Beating the Target: A Closer Look at Annual Incentive Plans[1]

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October 8, 2010

Abstract

This paper documents the performance metrics used in the annual incentive (bonus) plans for chief executive officers (CEOs). Our sample includes the S&P 500 constituent firms in the first three years after the disclosure compliance deadline of December 15, 2006. We find that firms tend to choose less volatile performance measures and measures where they have performed better than their industry peers. Our detailed analysis using earnings per share (EPS) shows that EPS targets are set consistently lower than earnings expectations. In particular, EPS targets are lower than analyst consensus, and EPS growth targets are lower than historical EPS growth rates of the firm and its industry. However, the magnitude of the difference is small. Compared with a hypothetical incentive plan that uses analyst consensus as the performance target, the minimum analyst forecast as the lower bound, and the maximum analyst forecast as the upper bound of the incentive zone, the original annul incentive plan awards an excess payout of approximately $30,000–60,000 ex ante. Market reacts positively (negatively) to the announcement of a challenging (less challenging) target established in the annual incentive plan.

JEL classification: G34, J31, J33

[1] This paper greatly benefits from the input of Kevin Murphy. We would like to thank the following for helpful comments and discussions: Daniel Beneish, Utpal Bhattacharya, Carol Bowie (RiskMetrics), Jie Cai, Naveen Daniel, Diane Denis, Andrew Ellul, Michael Faulkender, Fabrizio Ferri, Eitan Goldman, Nandini Gupta, Fritz Henderson (former CEO from GM), Craig Holden, Dirk Jenter, Srinivas Kamma, Simi Kedia, Tao Ma, Richard Mahoney (former CEO from Monsanto), Richard Mendenhall, Lalitha Naveen, Veronika Pool, Irina Stefanescu, Charlene Sullivan, Ralph Walkling, Ivo Welch, Fei Xie, Teri Yohn, and seminar participants at Indiana University, State of Indiana Conference, Loyola College Conference on Risk Management and Corporate Governance, and the AFA 2010 annual meeting. We thank Hannah Bolte and Jaden Falcone for their editorial help, and Henry Lin and Rohit Taparia for their help on data collection.

1. Introduction

The sheer amount of bonuses awarded to executives at Merrill Lynch and AIG in light of the firms' multi-billion dollar losses in 2008 has provoked much public outcry and policy debate.[2] The philosophy and rationale behind these awards have been questioned: Do we pay for performance or for failure? To answer this question, we need to examine not only the amount of bonus payouts for top executives but also the performance metrics used for determining the payout amount. In particular, we need to analyze whether the performance metric used in the bonus plan is challenging at the time when the plan is determined. Looking at ex-post payout amount alone provides only imprecise inferences about the rationale of the bonus plan. However, prior to December 15, 2006, performance metrics specified in executive bonus plans (referred to as the *annual incentive plans*) were not available except in a few cases with public disclosure.

The well-publicized case of the former NYSE chairman Richard Grasso offers some insight into the potential bias in setting the performance metrics in the bonus plan. Of Mr. Grasso's bonuses, 65% was based on quantitative factors and 35% on qualitative factors. Interestingly, during his tenure of over eight years, NYSE exceeded quantitative performance targets every year by an average of 27%. Moreover, the qualitative part (generally judged by Mr. Grasso himself) exceeded performance targets every year by an average of 53%. Mr. Grasso's case clearly raised a question of whether the incentive payouts were truly "at-risk." [3] However, even though unlikely, it is possible that NYSE had consistently delivered superior performance while the performance targets were set properly ex ante.

On one hand, the agency theory (e.g. Ross, 1973; Jensen and Meckling, 1976; Holmström, 1979) suggests that managerial compensation plans should be designed to align the interests of managers with the interests of shareholders. On the other hand, the debate on whether executive compensation contracts are properly structured is not resolved.[4] Regarding annual incentive plans, there is little empirical evidence on whether pay is linked to performance due to the limited

[2] The ten highest paid employees at Merrill Lynch received $209 million in bonuses while the company lost $26 billion, and executives at the Financial Product Division of AIG received $165 million in bonuses in 2008 while the company accepted $170 billion from the taxpayers.

[3] "Report to the New York Stock Exchange on Investigation Relating to the Compensation of Richard A. Grasso" by Dan K. Webb, *Winston & Strawn LLP,* December 15, 2003.

[4] See Lewellen and Huntsman (1970), Murphy (1985), Aggarwal and Samwick (1999), Hall and Liebman (2000), and Bizjak, Lemmon, and Naveen (2008) for positive evidence on pay-for-performance; and Baker, Jensen, and Murphy (1988), and Jensen and Murphy (1990) for the lack of evidence on pay-for-performance. Bebchuk and Weisbach (2010) provide a comprehensive review on the state of corporate governance research. Several studies examine pay-for-performance sensitivities using stock options, while other studies show the limitations of stock options and the associated corporate practices; see, for example, Hall and Murphy (2003), Yermack (1997), and Heron and Lie (2006).

availability of data. This study exploits the newly disclosed data on annual incentive plans and shows that performance targets have been set lower than expectations. However, the slack in setting performance hurdles is not nearly as dramatic as suggested by the three cases above.

Annual incentive plans (referred to by the media as *bonus programs*) are designed to improve firms' short-term performance. "Virtually every for-profit company offers a bonus plan covering its top executives and paid annually based on a single-year's performance" (Murphy, 1999). A typical annual incentive plan contains performance measures, performance goals, and the structure of the pay-for-performance relation. In particular, no bonus is paid until a performance threshold is reached, and the minimum bonus (often expressed as percentage of salary payment) is awarded at the performance threshold. The target bonus is paid for achieving the target performance, and there is typically a "cap" on the maximum payout amount. The range between the performance threshold and performance stretch is labeled the *incentive zone.* Figure 1 depicts the structure of a typical annual incentive plan.

Effective December 15, 2006, the Securities and Exchange Commission (SEC) required firms to disclose more information related to executive compensation contracts. In particular, firms need to disclose material information on

> "What specific items of corporate performance are taken into account in setting compensation policies and making compensation decisions… [*omitted by authors*] How specific forms of compensation are structured and implemented to reflect these items of the registrant's performance, including whether discretion can be or has been exercised (either to award compensation absent attainment of the relevant performance goal(s) or to reduce or increase the size of any award or payout), identifying any particular exercise of discretion, and stating whether it applied to one or more specified named executive officers or to all compensation subject to the relevant performance goal(s)." — SEC final rules 33-8732a, Item 402(b) (2) (v-vi), August 29, 2006.

This paper is, to our best knowledge, the first to comprehensively examine the performance metrics used in annual incentive plans in large US corporations. We focus on annual incentive plans for several reasons. First, annual incentive payout (AIP) is an important component of executive compensation (approximately 20% of ex-ante total pay for CEOs at our sample firms), and it is at the center of the current debate on executive compensation. Second, examining annual incentive payouts along with performance metrics gives a clearer view of pay-for-performance sensitivity because other components of compensation plans, such as restricted stock and stock options, are designed not only for incentive but also for retention purposes (Oyer, 2004). Third, it is relatively straightforward to verify performance outcomes and ex-post payouts against the ex-ante ones in annual incentive plans. While our findings are suggestive of the

properties of well-designed incentive plans, we leave the optimal design of the annual incentive plan for future research.

The sample of this study is the S&P 500 constituent firms (as of 2006) in the first three years after the compliance date for disclosing plan details. For each firm in each year, we collect performance measures (both quantitative and qualitative), the weight of each measure, the structure of the plan — the performance threshold, target, and stretch goal, as well as the corresponding payout amount in the annual incentive plan for the CEO. At the sample median, firms use two quantitative measures and one qualitative measure. Top five performance measures are earnings per share (EPS), revenue, operating income, net income, and free cash flow. We show that firms tend to choose performance measures at which they perform better than their industry peers. Firms also tend to choose performance measures with lower historical volatility, consistent with the predictions of optimal contracting theory such as Holmström (1979).

We then examine whether the performance target specified in the annual incentive plan reflects market expectations. There are several reasons why performance target is relevant. First, the use of annual and long-term incentive plans has increased dramatically after the enactment of IRS Code Section 162(m), according to which executive compensation exceeding $1 million is eligible for tax deductibility for the corporation only if the compensation is at risk (linked to performance). Thus, firms have the incentive to shift annual compensation from salary to bonus payment for tax saving. For any given amount of target payout, setting a low performance target helps the management secure the payout while satisfying the IRS code Section 162(m). Second, for over 60% of the annual incentive plans that have all necessary information for calculating the slopes within the incentive zone (the minimum, target, and maximum payout amount, as well as the performance threshold, target, and stretch goals), the slope between performance target and stretch is greater than that between performance threshold and target. Thus, there is actually a (third) kink at the performance target in most annual incentive plans. Third, according to private conversations with current and former directors, an executive who keeps missing performance targets that were determined with his/her input will be considered incompetent.[5]

We analyze earnings per share (EPS), the most popular performance measure, in great detail. We compare the EPS target (both the level and the growth rate) specified in the annual incentive plan with two sets of benchmarks: analyst consensus on annual EPS and historical EPS

[5] Our sample includes 103 firms in Year 3 that disclose EPS targets in the previous two years. Among these 103 firms, 13 CEO turnovers (including seven cases in which the firm disappeared from the S&P 500 index) occur. Among the 43 firms that missed the EPS target in one or both of the previous two years, nine CEOs are no longer in office. Among the 60 firms that achieved the EPS target in both years, only four CEOs are no longer in office. Three out of these four firms were acquired at a premium, and the fourth CEO retired and became the chairman emeritus.

performance of the firm and the firm's industry. Firms typically determine their annual incentive plans within the first 90 days of the fiscal year to be eligible for tax deductibility of executive compensation exceeding $1 million according to IRS Code Section 162(m). For analyst forecasts, we use the average of prevailing analyst forecasts (referred to as *analyst consensus*) issued in the first quarter, as reported in the First Call database. We find that the EPS target in the annual incentive plan is set consistently lower than analyst consensus. The difference is statistically significant for the first two years (fiscal years ending December 2006–November 2008). The results are stronger when we compare the EPS target with the analyst consensus prevailing at the approval date of the annual incentive plan. However, the magnitude of the discrepancy is only a few cents in dollar terms and approximately one percentage point in growth terms.

Does setting the EPS target a few cents lower matter economically? Prior literature suggests that a one-cent difference in EPS could affect firms' investment and reporting decisions.[6] To address this question and verify the validity of using analyst consensus as a proxy for market expectation on EPS performance, we examine market reactions to where the EPS target is set relative to the prevailing analyst consensus. Conducting an event study on the approval date of the annual incentive plan, we find that the market reacts positively if the EPS target is set at or higher than the prevailing analyst consensus, and negatively when the EPS target is set lower than analyst consensus. The difference in the cumulative abnormal return over three days is approximately one percent. This result is robust when we eliminate firms with concurrent 10-K filings and firms issuing earnings guidance within one day of the plan approval date.

In addition to setting the EPS target lower than analyst consensus, firms also tend to specify the incentive zone wider than the range of analyst forecasts. At the sample median, the EPS threshold goal is lower than the minimum analyst forecast by 12 cents and the EPS stretch goal is higher than the maximum analyst forecast by six cents. What are the implications of using these annual incentive plans for the CEOs? We compare the ex-ante value and pay-for-performance sensitivity of the original annual incentive plan with those of a hypothetical plan that uses analyst consensus as the performance target, the minimum analyst forecast as the lower bound, and the maximum analyst forecast as the upper bound of the incentive zone. The simulation approach we adopt is very similar to the approach used for calculating option price and option delta. We find that the ex-ante value of the AIP under the firm's original plan is lower than that under the hypothetical plan by approximately $60,000 at the mean and $30,000–40,000

[6] See Degeorge, Patel, and Zeckhauser (1999); Graham, Harvey, and Rajgopal (2004); Cheng and Warfield (2005); and Bhorjaj, Hribar, Picconi, and McInnis (2009).

at the median. To put this ex-ante value of excess pay into perspective, salary payment for CEOs in our sample is approximately $1 million. Moreover, we show that the original annual incentive plan has a lower pay-for-performance sensitivity than the hypothetical plan at both the mean and median.

One complication in comparing EPS targets with analyst consensus in the first quarter on annual EPS is that about 80% of the S&P 500 firms issue earnings guidance, which substantially influences the formation of analyst forecasts. If a firm guides its analysts to form a higher consensus on its annual EPS early during the year and walks the number down over time, then the observation that the EPS target is lower than analyst consensus in the first quarter is not an indication of a low target, but rather, a high consensus. While several early studies on the potential biases in analyst forecasts issued early during the year suggest positive analyst forecast biases, more recent studies show there are no forecast biases; see Brown (1993), Brown (1998), Lim (2001), and Abarbanell and Lehavy (2003). To further address this issue, we examine separately firms that do and firms that do not disclose EPS performance metrics in the annual incentive plan. We find that firms with EPS targets actually have lower analyst forecast biases (analyst consensus less actual EPS) than firms without. This relationship biases us against finding our results. Moreover, as shown in Figure 2, analyst consensus moves up gradually over time in the first two years, and walks down gradually in Year 3 due to the changing macroeconomic conditions in our sample period. It is unlikely that a positive analyst forecast bias is driving our result.

To further investigate whether the EPS target specified in the annual incentive plan reflects market expectation on EPS performance, we use an alternative measure for market expectation — the historical EPS performance of the firm and the firm's industry. Comparing EPS targets with historical performance, we find somewhat mixed results. EPS targets in annual incentive plans are significantly higher than the EPS performance in the previous year. EPS growth targets, however, are substantially lower than the historical EPS growth rates over one-, three- and five-year periods of the firm and the firm's industry in 45 out of 48 specifications. Examining historical EPS performance, we find high EPS growth rates during December 2002–November 2007 (with a mean of 13–30% and a median of 13–17%). This suggests that when setting the EPS target for the annual incentive plan, the board of directors takes into account past performance, but does not raise the EPS target one-by-one with good past performance.

To see how informative the ex-ante analysis of the annual incentive plan is, we next examine the ex-post outcomes. Not surprisingly, we find that easy targets are indeed more likely to be achieved. At the sample median, CEOs with easy EPS targets receive 127% of the target

AIP, while CEOs with challenging targets receive only 90% of the target AIP. Comparing the actual performance with EPS hurdles in the annual incentive plan, we find that for the full sample, 54.04% of firms outperform their EPS targets, 21.7% of firms exceed the EPS stretch, and 25.96% of firms miss the EPS threshold. As a result, CEOs receive payouts that are on average 112% of the target payouts (with a median of 117%). In dollar terms, realized payouts are higher than target AIP by $205,200 at the mean and $231,200 at the median.[7]

The ex-post results critically depend on the macroeconomic conditions. For example, 74.24% of sample firms achieved the EPS target in Year 1 (December 2006–November 2007) when the economy was strong, while only 35% of sample firms achieved the EPS target in Year 3 (December 2008–November 2009) when the economy was in a deep recession. Therefore, one needs to be cautious using the ex-post payout amount to judge the rationality of an incentive plan, because the plan was determined approximately 10 month earlier when the economic outlook of the year was still unclear.

Given the importance of achieving the performance target in the annual incentive plan, what should we expect if the EPS performance falls just short of the EPS target? We next examine earnings management that firms may engage in to beat the EPS target. We find that earning management is present not only in firms that set challenging EPS targets and but also in firms that set easy EPS targets. Moreover, some firms manipulate the calculation of the compensation-purpose EPS to beat the EPS target.

The board of directors designs annual incentive plans for top executives year after year. How does the board adjust performance targets over time? Analyzing the dynamics of performance target setting, we find that firms tend to increase the EPS target when the target was achieved and decrease the EPS target when the target was missed in the previous year. An interesting asymmetry emerges: on average, a firm increases the EPS target by 0.53 cents when the EPS target in the previous year was exceeded by one cent, but decreases the EPS target by 1.072 cents if the EPS target was missed by one cent. We do not attempt to argue that the EPS target should be adjusted one-by-one with an improved performance because doing so may discourage managers from exerting value-enhancing effort or motivate managers to reserve earnings in good years for the future.

Finally, we examine how corporate governance characteristics affect the design of the annual incentive plan. We use eight corporate governance variables and construct a corporate

[7] Using values reported in Panel C of Table 11, at the median, the target AIP is 1.36 million dollars and actual AIP is 117% of the target AIP. Thus, the difference between the actual and target payouts is 1.36*0.17 million dollars ($231,200). We calculate the mean value in a similar manner.

governance index aggregating these individual variables. After controlling for firm and compensation characteristics, we show that firms with stronger corporate governance tend to set a higher EPS target (relative to analyst consensus) and a greater pay-for-performance sensitivity, and tend not to grant discretionary bonuses — bonuses awarded partially or fully based on the discretion of the board of directors. This evidence is suggestive of the properties of well-designed incentive schemes.

This paper contributes to the literature on corporate governance and executive compensation in several aspects. First, this is the first paper that examines all three performance hurdles that are actually used in annual incentive plans for large US public corporations. With newly disclosed detailed information, we are able to look at the correspondence between the payout amount and performance goals in the annual incentive plan. Second, this paper looks at annual incentive plans from an ex-ante perspective, whereas most previous studies look at ex-post payouts or earnings management around the kinks (or inferred kinks) in the incentive plan. Because actual payouts are influenced by various factors during the year, inferences using ex-post values could be misleading when judging the effectiveness and rationality of an incentive plan. Third, this paper suggests that the design of the annual incentive plan can be improved as we improve corporate governance.[8]

Among the few papers that have sufficient information to study on annual incentive plans for top executives, Murphy (1999) is the first to describe detailed information on performance measures in annual incentive plans, using a comprehensive survey conducted by Towers Perrin in 1996–1997 that includes a sample of 177 publicly traded US corporations. Murphy (1999) argues that internal performance targets are problematic if executives can participate in setting performance targets. Along this line, Anderson, Dekker, and Sedatole (2008) suggest that the benefits of pay-for-performance will be attenuated if managers are given the opportunity to influence performance goals. However, in a field study of 54 profit centers in 12 corporations, Merchant and Manzoni (1989) argue that achievable performance targets might actually be more desirable in terms of corporate reporting, resource planning, and, when combined with other system elements, even motivation.

Murphy (2000) compares internal and external performance measures and finds that firms using internal measures have less variable incentive payouts and a higher likelihood of

[8] See, for example, Core, Holthausen, and Larker (1999) and Bebchuk, Fried, and Walker (2002) for the effect of corporate governance on executive compensation.

earnings smoothing. [9] Examining the dynamics of target bonuses, Indjejikian and Nanda (2002) infer that the design of annual incentive plans is largely consistent with the predictions of the agency theory. However, these two papers on annual incentive plans do not analyze performance targets because this information was unavailable at the time. In a similar vein, Abowd (1990) shows that when the increase in compensation is linked to the increase in after-tax gross return or stock return, future performance of after-tax gross return or stock return is enhanced. However, the *link* in Abowd (1990) is inferred based on regressions. Using survey data, Indjejikian, Matějka, Merchant, and Van der Stede (2010) document a discontinuity in earnings performance targets just below zero, suggesting that firms are reluctant to set negative earnings targets. The availability of the newly disclosed information allows us to examine performance metrics used in annual incentive plans in great detail. We hope to shed light on the current debate on bonus plans, and more generally, on how to improve the design of incentive schemes for top executives.

Another related strand of literature is on earnings management. Several papers show that firms manage earnings to meet or beat analyst consensus by one cent; see Degeorge, Patel, and Zeckhauser (1999), Cheng and Warfield (2005), and Bhojraj, Hribar, Picconi, and McInnis (2009). According to the survey conducted by Graham, Harvey, and Rajgopal (2004), over 40% of the 401 senior financial officers are willing to forgo a positive NPV project that would lead them to miss the analyst consensus by 10 cents. Moreover, Healy (1985), Gaver, Gaver, and Austin (1995), and Holthausen, Larker, and Sloan (1995) show that firms manage earnings around the kinks (the threshold and stretch goals) in the incentive plan.

The rest of the paper is organized as follows. Section 2 details the data used throughout the paper. Section 3 examines ex-ante aspects of the annual incentive plan. Section 4 examines performance outcomes, earnings management around the performance target, and the dynamics of performance target setting. Section 5 shows the effect of corporate governance on the design of the annual incentive plan. Section 6 concludes.

2. Data

Details of annual incentive plans are typically disclosed in companies' annual proxy statements, filed in the SEC's EDGAR database: http://idea.sec.gov/cgi-bin/srch-edgar. The section titled "Compensation Discussion and Analysis" (CD&A) under "Executive

[9] De Angelis and Grinstein (2010) test whether the choice of performance measures in the annual incentive plan depends on firm characteristics. They find that more complex firms tend to choose non-explicit measures over explicit measures, and market measures over accounting measures.

Compensation" includes compensation philosophy, compensation peers, as well as "Compensation Elements" among other information.[10] "Annual Incentive Plan Component" is located in the subsection of "Compensation Elements." If there are multiple annual incentive plans at a firm, we keep the plan for the CEO. We collect information on performance measures, performance hurdles (threshold, target, and stretch goals) and the corresponding payout amounts, and ex-post payouts for the S&P 500 constituent firms (as of 2006). Our sample period is fiscal years ending December 2006–November 2009, the first three years after the disclosure compliance deadline of December 15, 2006. Throughout the paper, "Year 1" is used for fiscal years ending December 2006–November 2007, "Year 2" December 2007–November 2008, and "Year 3" December 2008–November 2009.

The "Summary Compensation Table" in the CD&A of the proxy statement includes the amount expensed for each component of executive compensation. This is the source where we obtain salary payment, annual incentive payouts, discretionary bonuses,[11] and cash payouts under long-term incentive plans.[12] We obtain the minimum, target, and maximum incentive payouts from the "Grants of Plan-Based Awards" table, unless the numbers are stated in the text or footnotes. We collect the committee approval dates from this table or the company's 8-K filings.

In contrast to the prior literature, our main focus is the ex-ante value of each compensation component (except for discretionary bonuses), which we believe to be as informative as the ex-post payout in helping us understand firms' compensation policies. Table A1 in the appendix shows the unconditional breakdown of total compensation based on target value or grant-date fair value. Table 1 reports summary statistics on each of the compensation components if the component is used by the firm.

Target payouts for the annual and long-term incentive plans are the payout amount set at the beginning of the performance period if performance targets are achieved. Target payout of performance equity is the grant-date fair value of the securities multiplied by the target number of

[10] Different firms use different terms in their filings. For example, "Compensation Components" are used by some firms to replace "Compensation Elements."

[11] Discretionary bonuses (bonuses that are not linked to performance measures and are subject to the discretion of the board of directors) are currently reported under "bonuses" while performance-based bonuses (our variable of interest) are reported under "non-equity incentive pay."

[12] The ExecuComp database also includes the corresponding payout amounts but they are not always reliable for our purposes. For example, when a firm also has a long-term cash incentive plan, the numbers under "Non-Equity Incentive Payout" in the ExecuComp database include not only the annual incentive payout but also the cash portion of the long-term incentive payout during the year. In addition, incentive payouts were reported in the "Bonus" column before December 2006 and should be reported under the "Non-equity incentive payouts" column after December 2006. Firms sometimes report numbers in the wrong columns. The ExecuComp database does not always correct the inconsistency in firm filings, thus we obtain these numbers from the proxy statements.

the securities. Stock options and restricted stocks are reported at the grant-date fair value. As shown in Table 1, the median target payouts of annual, long-term incentive plans, and performance equity are $1.33, $1.95, and $2.68 million, respectively, conditional on the value is positive. These values are non-trivial compared to the grant-date fair value of stock options (with a median of $2.54 million) and restricted stocks (with a median of $1.9 million).

Panel B shows that the average (median) of the annual incentive payout (AIP) to base salary ratio is 1.55 (1.25). The average (median) of the realized AIP to target AIP ratio is 1.08 (1.11), ranging from 1.28 (1.26) in Year 1 when the economy was strong to 0.79 (0.84) in Year 3 when the economy was weak. Firms increase the target AIP by an average of 12% annually over the three years of our sample, with a median increase of 5%. In addition, the ex-ante maximum payout is approximately 200% of the target payout, and the minimum payout is approximately 25% of the target payout.

Panel C describes the actual payouts of various types of discretionary bonuses. There are 183 firm-years in total that grant discretionary bonuses, including bonuses granted upon pure discretion of the board, bonuses specified in employment contracts, bonuses without structured incentive plans, discretionary components of incentive plans, and others. The mean value of discretionary bonuses is $1.2 million and the median value is $0.61 million. Two categories have the highest payout amounts. Bonuses based on employment contracts have a mean of $4.53 million and a median of $1.23 million. Bonuses without structured incentive plans have a mean of $4.75 million and a median of $1.74 million. The usage of both types decreases over time.

Having documented ex-ante (and ex-post) value of various components of CEO compensation, we next describe performance measures and performance targets used in annual incentive plans. As shown in Table 2, as of July 2010, we are able to find 1,382 firm-years with proxy statements (or 10-K filings that contain the information on executive compensation) of which 1,295 firm-years have annual incentive plans in place and 1,260 firm-years disclose performance measures used in the plans.[13] In total, there are 3,090 (255+2,835) quantitative measures and 947 qualitative measures. The average number of performance measures used in annual incentive plans is 3.2, of which 2.45 are quantitative measures. The median number of performance measures is three, of which two are quantitative and one is qualitative. In our sample, 255 out of 1,260 firm-years use a single performance measure, all quantitative. In the order of popularity, the top five performance measures are earnings per share, profit before taxes,

[13] 118 firm-years that do not have proxy statements are from companies which were S&P 500 constituents in 2006 but subsequently left our sample due to mergers with or acquisitions/buyouts by other public or private entities, delisting, or bankruptcy.

operating income, net income, and economic value added (EVA). The remaining 1,005 firm-years use multiple performance measures, quantitative or a mix of quantitative and qualitative measures. The top five quantitative measures are EPS, revenue, operating income, net income, and free cash flow. The top five qualitative measures are individual, strategic, customer, safety, and employee goals.[14]

A subsample of 834 firm-years (227 in Year 1, 305 in Year 2, and 302 in Year 3) disclosed a sum of 1,730 (143+1,587) performance targets. For the most popular measure, EPS, we have 397 (56+341) firm-years with performance targets disclosed. [15] These correspond to 177 unique firms. The next widely used performance measure is revenue, of which 240 firm-years disclose their performance targets. Among all firms with proxy statements, about half does not disclose their performance targets in Year 1. This fraction goes down to 27% in Year 3. Some firms state that they do not disclose performance targets because the information is confidential in a competitive environment. For example, Affiliated Computer Services states the following on page 26 of its fiscal 2007 proxy statement. "We have not disclosed target levels with respect to specific quantitative or qualitative performance-related factors considered by the Compensation Committee because disclosure of the specific performance goals would give our competitors information that could be leveraged for competitive advantage which would result in competitive harm to the Company." However, some other companies simply do not disclose any information on performance targets. In 2007, SEC requested 350 companies to disclose more detailed information on performance policies, in particular, performance targets used in their annual incentive plans.[16]

The example below is extracted from the annual incentive plan of *Colgate-Palmolive* in fiscal year 2007.

> "Bonus payouts for a particular year are determined … [*omitted by authors*] by a formula based on the level of growth achieved the prior year in Base Business Earnings-

[14] An individual performance measure is used by the board to evaluate the CEO's individual contribution to achieve the company's strategic goals. For example, the individual performance goals for the CEO at Dow Chemical in Year 3 include driving financial discipline and low cost-to-serve, setting the standard for sustainability, building a people-centric performance culture, and investing for strategic growth.

[15] If the EPS target itself is not disclosed but both the threshold and stretch goal of the EPS are given, we assign the midpoint of the incentive zone as the EPS target. In total, there are 18 (out of 397) firm-years in this category.

[16] See Release 2007-14 entitled "Commission Staff Publishes Its Observations in the Review of Executive Compensation Disclosure." Among other things, "We [*SEC*] issued more comments regarding performance targets than any other disclosure topic in our review of the executive compensation and other related disclosure of the 350 companies. We often found it difficult to understand how companies used these performance targets or considered qualitative individual performance to set compensation policies and make compensation decisions."

> Per-Share or the applicable division's net sales and net profit after tax. The P&O Committee has discretion to adjust the calculated awards downward, but not upward.
>
> For 2007, in order for Named Officers with corporate-wide responsibilities to earn bonuses at the top end of their range, Base Business Earnings-Per-Share had to grow by 11.0% above the 2006 Base Business Earnings-Per-Share. The 11.0% goal was set based on the Company's business strategy to deliver consistent double-digit earnings per share growth each year. Since Base Business Earnings-Per-Share grew by 16.2% in 2007, bonuses for the Named Officers, before the supplemental award opportunity referred to above, were awarded at the maximum level allowed, and ranged from 130% to 220% of salary… [*omitted by authors*]"

Table 3 describes summary statistics on two performance measures: EPS and revenue. Firms "with EPS targets" have higher level and lower historical volatility in earnings than other firms (Panel A). Firms "with revenue targets" are smaller and have lower historical volatility in revenue and revenue growth than other firms (Panel B). The average of EPS in disclosing firms is \$2.81 while the average of EPS growth is 3.2% (17.35% in Year 1, 6.27% in Year 2, and -12.37% in Year 3). The median value of EPS is \$2.65 and the median of EPS growth is 10.59% (14.96% in Year 1, 12.07% in Year 2, and 4.59% in Year 3).

When only a single performance measure is used in the annual incentive plan, the weight for this measure is one; otherwise, we use the weights reported by the company when available, and assign equal weights to all performance measures when weights are not reported. EPS has a higher weight (with a mean of 53.9% and median of 50%) than revenue (with a mean of 31.84% and median of 30%) for target disclosing firms. Regarding incentive zones, on average, the EPS threshold is 12.11% below the EPS target, and the EPS stretch is 11.81% above the target. The incentive zones of revenue measure are much narrower: on average, the revenue threshold is 6.81% below the revenue target and the stretch is 4.89% above the target.

Analyst forecast data on EPS are mainly from the Thomson First Call database, which includes analyst consensus on annual EPS (and revenue), detailed forecasts, actual results, and corporate issued earnings guidance among other information. We use data in the I/B/E/S database for robustness tests. Both databases use non-GAAP EPS for actual results, which are adjusted for special and non-recurring items, similar to the EPS measures used by firms for their compensation purposes. We use the actual results reported in the First Call database (instead of the COMPUSTAT database) so that the matching of forecasted value to actual value is less problematic; see Bhojraj, Hribar, Picconi, and McInnis (2009). In a handful of cases where the

actual EPS result reported in the First Call database differs from the value reported in the firm's proxy statement as the EPS for compensation purpose, we use the value reported by the firm.[17]

The number of analysts is the head count of security analysts who followed the firm's stock in the previous year. Analyst forecast dispersion, often used as a proxy for the uncertainty in future earnings (Behn, Choi, and Kang, 2008), is the standard deviation of analyst forecasts on the firm's annual EPS in the first quarter of the fiscal year. Both firms with EPS targets and firms with revenue targets have lower analyst forecast dispersions than the full sample. We formally test whether a less uncertain measure is more likely to be selected as a performance measure in the annual incentive plan in Section 3.

Other variables used in our study include firm characteristics, CEO compensation, and corporate governance measures. Company financial data are obtained from the COMPUSTAT North America Fundamentals Annual database, and data on CEO equity exposure are obtained from the Standard & Poor's ExecuComp database. Governance characteristics are obtained from RiskMetrics. Information on institutional investor holdings is obtained from Thomson Reuters.

3. Analysis

In designing annual incentive plans, the board of directors needs to consider various factors, such as what performance measures to use, where to set the performance targets, how to relate annual incentive payouts (also in relation to other compensation components) to the performance metrics, and more specifically, how to determine the level of pay-for-performance sensitivity. In this section, we examine each of these factors.

3.1 Selection of performance measures

There is no one-size-fits-all performance measure that applies to all firms. Each board should choose performance measures that best serve their purpose of properly incentivizing top executives. For example, different measures may be applicable to different industries. In addition, a firm may choose a performance measure where it has a comparative advantage, or one that the firm needs to improve to catch up with the industry norm. The former might be more achievable while the latter might be strategically more important for the firm's long-term survival.

[17] For robustness, we test the results using the difference between the value reported in the First Call database and that reported by the firm to adjust analyst forecasts. The results are qualitatively same. There are in total 289 firm-years with company reported EPS results, which are used to calculate incentive payouts. For example, assume that the analyst forecast on EPS is \$2.55 and the actual EPS is \$2.5 in the First Call database, whereas the realized EPS in the firm's proxy statement is \$2.48. We use \$2.48 as realized EPS and adjust the analyst forecast downward by the difference of 2.5 – 2.48 = \$0.02. As a result, the analyst forecast on EPS becomes 2.55 – 0.02 = \$2.53.

More importantly, firms should choose performance measures reflecting managerial effort rather than picking up shocks beyond the managers' control. A performance measure with a higher signal to noise ratio would better reflect managerial effort and thus motivate managers to make better investment and financing decisions (see Holmström, 1979).[18]

Hypothesis 1: Firms should use less noisy performance measures to incentivize top executives.

We test this hypothesis using a logistic regression model. The dependent variable is one if a particular performance measure is used in the annual incentive plan, and zero otherwise. The two most popular measures, EPS and revenue, are our focus. *Relative performance* is one if the firm's growth rate of the measure is higher than the median growth rate of S&P 500 firms in the firm's Fama-French 12 industry over the past five years, and zero otherwise. Historical volatility of a performance measure is the volatility of the measure over the past five years. It is used as a proxy for the information content of a performance measure.

Table 4 reports the results. Models (1) and (3) use the firm's relative performance and historical volatility of the measure as independent variables. Models (2) and (4) add Fama-French 12 industry indicators to the regression to capture industry heterogeneity. The historical volatility of revenue is scaled by the level of revenue to be comparable across firms. We find that firms tend to choose performance measures where they have comparative advantages. For example, a firm that has historical EPS performance better than the industry norm is 13.1% more likely to choose EPS as a performance measure (keeping historical volatility at the sample median). Adding industry indicators, the probability difference reduces to 8.8%. The results using the revenue measure are weaker. In addition, firms tend to choose performance measures with low historical volatilities. Economically, the probability of selecting EPS as a performance measure decreases by 27.9% as the historical volatility variable moves from one standard deviation below the sample median to one standard deviation above, while *D*(*EPS above median*) remains at the sample median of one. Adding industry indicators significantly increases the pseudo-R^2 of the logistic regressions.[19]

[18] The theoretical and empirical literature on the link between uncertainty and incentives is inconclusive; see Prendergast (2002) and references therein.

[19] Using "other industry" (including mines, construction, building management, transportation, hotels, business services, and entertainment) as the benchmark, we find that the manufacturing industry and the chemical and allied products industry are more likely to use the EPS measure, and the wholesale, retail and some services industry is less likely to use the EPS measure. The finance industry is less likely to use the revenue measure. In addition, the healthcare and medical equipment industry likes both EPS and revenue measures, while the business equipment industry prefers revenue over EPS. Moreover, not a single firm in the oil, gas and coal industry or the utilities industry uses revenue as a performance measure (see Table A2).

3.2 Specification of performance targets

Next, we examine how the performance targets in annual incentive plans are determined. If a performance target is unachievable, it does not provide incentives for managers to engage in costly but value-enhancing activities (see Merchant and Manzoni, 1989). On the other hand, if a performance target is not challenging (potentially due to the influence of management; see Anderson, Dekker, and Sedatole, 2008), mediocre or even poor performance will be rewarded and the incentive mechanism will break down. Our empirical hypothesis is

Hypothesis 2: Firms tend to set performance targets lower than expectations to increase the likelihood of achieving the targets.

To examine whether performance targets are challenging, we need to define performance expectations. We use two proxies. The first proxy is analyst consensus on annual EPS at the time when the annual incentive plan was determined. The second proxy is the historical EPS performance of the firm and that of the firm's industry. A finding that EPS targets are consistently lower than their corresponding benchmarks would confirm Hypothesis 2.

3.2.1 EPS targets versus analyst consensus

According to O'Brien (1988), the most recent forecast given by an analyst is more accurate than other prevailing forecasts, implying the importance of forecast timing. Thus, our analysis only uses the latest EPS forecast of each analyst. We then calculate *analyst consensus* by taking the average of the most recent forecasts of all analysts covering the firm's securities. We transform EPS targets to EPS growth targets and vice versa using the actual EPS of the previous year.

The results presented in Table 5 include both the mean and median differences of EPS targets and analyst consensus. While interpreting the results, we focus on the median differences, which are less sensitive to outliers. Panel A presents the results using analyst consensus at the end of the first quarter. Panel B presents the results using analyst consensus on the approval date of the annual incentive plan for a subset of companies that disclosed the approval date.

As shown in Panel A, the median EPS target is lower than analyst consensus at the end of the first quarter by one cent for the full sample, and by two cents for each of the first two years. These differences are statistically significant. To put this into perspective, the dispersion of analyst forecasts in the first quarter on annual EPS has a median of six cents, and the historical volatility of annual EPS has a median of 44 cents. The magnitude of the difference is small.

Expressed in growth terms, the median target EPS growth is 0.59 percentage points lower than the EPS growth implied by analyst consensus for the full sample (given the sample median of EPS growth is 10.59%). In Year 3, EPS targets are closer to analyst consensus and the differences between the two become insignificant. This suggests that the board of directors and its compensation committee may have become more cautious in setting performance targets in incentive plans, perhaps due to the increased scrutiny (such as the inquiry letters issued by the SEC) in executive compensation.

For a subsample of 292 firm-years, the approval date of the annual incentive plan is available. The approval date is on average 47 days (with a median of 45 days) into the fiscal year. Because the proper benchmark with which to compare the EPS target is the analyst consensus prevailing at the time when the EPS target was determined, we believe the results reported in Panel B are directly relevant for our conclusion. In this subsample, the EPS target is lower than analyst consensus by at least two cents. The EPS growth target is lower than the EPS growth rate implied by the analyst consensus by 0.92–2.42%. Out of 24 specifications, 22 are statistically significant, including five out of six specifications in Year 3.

The results are strengthened when we use the forecasts from top brokers (including Morgan Stanley, Citi Group, Deutsche Bank, Barclays Capital, Goldman Sachs, Bear Sterns, Bank of America, JP Morgan, Nomura Securities, UBS, and ABN Amro). Our un-tabulated results using analyst forecasts reported in the I/B/E/S database are similar but slightly weaker. Including EPS targets converted from net income targets does not alter the conclusion. Interestingly, our results are weaker in the financial services industry. Perhaps, EPS is not the main performance measure used in the industry (as shown in Table A2), or perhaps, the pay practice in the financial services industry is not any worse than that in other industries even though it has attracted much regulatory and media attentions in recent years.

In interpreting the results that EPS targets are lower than analyst consensus, one potential problem is that if analyst consensus is upward biased, we would find the same results even if EPS targets are set properly. To address this concern, we compare analyst forecast biases, defined as analyst consensus less actual EPS result, for firms with EPS targets with those for firms without EPS targets. Table 6 reports the results. Analyst consensus in the first quarter on annual EPS is downward biased for Year 1 and upward biased for Year 3. This is not surprising given that in Year 1 the economy grew stronger as the year progresses, while in Year 3 the recession went deeper over time. More importantly, analyst consensus is less biased for firms with EPS targets than for firms without EPS targets in all 16 specifications, of which three are statistically

significant; see Panel C of Table 6. The difference of the analyst forecast bias between these two groups goes against finding our results. Thus, analyst forecast biases cannot be driving our results.

Figure 2 depicts the dynamics of corporate issued earnings guidance and analyst consensus for the sample median firm as the year progresses. The solid line corresponds to corporate issued earnings guidance, the two dotted lines are the lower and upper bounds of earnings guidance, and the dashed line is the prevailing analyst consensus. All values are scaled by the EPS target specified in the annual incentive plan, and thus a value greater than one indicates that the value is greater than the EPS target. For the sample median firm, the EPS target in the annual incentive plan equals earnings guidance in the first quarter. Except for Year 3 when the US economy was experiencing the worst recession since the 1930s, analyst forecasts go up as the year progresses and analyst consensus in the first quarter is actually downward biased (relative to actual EPS). At the end of the first quarter, 91 firm-years have EPS targets greater than and 21 firm-years have EPS targets equal to analyst consensus (challenging targets), while 114 firm-years have EPS targets lower than analyst consensus (easy targets). The imbalance is mainly driven by the first two years in which only 48 firms have EPS targets higher than analyst consensus while 84 firms have EPS targets lower than analyst consensus.

3.2.2 EPS targets versus historical EPS

Having shown that EPS targets are set lower than analyst consensus, we next compare EPS targets with alternative performance benchmarks: the EPS of the firm in the previous one, three, and five years, and those of the firm's industry based on Fama-French 12 industry classification. The results presented in Table 7 show mixed evidence. The EPS target is higher than the EPS level in the previous year. That is, the board does update its belief about firm profitability and raise the EPS target when the past performance was good. However, the EPS growth target is set lower than the historical EPS growth rate in 45 out of 48 specifications, all statistically significant. Looking into the recent history of earnings, we find that our sample firms experienced a low EPS growth during December 2001–November 2002, with a mean of -6.2% and a median of 2.6%. In contrast, the average (median) annual EPS growths of our sample firms during December 2002–November 2007 range from 13% to 30% (from 13% to 17%). The low EPS growth during December 2001–November 2002 is the main reason the EPS growth target is higher than the historical 5-year growth rate in three specifications, all for Year 1.

Our findings suggest that in determining the EPS target, the board takes into account (good) past performance but not to the full extent. This evidence can be interpreted as a lax performance standard, but it can also be consistent with optimal contracting theories. If the

performance target is adjusted to fully reflect good past performance, managers will reserve earnings, in anticipation of a ratcheting performance target in the future. This will exacerbate the earnings management problem caused by the kinks in the annual incentive plan.

3.2.3 Market reactions to performance targets

Is this one- or two-cent difference between the EPS target and analyst consensus economically meaningful? To answer this question, we examine market reactions to performance target setting. If performance targets, in relation to prevailing analyst consensus, convey meaningful information about the firm's prospect, we should observe different market reactions to firms that set challenging performance targets and firms that set easy performance targets. More specifically, if the market understands that firms tend to set easy performance targets for their top executives, a challenging performance target should signal to the market the firm's high profitability in the future. Our empirical hypothesis is

Hypothesis 3: Market should exhibit positive abnormal returns for firms with challenging performance targets.

To test this hypothesis, we conduct event studies using the Eventus software and restrict our sample to firms that disclose the approval date of the annual incentive plan. We divide the sample into firms that set EPS targets higher than or equal to prevailing analyst consensus at the approval date ("challenging targets"), and firms that set EPS targets lower than analyst consensus at the approval date ("easy target"). For each of the two subsamples, we use two abnormal return models and two market indices. The two models to quantify abnormal returns are the market model and the four factor model (Fama-French three factors plus momentum). The two indices for market returns are the CRSP value-weighted index and CRSP equal-weighted index.[20]

We look at the window of [-5,+5] days relative to the approval date of the annual incentive plan. We define [-5,-1] as the pre-event window, [0,+2] as the event window (because the 8-K filing that contains details of the annual incentive plan is typically filed electronically at the SEC within two days of the plan's approval), and [+3,+5] as the post-event window. The time period is restricted to 10 days because some firms file their 10-Ks or release earnings guidance around the time when annual incentive plan is approved. A relatively short period helps us avoid picking up the effect of other corporate events. To further address this issue, we redo the event study excluding firm-years that have the 10-K filing date in the window of [-5,+5] relative to the

[20] Results are very similar if we use the S&P 500 index as the proxy for the market return under the market model. However, Eventus does not allow us to use the S&P 500 index under the four factor model.

approval date of the annual incentive plan (Panel B), and further excluding firm-years that have earnings guidance issued in the window of [-1,+1] relative to the plan approval date (Panel C). We rule out 10-K filings over a relatively longer period because of potential information leakage of annual financial performance. Corporate issued earnings guidance, in contrast, is unlikely to leak out under the FD regulation.

Table 8 presents the event study results. For the full sample, as shown in Panel A, we observe positive and significant abnormal returns for firms with challenging targets but no abnormal returns for firms with easy targets. Panel B shows that when firms with concurrent 10-K filings are excluded, the results are strengthened. In all four specifications, market reacts positively to challenging targets and negatively to easy targets. When firms with concurrent earnings guidance are further excluded, the sample size reduces significantly. In Panel C, we show that the results are consistent with results of the previous tests, albeit with a weaker statistical significance. Overall, in 11 out of 12 specifications, we observe positive and significant abnormal returns for firms with challenging EPS targets. Moreover, in eight out of 12 specifications, we observe negative and significant abnormal returns for firms with easy EPS targets. These findings suggest that market updates its belief on firms' prospects according to where the performance targets are set relative to analyst consensus. This is consistent with a market belief that the management has some private information on strong profitability and signals this positive information by setting a challenging target. This evidence could also be consistent with a market belief that a more challenging target may motivate the management to improve performance.

3.3 Ex-ante value of annual incentive payout (*AIP*)

How does the difference between analyst consensus and the EPS target affect the ex-ante value of AIP? We next estimate at the time of plan approval how many extra dollars a CEO is expected to receive because of a slightly lower EPS target (and a wider incentive zone). The ex-ante value of AIP depends on the structure of the annual incentive plan and the distribution of earnings. A subsample of 165 firm-years has all the required information for this calculation: performance threshold, target, and stretch goals, as well as the payout amount for the performance at each of the threshold, target, and stretch goals. Following the accounting literature (see Albrecht, Lookabill, and Mckeown, 1977; and Ball and Watts, 1972), we assume EPS to follow a random walk with drift. We use two proxies for the drift term of the normal distribution: the firm's EPS growth rate in the previous three years and the previous five years. In both models,

the volatility of EPS growth in the previous five years is used as the proxy for the standard deviation of the normal distribution.

We use a simulation approach to calculate the ex-ante value of the AIP. For each of the 165 annual incentive plans, we simulate 1,000 normally distributed EPS using last year's EPS*(1+drift term) as the mean and the historical volatility of EPS growth as the standard deviation. The payout for a simulated EPS is determined according to the structure of the annual incentive plan (intermediate points between EPS threshold and EPS target, and between EPS target and EPS stretch goal are linearly interpolated). The sample average of these 1,000 simulated payout amounts is the ex-ante value of the incentive payout at the time of compensation decision.

For comparison purposes, we calculate two sets of ex-ante values for the AIP and their difference. The first set uses the original annual incentive plan. The second set uses analyst consensus at the approval date on annual EPS as the performance target, the minimum analyst forecast as the lower bound, and the maximum analyst forecast as the upper bound of the incentive zone. The results in Table 9 show that the ex-ante value of AIP under the original plan is on average $56,490–57,760 (with a median of $30,940–35,430) higher than that under the hypothetical plan. Scaling the dollar difference by the ex-ante value of AIP under the original plan, we obtain a percentage difference with a median of 2.44–2.46% for the full sample. The result is much stronger in Year 1 and mostly insignificant in Year 3.

3.4 Pay-for-performance sensitivity

We next calculate the pay-for-performance sensitivity ("PPS") for the annual incentive plan. The slope (PPS) represents the change in AIP, expressed in thousands of dollars, for an increase of one cent in EPS. This concept is very similar to option delta. Table 9 shows that the slope of the hypothetical plan (that uses analyst forecasts as the performance metrics) at last year's EPS is higher than that of the original plan in all specifications. For example, using the five-year historical EPS growth rate, for a one-cent change in EPS, the change in AIP under the hypothetical plan is on average $4,480 (with a median of $1,470) higher than that under the original plan. Thus, using analyst consensus to replace the EPS target and the range of analyst forecasts to replace the incentive zone specified in the annual incentive plan will enhance the link between pay and performance.

Using historical EPS data over the previous five years of one sample firm, we depict in Figure 3 the payout structure of the annual incentive plan, the ex-ante value of AIP under the original annual incentive plan, and the ex-ante value of AIP under the hypothetical plan. The

dotted-dashed line to the left represents the ex-ante value of the annual incentive plan over a range of EPS ($1–2.5 for the clarity of the graph, and $0–5 for the simulation), and the dashed line to the right represents the ex-ante value of the hypothetical plan. The vertical dashed line marks the firms' EPS the previous year ($1.64). Other parameters of the plan are marked in the figure. The distance between the two ex-ante value curves at the reference points (segment AB) is the difference between the ex-ante value of AIP under the original plan and that under the hypothetical plan. The slope at point A and that at point B represent the PPS under these two plans. For this specific firm, the ex-ante value of AIP is higher than that of the hypothetical plan by approximately half million dollars. In addition, the PPS of the original plan is lower than that of the hypothetical plan by $20,095 for a one-cent movement in the EPS.

We then compare the incentive zone of the annual incentive plan (the interval between EPS threshold and EPS stretch goal) with the range of analyst forecasts. The mean (median) length of the incentive zone is 62 (44) cents. Results presented in Panel A of Table 10 show that the incentive zone is wider than the range of analyst forecasts in all specifications. Interestingly, the slack at the low end is greater than the stretch at the high end. For the median firm of the full sample, the EPS threshold in the annual incentive plan is 12 cents lower than the minimum analyst forecast, while the EPS stretch is only six cents higher than the maximum analyst forecast. The median difference of 18 cents between the width of the incentive zone and the range of analyst forecasts is statistically significant and economically meaningful. The results using EPS growth rates are similar.

As shown in Panel B, the incentive zone in the annual incentive plan is also wider than the 95% confidence interval of analyst forecasts, as provided in the First Call database. This wider incentive zone may actually provide better incentives for top executives in firms with more volatile earnings, especially during economic downturns. This may also mitigate the tendency of earnings management around the kinks of the annual incentive plan, performance threshold and performance stretch goal, as advocated by Jensen (2003). However, a wider incentive zone, especially the low performance threshold, may reward CEOs with mediocre performance, attenuating pay for performance.

4. Ex-post performance, earnings management, and target setting dynamics

In this section, we provide additional analyses on annual incentive plans: how firms actually perform relative to the pre-determined performance metrics, whether firms manage earnings to meet or beat performance targets, and how the board of directors adjusts performance targets based on past performance.

4.1 EPS metrics versus ex-post performance

We first compare actual EPS with the EPS target to see how frequently the EPS target is achieved. This analysis also serves as a validity check on using analyst consensus as the benchmark for the EPS target. As reported in Panel A of Table 11, at the median, the actual EPS is higher than the EPS target in the annual incentive plan by four cents for the full sample and nine cents in Year 1. The comparison reverses in Year 3 when market conditions worsened. In Panel B, we show that 25.96% of firms miss the EPS threshold, 54.04% of firms meet or beat the EPS target, and 21.7% of our sample firms exceed the EPS stretch goal. The distribution of actual EPS relative to each performance hurdle is striking in Year 1 (fiscal year ending December 2006–November 2007): only 13.64% of firms miss the EPS threshold, 74.24% of firms meet or beat the EPS target, and 33.33% of our sample firms exceed the EPS stretch goal. However, this pattern flips in Year 3 (fiscal year ending December 2008–November 2009): 36.25% of firms miss the EPS threshold, 35% of firms meet or beat the EPS target, and only 13.75% of firms exceed the EPS stretch.

Panel C shows that the ex-post payout to target payout ratio is 1.12 at the mean and 1.17 at the median. Values are much higher in Year 1 (1.36 at the mean and 1.34 at the median) and much lower in Year 3 (0.84 at the mean and 0.92 at the median), consistent with the deteriorating economic conditions over the three years of our sample period. These findings suggest that it is problematic to use the ex-post payout relative to the target payout to judge whether the performance metrics were determined properly because actual performance depends on both managerial effort and macroeconomic conditions, which sometimes experience dramatic swings.

Panels D and E separately present the ex-post results for firms with easy EPS targets and firms with challenging EPS targets. The amount of target AIP is similar for these two groups of firms. Not surprisingly, *easy* targets are indeed easier to achieve. At the sample median, actual EPS performance is nine cents higher than the EPS target for firms with easy targets. In contrast, actual EPS performance is 13 cents lower than the EPS target for firms with challenging targets. The difference of 22 cents is statistically significant at the 1% level. As a result, CEOs at firms with easy targets receive 127% of the target AIP, while CEOs at firms with challenging targets receive 90% of the target AIP at the sample median over three years. The two groups diverge dramatically in Year 3 when the economy was weak: the median firm with an easy EPS target receives 117% of the target AIP, while the median firm with a challenging EPS target receives only 47% of the target AIP.

4.2 Earnings management around performance targets

Earnings management around analyst consensus is well documented in the accounting literature. It is natural to ask whether top executives manipulate earnings to beat the performance target used in the annual incentive plan. A number of papers show earnings management around the stretch and threshold goals of the annual incentive plan (see, for example, Healy 1985, Gaver, Gaver, and Austin, 1995; Holthausen, Larcker, and Sloan, 1995). Our study is the first to examine earnings management around the performance target of the annual incentive plan.

We follow the methodology used in Bollen and Pool (2009) to detect earnings management. Loosely speaking, the difference between actual EPS and the EPS target is sorted into bins with a predetermined optimal bin width. If an exceptional high (or low) number of observations relative to the number given by a variant of a kernel density is detected in a bin, an earnings management is found in that particular bin. Details of the procedure are provided in the Appendix. Figure 4 reports the results. In all graphs, the black bar represents the bin with (actual EPS – EPS target) just below zero and the blue bar the bin just above zero. The dotted line in red indicates the derived kernel density function, and the lower graph shows the statistical significance of the difference between actual frequency and that under the kernel density. The two dashed lines in the lower graph represent the upper bound and lower bound of the 95% confidence interval.

We first document in Figure 4a that for the full sample, the actual frequency is much higher than that under the kernel density in the bin just above zero and the difference is statistically significant — an indication of earnings management. Next, we exclude those firms in which earnings just beat analyst consensus (i.e. actual EPS is at or one cent higher than analyst consensus in the last quarter). This way, we leave out earnings management related to meeting or beating the prevailing analyst consensus. As shown in Figure 4b, we still find earnings management linked to beating the EPS target of the annual incentive plan. We then separately examine potential earnings management for firms with challenging targets and firms with easy targets. One potential concern on setting challenging performance targets is that the management may thus become more aggressive in earnings management. However, one may also argue that a CEO who misses an easy target would lose his/her credibility. As shown in Figures 4c and 4d, we find that earnings management around the EPS target is prevalent both in firms with challenging targets and in firms with easy targets.

Next, we approach the earnings management issue from a slightly different perspective. In most cases, EPS used in annual incentive plans are non-GAAP EPS. Non-GAAP EPS differs from 10-K reported EPS in that it excludes some one-time charges or M&A related expenses,

foreign currency translation costs, or other items deemed to be not representing core operating related income or expenses. EPS reported in the First Call database, both analyst consensus on annual EPS and actual EPS, are adjusted for these one-time expenses. While we cannot trace the precise definition of the EPS for compensation purpose in each firm, the EPS values reported in the First Call are close approximations for the compensation-purpose EPS. In our sample, 204 firm-years report their actual EPS for compensation purpose ("company-reported EPS"), out of which 77 are identical to the actual EPS reported in the First Call ("First Call EPS"). We divide the remaining firm-years into two subsamples: those with company-reported EPS higher than the First Call EPS and those with company-reported EPS lower than the First Call EPS. The first group contains 71 firm-years and the second 56 firm-years.

Hypothesis 4: If companies do not manipulate the compensation-purpose EPS, the earnings management behavior should not differ in these two subsamples.

Evidence shown in Figures 4e and 4f rejects the null hypothesis. Earnings management in the bin with actual earnings just above the EPS target only exists in companies that report the compensation-purpose EPS values higher than the First Call EPS. In other words, companies may opportunistically modify the calculation of EPS for compensation purpose to achieve the EPS target specified in the annual incentive plan.

4.3 Dynamics of performance target setting

We now examine the adjustment of the EPS target based on whether the target was achieved or missed in the previous year. In our sample, 218 firm-years disclose the EPS target in two consecutive years. First, we divide these 218 firm-years into four quadrants based on whether the EPS target was achieved or missed in the previous year, and whether the performance target is adjusted upward or downward this year. As shown in Panel A of Table 12, there are 178 upward adjustments of the EPS target, 150 of which are at firms that achieved the EPS target in the previous year. There are 40 downward adjustments of the EPS target, 31 of which are at firms that missed the EPS target in the previous year. Next, we run a regression of the adjustment of the EPS target on the difference between the actual EPS and EPS target in the previous year, allowing the sensitivity to be different for firms that achieved the previous EPS target and firms that missed the previous EPS target. The empirical specification is

$$(EPS\ target)_t - (EPS\ target)_{t-1} = \alpha + \beta_1 * D(Target\ missed)_{t-1} + \beta_2 * (Actual\ EPS - EPS\ target)_{t-1} + \beta_3 * (Actual\ EPS - EPS\ target)_{t-1} * D(Target\ missed)_{t-1} + \varepsilon_t. \quad (1)$$

As shown in Panel B of Table 12, when the EPS target was missed by one cent in the previous year, a firm adjusts its EPS target downward by 1.072 (=0.53+0.542) cents. In contrast, when the EPS target was exceeded by one cent in the previous year, the firm adjusts the EPS target upward by 0.53 cents. This asymmetric adjustment pattern could be consistent with either of two opposing theories. One view is, firms may be setting less challenging performance targets and cutting slacks for top executives. This is a reflection of agency problems. The other view is that adjusting performance target one-to-one with past performance may cause management to reserve more earnings in good years to ease the burden for the future. This will exacerbate the earning management problem associated with the unique structure of the annual incentive plan, especially, the capped payout when performance exceeds the stretch goal. Therefore, the observation that performance targets have not been adjusted (upward) one-to-one with (good) past performance may well serve the best interest of shareholders.

5. Corporate governance and the design of the annual incentive plan

In a typical pay setting process, the compensation committee of the board determines performance metrics of the annual incentive plan with the input of management. Thus, the annual incentive plan could be structured in favor of the CEO in a firm where the CEO has more power relative to the board. Naturally, a CEO would prefer to have an incentive plan with higher ex-ante payouts and lower risks. Our next empirical hypothesis is

Hypothesis 5: Firms with weak corporate governance tend to adopt annual incentive plans with low performance targets and low pay-for-performance sensitivity.

In the first set of regressions, the dependent variable is (EPS targets – analyst consensus). In the second set of regressions, the dependent variable is the pay-for-performance sensitivity of the annual incentive plan measured at last year's performance. Moreover, we look at whether a firm grants discretionary bonuses (the dependent variable is two if no discretionary bonuses are awarded, one if the discretionary portion of the annual incentive plan or bonuses without a structured incentive plan are paid out, and zero if bonuses are paid out purely based on the board's discretion). In all three sets of regressions, independent variables include firm characteristics (number of analysts, analyst forecast dispersion, ln(sales), leverage, book-to-market ratio of equity, ROA, and stock return), compensation variables (CEO salary payment, the

ratio of target AIP to target total pay, and the percentage of CEO equity ownership), and various corporate governance measures.[21]

We include eight corporate governance measures: whether the chairman of the board is independent (not being the CEO in particular), whether the difference of CEO tenure and median director tenure is low (lower than the sample median) so that the CEO did not hand-pick and capture the board, whether the board is small, whether the percentage of independent directors is high (higher than the sample median), whether the percentage of directors who are 70 years or older is low, whether the percentage of directors who serve on three or more other corporate boards is low, whether the percentage of compensation committee members who are CEOs of other firms is low, and whether the aggregated ownership of the top five institutions is high. All governance variables are indicator variables: one represents good corporate governance, and zero represents poor corporate governance.

Finally, we construct a corporate governance index that adds up the values of these eight governance variables. We test whether these governance variables and the governance index are significant in explaining the *characteristics of the annual incentive plan*, which includes the difference between the performance target and analyst consensus, the pay-for-performance sensitivity, and the award of discretionary bonuses. The regressions are described in Equation (2) and the results are reported in Table 13. To ensure the data availability at the approval time of the annual incentive plan, we use values in the previous year for firm characteristics and corporate governance variables.

$$
\begin{aligned}
&(\textit{Characteristics of annual incentive plan})_t \\
&= \alpha + \beta_1 * (\textit{Number of analysts})_{t-1} + \beta_2 * (\textit{Analyst forecast dispersion})_t \\
&\quad + \beta_3 * (\textit{CEO salary})_t + \beta_4 * (\textit{CEO target AIP/target total pay})_t + \beta_5 * (\textit{CEO equity exposure})_t \\
&\quad + \beta_6 * \textit{ln}(\textit{Sales})_{t-1} + \beta_7 * (\textit{Leverage})_{t-1} + \beta_8 * (\textit{Book-to-market})_{t-1} + \beta_9 * (\textit{ROA})_{t-1} + \beta_{10} * (\textit{Stock return})_{t-1} \\
&\quad + \beta_{11} * \textit{Dummy}\,(\textit{CEO is not a chair})_{t-1} + \beta_{12} * \textit{Dummy}\,(\textit{Low CEO tenure – director tenure})_{t-1} \\
&\quad + \beta_{13} * \textit{Dummy}\,(\textit{Small board})_{t-1} + \beta_{14} * \textit{Dummy}\,(\textit{High board independence})_{t-1} \\
&\quad + \beta_{15} * \textit{Dummy}\,(\textit{Young board})_{t-1} + \beta_{16} * (\textit{Non-busy board})_{t-1} \\
&\quad + \beta_{17} * (\textit{Low outside CEOs in comp. comm.})_{t-1} + \beta_{18} * (\textit{High top 5 institutional ownership})_{t-1} + \varepsilon_t .
\end{aligned}
\tag{2}
$$

Models (1), (3), and (5) contain firm characteristics, analyst and CEO compensation variables, and each of the eight corporate governance variables. Models (2), (4), and (6) replace these eight governance variables with the governance index. All specifications include year fixed effects and industry fixed effects (based on the Fama-French 12 industry classification). Standard errors are clustered at the firm level.

[21] For the literature on corporate governance variables used in the regressions, see Shivdasani and Yermack, 1999; Yermack, 1996; Coles, Daniel, and Naveen, 2008a, 2008b; Core, Holthausen, and Larcker, 1999; Fich and Shivdasani, 2006; Himmelberg, Hubbard, and Palia, 1999; and Hartzell and Starks, 2003.

The evidence on how corporate governance affects the setting of performance targets is mixed. In firms where the target amount of AIP is a greater fraction of total target compensation, the EPS target is set higher relative to analyst consensus. This evidence suggests that the board does take into account the target payout amount while setting the corresponding target. In particular, the target is set more challenging when the ex-ante payout amount is higher. We find no statistical significance in any of the individual governance variables. [22] However, using the governance index that aggregates eight corporate governance characteristics, we find that firms with stronger corporate governance set more challenging performance targets.

Results are less ambiguous for the analysis of pay-for-performance sensitivity. As the uncertainty of earnings increases (i.e. as analyst forecast dispersion increases), firms set pay-for-performance sensitivity lower. This is consistent with the optimal contracting theory in that the slope of pay over performance should be low when the noise in the performance measure is high. Interestingly, firms with higher leverage use lower PPS, suggesting perhaps lenders monitor and discipline managers, complementing the incentive mechanisms in executive compensation. Regarding corporate governance characteristics, firms in which CEOs have been in post shorter relative to directors, directors are younger, and fewer outside CEOs serve on the compensation committee adopt a higher pay-for-performance sensitivity.

Firms that disclose more information (for example, via issuing earnings guidance) tend to have fewer security analysts following their securities. These firms are more likely to use high pay-for-performance sensitivity, and less likely to award discretionary bonuses (recall the dependent variable in Models (5) and (6) has a higher value when less discretionary bonuses are granted). More importantly, firms with better corporate governance are less likely to grant discretionary bonuses. Overall, the results presented in Table 13 show the link between corporate governance and the design of annual incentive plans.

6. Conclusion

We examine the newly disclosed performance metrics used in the annual incentive (bonus) plans for CEOs of the S&P 500 firms in the first three years after the compliance deadline of December 15, 2006. We show that performance (EPS) targets specified in the annual incentive plans are lower than expectations. Low performance targets result in attenuated pay-for-

[22] In untabulated tables, we find that in Years 1 and 2, the EPS target is higher than analyst consensus in firms where the CEO is not a chair, where directors are younger, where institutional ownership is higher, and where directors are less busy serving on multiple boards.

performance links and high ex-ante values of the annual incentive payouts. However, the magnitude of the difference is not nearly as dramatic as the popular press has criticized.

The amount and quality of the disclosed information on annual incentive plans vary significantly across firms. In most cases, we are still unable to determine the exact payout amount given actual performance. Yet, the board of directors reserves the discretion to adjust the payout amount ex post for various reasons. Thus, this study mainly serves as the first step for us to understand the true philosophy and rationale of the board while determining executive compensation. It will be interesting to observe whether incentive payouts will be better linked to performance due to the enhanced disclosure.

References

Abarbanell, J., Lehavy, R., 2003. Biased forecasts or biased earnings? The role of reported earnings in explaining apparent bias and over/underreaction in analysts' earnings forecasts. Journal of Accounting and Economics 36, 105–146.

Abowd, J.M., 1990. Does performance-based managerial compensation affect corporate performance? Industrial and Labor Relations Review 43, 52–73.

Aggarwal, R.K., Samwick, A.A., 1999. The other side of the trade-off: the impact of risk on executive compensation. Journal of Political Economy 107, 65–105.

Albrecht, W.S., Lookabill, L.L., McKeown, J.C., 1977. The time-series properties of annual accounting earnings. Journal of Accounting Research 15, 226–244

Anderson, S.W., Dekker, H.C., Sedatole, K.L., 2010. An empirical examination of negotiated goals and performance-to-goal following the introduction of an incentive bonus plan with participative goal-setting. Management Science 56, 90–109.

Baker, G.P., Jensen, M.C., Murphy, K.J., 1988. Compensation and incentives: practice vs. theory. Journal of Finance 43, 593–616.

Ball, R., Watts, R., 1972. Some time series properties of accounting income. Journal of Finance 27, 663–681.

Bebchuk, L.A., Fried, J.M., Walker, D.I., 2002. Managerial power and rent extraction in the design of executive compensation. University of Chicago Law Review 69, 751–846.

Bebchuk, L.A., Weisbach, M.S., 2010. The state of corporate governance research. Review of Financial Studies 23, 939–961.

Behn, B.K., Choi, J.H., Kang, T., 2008. Audit quality and properties of analyst earnings forecasts. Accounting Review 83, 327–349.

Bhojraj, S., Hribar, P., Picconi, M., McInnis, J., 2009. Making sense of cents: an examination of firms that marginally miss or beat analyst forecasts. Journal of Finance 64, 2361–2388.

Bizjak, J.M., Lemmon, M.L., Naveen, L., 2008. Does the use of peer groups contribute to higher pay and less efficient compensation? Journal of Financial Economics 90, 152–168.

Bollen, N.P., Pool, V.K., 2009. Do hedge fund managers misreport returns? Evidence from the pooled distribution. Journal of Finance 64, 2257–2288.

Brown, L.D., 1993. Earnings forecasting research: its implications for capital markets research. International Journal of Forecasting 9, 295–320.

Brown, L.D., 1998. Managerial behavior and the bias in analysts' earnings forecasts. Unpublished working paper. Georgia State University.

Cheng, Q., Warfield, T.D., 2005. Equity incentives and earnings management. Accounting Review 80, 441–476.

Coles, J., Daniel, N., Naveen, L., 2008a. Boards: Does one size fit all? Journal of Financial Economics 87, 329–356.

Coles, J., Daniel, N., Naveen, L., 2008b. Co-opted boards: Costs, benefits, causes and consequences. Unpublished working paper. Arizona State University, Drexel University, and Temple University.

Core, J., Holthausen, R., Larcker, D., 1999. Corporate governance, chief executive officer compensation, and firm performance. Journal of Financial Economics 51, 371–406.

De Angelis, D., Grinstein,Y., 2010. Pay for the right performance. Unpublished working paper. Cornell University.

Degeorge, F., Patel, J., Zeckhauser, R., 1999. Earnings management to exceed thresholds. Journal of Business 72, 1–33.

Fich, E., Shivdasani, A., 2006. Are busy boards effective monitors? Journal of Finance 61, 689–724.

Gaver, J.J., Gaver, K.M., Austin, J.R., 1995. Additional evidence on bonus plans and income management. Journal of Accounting and Economics 19, 3–28.

Graham, J.R., Harvey, C.R., Rajgopal, S., 2005. The economic implications of corporate financial reporting. Journal of Accounting and Economics 40, 3–73.

Hall, B.J., Liebman, J.B., 2000. The taxation of executive compensation. Tax Policy and the Economy 14, 1–44.

Hall, B.J., Murphy, K.J., 2003. The trouble with stock options. Journal of Economic Perspectives 17, 49–70.

Hartzell, J.C., Starks, L., 2003. Institutional investors and executive compensation. Journal of Finance 58, 2351–2374.

Healy, P.M., 1985. The effect of bonus schemes on accounting decisions. Journal of Accounting and Economics 7, 85–107.

Heron, R.A., Lie, E., 2007. Does backdating explain the stock price pattern around executive stock option grants? Journal of Financial Economics 83, 271–295.

Himmelberg, C.P., Hubbard, R.G., Palia, D., 1999. Understanding the determinants of managerial ownership and the link between ownership and performance. Journal of Financial Economics 53, 353–384.

Holmström, B., 1979. Moral hazard and observability. The Bell Journal of Economics 10, 74–91.

Holthausen, R.W., Larcker, D.F., Sloan, R.G., 1995. Annual bonus schemes and the manipulation of earnings. Journal of Accounting and Economics 19, 29–74.

Hörmann, W., Leydold, J., 2000, Automatic random variate generation for simulation input. In: Joines, J.A., Barton, R.R., Kang, K., Fishwick, P.A. (Eds)., Proceedings of the 2000 Winter Simulation Conference (Winter Simulation Conference, Monterey , CA), 675–682.

Indjejikian, R., Matějka, M., Merchant, K., Van der Stede, W., 2010. Setting performance targets in recessionary times: survey evidence of a discontinuity in the distribution of earnings targets. Unpublished working paper. University of Michigan.

Indjejikian, R., Nanda, D., 2002. Executive target bonuses and what they imply about performance standards. The Accounting Review 77, 793–819.

Jensen, M.C., 2003. Paying people to lie: the truth about the budgeting process. European Financial Management 9, 379–406.

Jensen, M. C., Meckling, W.H., 1976. Theory of the firm: Managerial behavior, agency costs, and ownership structure. Journal of Financial Economics 3, 305–360.

Jensen, M.C., Murphy, K.J., 1990. Performance pay and top-management incentives. Journal of Political Economy 98, 225–264.

Lewellen, W.G., Huntsman, B., 1970. Managerial pay and corporate performance. American Economic Review 60, 710–720.

Lim, T., 2001. Rationality and analysts' forecast bias. Journal of Finance 56, 369–385.

Merchant, K.A., Manzoni, J.F., 1989. The achievability of budget targets in profit centers: a field study. Accounting Review 64, 539–558.

Murphy, K.J., 1985. Corporate performance and managerial remuneration: an empirical analysis. Journal of Accounting and Economics 7, 11–42.

Murphy, K.J., 1999. Executive compensation. In: Ashenfelter, O.C., Card, D. (Eds.), Handbook of Labor Economics. Elsevier, 2485–2563.

Murphy, K.J., 2000. Performance standards in incentive contracts. Journal of Accounting and Economics 30, 245–278.

O'Brien, P.C., 1988. Analysts' forecasts as earnings expectations. Journal of Accounting and Economics 10, 53–83.

Oyer, P., 2004. Why do firms use incentives that have no incentive effects? Journal of Finance 59, 1619–1649.

Prendergast, C. 2002. The tenuous trade-off between risk and incentives. Journal of Political Economy 110, 1071–1102.

Ross, S.A., 1973. The economic theory of agency: the principal's problem. American Economic Review 63, 134–139.

Shivdasani, A., Yermack, D., 1999. CEO involvement in the selection of new board members: an empirical analysis. Journal of Finance 54, 1829–1853.

Webb, D., 2003. Report to the New York Stock Exchange on investigation relating to the compensation of Richard A. Grasso. Winston & Strawn LLP, December 15, 2003.

Yermack, D., 1996. Higher market valuation of companies with a small board of directors. Journal of Financial Economics 40, 185–211.

Yermack, D., 1997. Good timing: CEO stock option awards and company news announcements. Journal of Finance 52, 449–476.

Table 1 Descriptive statistics of compensation components

This table reports descriptive statistics on compensation components for CEOs of S&P 500 constituent companies. Panel A presents components of annual CEO compensation. Panel B presents details on target and actual amount of annual incentive payout (AIP). Panel C summarizes different categories of discretionary bonuses. *Salary* is base salary. *A discretionary bonus is* bonus payout partially or fully based on the discretion of the board of directors. *Target AIP* is the amount of AIP a CEO receives if the firm meets the performance target in the annual incentive plan. *Target cash LTIP* is the target amount of the payout in cash based on long-term incentive plan (performance measures are evaluated over a period longer than one year). *Target performance equity* is the target amount of equity payout (based on the grant-date fair value of stock and target number of shares) of the long-term incentive plan. *Stock options* is the grant-date fair value of stock options, and *Restricted stocks* is the grant-date fair value of restricted stocks awarded to the CEO during the year. All values in Panels A and C are expressed in millions of dollars. *AIP* is the actual payout amount of the annual incentive plan. *Lagged target AIP* is the target AIP of the previous year. *Minimum AIP* the payout amount when the threshold performance in the annual incentive plan is achieved and *Maximum AIP* is the payout amount when the stretch performance goal is achieved. *Pure discretion* is bonuses awarded purely upon the discretion of the board of directors (without any incentive plan specified ex ante). *Employment contract* is bonuses awarded based on the terms specified in the CEO's employment contract. *Bonuses without structured incentives* is bonuses awarded based on a bonus plan that does not use any specific performance metric. *Discretionary component of incentive plan* is bonuses awarded based on the discretionary portion of the annual incentive plan. *Other* are bonuses paid out based on the board's discretion and do not fall into any of the categories described above. *Year 1* is the first fiscal year after the SEC regulation became effective (fiscal year ending December 2006–November 2007), *Year 2* is the fiscal year ending December 2007–November 2008, and *Year 3* is the fiscal year ending December 2008–November 2009. All observations are winsorized at the 1% level in both tails.

Table 1 Descriptive statistics of compensation components (continued)

	All years		Year 1		Year 2		Year 3	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A. Compensation components (if in use)								
Salary (millions of dollars)	1.03	1.00	1.01	1.00	1.04	1.00	1.07	1.01
		1,382		479		463		440
Discretionary bonuses (millions of dollars)	2.61	0.81	3.29	0.98	1.75	0.64	2.46	0.76
		183		67		66		50
Target AIP (millions of dollars)	1.67	1.33	1.60	1.25	1.69	1.33	1.71	1.44
		1,153		391		388		374
Target cash LTIP (millions of dollars)	2.31	1.95	2.11	1.80	2.27	1.95	2.54	2.03
		201		71		69		61
Target performance equity (millions of dollars)	3.52	2.68	3.38	2.50	3.54	2.80	3.64	2.77
		734		247		249		238
Stock options (millions of dollars)	3.38	2.54	3.61	2.49	3.44	2.61	3.12	2.54
		985		341		328		316
Restricted stocks (millions of dollars)	2.69	1.90	2.70	1.89	2.68	1.84	2.67	2.00
		575		195		179		201
Panel B. AIP and target AIP								
Target AIP/salary	1.55	1.25	1.53	1.20	1.57	1.25	1.55	1.25
		1,153		391		388		374
AIP/target AIP	1.08	1.11	1.28	1.26	1.13	1.15	0.79	0.84
		1,121		388		382		351
Target AIP/lagged target AIP	1.12	1.05	1.12	1.08	1.12	1.05	1.11	1.06
		704		55		324		325
Minimum AIP/target AIP	0.26	0.25	0.26	0.25	0.26	0.25	0.26	0.25
		948		312		320		316
Maximum AIP/target AIP	2.05	2.00	2.06	2.00	2.06	2.00	2.04	2.00
		1,029		340		344		345
Panel C. Discretionary bonuses (if in use)								
Pure discretion (millions of dollars)	1.20	0.61	3.04	0.69	0.70	0.48	0.92	0.70
		39		7		17		15
Employment contract (millions of dollars)	4.53	1.23	3.65	1.25	4.92	1.25	5.52	0.98
		38		16		13		9
Bonuses without structured incentives (millions of dollars)	4.75	1.74	5.72	1.62	3.81	1.83	4.19	1.95
		50		22		15		13
Discr. component of incentive plan (millions of dollars)	1.20	0.50	1.62	0.63	0.63	0.38	1.38	0.48
		29		12		11		6
Other (millions of dollars)	0.40	0.04	0.53	0.05	0.32	0.04	0.31	0.04
		27		10		10		7
Total number of observations		183		67		66		50

Table 2 Performance measures and performance targets in annual incentive plans

This table presents summary statistics of performance measures and the corresponding targets specified in the annual incentive plans of CEOs at the S&P 500 constituent companies (as of 2006). Panel A shows the number of firms that file the proxy statement, that disclose the annual incentive plan, that disclose performance measures used in the annual incentive plan, and that disclose performance targets used in the annual incentive plan (disclosing either the performance target, or both the threshold and stretch of performance so that we can infer the performance target using the midpoint). Panel B lists quantitative and qualitative performance measures used in the annual incentive plan. Firms using a single performance measure and firms using multiple performance measures are separately reported. Column 1 is the statistics on quantitative measures of all firms that disclose quantitative measures. Column 2 includes a subset of firms that disclose performance *targets*. Column 3 is the statistics on qualitative performance measures. Panel C reports the statistics on the number of performance measures used in annual incentive plans.

Table 2 Performance measures and performance targets used in annual incentive plans (continued)

Panel A. Annual incentive plan disclosure

	Firms with proxy	Firms with annual incentive plan	Firms with performance measures	Firms with performance targets
Overall	1,382	1,295	1,260	834
Year 1 (Dec.06–Nov. 07)	479	448	434	227
Year 2 (Dec.07–Nov. 08)	463	436	424	305
Year 3 (Dec.08–Nov. 09)	440	411	402	302

Panel B. Performance measures and performance targets used in annual incentive plans

	Quantitative measures		Qualitative measures	
	All	With targets	All	
Single quantitative measure				
EPS	70	56		
Profit before taxes	42	14		
Operating income	41	21		
Net income	29	11		
Economic value added	13	6		
Other	60	35		
Subtotal (number of firms)	255	143		
Multiple quantitative measures				
EPS	468	341	Individual	221
Revenue	427	240	Strategic	82
Operating income	247	146	Customer	70
Net income	209	84	Safety	61
Free cash flow	114	80	Employee	50
Other	1,370	696	Other	463
Subtotal	2,835	1,587		947
Number of firms	1,005	691		495

Panel C. Number of performance measures and performance targets

	Quantitative measures		Qualitative measures	All measures
	All	With targets		
Mean	2.45	2.07	1.91	3.20
Minimum	1	1	1	1
Median	2	2	1	3
Maximum	8	8	6	13

Table 3 Descriptive statistics of earnings per share (EPS) and revenue measures

This table presents the descriptive statistics of our sample firms, S&P 500 constituents as of 2006. Panel A reports values for EPS and Panel B reports values for revenue. *Measure weight* is the weight given to a performance measure (if not reported, we assign equal weights to all performance measures). *EPS* (*growth*) and *Revenue* (*growth*) are the on-going diluted EPS (growth rate) and ongoing revenue (growth rate), respectively. *Historical volatility* is the time-series volatility of the performance (its growth rate) measured over the past five years. *Number of analysts* indicates the number of security analysts following the firm's performance measure in the previous year. *Forecast dispersion* is the standard deviation of analyst forecasts in the first quarter on the performance measure if there are at least five analysts issuing forecasts. (*Target – threshold*)*/target* is the difference between performance target and threshold scaled by the target. (*Stretch – target*)*/target* is the difference between the performance stretch goal and target scaled by the target. Statistics are separately reported for the full sample and the subsample of firms with reported performance targets. Units are provided in the parenthesis next to variable names. The differences between the mean (median) values of the subsample and full sample are reported in the right-most columns along with statistical significance. The statistical significance is derived based on student's *t*-test (if variances are equal) or Satterthwaite test (if variances are not equal) for the mean difference, and Wilcoxon signed rank sum test for the median difference. * (c), ** (b), and *** (a) denote statistical significance at 10%, 5%, and 1% for the mean (median) difference, respectively. All observations are winsorized at the 1% level in both tails.

Panel A. EPS measure

	Full sample (A)				With EPS target (B)				Difference (B) – (A)	
Variables	Obs	Mean	Median	Std. Dev.	Obs	Mean	Median	Std. Dev.	Mean	Median
Measure weight (%)	538	51.37	50.00	25.68	397	53.90	50.00	25.28	2.53	0.00[c]
EPS (dollars)	1,381	2.55	2.35	2.55	397	2.81	2.65	1.67	0.26**	0.30[a]
EPS growth (%)	1,338	1.14	9.49	54.88	396	3.20	10.59	47.63	2.06	1.11
Historical volatility (5-year)	1,371	0.80	0.49	1.07	396	0.57	0.44	0.44	-0.23***	-0.05[a]
Historical growth volatility (%)	1,330	47.61	21.04	87.21	396	48.53	14.19	148.48	0.92	-6.85[a]
Number of analysts	1,367	21.56	21.00	8.45	394	20.84	20.00	7.48	-0.72	-1.00
Forecast dispersion	1,263	0.17	0.07	0.30	365	0.09	0.06	0.09	-0.08***	-0.01[a]
(Target – threshold)/target (%)					232	11.81	9.09	12.12		
(Stretch – target)/target (%)					220	12.11	7.63	13.71		

Panel B. Revenue measure

	Full sample (A)				With revenue target (B)				Difference (B) – (A)	
Variables	Obs	Mean	Median	Std. Dev.	Obs	Mean	Median	Std. Dev.	Mean	Median
Measure weight (%)	430	32.89	33.33	13.61	240	31.84	30.00	12.16	-1.05	-3.33
Revenue (billions of dollars)	1,357	17.25	8.23	26.72	238	13.98	6.17	21.68	-3.27**	-2.07[a]
Revenue growth (%)	1,346	6.62	6.52	17.32	236	7.26	7.14	11.90	0.64	0.62
Historical volatility (5-year)	1,344	2.56	1.02	4.33	233	1.98	0.73	3.45	-0.58***	-0.29[a]
Historical growth volatility (%)	1,329	15.68	10.24	18.09	230	11.24	7.25	11.80	-4.44***	-2.99[a]
Number of analysts	1,362	14.80	14.00	7.26	237	16.73	16.00	7.20	1.93***	2.00[a]
Forecast dispersion	1,316	1.42	0.17	12.16	230	0.25	0.07	0.67	-1.17***	-0.10[a]
(Target – threshold)/target (%)					130	6.81	5.00	5.63		
(Stretch – target)/target (%)					116	4.89	3.76	4.12		

Table 4 Selection of EPS and revenue measures

This table presents the logit regression results of the selection of EPS and revenue as performance measures for the annual incentive plan. The column header indicates the performance measure being tested. Dependent variable is one if a firm selects the variable as its performance measure (or one of the performance measures), and zero otherwise. Independent variables in Models (1) and (3) include a firm's performance relative to the performance of S&P 500 firms in its Fama-French 12 industry group and historical volatility of the firm's performance. Models (2) and (4) add industry indicators to capture industry fixed effects. *D*(*EPS above median*) is one if the EPS growth rate of the firm is higher than the median EPS growth rate in the firm's industry in the past five years, and zero otherwise. *D*(*Revenue above median*) is one if the revenue growth rate of the firm is higher than the median revenue growth rate in the firm's industry in the past five years, and zero otherwise. *Historical EPS volatility* is the time-series volatility of annual EPS in the past five years, and *Historical revenue volatility* is the time-series volatility of revenue scaled by the level of revenue in the past five years. Standard errors are provided in the parenthesis. *, **, and *** denote 10%, 5%, and 1% significance, respectively. All observations are winsorized at the 1% level in both tails.

Table 4 Selection of EPS and revenue measures (continued)

	EPS		Revenue	
	Model (1)	Model (2)	Model (3)	Model (4)
Relative performance				
D(EPS above median)	0.540***	0.362***		
	(0.116)	(0.123)		
D(Revenue above median)			0.213*	0.101
			(0.124)	(0.140)
Performance measure volatility				
Historical EPS volatility	-0.535***	-0.557***		
	(0.098)	(0.110)		
Historical revenue volatility			-2.719***	-3.064***
			(0.777)	(0.943)
Industries				
Consumer non-durable		0.281		0.354
		(0.283)		(0.294)
Consumer durable		0.511		-0.566
		(0.455)		(0.542)
Manufacturing		0.455*		-0.193
		(0.261)		(0.282)
Oil, Gas, & Coal		-0.298		
		(0.355)		
Chemicals and allied products		0.840**		0.441
		(0.359)		(0.360)
Business Equipment		-0.600**		1.339***
		(0.255)		(0.251)
Telephone and TV Transmission		-0.599		0.009
		(0.401)		(0.394)
Utilities		0.496*		
		(0.295)		
Wholesale, retail and some services		-0.966***		-0.341
		(0.292)		(0.291)
Healthcare, medical equipment		1.192***		1.684***
		(0.301)		(0.301)
Finance		0.059		-0.694**
		(0.243)		(0.272)
Intercept	-0.330***	-0.260	-0.500***	-0.516**
	(0.098)	(0.222)	(0.122)	(0.248)
Sample size	1,349	1,349	1,367	1,203
Pseudo−R^2	0.035	0.090	0.011	0.114
Industry fixed effects	No	Yes	No	Yes

Table 5 EPS target versus analyst consensus

This table shows the difference between the EPS target used in the annual incentive plan and analyst consensus on annual EPS. Analyst forecast data are obtained from the Thomson First Call database and *Analyst consensus* is the average of each analyst's most recent forecast. (*EPS target – analyst consensus*) is the difference between the EPS target and analyst consensus. (*EPS growth target – growth consensus*) is the difference between EPS growth target and analyst consensus on EPS growth, and (*EPS target – consensus*)*/historical volatility* measures the difference scaled by the five-year historical volatility. *Easy targets* are EPS targets strictly lower than analyst consensus. Analyst consensus on EPS is calculated over the first quarter of the fiscal year in Panel A, and from the beginning of the fiscal year to the approval date of the annual incentive plan in Panel B. *P*-values are based on *t*-test for means and Wilcoxon signed rank sum test for medians. All observations are winsorized at the 1% level in both tails.

	All years		Year 1		Year 2		Year 3	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A. All firms with EPS targets								
EPS target –	-0.03	-0.01	-0.04	-0.02	-0.05	-0.02	0.01	-0.01
analyst consensus (dollars)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	(0.74)	(0.67)
EPS growth target –	-0.98	-0.59	-1.95	-0.76	-1.38	-0.62	0.81	-0.24
growth consensus (%)	**(0.01)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.01)**	**(0.00)**	(0.34)	(0.88)
(EPS target – consensus)/	-5.35	-2.71	-7.78	-4.35	-9.52	-2.71	2.07	-1.86
historical EPS volatility (%)	**(0.00)**	**(0.00)**	**(0.01)**	**(0.01)**	**(0.00)**	**(0.00)**	(0.53)	(0.82)
% of firms with easy targets		61.46		65.83		64.54		54.41
Sample size		396		119		141		136
Panel B. Subset of firms with approval dates of annual incentive plans								
EPS target –	-0.05	-0.02	-0.05	-0.02	-0.07	-0.03	-0.03	-0.02
analyst consensus (dollars)	**(0.00)**	**(0.00)**	**(0.02)**	**(0.02)**	**(0.01)**	**(0.00)**	**(0.09)**	**(0.02)**
EPS growth target –	-1.50	-1.01	-1.69	-1.01	-2.42	-1.08	-0.72	-0.92
growth consensus (%)	**(0.00)**	**(0.00)**	**(0.04)**	**(0.01)**	**(0.00)**	**(0.00)**	(0.23)	**(0.05)**
(EPS target – consensus)/	-6.25	-5.06	-5.19	-4.21	-9.65	-6.08	-4.49	-4.94
historical EPS volatility (%)	**(0.00)**	**(0.00)**	(0.26)	**(0.07)**	**(0.01)**	**(0.00)**	**(0.08)**	**(0.05)**
% of firms with easy targets		61.64		62.22		67.35		55.77
Sample size		292		90		98		104

Table 6 Analyst consensus and actual performance

This table reports the results of univariate tests on the difference between analyst consensus and actual EPS performance, commonly phrased as "forecast bias." Panel A presents the results using firms that disclosed EPS targets in their incentive plans. (*Analyst consensus – actual EPS*) is the difference between analyst consensus in the first quarter on annual EPS and the actual EPS of the year. Panel B compares analyst consensus with actual EPS for firms that do not disclose the EPS target (some of which do not use EPS as a performance measure for the annual incentive plan). Panel C compares the values of firms in Panel A with those of firms in Panel B. If the variance of firms in Panel A is not statistically different from that of firms in Panel B, we use *t*-test; otherwise, we use Satterthwaite test for the mean difference. We use Wilcoxon signed rank sum test for the median difference. *P*-values presented Panel A and Panel B are based on *t*-test for means and Wilcoxon signed rank sum test for medians. All observations are winsorized at the 1% level in both tails.

	All years		Year 1		Year 2		Year 3	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A. Firms with EPS targets								
Analyst consensus –	0.18	-0.01	-0.09	-0.07	0.10	-0.03	0.50	0.11
actual EPS (dollars)	**(0.00)**	(0.20)	**(0.01)**	**(0.00)**	**(0.08)**	(0.79)	**(0.00)**	**(0.00)**
Analyst consensus –	8.63	-0.61	-3.54	-4.15	5.44	-1.49	22.49	4.11
actual EPS growth (%)	**(0.00)**	(0.42)	**(0.03)**	**(0.00)**	(0.11)	(0.56)	**(0.00)**	**(0.00)**
Sample size		396		119		141		136
Panel B. Firms without EPS targets								
Analyst consensus –	1.19	0.01	0.29	-0.05	0.85	0.00	2.61	0.21
actual EPS (dollars)	**(0.02)**	**(0.00)**	(0.24)	**(0.00)**	**(0.00)**	(0.28)	(0.11)	**(0.00)**
Analyst consensus –	14.60	0.42	1.56	-2.00	12.44	-0.36	32.36	10.17
actual EPS growth (%)	**(0.00)**	**(0.00)**	(0.73)	**(0.00)**	**(0.00)**	(0.33)	**(0.00)**	**(0.00)**
Sample size		977		353		320		304
Panel C. Difference between the two groups								
Analyst consensus –	-1.01	-0.02	-0.38	-0.02	-0.75	-0.03	-2.11	-0.10
actual EPS (dollars)	**(0.05)**	(0.32)	(0.13)	(0.38)	**(0.01)**	(0.63)	(0.19)	(0.13)
Analyst consensus –	-5.97	-1.03	-5.10	-2.15	-7.00	-1.13	-9.87	-6.06
actual EPS growth (%)	(0.14)	(0.25)	(0.30)	(0.46)	(0.19)	(0.67)	(0.30)	**(0.04)**

Table 7 EPS target versus historical performance

This table reports the results of univariate tests on the difference between the EPS (growth) target used in the annual incentive plan and historical EPS performance. The EPS growth target is compared with the EPS growth rate of the firm over the period of one, three, and five years, and the median EPS growth rate of S&P 500 firms in the firm's industry (using the Fama-French 12 industry classification) over the period of one, three, and five years. *P*-values presented are based on *t*-test for means and Wilcoxon signed rank sum test for medians. All observations are winsorized at the 1% level in both tails.

	All years		Year 1		Year 2		Year 3	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Previous year EPS								
EPS target –	0.23	0.23	0.25	0.22	0.23	0.24	0.22	0.22
previous year EPS (dollars)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Historical EPS growth								
Target growth –	-7.47	-4.96	-8.82	-6.61	-9.04	-5.24	-4.91	-3.49
prev. year growth (%)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.02)**	**(0.00)**
Target growth –	-8.67	-5.09	-7.03	-5.15	-9.11	-5.10	-9.05	-3.59
prev. 3 year growth (%)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Target growth –	-4.24	-3.25	2.13	-1.10	-5.41	-4.85	-9.09	-3.67
prev. 5 year growth (%)	**(0.00)**	**(0.00)**	(0.17)	(0.85)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Historical industry EPS growth								
Target growth – industry	-3.26	-2.63	-3.70	-3.09	-2.90	-2.21	-3.11	-2.66
prev. year growth (%)	**(0.00)**	**(0.00)**	**(0.01)**	**(0.00)**	**(0.03)**	**(0.00)**	**(0.02)**	**(0.02)**
Target growth – industry	-4.60	-3.58	-3.38	-3.59	-4.32	-3.59	-5.61	-3.27
prev. 3 year growth (%)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Target growth – industry	-1.82	-2.10	2.36	0.42	-2.46	-3.65	-5.72	-4.10
prev. 5 year growth (%)	**(0.01)**	**(0.00)**	**(0.03)**	(0.21)	**(0.06)**	**(0.00)**	**(0.00)**	**(0.00)**
Sample size		397		120		141		136

Table 8 Market reactions to performance target setting

This table presents the results of event studies around the approval date of the annual incentive plan. If the market is closed in the approval date, the event date is the next trading day. Our sample firms are divided into two groups. Firms in the "challenging" group have the EPS target greater than or equal to analyst consensus prevailing on the approval date of the annual incentive plan. Firms in the "easy" group have the EPS performance target lower than the prevailing analyst consensus. We use the Eventus software to conduct the event study. Market returns are measured by the returns of the CRSP value-weighted index and CRSP equally-weighted index. Two models are used to estimate expected returns: the market model and the four factor model (Fama-French three factors plus the momentum factor). The market model for firm j is $R_{jt} = \alpha_j + \beta_j R_{Mt} + \varepsilon_{jt}$. The momentum model for firm j is $R_{jt} = \alpha_j + \beta_j R_{Mt} + s_j SMB_t + h_j HML_t + u_j UMD_t + \varepsilon_{jt}$. The abnormal return is the actual return less the predicted return using the estimated coefficients in each of the two models. Panel A presents the results using all firms with a known approval date of the annual incentive plan. Panel B presents the results using a subsample excluding observations with the 10-K filing date within [–5,+5] of the approval date, and Panel C presents the results using a subsample excluding the observations with the 10-K filing date within [–5,+5] of the approval date and observations with earnings guidance issued within [–1,+1] of the approval date. The two tests address a possible concern that stock returns might be affected not only by information contained in the annual incentive plan, but also by information contained in the 10-K filing or corporate issued earnings guidance. Each event study uses a 10-day window centered at the approval date. The pre-event period is [–5,–1], the event period is [0,+2], and the post-event period is [+3,+5] relative to the approval date of the annual incentive plan. Statistical significance is derived using Patell's Z-test for market model, and the time-series standard deviation test for the momentum model. Statistical test on the difference between the two groups is based on *t*-test. *, **, and *** denote 10%, 5%, and 1% significance, respectively.

Table 8 Market reactions to performance target setting (continued)

	Value-weighted index			Equal-weighted index		
	Challenging (A)	Easy (B)	(A) – (B)	Challenging (A)	Easy (B)	(A) – (B)
Panel A. All firms with approval date of the annual incentive plan						
Abnormal return under the market model (%)						
[–5,–1]	-0.01	0.10	-0.11	-0.22	-0.04	-0.18
[0,+2]	0.54**	-0.06	0.60	0.64***	-0.13	0.77**
[+3,+5]	-0.07	-0.03	-0.04	-0.20	-0.11	-0.09
Abnormal return under the four factor model (%)						
[–5,–1]	-0.09	0.06	-0.15	-0.24	-0.04	-0.20
[0,+2]	0.69***	-0.01	0.70*	0.78***	-0.07	0.85**
[+3,+5]	-0.02	0.02	-0.04	0.05	0.04	0.01
Sample size	112	180		112	180	
Panel B. Subsample excluding firms with concurrent 10-K filing						
Abnormal return under the market model (%)						
[–5,–1]	-0.58*	-0.24*	-0.34	-0.58*	-0.43**	-0.15
[0,+2]	0.95***	-0.38**	1.33***	1.02***	-0.46***	1.48***
[+3,+5]	0.19	-0.03	0.22	0.25	-0.14	0.39
Abnormal return under the four factor model (%)						
[–5,–1]	-0.54*	-0.28	-0.26	-0.56**	-0.37*	-0.19
[0,+2]	0.93***	-0.35**	1.28***	0.95***	-0.43**	1.38***
[+3,+5]	0.21	0.05	0.16	0.25	0.03	0.22
Sample size	73	131		55	131	
Panel C. Subsample excluding firms with concurrent 10-K filing and earnings guidance						
Abnormal return under the market model (%)						
[–5,–1]	-0.48	-0.24	-0.24	-0.53	-0.42*	-0.11
[0,+2]	0.39	-0.43**	0.82	0.50*	-0.51***	1.01*
[+3,+5]	-0.01	0.04	-0.05	0.05	0.04	0.01
Abnormal return under the four factor model (%)						
[–5,–1]	-0.51	-0.42*	-0.09	-0.57*	-0.48*	-0.09
[0,+2]	0.45*	-0.49**	0.94*	0.46*	-0.55**	1.01*
[+3,+5]	0.02	-0.02	0.04	0.03	0.04	-0.01
Sample size	46	85		46	85	

Table 9 Ex-ante value and pay-for-performance sensitivity of the annual incentive plan

This table compares the ex-ante value and pay-for-performance sensitivities under the original annual incentive plans with those under hypothetical incentive plans based on simulations of annual EPS. A hypothetical incentive plan is constructed using the minimum analyst forecast as the performance threshold, analyst consensus as the performance target, and maximum analyst forecast as the performance stretch goal. Assuming that annual EPS follows a random walk with drift, we generate 1,000 simulated annual EPS based on the EPS of the previous year, a drift term and a standard deviation of a normal distribution. We use two proxies for the drift term: annual EPS growth rate in the previous three years and that in the previous five years. In both models, the volatility of EPS growths in the previous five years is used as the standard deviation of the normal distribution. *Difference* (000s) is the difference of the ex-ante value of the annual incentive payout (AIP) using EPS target specified in the annual incentive plan and the ex-ante value of AIP under a plan using analyst consensus as the performance target, expressed in thousands of dollars. *Difference* (%) is the difference in ex-ante values between the two plans scaled by the ex-ante value under the company's original incentive plan, expressed in percentage. *Slope difference* indicates the pay-for-performance sensitivity (PPS) difference of the two plans, where PPS is measured as the change in the ex-ante value of AIP, expressed in thousands of dollars, for an increase of one cent in EPS. *P*-values of the statistical significance on the differences are provided in the parenthesis. All observations are winsorized at the 1% level in both tails.

	All years		Year 1		Year 2		Year 3	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Using EPS growth in the previous three years								
Difference (000s)	57.76	35.43	145.67	71.09	61.37	13.54	-7.77	13.70
	(0.05)	**(0.03)**	**(0.01)**	**(0.01)**	**(0.09)**	(0.19)	(0.90)	(0.84)
Difference (%)	1.33	2.44	9.97	6.76	3.53	1.56	-6.16	0.46
	(0.63)	**(0.03)**	**(0.00)**	**(0.00)**	(0.37)	(0.21)	(0.24)	(0.97)
Slope difference (000s)	-4.48	-1.47	-7.67	-2.06	-4.57	-1.96	-2.15	-1.04
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	(0.14)	**(0.06)**
Using EPS growth in the previous five years								
Difference (000s)	56.49	30.94	181.7	73.48	48.76	13.28	-5.49	20.02
	(0.06)	**(0.03)**	**(0.01)**	**(0.01)**	(0.22)	(0.31)	(0.93)	(0.80)
Difference (%)	2.22	2.46	10.37	8.71	3.86	1.70	-4.31	0.99
	(0.40)	**(0.02)**	**(0.01)**	**(0.00)**	(0.35)	(0.23)	(0.38)	(0.81)
Slope difference (000s)	-4.47	-1.35	-7.31	-2.58	-4.51	-1.29	-2.46	-0.69
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	(0.13)	(0.11)
Sample size		165		41		64		60

Table 10 Incentive zone versus the range of analyst forecasts

In Panel A, for both EPS target and EPS growth target, the EPS threshold goal is compared with the minimum value of analyst forecasts, (*Threshold – minimum forecast*). The EPS stretch goal is compared with the maximum value of analyst forecasts, (*Stretch – maximum forecast*). In Panel B, the threshold and stretch goals specified in the annual incentive plan are compared with the lower bound and upper bound of the 95% confidence interval of analyst forecasts, respectively. *Lower bound* equals two standard deviations below the mean analyst forecast, and *upper bound* equals two standard deviations above the mean analyst forecast. *P*-values presented are based on *t*-test for means and Wilcoxon signed rank sum test for medians. All observations are winsorized at the 1% level in both tails.

	All years		Year 1		Year 2		Year 3	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A. Using minimum and maximum of analyst forecasts								
EPS targets								
Threshold –	-0.20	-0.12	-0.16	-0.12	-0.25	-0.16	-0.16	-0.10
minimum forecast (dollars)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Stretch –	0.14	0.06	0.09	0.05	0.15	0.06	0.12	0.12
maximum forecast (dollars)	**(0.00)**	**(0.00)**	**(0.02)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
EPS growth targets								
Threshold –	-7.56	-5.44	-8.41	-6.00	-9.44	-6.67	-4.53	-4.47
minimum forecast (%)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.02)**	**(0.00)**
Stretch –	5.95	3.11	4.77	2.33	6.07	3.06	7.21	4.21
maximum forecast (%)	**(0.00)**	**(0.00)**	**(0.02)**	**(0.01)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Sample size (Threshold)		250		70		94		86
Sample size (Stretch)		227		69		83		75
Panel B. Using 95% confidence interval of analyst forecasts								
EPS targets								
Threshold –	-0.19	-0.10	-0.13	-0.09	-0.24	-0.15	-0.13	-0.10
lower bound (dollars)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.02)**	**(0.00)**
Stretch –	0.12	0.05	0.03	0.03	0.15	0.04	0.10	0.09
upper bound (dollars)	**(0.00)**	**(0.00)**	(0.44)	**(0.07)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
EPS growth targets								
Threshold –	-6.57	-4.63	-7.15	-4.11	-8.96	-6.34	-3.62	-3.97
lower bound (%)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.06)**	**(0.02)**
Stretch –	4.51	2.26	2.29	1.44	5.22	2.26	5.62	3.49
upper bound (%)	**(0.00)**	**(0.00)**	(0.16)	(0.11)	**(0.00)**	**(0.00)**	**(0.01)**	**(0.00)**
Sample size (Threshold)		233		60		91		82
Sample size (Stretch)		210		58		80		72

Table 11 Performance target versus actual performance

This table reports the actual EPS performance of firms that use EPS performance measure in their annual incentive plans. Panel A presents the results of univariate tests on the difference between the EPS (growth) target and actual EPS (growth) of the year. Panel B reports the distribution of actual EPS relative to the performance metric specified in the annual incentive plan. Using a subset of firms that report each of the EPS threshold, target, and stretch goals, we divide the incentive zone into four segments: below the EPS threshold, between the EPS threshold and EPS target, between the EPS target and EPS stretch goal, and above the EPS stretch goal. Sample firms are then sorted into these four categories based on the value of its actual EPS relative to the EPS performance metrics. Panel B reports the percentage of firms in each segment for each year of our sample period. Panel C reports the target amount of the annual incentive payout (AIP) and the ratio of the actual AIP to target AIP for firms that disclose EPS targets and actual AIP. Panel D and Panel E repeat the analysis in Panel A and Panel C for the subsample of firms with challenging EPS targets and firms with easy EPS targets separately. The difference in values and the statistical significance of the differences are provided in each panel. *P*-values presented in Panels A and D are based on *t*-test for means, and Wilcoxon signed rank sum test for medians. All observations are winsorized at the 1% level in both tails.

	All years		Year 1		Year 2		Year 3	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A. All firms with EPS targets								
EPS target –	0.10	-0.04	-0.14	-0.09	0.02	-0.06	0.50	0.09
actual EPS (dollars)	**(0.01)**	(0.71)	**(0.00)**	**(0.00)**	(0.66)	(0.18)	**(0.00)**	**(0.00)**
EPS growth target –	4.89	-1.49	-5.99	-4.33	-0.33	-2.39	20.83	3.44
actual EPS growth (%)	**(0.01)**	(0.54)	**(0.00)**	**(0.00)**	(0.82)	(0.13)	**(0.00)**	**(0.00)**
Sample size		397		120		141		136
Panel B. Firms with EPS threshold, target, and stretch goals								
% of firms missing threshold (actual < threshold)		25.96		13.64		25.84		36.25
% of firms between threshold and target (threshold ≤ actual < target)		20.00		12.12		17.98		28.75
% of firms between target and stretch (target ≤ actual < stretch)		32.34		40.91		35.96		21.25
% of firms beating stretch (stretch ≤ actual)		21.70		33.33		20.22		13.75
Sample size		235		66		89		80
Panel C. Actual AIP versus target AIP								
Target AIP (millions of dollars)	1.71	1.36	1.68	1.30	1.72	1.36	1.70	1.44
Actual AIP/target AIP	1.12	1.17	1.36	1.34	1.16	1.23	0.84	0.92
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.01)**	**(0.01)**
Sample size		381		115		138		128

Table 11 Performance target versus actual performance (continued)

	All years		Year 1		Year 2		Year 3	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel D. (Target – actual EPS) for firms with challenging targets and firms with easy targets								
Firms with challenging targets								
EPS target –	0.45	0.13	0.01	-0.05	0.26	0.12	0.99	0.32
actual EPS (dollars)	**(0.00)**	**(0.00)**	(0.77)	(0.32)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
EPS growth target –	22.59	5.55	1.37	-1.57	14.19	6.11	50.30	15.90
actual EPS growth (%)	**(0.00)**	**(0.00)**	(0.54)	(0.40)	**(0.01)**	**(0.00)**	**(0.00)**	**(0.00)**
Sample size		153		41		50		62
Firms with easy targets								
EPS target –	-0.11	-0.09	-0.22	-0.11	-0.13	-0.09	0.01	-0.03
actual EPS (dollars)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	(0.89)	(0.88)
EPS growth target –	-4.96	-3.65	-9.33	-6.37	-5.69	-4.07	0.15	-1.19
actual EPS growth (%)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	(0.95)	(0.70)
Sample size		244		79		91		74
Difference between the two groups								
EPS target –	0.56	0.22	0.23	0.06	0.39	0.21	0.98	0.35
actual EPS (dollars)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
EPS growth target –	27.55	9.20	10.70	4.80	19.88	10.18	50.15	17.09
actual EPS growth (%)	**(0.00)**	**(0.00)**	**(0.02)**	**(0.00)**	**(0.01)**	**(0.00)**	**(0.00)**	**(0.00)**
Panel E. Target AIP and actual payouts for firms with challenging targets and firms with easy targets								
Firms with challenging targets								
Target AIP (millions of dollars)	1.73	1.39	1.61	1.32	1.87	1.33	1.67	1.47
Actual AIP/target AIP	0.85	0.90	1.31	1.32	0.89	0.92	0.53	0.47
	(0.01)	**(0.01)**	**(0.00)**	**(0.00)**	(0.28)	(0.28)	**(0.00)**	**(0.00)**
Sample size		145		38		49		58
Firms with easy targets								
Target AIP (millions of dollars)	1.69	1.36	1.72	1.29	1.64	1.36	1.66	1.40
Actual AIP/target AIP	1.27	1.27	1.38	1.34	1.32	1.30	0.98	1.17
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	(0.17)	**(0.07)**
Sample size		236		77		89		62
Difference between the two groups								
Target AIP (millions of dollars)	0.04	0.03	-0.11	0.03	0.23	-0.03	0.01	0.07
	(0.92)	(0.76)	(0.46)	(0.83)	(0.55)	(0.63)	(0.92)	(0.58)
Actual AIP/target AIP	-0.42	-0.37	-0.07	-0.02	-0.43	-0.38	-0.45	-0.70
	(0.00)	**(0.00)**	(0.62)	(0.59)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**

Table 12 Dynamics of EPS target setting

This table reports the adjustment of the EPS target based on whether the previous year's EPS target was achieved or missed. Each firm that reports EPS performance target for both Year 1 and Year 2 (103 firms in total) or for both Year 2 and Year 3 (115 firms in total) is grouped based on whether the firm's EPS target is elevated or lowered, and whether the previous year's EPS target was achieved or missed. Panel A reports the number of firms in each of these four categories. Panel B reports the regression results of ($EPS\ target_t - EPS\ target_{t-1}$) on whether the EPS target was achieved or missed in the previous year. $D(Target\ missed)_{t-1}$ is one if the previous year's EPS target was missed, and zero otherwise; $(Actual\ EPS - EPS\ target)_{t-1}$ is the EPS result less EPS target in the previous year. Standard errors are reported in the parenthesis below the coefficient estimates. *, **, and *** denote 10%, 5%, and 1% significance, respectively. All observations are winsorized at the 1% level in both tails.

Panel A. Adjustments of EPS targets and the previous year's results

	Previous year target achieved	Previous year target missed	Total
Firms that increased EPS targets	150	28	178
Firms that decreased EPS targets	9	31	40
Total	159	59	218

Panel B. Regression of adjustments in EPS targets based on the previous year's results

	$EPS\ target_t - EPS\ target_{t-1}$
$D(Target\ missed)_{t-1}$	-0.174*
	(0.09)
$(Actual\ EPS - EPS\ target)_{t-1}$	0.530***
	(0.08)
$(Actual\ EPS - EPS\ target)_{t-1} * D(Target\ missed)_{t-1}$	0.542**
	(0.22)
Intercept	0.327***
	(0.04)
Sample size	218
Adjusted R^2	0.430

Table 13 Effect of corporate governance on the design of the annual incentive plan

This table presents test results on the effect of corporate governance on the design of the annual incentive plan. The dependent variable is (EPS target – analyst consensus) in Models (1) and (2), the slope of the annual incentive plan (PPS) in Models (3) and (4), and the type of discretionary bonuses in Models (5) and (6) (equals two if no discretionary bonuses are granted, one if the discretionary portion of the annual incentive plan or bonuses without a structured incentive plan are granted, and zero otherwise). Models (1), (3), and (5) use compensation, company, and governance characteristics as independent variables, and Models (2), (4), and (6) replace governance variables with a governance index. All compensation variables are constructed using the current year's data. Firm and governance characteristics are constructed using the previous year's data. *Number of analysts* is the number of analysts who followed the company over the previous year. *Analyst forecast dispersion* is the standard deviation of analyst forecasts issued within the first quarter. *Target total pay* include salary, target AIP, target payout in cash on long-term performance, target performance equity, and grant-date fair value of stock options and restricted stock. *CEO equity exposure* is the percentage of CEO ownership (excluding options). *Book-to-market* is the book-to-market ratio of equity. *D*(*Low CEO tenure − director tenure*) is one if the difference between CEO tenure and the median of directors' tenure is lower than the sample median, and zero otherwise. *D*(*Small board*) is one if the number of directors is lower than the sample median, and zero otherwise. *D*(*High board independence*) is one if the percentage of independent directors is higher than the sample median, and zero otherwise. *D*(*Young board*) is one if the percentage of directors who are younger than 70 years is higher than the sample median, and zero otherwise. *D*(*Non-busy board*) is one if the percentage of directors who have three or more other corporate board seats is lower than the sample median, and zero otherwise. *D*(*Low outside CEOs in comp. comm.*) is one if the percentage of compensation committee members who are CEOs of other firms is lower than the sample median, and zero otherwise. *D*(*High top 5 institutional ownership*) is one if the percentage ownership of the top five institutional investors is higher than the sample median, and zero otherwise. Governance index is constructed by adding all eight governance variables defined above. All models include year fixed effects and industry fixed effects (using Fama-French 12 industry classifications). Standard errors are clustered at the firm level, and are provided in the parenthesis. *, **, and *** denote 10%, 5%, and 1% significance, respectively. All observations are winsorized at the 1% level in both tails.

Panel A. Descriptive statistics of corporate governance characteristics

	Sample size	Mean	Median	Std. Dev
CEO/Chairman duality (%)	397	66.25	100.00	47.35
CEO tenure − director tenure (years)	378	-1.25	-1.50	5.34
Board size	378	11.06	11.00	2.57
Board independence (%)	378	78.12	81.82	12.14
Old board (%)	378	11.63	10.00	11.74
Busy board (%)	378	11.52	10.00	11.67
Outside CEOs in compensation committee (%)	378	16.71	0.00	24.86
Top 5 institutional ownership (%)	397	24.85	23.93	8.00
Corporate governance index	397	3.76	4.00	1.57

Table 13 Effect of corporate governance on design of annual incentive plan (continued)

Panel B. Analysis of corporate governance and design of annual incentive plan

	Target - analyst consensus		Pay-for-performance sensitivity		Discretionary bonuses	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Analyst and compensation characteristics						
Number of analysts	-0.003	-0.004	-0.002**	-0.002*	-0.043*	-0.038*
	(0.003)	(0.003)	(0.001)	(0.001)	(0.023)	(0.022)
Analyst forecast dispersion	-0.026	-0.178	-0.159***	-0.141***	-0.249	-0.255
	(0.322)	(0.225)	(0.038)	(0.044)	(0.507)	(0.494)
CEO salary	0.068	0.118*	0.017	-0.001	0.921	1.016
	(0.058)	(0.070)	(0.018)	(0.015)	(0.965)	(0.831)
Target AIP/target total pay	0.226**	0.274**	-0.006	-0.023	1.599	1.497
	(0.107)	(0.106)	(0.021)	(0.024)	(1.345)	(1.209)
CEO equity exposure	0.205	0.371	0.064	0.056	1.086	2.064
	(0.935)	(0.866)	(0.154)	(0.126)	(5.516)	(5.190)
Firm characteristics						
Ln(Sales)	-0.021	-0.029	0.009	0.015**	-0.100	-0.051
	(0.017)	(0.018)	(0.006)	(0.007)	(0.216)	(0.210)
Leverage	0.026	0.023	-0.009***	-0.006*	-0.020	-0.014
	(0.026)	(0.027)	(0.002)	(0.003)	(0.109)	(0.120)
Book-to-market	0.001	0.017	0.007	-0.006	0.685*	0.610
	(0.045)	(0.045)	(0.009)	(0.011)	(0.403)	(0.391)
ROA	0.015	0.127	0.045	0.082	0.411	-0.677
	(0.193)	(0.173)	(0.054)	(0.053)	(1.700)	(1.471)
Stock return	0.025	0.021	-0.006	0.004	-0.314	-0.211
	(0.051)	(0.041)	(0.012)	(0.010)	(0.347)	(0.309)
Governance characteristics						
D(CEO is not a chair)	0.046		-0.004		0.266	
	(0.030)		(0.007)		(0.277)	
D(Low CEO tenure − director tenure)	0.039		0.016**		0.175	
	(0.029)		(0.007)		(0.271)	
D(Small board)	0.013		0.005		-0.268	
	(0.033)		(0.006)		(0.275)	
D(High board independence)	-0.023		-0.004		0.268	
	(0.028)		(0.007)		(0.297)	
D(Young board)	0.033		0.024***		-0.006	
	(0.027)		(0.006)		(0.273)	
D(Non-busy board)	0.033		0.005		0.423	
	(0.037)		(0.006)		(0.291)	
D(Low outside CEOs in comp. comm.)	0.024		0.010*		0.014	
	(0.030)		(0.006)		(0.276)	
D(High top 5 institutional ownership)	0.013		-0.004		-0.135	
	(0.026)		(0.006)		(0.285)	
Corporate governance index		0.024***		0.005**		0.155*
		(0.009)		(0.002)		(0.087)
Intercept	-0.013	-0.024		-0.093		
	(0.168)	(0.173)		(0.056)		
Sample size	302	317	129	134	878	932
Adjusted (Pseudo-) R^2	0.147	0.161	0.428	0.250	0.0395	0.0365
Year fixed effect and industry fixed effect	Yes	Yes	Yes	Yes	No	No

Figure 1 Structure of a typical annual incentive plan

This figure describes how a typical annual incentive plan is structured. Firms set performance threshold below which no annual incentive is paid out, performance target at which the target amount of annual incentive can be paid out, and performance stretch above which no more annual incentive plan is paid out. Firms also set the threshold payout amount, the amount of payout that a CEO receives when the performance threshold is achieved, and stretch payout amount, the amount of payout that a CEO receives when the performance stretch is achieved. The zone between performance threshold and performance stretch is so-called *incentive zone*. Typically, the payout amount in the incentive zone is interpolated. The slope between performance threshold and performance target may differ from the slope between performance target and performance stretch.

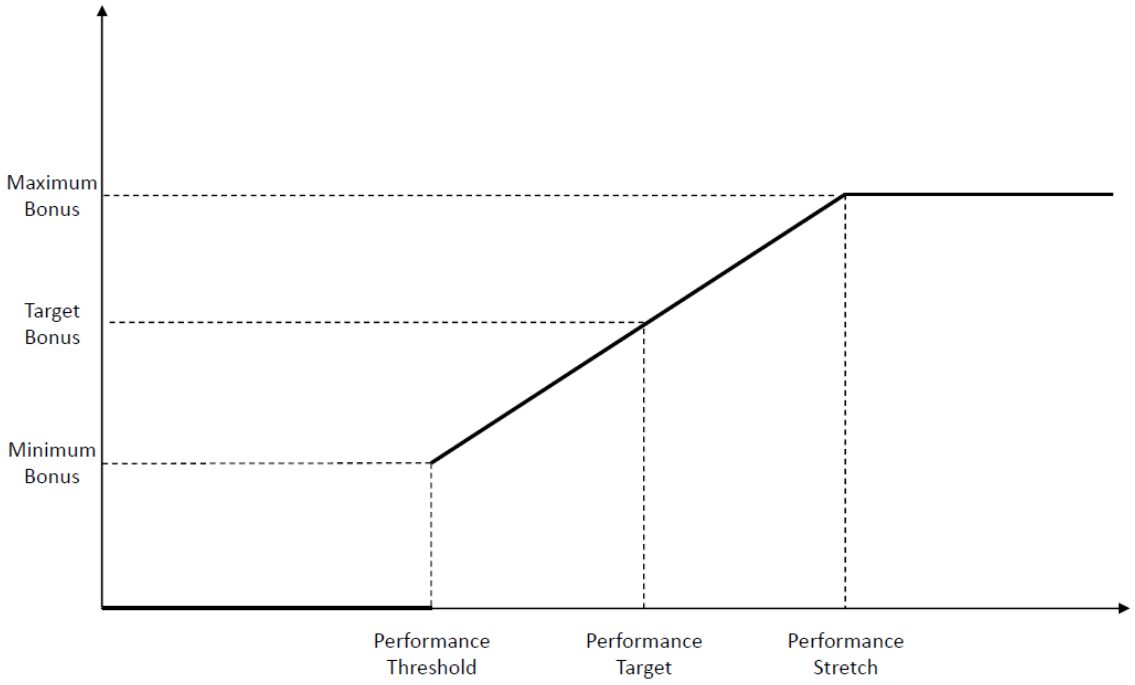


Figure 2 EPS target, analyst consensus and corporate issued earnings guidance

The graph below plots evolvement of corporate earnings guidance and analyst consensus over time during the year, both normalized by the EPS target specified in the annual incentive plan. Corporate earnings guidance (target, lower bound, and upper bound) is obtained from the First Call database. *Analyst consensus*, the mean of analyst forecasts which is updated once a new forecast is issued, is obtained from First Call Summary Statistics Database. The daily value of earnings guidance and analyst consensus scaled by EPS performance target is plotted. The horizontal axis is the number of days from the beginning of the fiscal year. Figure 2a presents the graph for the full sample, Figure 2b presents the graph for Year 1 and Year 2 combined. Figure 2c presents the graph for Year 3. The dashed line represents target earnings guidance, the solid line represents analyst consensus, and red dotted lines represent the lower and upper bounds of earnings guidance. The horizontal line at one is the EPS performance target. All values are based on the median values in each day of the fiscal year.

Figure 2a Full sample

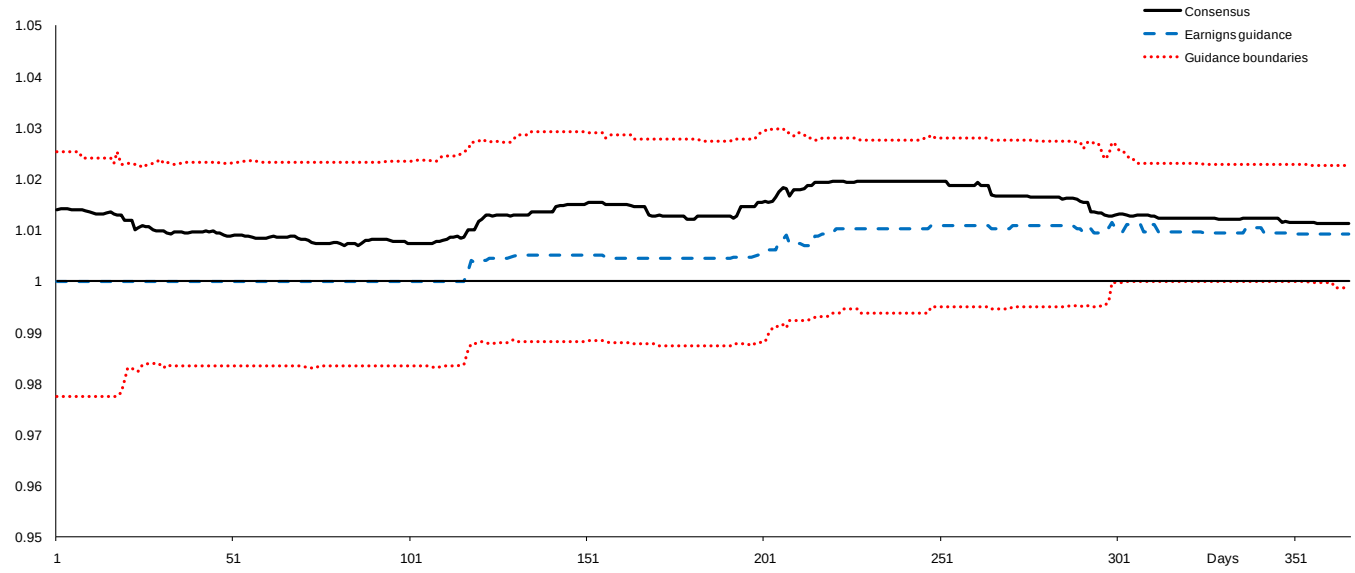


Figure 2b Year 1 and Year 2

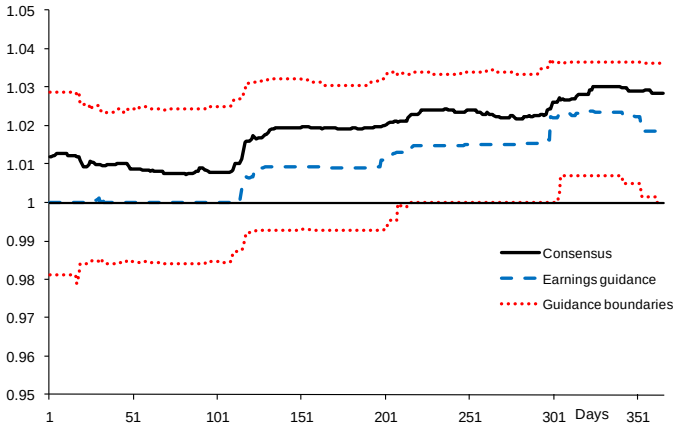


Figure 2c Year 3

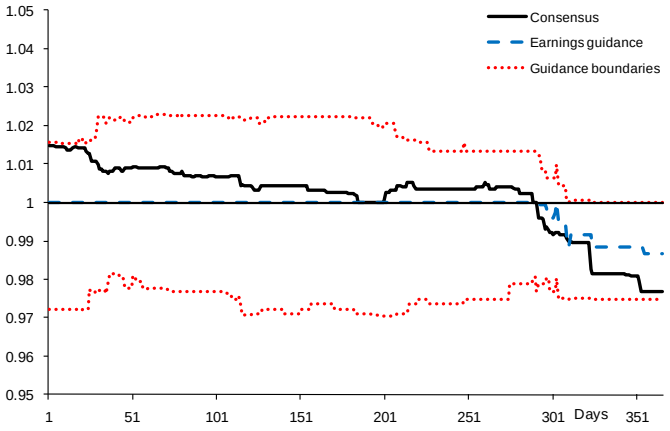


Figure 3 Ex-ante value and pay for performance sensitivity (PPS) of the annual incentive plan

The graph below illustrates the ex-ante value and pay for performance sensitivity of the annual incentive plan of a sample firm. The bold line represents the payout structure of the firm's annual incentive plan. The dotted-dashed line represents the ex-ante value of the original annual incentive plan, and the dashed line represents the ex-ante value of a hypothetical annual incentive plan when EPS target is replaced by analyst consensus on EPS, and the incentive zone is replaced by the range of analyst forecasts. The value of each incentive plan is obtained based on 1,000 simulations of the year-end EPS for every cent over $0–5, assuming annual EPS follows a random walk with drift. For clarity, we only show the range of $1–2.5. The five-year historical data is used to calculate the drift and volatility. The vertical dashed line marks the firm's actual EPS in the previous year ($1.64 for this particular firm), at which the ex-ante values of AIP and slopes of the two value curves are compared. When reading the graph, the horizontal and vertical refer to the year-end EPS and the actual amount of AIP, respectively, for the bold line (annual incentive pay structure); and the EPS in the previous year and the ex-ante value of AIP, respectively, for the dashed and dotted-dashed lines.

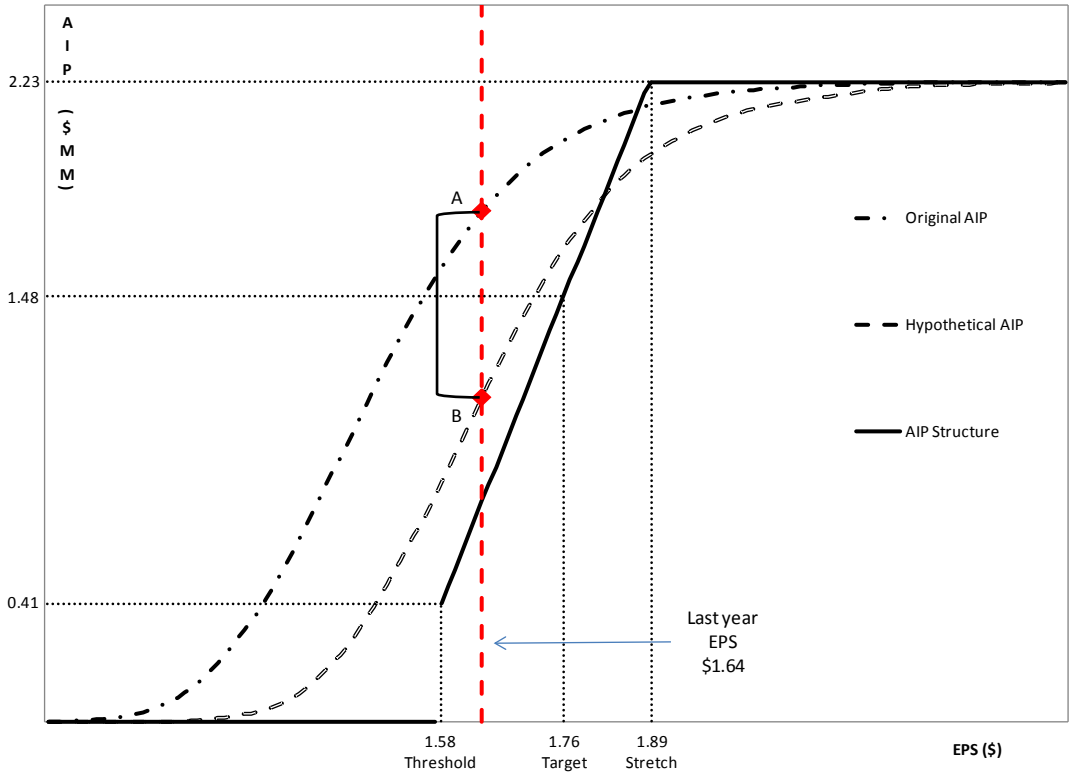


Figure 4 Earnings management (actual EPS versus EPS target)

These histograms exhibit the distribution of difference between a company's actual EPS and the EPS target in the annual incentive plan (Figure 4a),[23] the distribution when firms that just beat analyst consensus (0 ≤ actual EPS – most recent analyst consensus < two cents) are excluded (Figure 4b), the distribution for firms with challenging EPS targets (Figure 4c) and for firms with easy EPS targets (Figure 4d), the distribution for firms that report the compensation-purpose EPS higher than the actual EPS reported in the First Call database ("upward EPS adjustment," see Figure 4e) and for firms that report the compensation-purpose EPS lower than the actual EPS reported in the First Call database ("downward EPS adjustment," see Figure 4f). The bars in the upper graph represent the number of observations in each bin. The dash line represents the kernel density function under the Gaussian distribution assumptions. The black bar is the bin just below zero and the blue bar is the bin just above zero. The lower graph graphically shows t-statistics value for each bin, testing whether actual number of observations in each bin significantly differs from the value predicted by the kernel density function. Two horizontal dashed lines represent the upper bound and lower bound of the 95% confidence level. The t-statistic value and the square dot represent the t-statistics of the bin just above the zero difference.

Figure 4a Full sample

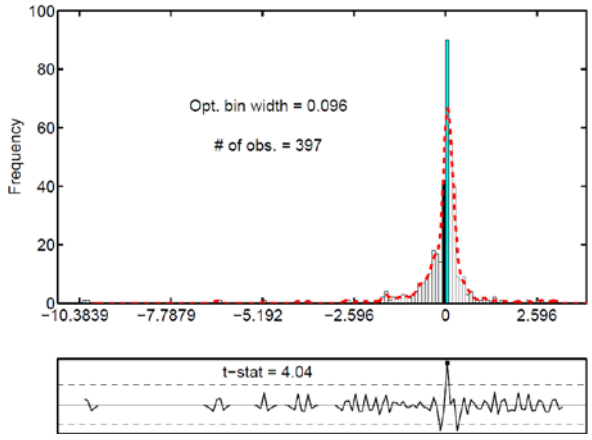
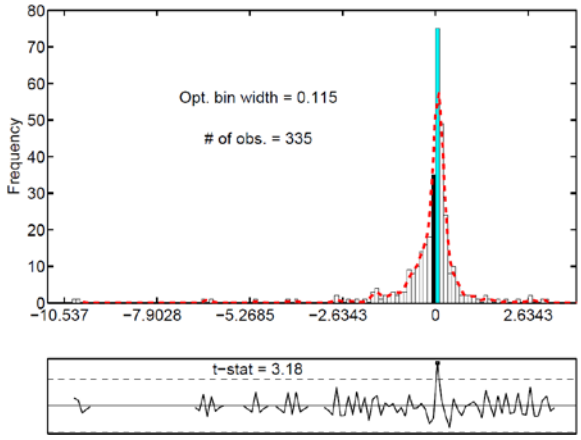


Figure 4b Excluding consensus beaters



[23] Several firms have a large gap between actual EPS and the EPS target set earlier in the year. The left most outliers are Regions Financial (EPS target is $2.25 and actual EPS is $-7.89), Marshall & Ilsley Corp (EPS target is $2.29 and actual EPS is $-7.92), Keycorp (EPS target is $3.05 and actual EPS is $-3.36), FedEx Corp (EPS target is $6.84 and actual EPS is $-0.31) in Year 3, and E Trade Financial Corp (EPS target is $1.7 and actual EPS is $-3.4) in Year 2.

Figure 4 Earnings management (actual versus EPS target) (continued)

Figure 4c Firms with challenging target

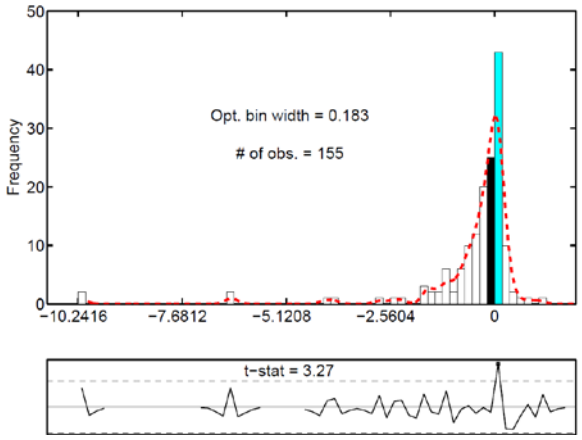


Figure 4d Firms with easy target

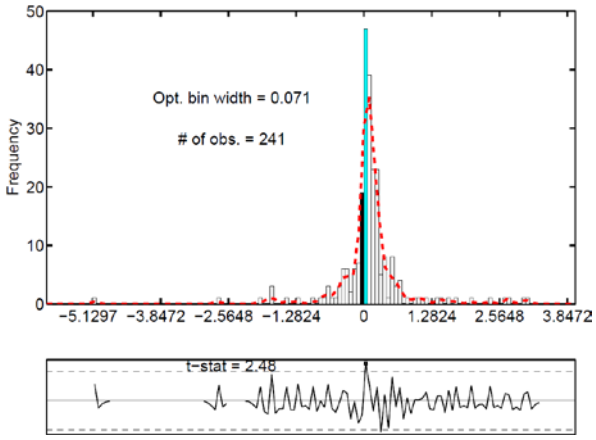


Figure 4e Downward EPS adjustment

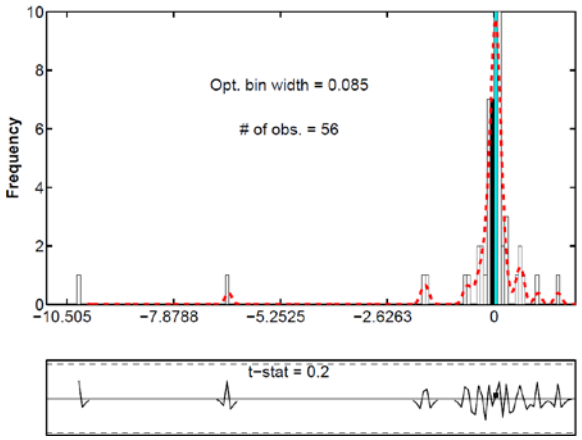
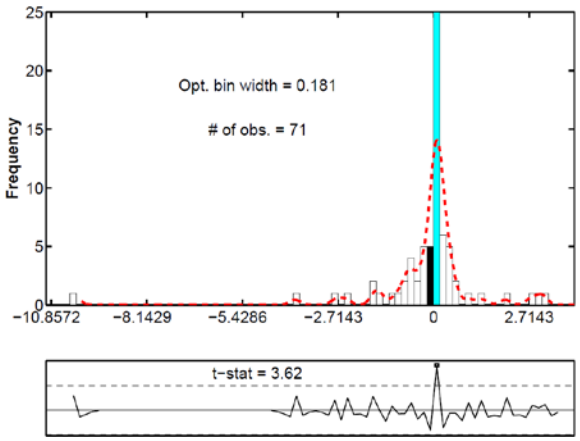


Figure 4f Upward EPS adjustment



Appendix

Table A1 Trend in compensation composition

This table shows the breakdowns of CEO compensation components for the S&P 500 index component companies (as of 2006) during December 2006–November 2009. Each component (except salaries) is based on its target or grant-date fair value. *Salary* is the actual salary paid during the fiscal year. *Target AIP* is the target amount of annual incentive payout (whether paid in cash or equity) set during the first quarter of the fiscal year. *Target payout in cash based on long-term performance* is the target amount of cash payout under a long-term incentive plan (over a period longer than one year). *Target performance equity* is the target amount of performance equity, which includes performance shares, performance units, and restricted stock and options with vesting schedules based on performance over a period longer than one year. *Stock options* is the grant-date fair value of stock options and stock appreciation rights granted during the fiscal year, and *Restricted stocks* is the grant-date value of the time-vested restricted stocks granted during the fiscal year.

At the sample mean, salary payment represents 16.49% of total compensation. Compensation components that depend on (annual or long-term) incentive plans represent 46.77% of total compensation. There are three types of incentive payouts. Target payout of the annual incentive plan, the main focus of this paper, represents 21.6% of total compensation. Cash payout based on long-term performance represents 4.24% of total compensation.[24] This unconditional amount is small mainly because this type of compensation is no longer popular after December 15, 2006. Performance equity, defined as equity payout (stocks or stock options) conditional on achieving performance targets in long-term incentive plans, represents 20.93% of total compensation. Finally, the grant-date fair value of pure equity-based compensation represents 36.73% of total compensation, of which 26.14% are stock options and 10.59% are restricted stocks.

	All years		Year 1		Year 2		Year 3	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Salary (%)	16.49	13.87	16.38	14.24	16.91	14.16	16.16	13.43
Target AIP (%)	21.60	18.20	20.79	17.24	22.39	18.43	21.50	18.26
Target payout in cash based on long-term performance (%)	4.24	0.00	4.66	0.00	3.55	0.00	4.57	0.00
Target Performance equity (%)	20.93	18.43	20.91	15.50	21.54	18.43	20.32	18.61
Stock options (%)	26.14	26.85	26.76	26.16	25.00	27.01	26.79	26.95
Restricted stocks (%)	10.59	0.00	10.51	0.00	10.61	0.00	10.65	0.00
Sample size		397		120		141		136

[24] These values are extracted from the company's proxy statement. *Target payout in cash based on long-term performance* is not the same as *LTIP* in the ExecuComp database after December 2006.

Table A2 Industry distribution of EPS and revenue performance measures

This table presents the industry distribution of our sample firms based on their selected performance measures. We use the Fama-French 12 industry classifications. Panel A reports the distribution of firms based on EPS measure, and Panel B revenue measure. Column 1 presents the number of firms in each industry with available proxy statements. Column 2 counts the number of firm-years that disclose EPS/revenue as performance measures in the annual incentive plan. Column 3 counts the number of firm-years that disclose EPS/revenue targets; this number is scaled by the number of firms that file a proxy statement in Column 4 and by the number of firms that choose EPS/revenue as their performance measures in Column 5.

	Proxy statement	Performance measure	Performance target		
	Freq.	Freq.	Freq.	As % of firms with proxy (%)	As % of firms with measure (%)
Panel A. Industry distribution of firms with EPS performance measure					
Consumer non-durable	105	53	40	38.10	75.47
Consumer durable	26	12	3	11.54	25.00
Manufacturing	150	72	59	39.33	81.94
Oil, Gas, & Coal	74	17	14	18.92	82.35
Chemicals and allied products	49	30	23	46.94	76.67
Business Equipment	229	60	41	17.90	68.33
Telephone and Television Transmission	49	13	11	22.45	84.62
Utilities	90	50	41	45.56	82.00
Wholesale, retail and some services	141	29	22	15.60	75.86
Healthcare, medical equipment	102	68	51	50.00	75.00
Finance	250	92	63	25.20	68.48
Other	117	42	29	24.79	69.05
	1,382	538	397	28.73	73.79
Panel B. Industry distribution of firms with revenue performance measure					
Consumer non-durable	105	41	22	20.95	53.66
Consumer durable	26	5	2	7.69	40.00
Manufacturing	150	38	21	14.00	55.26
Oil, Gas, & Coal	74	0	0	0.00	N/A
Chemicals and allied products	49	20	15	30.61	75.00
Business Equipment	229	136	68	29.69	50.00
Telephone and Television Transmission	49	15	11	22.45	73.33
Utilities	90	0	0	0.00	N/A
Wholesale, retail and some services	141	33	17	12.06	51.52
Healthcare, medical equipment	102	68	49	48.04	72.06
Finance	250	42	15	6.00	35.71
Other	117	32	20	17.09	62.50
	1,382	430	240	17.37	55.81

Algorithm for detecting earnings management above the EPS target in the annual incentive plan.

We follow the methodology used in Bollen and Pool (2009) and Hörmann and Leydold (2000) to detect earnings management. First, we derive the optimal bin width for a smooth distribution under the assumption of a Gaussian distribution. Bin width *b* is defined as

$$b = a(k) * 1.364\min\{\sigma, \frac{IQR}{1.34}\}n^{-0.2}, \quad (3)$$

where $a(k)$ is 0.776 for a Gaussian distribution, σ is the volatility of the empirical distribution of the difference between actual EPS and EPS target, *IQR* is the difference between the 75th percentile and 25th percentile of the EPS difference, and *n* is the number of observations. Using this bin width, we count the number of observations in each bin j, c_j.

We bootstrap the sample 1,000 times to generate the simulated sample. First, we sort the original sample of (actual EPS – EPS target), $x(\cdot)$, from the smallest to the largest value. We then randomly select *n* observations with replacement from our original sample by (i) randomly drawing *n* integers uniformly distributed on [1, *n*], $I(i)$, for $i = 1 \dots n$, and (ii) picking the corresponding observation from our original sample, $x(I(i))$. Next, for each observation in the re-sampled set, $x(I(i))$, we add a noise component $W(i)$ and scale it by the optimal bin width b, where the noise component $W(i)$ is randomly drawn from a kernel density which is a Gaussian distribution. By adding the two components, we get $y(i) = x(I(i)) + bW(i)$, where $y(i)$ is the i^{th} generated random number. This smoothed bootstrap algorithm generates random numbers that are centered on one sample point. Then we count how many $y(\cdot)$ are in each bin. We repeat this procedure 1,000 times.

For each bin, j, we calculate the average number of observations ($\overline{c_j}$) and its standard deviation (σ_{c_j}) over these 1,000 simulations. We use the statistics ($\frac{c_j - \overline{c_j}}{\sigma_{c_j}}$) to test whether the number of observations in our original sample in bin j is statistically different from that under the kernel density. An earnings management is detected in the bin if the statistics is significant.