_L			0.094**
			2.03
EXL		-0.016	
		-0.58	
EXL_H			0.245***
			3.92
EXL_L			-0.112***
			-2.85
INVS		0.122**	0.104**
		2.24	*2.00*
INTERCEPT		0.002	0.110***
		0.30	*20.45*
# Obs.		1,875	1,875
Adj. R^2		85.00%	85.00%

Table 4: Target revision and cash vs. accrual performance

This table presents the differential relationships between target revision of next year (REV_{t+1}) and current year's operating cash flows vs. accrual performance. All regressions include industry fixed effects and metric-year fixed effects, where earnings metrics include EPS, Earnings, and Operating Income. *T*-statistics are based on standard errors are clustered by firms. The sample includes 1,800 firm-years from 2006 to 2014 with necessary data to estimate the regressions. Please refer to Appendix A for variable definition.

*** significant at 1% (two-tailed) level; ** significant at 5% (two-tailed) level; * significant at 10% (two-tailed) level

Variable		Dep Var. = REV_{t+1}	Dep Var. = REV_{t+1}
TARGET		0.019	0.010
		0.77	*0.43*
DEV_P		0.678***	0.640***
		9.60	*9.11*
DEV_N		0.867***	0.885***
		13.40	*13.67*
CFO		0.033*	
		1.78	
CFO_H			0.047*
			1.94
CFO_L			0.014
			0.59
EXL		0.018	
		0.94	
EXL_H			0.178***
			4.31
EXL_L			-0.054**
			-2.01
RTP		0.000	0.001
		0.19	*0.82*
SG		0.038***	0.038***
		5.86	*5.87*
INVS		0.105***	0.097***
		3.52	*3.44*
INTERCEPT		0.010***	0.008*
		2.69	*1.90*
# Obs.		1,800	1,800
Adj. R^2		55%	56%

Table 5: Target achievability and the differential persistence of operating cash flows
This table presents the relationship between target deviation (DEV_{t+1}) and the incidence of meeting or beating target of next year ($MEET_{t+1}$) and current year's operating cash flows, while holding current year's target deviation constant. All regressions include industry fixed effects and metric-year fixed effects, where earnings metrics include EPS, Earnings, and Operating Income. *T*-statistics (*Z*-statistics) for OLS (logistic) regressions predicting DEV_{t+1} ($MEET_{t+1}$) are based on standard errors are clustered by firms. The sample includes 1,800 firm-years from 2006 to 2014 with necessary data to estimate the regressions. Please refer to Appendix A for variable definition.

*** significant at 1% (two-tailed) level; ** significant at 5% (two-tailed) level; * significant at 10% (two-tailed) level

Variable		Dep Var. = DEV_{t+1}			Dep Var. = $MEET_{t+1}$	
TARGET		-0.050**	-0.054**		-7.401***	-7.279***
		-2.28	*-2.43*		*-3.47*	*-3.38*
DEV_P		0.393***	0.377***		34.999***	35.207***
		5.81	*5.48*		*4.91*	*4.91*
DEV_N		0.030	0.037		-0.504	-0.498
		0.42	*0.51*		*-0.08*	*-0.08*
CFO		0.060***			4.121**	
		3.58			*2.55*	
CFO_H			0.070***			3.578
			2.81			*1.62*
CFO_L			0.045**			4.782**
			2.24			*2.00*
EXL		-0.014			-1.706	
		-0.79			*-0.98*	
EXL_H			0.033			-0.657
			0.81			*-0.17*
EXL_L			-0.034*			-2.175
			-1.70			*-0.90*
RTP		-0.002	-0.001		0.147	0.132
		-1.24	*-0.88*		*0.88*	*0.78*
SG		-0.002	-0.002		-0.747	-0.746
		-0.38	*-0.43*		*-1.44*	*-1.44*
INVS		-0.028	-0.032		-0.722	-0.650
		-1.09	*-1.22*		*-0.27*	*-0.24*
INTERCEPT		-0.007**	-0.001		0.321*	0.919***
		-2.02	*-0.22*		*1.92*	*3.66*
# Obs.		1,800	1,800		1,800	1,800
Adj. R^2		18%	18%		16%	16%
R.O.C					74%	74%

Table 6: The role of expectation bias in explaining the relationship between target achievability and the differential persistence of operating cash flows

This table presents the relationship between bias in analysts' forecast of next year's EPS (AFE_{t+1}) and current year's operating cash flows. It also examines the ability of such relationship to explain the association between operating cash flows and next year's target deviation (DEV_{t+1}) or ex ante budgetary slack ($SLACKAF_{t+1}$). All regressions include industry fixed effects and metric-year fixed effects, where earnings metrics include EPS, Earnings, and Operating Income. *T*-statistics are based on standard errors are clustered by firms. Control variables in the regressions include *TARGET*, *RTP*, *SG*, and *INVS*. The full sample in Panel A includes 1,797 firm-years from 2006 to 2014 with necessary data to estimate the regressions and Panel B repeat the same analysis on the subsample without annual horizon management forecast issued before the grant date of bonus plan. Please refer to Appendix A for variable definition.

*** significant at 1% (two-tailed) level; ** significant at 5% (two-tailed) level; * significant at 10% (two-tailed) level

Panel A: Full sample

Variable		(1) AFE_{t+1}	(2) AFE_{t+1}	(3) DEV_{t+1}	(4) DEV_{t+1}	(5) $SLACKAF_{t+1}$	(6) $SLACKAF_{t+1}$
DEV_P		0.138***	0.144***	0.266***	0.244***	0.235***	0.218***
		2.90	*2.92*	*4.20*	*3.85*	*4.31*	*4.01*
DEV_N		-0.054	-0.055	0.079*	0.087*	0.074	0.080*
		-0.96	*-0.99*	*1.68*	*1.89*	*1.57*	*1.71*
CFO		0.038***		0.025**		0.023**	
		3.08		*1.98*		*2.10*	
CFO_H			0.028		0.045**		0.040**
			1.60		*2.36*		*2.44*
CFO_L			0.051***		-0.002		0.000
			3.03		*-0.18*		*-0.01*
EXL		-0.007		-0.007		-0.007	
		-0.64		*-0.53*		*-0.58*	
EXL_H			-0.001		0.032		0.015
			-0.05		*1.05*		*0.52*
EXL_L			-0.010		-0.024		-0.018
			-0.63		*-1.46*		*-1.10*
FE_{t+1}				0.938***	0.939***	-0.059	-0.058
				23.50	*23.80*	*-1.53*	*-1.50*
∑*Control*		*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
# Obs.		1,797	1,797	1,797	1,797	1,797	1,797
Adj. R^2		11%	11%	60%	60%	15%	16%

Table 6: (continued.)

Panel B: Sample without annual horizon management forecast before bonus grant

Variable		(0A) DEV_{t+1}	(0B) DEV_{t+1}	(1) AFE_{t+1}	(2) AFE_{t+1}	(3) DEV_{t+1}	(4) DEV_{t+1}	(5) $SLACKAF_{t+1}$	(6) $SLACKAF_{t+1}$
DEV_P		0.409***	0.394***	0.143**	0.159**	0.290***	0.258***	0.253***	0.226***
		4.26	*4.06*	*2.06*	*2.13*	*2.99*	*2.71*	*3.07*	*2.77*
DEV_N		-0.038	-0.033	-0.088	-0.092	0.032	0.042	0.054	0.062
		-0.38	*-0.33*	*-1.11*	*-1.15*	*0.46*	*0.60*	*0.76*	*0.88*
CFO		0.063**		0.028		0.041**		0.041**	
		2.21		*1.37*		*1.99*		*2.35*	
CFO_H			0.064		-0.002		0.069**		0.072***
			1.50		*-0.08*		*2.31*		*2.80*
CFO_L			0.066**		0.068***		0.006		0.002
			2.07		*2.72*		*0.27*		*0.10*
EXL		-0.015		0.000		-0.015		-0.014	
		-0.55		*-0.01*		*-0.74*		*-0.65*	
EXL_H			0.072		0.045		0.028		-0.002
			1.11		*1.00*		*0.62*		*-0.05*
EXL_L			-0.053		-0.018		-0.034		-0.020
			-1.65		*-0.71*		*-1.30*		*-0.78*
FE_{t+1}						0.879***	0.883***	-0.095*	-0.089
						15.33	*15.59*	*-1.74*	*-1.64*
∑*Control*		*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
# Obs.		726	726	723	723	723	723	723	723
Adj. R^2		18%	18%	9%	9%	56%	56%	17%	17%

Table 7: Cross-sectional variations in the relationship between target achievability and the differential persistence of operating cash flows

This table presents the cross-sectional variations in the relationship between operating cash flows (*CFO*) and target deviation of the next year (DEV_{t+1}) in Panel A and ex ante budgetary slack ($SLACKAF_{t+1}$) in Panel B. The interaction variables include the relative stewardship role of CFO compared with earnings (*RSV*), the relative standard deviation of earnings compared with CFO (*RSTD*), the relative magnitude of earnings change compared with CFO change (*RMAG*), the level of capital investment in year t+1 ($INVEST_{t+1}$), and CEO stock/option portfolio delta (*DELTA*) and vega (*VEGA*). All interaction variables *X* are transformed to log(*X* – *Min*(*X*) + 1), where *Min*() is measured on the full sample. All regressions include control variables *CSVAR*, *TARGET*, *EXL_H*, *EXL_L*, *RTP*, *SG*, *INVS*, AFE_{t+1}, *CSVAR*TARGET*, *CSVAR*EXL_H*, *CSVAR*EXL_L*, *CSVAR*RTP*, *CSVAR*SG*, *CSVAR*INVS*, $CSVAR*AFE_{t+1}$. All regressions include industry fixed effects and metric-year fixed effects, where earnings metrics include EPS, Earnings, and Operating Income. *T*-statistics are based on standard errors are clustered by firms. The sample includes 1,797 firm-years from 2006 to 2014 with necessary data to estimate the regressions. Please refer to Appendix A for variable definition.

*** significant at 1% (two-tailed) level; ** significant at 5% (two-tailed) level; * significant at 10% (two-tailed) level

Panel A: Explaining target deviation DEV_{t+1}

Variable	(1) RSV	(2) RSTD	(3) RMAG	(4) $INVEST_{t+1}$	(5) DELTA	(6) VEGA
DEV_P	0.309***	0.142	0.306***	0.269***	0.161**	0.033
	2.62	*1.35*	*4.22*	*3.65*	*2.01*	*0.40*
DEV_P*CSVAR	-0.044	0.183	-0.086	-0.312	0.143	1.097***
	-0.58	*1.12*	*-1.29*	*-0.46*	*0.85*	*2.76*
DEV_N	0.038	0.217**	0.134*	0.064	0.079	0.136
	0.44	*2.20*	*1.67*	*1.02*	*1.05*	*1.60*
DEV_N*CSVAR	0.045	-0.266	-0.046	0.533	0.071	-0.157
	0.64	*-1.47*	*-0.60*	*0.70*	*0.42*	*-0.40*
CFO_H	-0.020	-0.021	0.012	0.008	0.058**	0.082***
	-0.81	*-0.63*	*0.62*	*0.31*	*2.27*	*2.81*
CFO_H*CSVAR	0.062***	0.153**	0.054*	0.472**	-0.047*	-0.252***
	2.83	*2.23*	*1.90*	*2.37*	*-1.77*	*-2.70*
CFO_L	-0.026	-0.013	-0.007	0.007	-0.013	-0.030
	-1.16	*-0.58*	*-0.44*	*0.39*	*-0.57*	*-1.38*
CFO_L*CSVAR	0.030	0.054	0.011	-0.234	0.046	0.155*
	1.29	*1.07*	*0.41*	*-1.21*	*0.92*	*1.71*
# Obs.	1,578	1,728	1,797	1,797	1,639	1,648
Adj. R^2	60%	60%	61%	60%	60%	61%

Table 7: (continued.)

Panel B: Explaining ex ante budgetary slack $SLACKAF_{t+1}$

Variable	(1) RSV	(2) RSTD	(3) RMAG	(4) $INVEST_{t+1}$	(5) DELTA	(6) VEGA
DEV_P	0.308***	0.158*	0.262***	0.247***	0.179**	0.080
	3.06	*1.70*	*4.25*	*3.51*	*2.45*	*1.06*
DEV_P*CSVAR	-0.053	0.102	-0.061	-0.288	0.071	0.738**
	-0.82	*0.63*	*-1.09*	*-0.41*	*0.50*	*2.23*
DEV_N	0.060	0.152	0.150**	0.071	0.100	0.144*
	0.76	*1.63*	*2.05*	*1.13*	*1.48*	*1.79*
DEV_N*CSVAR	0.021	-0.151	-0.081	0.269	0.007	-0.225
	0.33	*-0.83*	*-1.09*	*0.38*	*0.06*	*-0.69*
CFO_H	-0.024	-0.007	0.003	-0.008	0.059**	0.082***
	-1.12	*-0.23*	*0.19*	*-0.33*	*2.49*	*2.86*
CFO_H*CSVAR	0.071***	0.112*	0.064***	0.584***	-0.033	-0.206**
	3.66	*1.91*	*3.22*	*3.06*	*-1.48*	*-2.39*
CFO_L	-0.030	-0.014	0.000	0.003	-0.007	-0.027
	-1.47	*-0.67*	*0.00*	*0.16*	*-0.32*	*-1.26*
CFO_L*CSVAR	0.032	0.064	0.001	-0.140	0.024	0.135
	1.57	*1.35*	*0.06*	*-0.81*	*0.52*	*1.62*
# Obs.	1578	1728	1797	1797	1639	1648
Adj. R^2	20.00%	17.00%	18.00%	17.00%	16.00%	17.00%

Table 8: Cross-sectional variations in the restriction of cash-flow-based performance

Panel A presents the cross-sectional variations in correlation between operating cash flows in the first two quarters of year t+1 ($CFO_{t+1(q1,q2)}$) and that in the last two quarters ($CFO_{t+1(q3,q4)}$), while holding earnings in the first two quarters ($EARN_{t+1(q1,q2)}$) constant. The dependent variable in the regressions is $CFO_{t+1(q3,q4)}$. Panel B repeats the same set of analyses for accruals ($ACC_{t+1(q1,q2)}$). Column headers indicate the interaction variable (CSVAR) used in the regression, including the relative stewardship role of CFO compared with earnings (*RSV*), the relative standard deviation of earnings compared with CFO (*RSTD*), the relative magnitude of earnings change compared with CFO change (*RMAG*), the level of capital investment in year t+1 ($INVEST_{t+1}$), and CEO stock/option portfolio delta (*DELTA*) and vega (*VEGA*). All interaction variables *X* are transformed to log(*X* – *Min*(*X*) + 1), where *Min*() is measured on the full sample. All regressions include industry fixed effects and metric-year fixed effects, where earnings metrics include EPS, Earnings, and Operating Income. *T*-statistics are based on standard errors are clustered by firms. The sample includes 1,797 firm-years from 2006 to 2014 with necessary data to estimate the regressions. Please refer to Appendix A for variable definition.

*** significant at 1% (two-tailed) level; ** significant at 5% (two-tailed) level; * significant at 10% (two-tailed) level

Panel A: Serial correlation of quarterly cash flows

Variable	(0)	(1) RSV	(2) RSTD	(3) RMAG	(4) $INVEST_{t+1}$	(5) DELTA	(6) VEGA
$EARN\_H_{t+1(q1,q2)}$	1.117***	0.949***	1.400***	1.196***	1.337***	1.059***	0.989***
	10.36	*5.25*	*6.96*	*9.03*	*10.00*	*6.93*	*6.09*
$EARN\_H_{t+1(q1,q2)}$*CSVAR		0.120	-0.505	-0.109	-2.818**	0.017	0.505
		1.07	*-1.62*	*-1.12*	*-2.40*	*0.09*	*0.87*
$EARN\_L_{t+1(q1,q2)}$	1.066***	1.234***	1.293***	1.211***	1.187***	1.308***	1.250***
	7.06	*6.37*	*5.78*	*7.12*	*7.28*	*8.89*	*8.94*
$EARN\_L_{t+1(q1,q2)}$*CSVAR		-0.074	-0.452	-0.246*	-2.460	-0.507*	-0.773
		-0.45	*-1.20*	*-1.86*	*-1.39*	*-1.78*	*-0.91*
$CFO\_H_{t+1(q1,q2)}$	-0.003	0.046	-0.299*	-0.118	-0.132	-0.015	0.053
	-0.04	*0.26*	*-1.72*	*-1.06*	*-1.19*	*-0.13*	*0.41*
$CFO\_H_{t+1(q1,q2)}$*CSVAR		-0.052	0.599**	0.177**	1.424*	0.020	-0.342
		-0.49	*2.14*	*2.26*	*1.77*	*0.17*	*-0.85*
$CFO\_L_{t+1(q1,q2)}$	-0.308***	-0.158	-0.167	-0.310***	-0.351***	-0.254**	-0.230**
	-3.54	*-1.37*	*-1.07*	*-3.12*	*-3.25*	*-2.58*	*-2.28*
$CFO\_L_{t+1(q1,q2)}$*CSVAR		-0.146	-0.323	0.013	0.690	-0.224	-0.769
		-1.34	*-0.89*	*0.15*	*0.65*	*-1.20*	*-1.24*
CSVAR		-0.001	-0.017*	-0.006***	0.034	-0.005	-0.013
		-0.31	*-1.92*	*-2.77*	*1.24*	*-1.12*	*-1.24*
Intercept	0.061***	0.068***	0.076***	0.056***	0.059***	0.063***	0.062***
	7.65	*7.99*	*8.97*	*6.31*	*6.77*	*8.65*	*8.05*
# Obs.	1,733	1,536	1,670	1,727	1,733	1,619	1,629
Adj. R^2	49.00%	47.00%	49.00%	49.00%	49.00%	49.00%	48.00%

Panel B: Serial correlation of quarterly accruals

Variable	(0)	(1) RSV	(2) RSTD	(3) RMAG	(4) $INVEST_{t+1}$	(5) DELTA	(6) VEGA
$EARN\_H_{t+1(q1,q2)}$	-0.099	-0.004	-0.083	-0.084	-0.253***	-0.136	-0.049
	-1.38	*-0.02*	*-0.55*	*-0.80*	*-2.85*	*-1.45*	*-0.51*
$EARN\_H_{t+1(q1,q2)}$*CSVAR		-0.053	-0.071	-0.046	2.160**	0.086	-0.207
		-0.53	*-0.32*	*-0.61*	*2.55*	*0.72*	*-0.60*
$EARN\_L_{t+1(q1,q2)}$	-0.002	-0.098	-0.187	-0.134	0.082	-0.125	-0.218**
	-0.02	*-0.62*	*-1.17*	*-1.33*	*0.74*	*-1.28*	*-1.97*
$EARN\_L_{t+1(q1,q2)}$*CSVAR		0.043	0.395	0.231**	-1.044	0.208	1.007*
		0.37	*1.25*	*2.35*	*-0.79*	*1.17*	*1.72*
$ACC\_H_{t+1(q1,q2)}$	-0.371***	-0.172	-0.168	-0.349***	-0.386***	-0.371***	-0.295***
	-4.80	*-1.31*	*-1.37*	*-3.83*	*-3.58*	*-3.87*	*-2.98*
$ACC\_H_{t+1(q1,q2)}$*CSVAR		-0.190**	-0.418*	-0.031	0.528	0.008	-0.470
		-2.50	*-1.71*	*-0.38*	*0.45*	*0.05*	*-0.80*
$ACC\_L_{t+1(q1,q2)}$	0.092	0.015	-0.213	0.006	-0.104	0.040	0.087
	1.02	*0.08*	*-1.38*	*0.06*	*-0.92*	*0.36*	*0.77*
$ACC\_L_{t+1(q1,q2)}$*CSVAR		0.107	0.668***	0.140**	2.203***	0.065	-0.138
		0.95	*2.78*	*2.06*	*2.65*	*0.67*	*-0.35*
CSVAR		0.002	0.019***	0.006***	-0.036	0.003	0.019*
		0.82	*2.97*	*3.17*	*-1.42*	*0.77*	*1.91*
Intercept	-0.005	-0.011	-0.017***	-0.004	-0.006	-0.005	-0.007
	-0.98	*-1.65*	*-2.74*	*-0.61*	*-0.96*	*-0.85*	*-1.16*
# Obs.	1,733	1,536	1,670	1,727	1,733	1,619	1,629
Adj. R^2	19.00%	21.00%	21.00%	19.00%	21.00%	19.00%	19.00%

Table 9: Cash flows target and target achievability

This table presents the cross-sectional variation in the relationship between earnings performance (*DEV, CFO*) and target achievability of the next year (DEV_{t+1}, $SLACKAF_{t+1}$) with the presence of cash flows target in bonus plan (*WCFOT*). All regressions include control variables *WCFOT*, *TARGET*, *EXL_H*, *EXL_L*, *RTP*, *SG*, *INVS*, AFE_{t+1}, *WCFOT*TARGET*, *WCFOT*EXL_H*, *WCFOT*EXL_L*, *WCFOT*RTP*, *WCFOT*SG*, *WCFOT*INVS*, $WCFOT*AFE_{t+1}$. All regressions include industry fixed effects and metric-year fixed effects, where earnings metrics include EPS, Earnings, and Operating Income. *T*-statistics are based on standard errors are clustered by firms. The sample includes 1,797 firm-years from 2006 to 2014 with necessary data to estimate the regressions. Please refer to Appendix A for variable definition.

*** significant at 1% (two-tailed) level; ** significant at 5% (two-tailed) level; * significant at 10% (two-tailed) level

Variable	DEV_{t+1}	$SLACKAF_{t+1}$
DEV_P	0.296***	0.271***
	3.92	*4.23*
DEV_P*WCFOT	-0.240**	-0.250**
	-2.12	*-2.48*
DEV_N	0.091	0.064
	1.39	*1.02*
DEV_N*WCFOT	-0.033	0.024
	-0.37	*0.26*
CFO_H	0.039*	0.039**
	1.92	*2.12*
CFO_H*WCFOT	0.018	0.002
	0.53	*0.06*
CFO_L	0.001	0.004
	0.08	*0.27*
CFO_L*WCFOT	-0.011	-0.012
	-0.40	*-0.46*
# Obs.	1,797	1797
Adj. R^2	60%	16%

Table 10: Target revision, target achievability, and the differential persistence of operating cash flows using median regressions

This table presents the relationship between target revision (REV_{t+1}) and target deviation (DEV_{t+1}) of next year and current year's operating cash flows (*CFO*), while holding current year's target deviation constant. Coefficient estimates and associated *T*-statistics are from median regressions instead of OLS regressions. All regressions include industry fixed effects and metric-year fixed effects, where earnings metrics include EPS, Earnings, and Operating Income. The sample includes 1,800 firm-years from 2006 to 2014 with necessary data to estimate the regressions. Please refer to Appendix A for variable definition.

*** significant at 1% (two-tailed) level; ** significant at 5% (two-tailed) level; * significant at 10% (two-tailed) level

Variable		Dep Var. = REV_{t+1}			Dep Var. = DEV_{t+1}	
TARGET		0.054***	0.056***		-0.026**	-0.029***
		4.62	*4.51*		*-2.24*	*-2.68*
DEV_P		0.934***	0.898***		0.449***	0.440***
		25.84	*23.75*		*11.61*	*12.75*
DEV_N		0.897***	0.912***		0.004	0.011
		20.90	*17.57*		*0.08*	*0.30*
CFO		0.028***			0.030***	
		3.66			*3.38*	
CFO_H			0.032***			0.052***
			2.83			*3.96*
CFO_L			0.016			0.010
			1.30			*1.07*
EXL		0.009			-0.020**	
		1.12			*-2.13*	
EXL_H			0.074***			-0.036**
			2.82			*-2.06*
EXL_L			-0.021			-0.013
			-1.25			*-1.12*
RTP		0.000	0.000		-0.001	-0.001
		-0.07	*0.03*		*-1.40*	*-0.96*
SG		0.029***	0.029***		-0.002	-0.003
		9.83	*9.03*		*-0.77*	*-1.15*
INVS		0.043**	0.052***		-0.004	-0.004
		2.49	*2.81*		*-0.29*	*-0.29*
INTERCEPT		0.000	0.000		-0.004	-0.004
		0.05	*-0.03*		*-0.61*	*-0.56*
# Obs.		1,800	1,800		1,800	1,800