

Learning through a Smokescreen: Earnings Management and CEO Compensation over Tenure

Cristina Cella
Stockholm School of Economics, CSEF

Andrew Ellul
Indiana University, CSEF and ECGI

Nandini Gupta
Indiana University

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ABSTRACT

Uncertainty about CEO's ability, quality of the CEO-firm job match, and career concerns are high in the initial stages of tenure. Boards and shareholders update their beliefs about the CEO's ability using current firm performance which, as suggested by Fudenberg and Tirole (1995), may be distorted by CEOs to maximize the length of their tenure. Using data on 1,624 CEO turnovers in 1,023 firms between 1992 and 2009, we investigate whether the presence of reporting distortions affects CEOs' compensation packages over their tenure. Consistent with the view that uncertainty about CEOs is greater early on in the CEO's tenure, we find that earnings management is highest in the first years and decreases monotonically over the CEO's tenure. Treating both earnings management and tenure as endogenous in an instrumental variable regression, we show that earnings management is positively associated with compensation, but this effect becomes significantly less positive over tenure. The relationship between reporting distortions and compensation is also observed to vary based on CEO and firm characteristics that capture uncertainty about ability and career concerns. In particular, we find that earnings management has a greater influence on the compensation of CEOs who do not have a fixed term employment contract, and on younger CEOs. These results suggest that both managers and firms learn about CEO's ability and the quality of the job match over the tenure of the CEO, and that this learning process is affected by the CEOs' career concerns.

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* Cella (email address: cristina.cella@hhs.se) is at the Stockholm School of Economics and CSEF, Ellul (email address: anellul@indiana.edu) is at Indiana University (Bloomington), CSEF and ECGI, and Gupta (email address: ngupta@indiana.edu) is at Indiana University (Bloomington).

1. Introduction

Career concerns, which arise when a CEO's current performance is linked to future compensation (Gibbons and Murphy (1992)), are likely to be particularly critical during the early years of the CEO's tenure when the lack of past performance measures makes it harder for shareholders to disentangle random fluctuations in performance from the CEO's inherent ability and the quality of the match with the firm.¹ In this environment, both firms and managers learn about true managerial ability and the quality of the CEO-firm job match by observing recent performance measures (Harris and Holmstrom (1982), and Holmstrom and Ricart I Costa (1986)). At the same time, Fudenberg and Tirole (1995) argue that in an environment with "information decay", where recent performance measures are more informative for predicting future performance, managers have an incentive to distort reported earnings to maximize the chances of survivability and thus the length of their tenure. In this paper, we examine how CEO compensation is set in this typical environment where shareholders and boards learn about CEO's ability and the quality of the job match by observing potentially distorted performance measures.

Recent evidence suggests that earnings management may influence the level of CEO compensation in the cross-section (see for example Safdar (2003), Burns and Kedia (2006), Bergstresser and Philippon (2006), Efendi, Srivastava, and Swanson (2007), and Cornett, Marcus, and Tehranian (2008)). Not much is known empirically about the change in earnings management and its impact on compensation over the CEO's tenure. Theory suggests that the importance of performance measures for compensation creates an incentive for CEOs to distort reported performance in order to increase their expected tenure (Fudenberg and Tirole, 1995). As noted by Gibbons and Murphy (1992), career concerns imply that the further a worker is from retirement, the more willing he is to take costly unobservable actions in order to influence the market's beliefs. Over time and with more information, however, shareholders should be able to "see through" any distorted reported performance with a consequent decay of earnings management's importance in the compensation choices made by shareholders, over the tenure of a CEO.

¹ Fama (1980), one of the first to discuss career concerns, argued that the discipline imposed by the managerial labor market made incentive contracts for CEOs redundant. Holmstrom (1982) showed that, while labor market discipline is important, it is not a perfect substitute for incentive contracts.

Theory suggests that compensation will increase over a CEO's tenure as more information is revealed about the CEO's performance, and due to accumulation of job-specific human capital (see Becker (1962), Mincer (1974), Parsons (1972), Kuratani (1973), and Hashimoto (1980), among others). To consider the effect of tenure on compensation, we need to disentangle the effect of tenure as a measure of the CEO's firm-specific skills from the effect that earnings management, a la Fudenberg and Tirole (1995), has on compensation via its impact on CEO tenure.²

To examine the dynamics of CEO compensation over the tenure of the CEO and in the presence of earnings management, we use data on 1,624 CEO turnovers in 1,023 firms forming part of the S&P 1500 index over the period 1992 to 2009.³ We examine the effects of tenure, different measures of earnings management, and the interaction between tenure and earnings management, on total CEO compensation, controlling for other firm characteristics that are likely to affect compensation.

To identify the effect of tenure and earnings management on compensation we need to account for the possibility that tenure and earnings management are likely to be endogenous to unobservable CEO's ability, quality of the CEO-firm match, and CEO and firm factors, which also affect compensation. In particular, since good CEO-firm matches are likely to survive longer than bad matches, CEOs that last longer may have higher compensation because they have located jobs where their productivity is high. Earnings management is also a choice variable, and likely to be correlated with unobserved ability, firm, and job match effects. To address these issues, we estimate an instrumental variable panel data regression with CEO and firm fixed effects to account for unobservable CEO and firm characteristics. In particular, we use firm-level special accounting items and volatility of operating earnings as instruments for earnings management (Dechow and Dichev (2002), Hribar and Nichols (2007), and Hribar and Collins (2002)). To account for CEO-firm job match effects, we instrument tenure using Altonji

² Using a normal learning process, Harris and Holmstrom (1982) argue along the same lines: the workers' market wage should be her current mean perceived productivity minus a term which depends only on the precision of beliefs about her productivity and her age. This second term may be thought of as an insurance premium for the downward rigidity of wages.

³ We remove the year of turnover, year 0, from our analysis because it is well known that incoming CEOs often engage in "big bath" accounting practices in their incoming year (Murphy and Zimmerman (1993)) in order to make their performance look good in subsequent years.

and Shakotko's (1987) approach, widely used in the labor economics literature to examine the effect of tenure on wages.⁴

We start by showing that earnings management is highest in the early years when there is greatest uncertainty about a CEO's quality, decreasing monotonically over the CEO's tenure. Our results on the dynamics of earnings management suggest that CEOs may use earnings management to show higher ability when survival is at greatest risk. If the CEO survives and thus becomes a "known quantity", boards would have learned more about the CEO's ability so that the importance of earnings management decreases over tenure. It should be noted that our results on earnings management are obtained after omitting the year of the turnover, and are not a function of the "big bath" behavior.

Having established that earnings management declines over the CEO's tenure, we explore the impact of earnings management on the total compensation of CEOs. We find strong evidence that while on average earnings management appears to be positively related to compensation, the effect decreases rapidly over the tenure of the CEO. The impact of earnings management disappears around the fourth year of a CEOs' tenure. This result, coupled with the result that compensation increases with tenure, is consistent with the view that uncertainty about CEO's ability and job match is resolved over time, and that the CEO is compensated for job-specific human capital investment.

The decreasing impact of earnings management on total CEO compensation over a CEO's tenure is consistent with Fudenberg and Tirole (1995). First, the impact is greater in the early years of tenure, when the CEO's concerns about survival are likely to be at their peak. Second, the impact decays over tenure as shareholders' uncertainty about CEO's ability and the quality of match decreases as more information is revealed over time. The results are also broadly consistent with Harris and Holmstrom (1982): first, as seniority in the job increases (tenure is extended) CEOs should have had more chances for their compensation to be bid up,

⁴ Jovanovic (1979) and Johnson (1978) provided the first theoretical work about the importance of job match quality as an explanation for both workers' tenure and their wage growth. Since we do not observe very few CEO transitions across multiple firms, we cannot separately identify an individual effect and a job match effect, and refer to the sum of these as the job match effect. This is due to the specificity of the CEO market where there are very few transitions of CEOs across firms.

and, second, as they survive and more information is produced they should pay a lower (employment) insurance premia because their ability can be more precisely assessed.^{5,6}

Next, we examine cross-sectional heterogeneity in the dynamics of CEO compensation and earnings management based on CEO and firm characteristics. First, if CEOs use more earnings management at the beginning of their tenure, and if uncertainty about CEO quality is reduced over time, we should find that CEOs with high ability or whose match with the firm is of high quality should reduce earnings management most over their tenure. This, in turn, should mean that the CEOs who decrease earnings management the most should be rewarded by the largest increase in compensation. Such an increase is consistent with the Harris and Holmstrom (1982) hypothesis that resolution of uncertainty is largest for these CEOs. This is precisely what we find: CEOs who decrease earnings management most over time with respect to the first year of tenure, experience the largest increase in their level of compensation over their tenure.

Second, Fudenberg and Tirole (1995) note that CEOs may be more likely to distort reported performance if the firm cannot commit to a long-term employment contract. Indeed, if a CEO engages in performance distortion as an insurance device to increase the likelihood of survival then one should not expect such behavior if the CEO's position is covered by a long-term contract. We use hand-collected data on the type of contract, if any, given to a CEO at the time of the appointment. These contracts can be of two types: either a fixed-term employment contract or an at-will employment contract. The former is a long-term type of contract while the latter is a short-term contract. We find that the dynamics of earnings management described above are driven by the CEOs without any contracts or with at-will employment contracts. Indeed we find that CEOs with a fixed-term employment contract show lower earnings management and their compensation is not sensitive to the level of earnings management and its evolution through time. Thus, consistent with Fudenberg and Tirole (1995) and the career

⁵ The first set of results about the relationship between tenure and compensation may also be consistent with the dynamic contracting hypothesis of Edmans, Gabaix, Sadzik and Sannikov (2009). Intertemporal risk sharing occurs in this model where the rewards to CEO's effort are spread across all future periods. Thus a higher compensation level will be required as tenure increases, because a risk-averse more-experienced CEO gets less utility from an increase in wealth as she is forced to consume it over fewer periods. However, the dynamic contracting theory has nothing to say about the use of earnings management, and its dynamic impact on CEO compensation across tenure.

⁶ While the results on the impact of tenure on compensation may be consistent with the entrenchment hypothesis of Bebchuk and Fried (2004), because entrenchment should increase with tenure (thus, through their power, entrenched CEOs may set their own compensation), the entrenchment hypothesis has nothing directly to say about the dynamics of earnings management on compensation over tenure. In fact, more entrenched CEOs may be more likely to use their power to manage more earnings over tenure. However, our evidence shows the opposite.

concerns argument, when given a long-term contract, CEOs are less likely to use earnings management to distort reported performance. Since on average the fixed term contracts' duration is about three years, these results explain, at least partially, the difference in the behavior of CEOs with and without a contract: it is precisely in the first few years of tenure that earnings management is mostly commonly used.

Third, as suggested by Gibbons and Murphy (1992) we should expect that career concerns are more important for younger CEOs compared to older CEOs, who are closer to retirement. Consistent with this hypothesis, we find that younger CEOs are more likely to use earnings management early on in their tenure compared to older CEOs, and the dynamics between earnings management and compensation across tenure is present only for younger CEOs.

Lastly, we investigate how the earnings management dynamics over tenure may be different between insider CEOs – those who have been promoted from within the firm – and outsider CEOs – those who have been appointed from outside the firm. We find no evidence that the earnings management dynamics over the tenure of insiders CEOs are different from those of outsiders. This is consistent with Gibbons and Murphy's (1992) argument that prior experience serving at lower levels in the corporation is “unlikely to yield precise information about the individual's potential performance as CEO”. We find that what matters for how earnings management's evolution influences compensation in the case of insiders is whether they are given a fixed-term employment contract or an at-will contract (or no contract), confirming the importance of such agreements for our research question.

Our results suggest the use of earnings management by CEOs early on in their tenure as one possible way to deal with the uncertainty that exists about their ability and the quality of the match and increase the survivability on the job (insurance motive). More importantly, we find that the impact of earnings management over compensation decreases over time. This result, coupled with the findings of Hazarika et al. (2012) who show that CEOs with higher earnings management are more likely to be fired by the firm, imply that CEOs whose ability or whose match with the firm are found to be acceptable to shareholders remain on the job and are rewarded with higher compensation. One may ask whether the use of earnings management over the CEOs' tenure is an optimal response given that such behavior may be costly. As Hermalin and Weisbach (2008), and Fudenberg and Tirole (1995) demonstrate, it is very likely that the

optimal amount of earnings management is higher than zero for most firms. Monitoring CEOs' actions in the first few years of the tenure, when such uncertainty exists, and detecting performance distortion is a costly activity as well. Recently appointed CEOs may also need to be given some space by the shareholders to find their feet. Thus, while Clikeman (2003) and Leuz, Nanda, and Wysocki (2003) show that earnings management may be costly in the cross-section, the dynamics that we describe in this paper may emerge as one type of response that firms and CEOs have to address uncertainty and career concerns.

Evidence suggests that earnings management may be costly for firms (see, amongst many others, Dechow, Sloan, and Sweeney (1996), Palmrose, Richardson, and Scholz (2004), Karpoff, Lee, and Martin (2008), Hennes, Leone, and Miller (2008), Gande and Lewis (2009), and Karpoff and Lou (2010)), and Hazarika, Karpoff and Nahata (2012) show that earnings management increases the likelihood of a forced CEO turnover. Shareholders can take actions to control such behavior but such actions crucially depend on the shareholders' ability to disentangle real performance from distorted reported performance, which may be more difficult in the early years of the CEO's tenure. Over time, and with more information updates, shareholders should have enough information that can be used to assess correctly the CEO's ability and quality of the match. Our results suggest that managers may use earnings management to increase compensation, but this effect diminishes over time.

Our paper makes a contribution to two main strands of the literature. First, the empirical literature on executive compensation focuses on the cross-sectional variation in compensation across firms and sectors. Gibbons and Murphy (1992) and, more recently, Cremers and Palia (2011), investigate an under-researched area in executive compensation: how compensation changes over the tenure of the CEO. Murphy (1986) models and empirically examines implications of multi-period managerial labor contracts under two alternative hypotheses: incentives (where productivity depends on unobservable managerial effort), and learning (where ability is revealed over time). While the evidence supports both arguments, the learning hypothesis appears to be a better fit for the results, which show that earnings growth decreases with experience. We make two contributions to this literature. As suggested by Fudenberg and Tirole (1995), we introduce the distortions that CEOs can make to reported performance to survive on the job, and investigate how the interaction of these distortions with (over) tenure influence compensation. Thus, we are the first – to our knowledge – to consider how CEOs

change their earnings management over tenure and, through the use of the instrumental variables methodology, disentangle the effect of tenure as a measure of the CEO's firm-specific skills from the effect that earnings management has on compensation via its impact on CEO tenure. Second, we also make a contribution to the large literature on firm transparency, showing how earnings management is strategically used by incoming CEOs due to career concerns and its impact on compensation.

The remainder of the paper is organized as follows. Section 2 discusses the sample construction and the empirical methodology. Section 3 and 4 describe the results, and, Section 5 concludes.

2 Data and Empirical Methodology

2.1 Data

We obtain data from a variety of sources. We identify all CEO turnovers from the Standard & Poor's ExecuComp database over the period 1992–2010. From these data we exclude interim CEO appointments, i.e. CEOs with tenure of two years including the year of the appointment, and retain CEOs for whom we observe consecutive years from at least the first year of appointment. Following the literature, financial firms (6000-6999) and regulated utilities (4900-4999) are excluded. The final sample includes 1,624 CEO turnovers in 1,023 firms for a total of 7,941 firm-year observations. All variables used in the analysis are described in Appendix A.

We focus on the level of total compensation, and collect the relevant variable (TDC1) recorded by ExecuComp. We use the natural logarithm of total compensation for our compensation specifications.

Firm-level control variables that have been found to influence compensation (such as firm size, return on assets, market-to-book ratio, etc.) are obtained from Compustat, and data on share prices and number of shares outstanding from the Center for Research in Security Prices (CRSP). The institutional ownership data are from Thomson Financial. We have complete

information about compensation and earning management measures for 7,628 firm-year observations. All variables are winsorized at the 1st and 99th percentiles.⁷

As career concerns are likely to influence CEOs differently, depending on their characteristics, we collect data on (a) whether a CEO has an employment contract with the firm and its type (fixed term vs. at-will), (b) CEO's age at the time of appointment, and (c) whether a CEO is promoted internally (insider) or recruited from outside the firm (outsider).

The Securities Exchange Act of 1934, Regulation S-K, Item 402 requires that firms disclose information about the employment contract terms between the firm and the CEO. Similar to Schwab and Thomas (2005), Gillan et al. (2009), and Xu (2011), we collect information about the existence of an employment contract and its terms (fixed term or at-will) from SEC filings.⁸ For each CEO in the sample, we collect information about CEO age at the time of appointment and year of appointment from ExecuComp and, if the data is missing (and to check its correctness), we also search the Factiva and Lexis-Nexis databases. We also obtain data about whether the newly appointed CEO is an insider (defined as a CEO who was an employee of the firm for at least five years before being appointed as the CEO), or an outsider from ExecuComp, Factiva, and Lexis-Nexis by reading the press statements and related news issued by the companies in our sample around the date of the CEO appointment.

2.2 Measures of Earnings Management

As highlighted in the literature,⁹ the degree of accounting transparency of a firm is inversely related to the degree of earnings smoothing and discretion: both measures should capture the extent to which CEOs misstate the firm's true economic performance. Earnings smoothing measures gauge the extent to which management dampens fluctuations in reported earnings relative to true earnings, thus increasing accounting opacity. Another measure of

⁷ Results are unchanged if we employ a different winsorization or do not winsorize at all.

⁸ In a fixed term contract, the firm's commitment is to pay compensation to the CEO for a specific number of years and should continue to do so if it terminates employment without cause. Under at-will contract, the employment relationship can be terminated by both the employer and the employee for "good cause, for no cause, or even for cause morally wrong, without being thereby guilty of legal wrong" (Payne vs. Western & Atlantic Railroad Co., 81 Tenn. 507, 519-520, 1884 WL 469 (September Term, 1884).

⁹ See, for example, Jones (1991), Dechow and Dichev (2002), Dechow et al. (2010), Francis, LaFond, Olsson and Schipper (2005), and Leuz, Nanda and Wysocki (2003).

accounting opacity is earnings discretion, namely the latitude that management has in reporting – and thereby misstating – earnings, based on the extent and use of accounting accruals.

We first compute earnings management measures at the firm level, and then disentangle other measures into their “normal” and “abnormal” components, thereby obtaining firm-level measures of excessive earnings management. As shown in the accounting literature (for example Francis et al. (2005)), the informativeness of reported earnings is influenced by various factors, such as environmental uncertainty and industry affiliation, as well as by intentional estimation mistakes arising from insiders’ incentives to reduce transparency. In keeping with the maintained hypothesis, we want to capture exclusively management’s intentional errors to reduce transparency. For our baseline results we use the *abnormal* component of earnings smoothing and earnings discretion. We also use a measure of actual firm-level accruals and, in line with the accounting literature, firm-level controls will be used.

We use two different measures of accounting transparency. The first earnings management measure we use is the Performance-adjusted Modified Jones Model which is based on an approach that disentangles normal from abnormal accruals using performance-augmented modified Jones model as in Hazarika, Karpoff and Nahata (2012). Following Bergstresser and Philippon (2006), we use the Fama-French 48 industry-groups and include year dummies in the specification to compute industry-specific parameter estimates that then give us firm-specific normal accruals. Following the literature, we exclude all firm-year observations that do not have sufficient data to estimate any of the measures of earning management and we exclude industry-year observations if there are fewer than ten observations in a Fama-French 48 industry group for any specific year. We then proceed to compute the absolute level of abnormal accruals by subtracting normal accruals from actual accruals. The second measure uses the absolute level of firm-level Operating Accruals calculated using information from the cash-flow statement (Hribar and Collins (2002)). Appendix A explains the details of how we calculate these two measures of accounting transparency.

2.3 Sample Description

Table 1 provides the descriptive statistics of our sample of completed spells. Panel A shows the number of CEOs in each year of their tenure, Panel B shows the number of CEO turnovers in each calendar year over our sample period together with the CEO characteristics

(insiders, young CEOs and CEOs with fixed-term contract), Panel C shows the distribution of the main compensation variable and the two main measures of earnings management and Panel D shows the correlation between tenure, compensation and different earnings management measures.

[Insert Table 1]

From Panel A, we note that out of the 1,624 CEO appointments over our sample period, almost 300 CEOs are not observed any longer in our data at the start of the fourth year and another 300 CEOs drop out in the fourth year. Only 555 CEOs of the original 1,624 CEOs start the seventh year of their tenure. These statistics show that the probability of termination is high in the first four years of tenure. These terminations may be voluntary or forced turnovers (firings), or retirements. Panel C shows that, consistent with existing literature, the median (mean) tenure of a CEO is 7 (7.25) years. The average (median) CEO's age at the time of appointment is 52 (51) years, almost 40% of the CEOs are promoted from inside the firm, and more than 30% of the CEOs start their tenure with an employment contract. The mean and median values of the two earnings management measures are consistent with those found in existing literature. Importantly, Panel D shows that the total level of compensation is positively correlated with tenure and negatively correlated with our measures of earnings management. Importantly, we find that our measures of earnings management are positively correlated with both special items, and operating earnings volatility, which we will use as instruments for our empirical specification.

2.4 Empirical Methodology

Identifying the effect of earnings management, especially the dynamics of earnings management over tenure, on compensation is a difficult task for two reasons. Earnings management may be correlated with unobserved CEO and firm factors or with the quality of the CEO-firm match, that also affect compensation. Similarly, the labor economics literature suggests several theories for why compensation may increase with tenure. The human capital argument discussed by Becker (1975), and Mincer (1974), among others, suggests that additional years on the job imply accumulated job-specific skills, which are rewarded with higher compensation by the current employer. Other explanations for the compensation and tenure relationship rely on uncertainty

about the innate ability of the worker, and the quality of the job match. CEO compensation may increase over the tenure of the CEO because good CEO job matches survive, while bad matches do not. We examine whether the dynamics of earnings management over tenure affects compensation using the following specification:

$$Y_{i,j,t} = \beta_1 T_{ijt} + \beta_2 T_{ijt}^2 + \beta_3 EM_{ijt} + \beta_4 T_{ijt} \times EM_{ijt} + \beta_5 T_{ijt}^2 \times EM_{ijt} + \beta_6 X + \varepsilon_{ijt} \quad (1)$$

$$\varepsilon_{ijt} = \alpha_i + \alpha_j + \alpha_{ij} + \eta_{ijt}$$

where i indexes CEOs, j indexes firms, and t indexes the time. Y is the natural log of TDC1, T is the number of years CEO i has been the CEO at firm i , at time t , and EM refers to earnings management. X includes observable firm characteristics that are likely to affect CEO compensation. The error term ε_{ijt} consists of a fixed individual effect α_i , a fixed firm effect α_j , a fixed job-match effect α_{ij} , and a transitory component η_{ijt} . The fixed job match effect reflects variations in compensation across firms that arise due to reasons raised in the job-matching and efficiency wages literature (Altonji and Shakotko, 1987). Both EM and T may be correlated with α_i , α_j , α_{ij} , so ordinary least squares will yield inconsistent estimates. The net effect of the job match component is to introduce an additional upward bias in the OLS estimates of the tenure variable in equation (1).

To control for job match effects in the relationship between tenure and compensation, we adopt an instrumental variable approach and instrument tenure following the methodology used by Altonji and Shakotko (1987).

Let τ_{ij} be the set of t for which we can observe individual i in firm j , and N_{ij} the number of such observations. Altonji and Shakotko (1987) propose an instrumental variable that is the deviation of the tenure variables around their means for each job match spell:

$$\hat{T}_{ijt} \equiv T_{ijt} - \bar{T}_{ijt} \quad (2)$$

where

$$\bar{T}_{ijt} \equiv \frac{1}{N_{ij}} \sum_{t \in \tau_{ij}} T_{ijt}$$

For example, since we observe completed spells only, if a CEO has a tenure of 7 years with a given firm, $\bar{T}_{ijt} = \frac{1}{7}(1 + 2 + 3 + 4 + 5 + 6 + 7) = 4$. For a CEO with a tenure of 4 years, $\bar{T}_{ijt} = 2.5$. The instrumental variable is then constructed as $T_{ijt} - \bar{T}_{ijt}$ for each year of tenure. We construct the instrumental variable T^2 similarly. The main advantage of this instrumental variable is that it is uncorrelated by construction with the individual, firm and job match effects. However, because we do not observe CEO transitions across firms, i.e. we do not observe a CEO moving to another firm as a CEO, since such events are quite rare, we are not able to distinguish the individual effect α_i from the job match effect α_{ij} in equation (1), so we refer to the sum of these two effects as the job match effect. The problem of disentangling time-invariant CEO effects from time-invariant firm effects on compensation, given the very limited mobility of CEO across firms, was highlighted by Graham, Li and Qiu (2012), who focus on this specific dimension but do not control for the job-match effect which, according to the labor literature, is a crucial dimension of how compensation varies over tenure.

Earnings management is also likely to be correlated with unobservable CEO and firm factors that also affect compensation. For example, the accounting literature finds evidence consistent with the conjecture that the level of earnings management is decided by the CEO. In our set-up, earnings management may be decided by the CEO for strategic reasons precisely to increase the probability of survival on the job. Thus, we instrument earnings management by using (i) special items, which is the sum of special items, extraordinary items, and restructuring charges as reported by Compustat; and (ii) operating earnings volatility, computed as the standard deviation of operating earnings (ROA) measured over the five prior years.

The estimation method is a instrumental variable approach, using special items and operating earnings volatility as instruments for earnings management, the variable in equation (2) as an instrument for the tenure and tenure squared. When we instrument both the measures of earnings management and tenure, the instrumental variable regressions are estimated with firm fixed because including a CEO fixed effect tenure and tenure squared would not be identified. As a robustness check, in some specifications we only instrument the measures of earnings management and thus are able to include a CEO fixed effect in the instrumental variable regressions. Finally, we also provide estimates using a panel OLS methodology with CEO fixed effects.

3. Results: Earnings Management and Tenure

We start our analysis by exploring the behavior of earnings management over the CEOs' tenure. Under our maintained hypothesis of career concerns, we should find that CEOs use more earnings management early on in their tenure and reduce it over the years as uncertainty diminishes. We regress each of our measures of earnings management on tenure and include firm-level observable characteristics (*Leverage*, *Market-to-Book Ratio*, *Firm Size* and *Past Returns*) and use specification where we use CEO fixed effects and year dummies and others where we use firm fixed effects and year dummies. It should be noted that our objective in this specification is to explore, in a multivariate set-up and one where we control for unobserved heterogeneity at the CEO and firm levels besides firm characteristics, whether earnings management correlates with tenure and in what way. Thus in these specifications we do not use any instrument for tenure. The results are shown in Table 2 and Figure 1.

[Insert Table 2 and Figure 1]

The main result in Table 2 is found in the first row: in all specifications, whether we include firm characteristics as controls or not, we find that our measures of earnings management correlate negatively with tenure. As expected, the statistical and economic significance varies across the different specifications but we always find that as earnings management is highest in the first years of tenure and then it diminishes monotonically. It should be noted that we remove the first year of the CEO's tenure (year 0) from our analysis and thus these results are not driven by the "big bath" behavior of CEOs as they start their job. Figure 2 shows graphically the evolution of the Operating Accruals measure of earnings management over the CEOs' tenure together with the fitted values obtained from the regression shown in Column 5 of Table 2. A similar result is obtained when using the Performance-Adjusted Modified Jones measure of earnings management.

The results in Table 2 and Figure 1 are consistent with the view that earnings management is very high in the first years of tenure and diminishes rapidly in successive years. These results, together with those of Hazarika et al. (2012), suggest that the dynamics of income

smoothing modeled by Fudenberg and Tirole (1995) evolve significantly over tenure: if managers have an incentive to distort reported earnings to maximize the chances of survival then such career concerns appear to be highest in the first three years of tenure and diminish significantly afterwards.

If it is true that CEOs tend to use more earnings management at the beginning of their tenure because of career concerns and that shareholders learn about the CEO and match over time, we should find that CEOs with intrinsically high ability or whose match with the firm is of high quality should reduce the level of earnings management the most compared with other CEOs. This, in turn, should imply that the CEOs who decrease significantly their earnings management will be rewarded by the sharpest rise of their total level of compensation (besides being kept on the job). To investigate this, we consider how the *change* in the level of earnings management for each year of the CEO's tenure relative to the level of earning management in the first year of tenure influences the change in the level of compensation with respect to the first year of tenure.

Specifically, we investigate the correlation between the change in CEO's compensation in year t from the level of compensation in the first year of tenure with the change in each measure of earnings management measured in a similar way (the change in the level of earnings management in year t from its value in the first year of tenure). We include CEO-level (or firm-level) fixed effects and cluster standard errors at the CEO-firm level. We show the results graphically in Figure 2.

[Insert Figures 2 and 3]

Figure 2 shows that there is a very strong negative correlation between changes in compensation from the first year of tenure and changes in the earnings management measure (using Operating Accruals) from its value in the first year of tenure. This means that CEOs who decrease (increase) their earnings management most with respect to their own level in the first year of tenure are those who experience the largest increase (decrease) in their level of compensation. Hence, it appears that, on average, CEOs that survive tend to use a much lower level of earnings management compared to their own level of earnings management in the early part of the tenure and any excessive use of earnings management in later years has a negative impact on their compensation.

Gibbons and Murphy (1992) argue that career concerns are not likely to influence all CEOs in the same way. For example, they suggest that such concerns are strongest for workers further away from their retirement. Fudenberg and Tirole (1995) show that one important condition for CEOs to distort reported performance is that the firm cannot commit to a long-term contract. This means that older CEOs, and CEOs who have been given a long-term contract are likely to suffer less from career concerns compared to younger CEOs and those without a long-term contract. In line with these arguments, we should expect that the negative relationship between changes in CEO compensation and changes of earnings management shown in Figure 2 should be strongest for younger CEOs and those without a contract. We show graphically the results in Panel A (CEOs with and without contract) and B (young CEOs and older CEOs) of Figure 3 which plot the fitted values from a regression that runs changes in compensation over changes in earnings management and includes CEO fixed effects. We find strong negative correlation between changes in compensation and changes in earnings management for young CEOs and CEOs without a contract while no such correlation exists for older CEOs and those with a contract.

Our results so far, establishing that there is (a) a negative correlation between earnings management and tenure, and (b) a negative correlation between changes in compensation and changes in earnings management with respect to the first year of tenure, are suggestive that career concerns are particularly critical during the early years of the CEO's tenure because lack of past performance measures makes it harder for shareholders to disentangle random fluctuations in performance from the CEO's inherent ability and the quality of the match with the firm. Over time, and with more information arriving about the quality of the CEO and his match with the firm, shareholders are able to determine the CEO's true ability and the importance of earnings management diminishes over tenure. So far we have found that CEO compensation broadly correlates with this behavior.

We next investigate the dynamics of executive compensation over a CEOs' tenure at a firm, when shareholders learn about CEO's ability and the quality of the job match with the firm, in the presence of reporting distortions used strategically by CEOs for survival purposes. We do so in a specification that fully considers the endogeneity that may exist in the level and evolution of earnings management and tenure. Existing literature has investigated the cross-sectional relationship between earnings management and compensation, ignoring the relationship over the

tenure of the CEO at the firm. Thus, the main variable of interest is the interaction of earnings management with tenure (and tenure squared) on the level of compensation. Under the hypothesis that shareholders' uncertainty about CEO's ability and the quality of match decreases as more information is revealed over time, we should expect that the impact of any performance distortion on compensation decreases over the CEO's tenure. The results are shown in Table 3.

[Insert Table 3]

We start the analysis using panel OLS regression of specification (1) above and including firm, and CEO fixed effects separately, which are reported in the Panel A of Table 3 (Columns 1-2 report the results with CEO fixed effects and Columns 3-4 report the results with firm fixed effects). In every specification we include firm-level observable characteristics (*Market-to-Book Ratio, Firm Size, Firm Size Squared, Stock Returns Volatility, and Past Returns, and Return on Assets, etc.*) and include year dummies. We cluster the standard errors at either the CEO-level or the firm-level.

In every specification we find that the level of earnings management positively correlates with the level of compensation. Most importantly, the coefficient estimates of the interaction variable between earnings management and tenure is always negative with high statistical and economic significance across most of the measures we use. This evidence is consistent with the view that the impact of performance distortion on compensation becomes smaller over the CEO's tenure. In the OLS specification we find ambiguous results on how compensation evolves over tenure: compensation is found to be positively correlated with tenure when using firm-level fixed effects but negatively correlated with tenure when we use CEO-level fixed effects.

While our OLS results support the hypothesis when controlling for individual CEO effects and firm effects, tenure and earnings management are also likely to be correlated with the job-match effect in the error term, as described in Section 2. We proceed to address these sources of endogeneity in the following way. First, we use a specification that instruments only for earnings management by using (a) special items, and (b) volatility of operating earnings. We show these results in Columns 1 and 2 of Panel B of Table 3. Second, we proceed to instrument both earnings management and tenure, where for earnings management we use the same instruments as before and we use the instrument suggested by Altonji and Shakotko (1987) for

tenure. We show these results in Columns 3 and 4 of Panel B of Table 3. We include CEO-level fixed effects in the first two specifications and firm-level fixed effects the last two specifications.

From our IV estimation we find two important results, consistent with what we also found in the OLS specification. First, earnings management has a positive impact on compensation, consistent with the existing literature that has explored the cross-sectional relationship between earnings management and compensation. Second, and most important for our research question, the effect of earnings management on compensation *decreases* significantly over tenure. Thus, after controlling for the job-match effect, we find that the negative coefficient of the interaction variable between each earnings management measure and tenure becomes larger when compared with our OLS estimates, with higher economic and statistical significance. For our two measures of earnings management, the coefficient is significant at the 1% confidence level. This result confirms that the impact of earnings management on compensation decays rapidly over tenure. We also find that the coefficient of the interaction between the earnings management measures and tenure squared is positive and statistically significant as well. Broadly speaking, CEOs' compensation does not appear to suffer negatively in the first three years of tenure from high earnings management, but the effect becomes negative after this period.

Panel C of Table 3 shows the estimates from the first stage of the IV specification and the diagnostic tests we carry out. Few important results need to be pointed out. First, we find that our measures of earnings management correlate with special items and volatility of operating earnings, even after using firm-level control variables, firm fixed effects and year dummies. At the same time, tenure is correlated with the tenure IV obtained from the Altonji and Shakotko (1987) methodology. This means that the instruments we use are relevant. Furthermore, the F-test is high and the R-squared are also relatively high implying that our instruments are good instruments.

Putting together these three results on the evolution of the impact of earnings management on compensation, we find that the evidence is consistent with Fudenberg and Tirole (1995): the impact is largest in the first years of the tenure, precisely when the CEO's concerns about survival are highest, and, second, the impact decays over tenure as more information is produced reducing shareholders' uncertainty about CEO's ability and the quality of the job match.

Considering the effect of tenure on compensation, we find that the coefficient estimate is positive and statistically significant, implying that compensation rises with tenure, consistent with the labor economics literature. Theory suggests that the effect of tenure over compensation can be due to two forces: first, accumulation of job-specific human capital, and, second, resolution of uncertainty about ability and match. At the very least, one has to disentangle the effect of tenure as a measure of the CEO's firm-specific skills from the effect that earnings management, a la Fudenberg and Tirole (1995), has on compensation via its impact on CEO tenure. Our methodology allows us to reach this objective, and we find evidence consistent with both channels.

The result regarding the impact of tenure on compensation may also be consistent with other theories that have been proposed in the executive compensation literature. One potential explanation is the entrenchment hypothesis of Bebchuk and Fried (2004): CEOs who survive in the job may become more powerful as their tenure is extended and, through their power, entrenched CEOs may set their own compensation. Another potential explanation is the dynamic contracting hypothesis of Edmans, Gabaix, Sadzik and Sannikov (2009) where intertemporal risk sharing generates rewards to CEO's effort to be spread across all future periods. In such a scenario, a higher compensation level will be required as tenure increases, because a risk-averse more-experienced CEO gets less utility from an increase in wealth as she is forced to consume it over fewer periods. However, the entrenchment hypothesis and the dynamic contracting hypothesis are silent on how earnings management interacts with tenure to produce an impact on compensation that evolves over tenure. It is possible that more entrenched CEOs may be more likely to use their power to manage more earnings over tenure. To the extent that this is done, our results suggest that higher levels of distortions in reported income by entrenched managers produce a negative impact on their level of compensation. This is not to say that the entrenchment effect does not influence compensation. However, our results rule out that such effects occur through the management of earnings which existing literature has indicated as a potential tool that entrenched managers can use for strategic reasons (other than survival).

4. CEO characteristics and the dynamics of compensation and earnings management

Gibbons and Murphy (1992) argue that career concerns are not likely to influence all CEOs in the same way. For example, they suggest that such concerns are strongest for workers further away from their retirement. Fudenberg and Tirole (1995) show that one important condition for CEOs to distort reported performance is that the firm cannot commit to a long-term contract. Indeed, if a CEO engages in performance distortion to increase the likelihood of survivability then one should not expect such behavior (or less likely) to take place if the CEO's position is covered by a long term contract. These considerations suggest that we should investigate more deeply the cross-sectional heterogeneity across CEOs to explore whether and how career concerns shape the influence of tenure and earnings management on the level of compensation.

We start by investigating the condition imposed by Fudenberg and Tirole (1995): the presence of long term contracts given by the firm to the CEO. We collect data on the type of contract, if any, a CEO is given at the time of the appointment. These contracts can be of two types: either a fixed-term employment contract or at-will employment contract. The former is a long-term type of contract while the latter is a short-term contract. In Panel A of Figure 3 we already showed how changes in compensation are negatively correlated with changes in earnings management for CEOs without a long-term contract, but no such correlation exists for CEOs with contract. In unreported results we find evidence consistent with the view that distortions of reported performance are larger in the first years of CEOs without a contract (compared to CEOs with contracts) and its use rapidly diminishes over tenure.

[Insert Table 4]

Table 4 reports the results from estimating specification (1) for the two groups of CEOs where in Columns 1 to 4 we show the results from the IV specification with firm fixed effects and in Columns 5 and 6 we show the results from the panel OLS specification with CEO fixed effects. The results for the compensation dynamics for CEOs with fixed-term employment contracts are shown in Columns 1 and 2 (IV estimation) and 5 (OLS estimation), while the results for the compensation dynamics for CEOs without contracts are shown in Columns 3 and 4 (IV estimation) and 6 (OLS estimation).

There is a striking difference between the impact of earnings management on compensation for the two groups of CEOs: the dynamics of earnings management found in the overall sample are

driven exclusively by the CEOs without a contract or with an at-will employment contract. Overall, we find that CEOs with a fixed-term employment contract use significantly less earnings management, and that their compensation is not sensitive to the level of earnings management and its evolution through time. Thus, consistent with Fudenberg and Tirole (1995) and career concerns, when given a long-term contract, CEOs are not found to use earnings management to distort reported performance, probably because their survival, at least up to the duration of the contract, is more likely than that of CEOs without any contract. Since fixed term contracts have an average duration of about three years, these results explain, at least partially, the difference in the behavior between CEOs with and without a contract: as we discussed above it is precisely in the first three years of tenure that earnings management is mostly used.

Our results raise the question as to why all firms do not provide a fixed term contract to their newly appointed CEOs, given the evidence in the literature regarding the costs of earnings management. It should be noted, though, that there are costs associated with fixed term contracts, the most important of which is giving up the relative ease with which shareholders can terminate the employment if the CEO does not perform as expected. Shareholders may value this option especially in the early years when they need to learn about the CEOs' ability and job match with relatively limited information. At the very least these results show that there is an important trade-off that shareholders face. The actual outcome may depend on time-invariant firm characteristics (like firm culture) or the job match. Our empirical design considers both dimensions.

We also investigate how the earnings management dynamics over tenure may be different between insider CEOs – those who have been promoted from within the firm – and outsider CEOs – those who have been appointed from outside the firm. On one hand, if one were to focus entirely on the CEO's inherent ability, one should expect that an insider CEO is better known than an outsider CEO, and we should expect that earnings management's impact on compensation will have very different dynamics compared to that of outsiders. On the other hand, the other important dimension is the CEO-firm match and, as Gibbons and Murphy (1992) argue, being an insider in a non-CEO role may be a very different experience than being a CEO. In other words, the challenges inherent in the job match are such that insiders may not be judged differently than outsiders by shareholders.

We find no evidence that the earnings management dynamics on compensation over the tenure of insider CEOs are different from those of outsiders, consistent with the conjecture of Gibbons and Murphy (1992). Thus, what may matter is not so much the status of insiders versus outsiders, but whether a fixed-term employment contract is given to the CEO or not. Consistent with this conjecture, we proceed to use our employment contract data to explore whether insider CEOs with a fixed term employment contract behave differently from other insider CEOs without a fixed term employment contract in Table 5.

[Insert Table 5]

The results shown in Table 5 provide evidence consistent with the view that having an employment contract matters even when an insider is promoted to the role of the CEO: insider CEOs with an employment contract are found to have a much lower propensity to use earnings management early during their tenure compared to other insider CEOs without a contract.

As suggested by Gibbons and Murphy (1992) we expect that career concerns are likely to be more important for younger CEOs who are further from retirement. For example, Panel B of Figure 3 shows that changes in compensation are negatively correlated with changes in earnings management for younger, but not for older, CEOs. This evidence suggests that distortions of reported performance are larger in the early years of tenure for young CEOs (compared to old CEOs) and its use rapidly diminishes over tenure.

[Insert Table 6]

We test this hypothesis using specification (1) for the young and old CEO samples and report the estimates in Table 6. Consistent with our hypothesis, we find that younger CEOs show a larger use of earnings management early on in their tenure compared to older CEOs, and the dynamics between earnings management and compensation across tenure is found only for younger CEOs.

5. Conclusions

In this paper, we investigate the dynamics of executive compensation over a CEOs' tenure at a firm, when shareholders learn about CEO's ability and the quality of the job match with the firm, in the presence of reporting distortions used strategically by CEOs for survival purposes. To precisely estimate the effect of tenure on compensation we need to consider that tenure is influenced by reported performance, which may be distorted by the CEO's actions. At the very least, one has to disentangle the effect of tenure as a measure of the CEO's firm-specific skills from the effect that earnings management, a la Fudenberg and Tirole (1995), has on compensation via its impact on CEO tenure.

To examine the dynamics of CEO compensation over the tenure of the CEO and in the presence of earnings management, we use data on 1,624 CEO turnovers in 1,023 firms forming part of the S&P 1500 index. We examine the effects of tenure, various measures of earnings management, and the interaction between the tenure and earnings management, on total CEO compensation, controlling for other firm characteristics that are likely to affect compensation and using a methodology that takes into account the CEO-firm match. While earnings management is found to influence compensation, this effect diminishes over the CEO's tenure. CEOs that decrease earnings management the most experience the highest increase in compensation. We show that the effect of career concerns varies based on CEO and firm characteristics. Consistent with the theory, earnings management is observed to have a stronger influence on compensation for CEOs without a fixed term employment contract and younger CEOs. These results suggest that both managers and firms learn about CEO's ability and the quality of the job match over the tenure of the CEO, and that this learning process is affected by the career concerns of CEOs.

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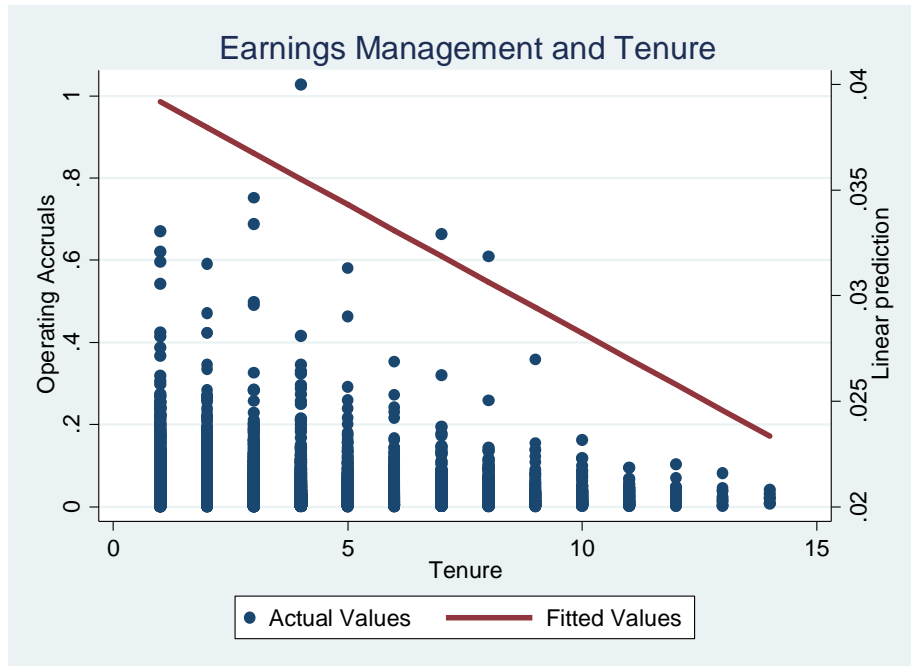


Figure 1. The figure shows the evolution of earnings management (Operating Accruals) over the CEOs' tenure. Fitted values are obtained from a Panel OLS regression that includes CEO fixed effects and clusters standard errors at the CEO-firm level.

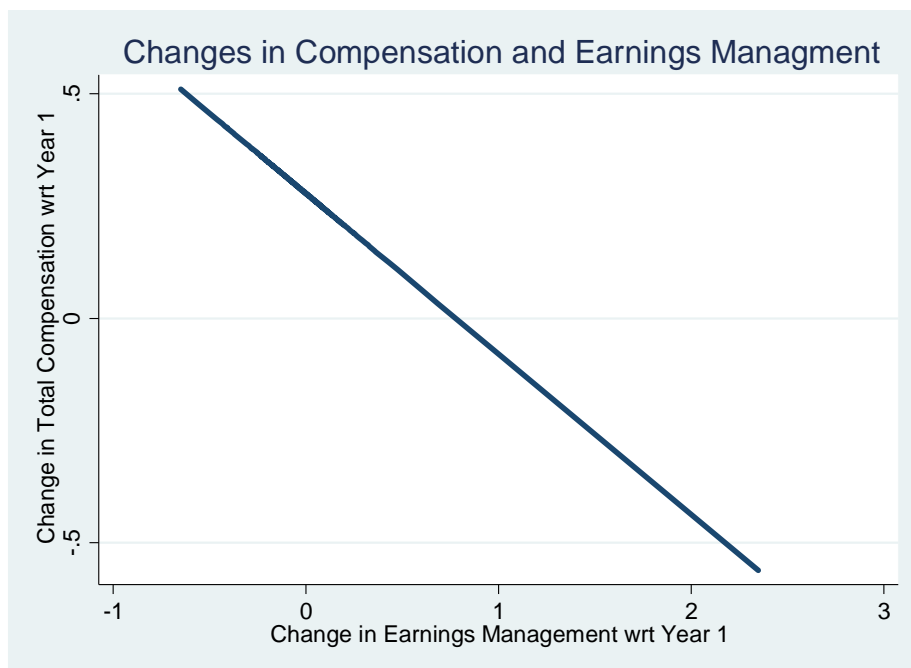
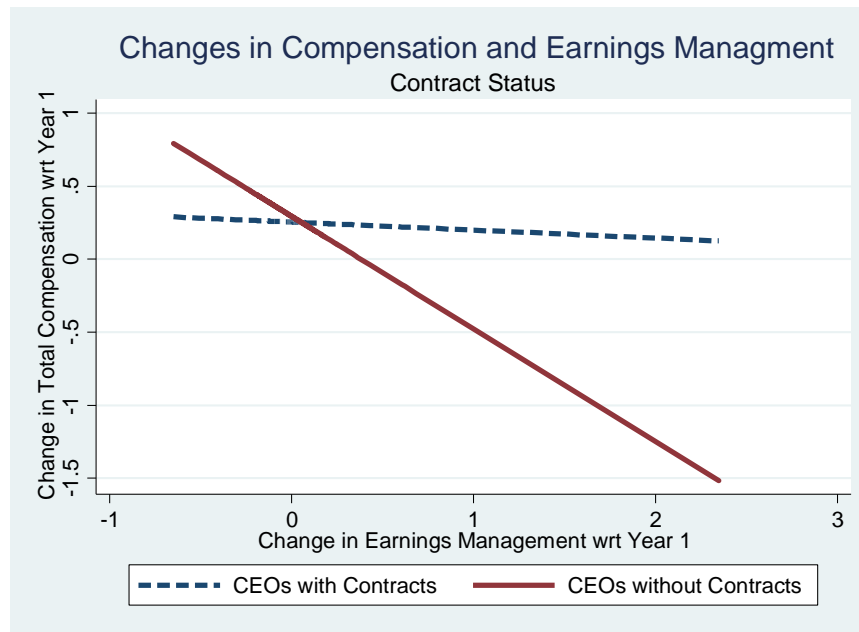


Figure 2. This Figure plots the relationship between changes in compensation and changes in earnings management over the CEO's tenure. For each year of the CEO's tenure, we calculate the difference between the CEO's Total Compensation (Operating Accruals) and her Total Compensation (Operating Accruals) during the first year of her appointment. The line plots the curve resulting from the prediction of a panel OLS regression of changes in Total Compensation on changes in Operating Accruals. The regression includes CEO fixed effects and clusters standard errors at the CEO-firm level.

Panel A: Contract Status



Panel B: CEO's Age

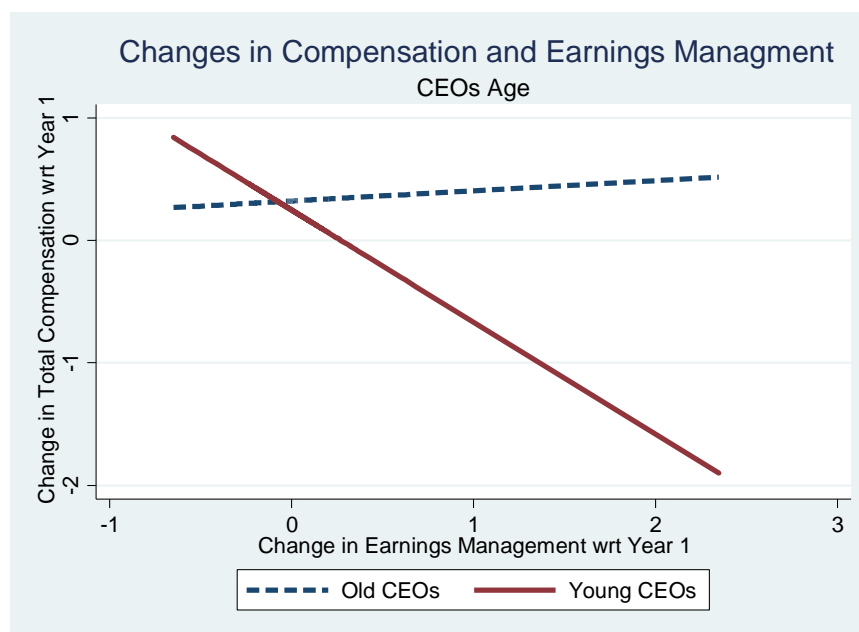


Figure 3. This Figure plots the relationship between changes in compensation and changes in earnings management over the CEO's tenure. Panel A shows results for CEOs with an explicit employment agreement (CEOs with Contracts) and CEOs that have been appointed without a contract (CEOs without Contracts). Panel B shows results for young CEOs (Young CEOs) and old CEOs (Old CEOs). A CEO is defined as young if she was no older than 58 years when appointed and old if she was 59 years old or older when appointed. For each year of the CEO's tenure, we calculate the difference between the CEO's Total Compensation (Operating Accruals) and her Total Compensation (Operating Accruals) during the first year of her appointment. Each line plots the curve resulting from the prediction of a panel OLS regression of changes in Total Compensation on changes in Operating Accruals estimated separately for each sub-sample. The regression includes CEO fixed effects and clusters standard errors at the CEO-firm level.

Appendix - Variable Definitions

Panel A. CEO Level Variable	
Tenure	The tenure of the CEO in years.
Total Compensation	The natural logarithm of the CEO total compensation. We use TDC1 in ExecuComp. Prior to December 2006, TDC1 was Salary + Bonus + Other Annual + LTIP Payouts + Restricted Stock Grants + Value of Options Granted+ All Other. After December 2006, TDC1 was Salary + Bonus+ Non-Equity Incentive Plan Compensation + Grant-Date Fair Value of Stock Awards + Value of Options Granted + Other Compensation.
CEO Age	The CEOs age at the appointment.
Young CEO Dummy	A dummy variable that is equal to 1 if the CEO has less than 59 years when she is appointed, and zero otherwise.
CEO Contract Dummy	A dummy variable that is one if the CEO has an explicit employment agreement, and zero otherwise.
Insider CEO Dummy	A dummy variable that is one if the CEO has spent at least 5 years in the firm before being appointed, and zero otherwise.
Panel B. Measures of Discretionary Accruals	
Operating Accruals	<p>Absolute operating accruals over lagged assets as in Hribar and Collins (2002). Total accruals for firm j in year t are measured as:</p> $ACC_{j,t} = -(CHGAR_{j,t} + CHGINV_{j,t} + CHGAP_{j,t} + CHGTAX_{j,t} + CHGOTH_{j,t} + DEP_{j,t}) / Assets_{j,t-1}$ <p>where $CHGAR_{j,t}$ is the decrease (increase) in accounts receivable (Compustat data item 302); $CHGINV_{j,t}$ is the decrease (increase) in inventory (Compustat data item 303); $CHGAP_{j,t}$ is the increase (decrease) in accounts payable (Compustat data item 304); $CHGTAX_{j,t}$ is the increase (decrease) in taxes payable (Compustat data item 305); $CHGOTH_{j,t}$ is the net change in other current assets (Compustat data item 307); and $DEP_{j,t}$ is depreciation expense (Compustat data item 125). Closely following Hribar and Collins (2002), we take all of these variables from the operating section of the statement of cash flows and, hence, they are not affected by non-operating changes in these accounts.</p>
Performance-adjusted Modified Jones Model	<p>Absolute discretionary accruals calculated using the performance-adjusted modified Jones model as in Hazarika, Karpoff and Nahata (2012), p. 48, including year dummy variables as in Bergstresser and Philippon (2006).</p> <p>Total accruals for firm j in year t are measured as: $TA_{j,t} = (\Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STDEBT_{j,t} - DEP_{j,t}) / Assets_{j,t-1}$, where $\Delta CA_{j,t}$ = firm j's change in current assets (Compustat #4) from year $t-1$ to year t, $\Delta CL_{j,t}$ = firm j's change in current liabilities (Compustat data item 5) from year $t-1$ to year t, $\Delta Cash_{j,t}$ = firm j's change in cash (Compustat data item 1) from year $t-1$ to year t, $\Delta STDEBT_{j,t}$ = firm j's change in debt in current liabilities (Compustat data item 34) from year $t-1$ to year t, $DEP_{j,t}$ = firm j's depreciation and amortization expense (Compustat data item 14) in year t and $Assets_{j,t-1}$ = firm j's book value of assets (Compustat data item 6) in year $t-1$. We estimate the following regression, which is estimated for each of the 48 Fama-French (1997) industry groups in each calendar year t.</p> $TA_{j,t} = \phi_{0j} + \phi_{1j} \left(\frac{1}{Assets_{j,t-1}} \right) + \phi_{2j} (\Delta Rev_{j,t} - \Delta AR_{j,t}) + \phi_{3j} PPE_{j,t} + \phi_{4j} ROA_{j,t-1} + \sum_{year=y} \gamma_y + u_{j,t}$ <p>$\Delta Rev_{j,t}$ = firm j's change in revenues (Compustat data item 12), divided by $Assets_{j,t-1}$ (Compustat data item 6); $\Delta AR_{j,t}$ = firm j's change in account receivables (Compustat data item 2), divided by $Assets_{j,t-1}$; $PPE_{j,t}$ = firm j's gross value of property, plant and equipment (Compustat data item 7) divided by $Assets_{j,t-1}$; $ROA_{j,t-1}$ = firm j's operating income before depreciation (Compustat data item 13) on assets in year $t-1$. We use the Fama-French 48 industry-groups to compute industry-specific parameter estimates that then give us firm-specific normal accruals. We exclude all firm-year observations that do not have sufficient data to estimate any of the measures of earning management and when there are fewer than ten observations in a Fama-French 48 industry group for any specific year. In the analyses we use the absolute value of the difference between total accruals and the estimated value of total accruals calculated using the coefficients obtained by the regression above.</p>
Special items, extraordinary items, restructuring charges	Sum of special items, extraordinary items, and restructuring charges.

Operating Earnings Volatility Standard deviation in the firm's ROA over the prior five years including the current fiscal year.

Panel C. Firm-Level Control Variables

Firm Size	The natural logarithm of a firm's market capitalization calculated as the company's shares outstanding (in million) multiplied by market price as of the end of the month of December.
Firm Size Squared	The squared value of Firm Size..
Leverage	The book value of debt divided by the book value of total assets.
Market-to-Book	The market value of equity at the end of the year divided by the book value of common equity.
Past Stock Returns	The firm's stock returns, computed as the average stock market return over the previous 12 months.
Return on Assets	The net income in year t divided by total assets in year $t-1$.
Stock Return Volatility	The firm's stock returns volatility, computed as the standard deviation of the stock returns over the previous 12 months.
Stock Turnover	The average of the previous 12 months stock turnover.

Table 1
Descriptive Statistics

This table describes the main characteristics of the CEOs and firms in the sample. For the period 1992–2010, we obtain information from ExecuComp, Factiva, Lexis-Nexis, Compustat and CRSP. Panel A describes the number of CEOs-firm observations. Panel B describes the frequency of CEO turnovers. Panel C shows descriptive statistics for CEO level characteristics, discretionary earnings management measures and firm level characteristics. Panel D provides the time-average of the cross-sectional pairwise correlation coefficients between the CEOs' tenure, total pay and the earnings management measures for the entire sample. We report the significance level of correlation coefficients using the Bonferroni adjustment. In Panel D, * indicates significance at 10% or less. All variables shown are described in the Appendix and are winsorized at the 1% level.

Panel A – Sample Description				
Year from Appointment	Number of CEOs	No Missing Compensation		No Missing Compensation & All Measures of EM
1	1,624	1,579		1,530
2	1,624	1,616		1,571
3	1,305	1,300		1,267
4	1,026	1,018		990
5	745	743		719
6	555	552		535
7	398	397		382
8	274	274		264
9	168	167		160
10	101	101		95
11	66	65		62
12	35	35		33
13	14	14		14
14	6	6		6
Number of Observations	7,941	7,867		7,628

Panel B – Frequency of CEO Turnovers				
First Year of Appointment (Year of Appointment =1)	Number of CEOs	Insiders	Young CEOs	CEOs with Contract
1992	1	0	0	0
1993	63	27	49	7
1994	36	10	27	6
1995	56	27	35	9
1996	88	38	68	20
1997	91	29	75	29
1998	88	30	68	27
1999	97	32	73	27
2000	112	48	98	41
2001	129	55	112	49
2002	140	50	115	54
2003	94	44	79	34
2004	104	38	88	39
2005	90	33	78	33
2006	123	52	98	56
2007	104	44	89	33
2008	114	46	94	49
Total Number of Observations	1,530	603	1,246	513

Panel C – Descriptive Statistics						
	N	Mean	SD	P05	Median	P95
CEO Level Variable						
Tenure	7,867	7.25	2.89	3.00	7.00	13.00
Total Compensation (in Million of \$)	7,867	5442.63	10486.90	538.49	3120.96	16631.88
CEO Age at Appointment	7,867	51.37	6.25	41.00	52.00	61.00
Young CEO Dummy	7,867	0.67	0.47	0.00	1.00	1.00
CEO Contract Dummy	7,867	0.29	0.46	0.00	0.00	1.00
Proportion of Insider CEOs	7,867	0.40	0.49	0.00	0.00	1.00
Measures of Discretionary Accruals						
Operating Accruals	7,860	0.04	0.06	0.00	0.02	0.11
Perf.-Adj. Modified Jones Model	7,628	0.05	0.06	0.00	0.03	0.13
Firm Characteristics						
Return on Assets	7,616	0.042	0.150	-0.157	0.056	0.187
Leverage	7,597	0.232	0.197	0.000	0.214	0.539
Market-to-Book	7,350	2.769	22.051	0.365	2.089	7.982
Firm Size (in Billions of \$)	6,891	3.880	6.390	0.104	1.400	17.100
Stock Turnover	7,390	0.17%	0.14%	0.04%	0.13%	0.46%
Past Stock Returns	7,228	11.26%	5.91%	4.44%	9.78%	23.54%
Stock Returns Volatility	7,228	0.87%	3.75%	-5.17%	0.91%	6.94%

Panel D – Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Tenure	1									
(2) Total Compensation	0.0814*	1								
(3) Operating Accruals	-0.0722*	-0.0463*	1							
(4) Perf.-Adj. Modified Jones Model	-0.0598*	-0.0228	0.4998*	1						
(5) Total Accruals from Cash-flow Statement	-0.0319	-0.0146	0.4097*	0.3563*	1					
(6) Perf.-Adj. Modified Jones Model without Year Dummies	-0.0584*	-0.0407*	0.3851*	0.6269*	0.4645*	1				
(7) Classic Jones Model	-0.0584*	-0.0389*	0.3714*	0.6334*	0.4607*	0.8857*	1			
(8) Total Accrual from Balance Sheet	-0.0556*	-0.0361*	0.4196*	0.7059*	0.5646*	0.8157*	0.8114*	1		
(9) Special items, extraordinary items, restructuring charges	0.0112	-0.0019	0.1054*	0.1374*	-0.2272*	0.1215*	0.1137*	0.0932*	1	
(10) Operating Earnings Volatility	-0.0153	-0.0233	0.347*	0.2794*	0.2079*	0.2463*	0.2368*	0.2571*	0.6182*	1

Table 2 -- Earnings Management and Tenure

This Table reports panel regressions with CEO and firm fixed effects for the relationship between earnings management and CEO's tenure. The dependent variables are different proxies of earnings management: We use Performance-adjusted Modified Jones Model calculated including year dummies in the model in columns from (1) to (4) and Operating Accruals calculated using the firm's cash-flow statement in columns from (5) to (8). All the variables of earnings management are unsigned. All regressions exclude the year in which the CEO was appointed. Variable definitions are found in the Appendix. Variables are winsorized at the 1% level. All regressions include the constant term, but the coefficient is not reported. P-values are in parentheses. * indicates significance at 1% (**), 5% (**), 10% (*).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Perf.-Adj. Modified Jones Model				Operating Accruals			
Tenure	-0.0057*** (0.010)	-0.0057* (0.079)	-0.0023** (0.025)	-0.0024** (0.026)	-0.0043*** (0.003)	-0.0058*** (0.000)	-0.0013* (0.056)	-0.0011 (0.138)
Tenure Squared	0.0002* (0.079)	0.0001 (0.154)	0.0002** (0.032)	0.0002** (0.041)	0.0001 (0.245)	0.0000 (0.898)	0.0001 (0.205)	0.0001 (0.416)
Firm Size		0.0027 (0.394)		0.0013 (0.630)		0.0027 (0.376)		0.0006 (0.786)
Market-to-Book Ratio		-0.0001 (0.358)		-0.0000 (0.504)		-0.0001** (0.022)		-0.0001** (0.025)
Past Returns		0.0146 (0.753)		0.0161 (0.715)		0.0957*** (0.006)		0.0990*** (0.002)
Leverage		0.0053 (0.837)		0.0072 (0.508)		0.0098 (0.424)		0.0077 (0.299)
CEO Fixed Effects	YES	YES	NO	NO	YES	YES	NO	NO
Firm Fixed Effects	NO	NO	YES	YES	NO	NO	YES	YES
Industry Dummies	YES	YES	NO	NO	YES	YES	NO	NO
Year Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	7,908	6,887	7,908	6,887	8,139	7,075	8,139	7,075
Adj. R-squared	0.00559	0.00730	0.00961	0.00988	0.00609	0.0141	0.00859	0.0138
Number of CEOs/Firms	1,573	1,463	998	941	1,608	1,492	1,021	961

Table 3 -- CEO Compensation, Earnings Management and Tenure

This Table reports multivariate analyses for the relationship between CEO compensation and earnings management over the CEO's tenure. Panel A reports panel regressions with CEO fixed in columns (1) and (2), panel regressions with firm fixed effects in columns (3) and (4). Panel B reports instrumental variables regressions. In columns (1) and (2), we only instrument the measure of earning management and assume tenure is exogenous, in columns (3) and (4) we instrument both the measure of earning management and tenure. Panel C reports the first stage of the instrumental variables regressions in column (3) and (4) of Panel B. In Panel A and Panel B, the dependent variable is the logarithm of total compensation (Total Compensation). Both Panel A and Panel (B) shows results using two different measures of earnings management as dependent variables: (a) Performance-adjusted Modified Jones Model calculated including year dummies in the model in columns (1) and (3) and Operating Accruals calculated using the firm's cash-flow statement in columns (2) and (4). Panel C shows the first stage results for Performance-adjusted Modified Jones Model in column (1), Operating Accruals in column (4), Performance-adjusted Modified Jones Model times tenure in column (2), Operating Accruals times tenure in column (5), Performance-adjusted Modified Jones Model times tenure squared in column (3), Operating Accruals times tenure squared in column (6), tenure in column (7) and tenure squared in column (8). As instruments for earning management, we use both Special items, extraordinary items, restructuring charges and Operating Earnings Volatility (Hazarika et al (2012)). As instruments for tenure and tenure squared we use the deviation of the tenure and tenure squared variables around their means for each job match spell (Altonji and Shakotko (1987)). All the variables of earnings management are unsigned. All regressions exclude the year in which the CEO was appointed. Variable definitions are found in the Appendix. Variables are winsorized at the 1% level. All regressions include the constant term, but the coefficient is not reported. In Panel A, errors are standard errors are White-corrected for heteroscedasticity. P-values are in parentheses. * indicates significance at 1% (**), 5% (**), 10% (*).

Panel A: OLS Regressions

	(1)	(2)	(3)	(4)
Perf.-Adj. Modified Jones Model	1.623*** (0.004)		1.898*** (0.001)	
Perf.-Adj. Modified Jones Model *Tenure	-0.620** (0.010)		-0.730*** (0.003)	
Perf.-Adj. Modified Jones Model *Tenure Squared	0.048** (0.036)		0.058** (0.012)	
Operating Accruals		1.915** (0.014)		1.544** (0.039)
Operating Accruals* Tenure		-0.766** (0.018)		-0.603* (0.064)
Operating Accruals* Tenure Squared		0.047 (0.122)		0.033 (0.290)
Tenure	-0.067* (0.076)	-0.069* (0.067)	0.036** (0.034)	0.026* (0.099)
Tenure Squared	-0.002 (0.286)	-0.001 (0.347)	-0.002 (0.147)	-0.001 (0.454)
Firm Size	0.564 (0.511)	0.478 (0.559)	0.430 (0.455)	0.353 (0.523)
Firm Size Squared	-0.005 (0.817)	-0.003 (0.897)	-0.002 (0.909)	0.000 (0.980)
Market-to-Book Ratio t-1	0.001* (0.066)	0.001 (0.103)	0.001** (0.013)	0.001** (0.025)
Past Returns	-1.363** (0.031)	-1.382** (0.024)	-1.450*** (0.010)	-1.477*** (0.007)
Past Returns t-1	0.703 (0.156)	0.694 (0.142)	0.630 (0.178)	0.661 (0.141)
Return on Assets	0.488*** (0.000)	0.466*** (0.000)	0.454*** (0.000)	0.433*** (0.000)
Return on Assets t-1	-0.078 (0.512)	-0.067 (0.598)	0.072 (0.478)	0.072 (0.486)
Stock Returns Volatility	0.708** (0.031)	0.743** (0.021)	0.727** (0.017)	0.742** (0.014)
CEO Fixed Effects	YES	YES	NO	NO
Firm Fixed Effects	NO	NO	YES	YES
Industry Dummies	YES	YES	NO	NO
Year Dummies	YES	YES	YES	YES
Cluster	CEO	CEO	Firm	Firm
Observations	6,410	6,588	6,410	6,588
Adj. R-squared	0.158	0.164	0.237	0.239
Number of CEOs/Firms	1,443	1,472	937	957

Panel B: Second Stage of IV Regressions

	(1)	(2)	(3)	(4)
Perf.-Adj. Modified Jones Model	18.253*** (0.001)		36.120*** (0.010)	
Perf.-Adj. Modified Jones Model *Tenure	-7.155*** (0.003)		-15.865** (0.014)	
Perf.-Adj. Modified Jones Model *Tenure Squared	0.705*** (0.007)		1.771** (0.018)	
Operating Accruals		19.309*** (0.002)		41.839*** (0.002)
Operating Accruals* Tenure		-8.511*** (0.002)		-19.063*** (0.003)
Operating Accruals* Tenure Squared		0.848*** (0.003)		1.963*** (0.003)
Tenure	0.244* (0.064)	0.202* (0.086)	0.689** (0.014)	0.585*** (0.003)
Tenure Squared	-0.030*** (0.008)	-0.025*** (0.004)	-0.076** (0.018)	-0.058*** (0.004)
Firm Size	1.031*** (0.000)	0.855*** (0.001)	1.128*** (0.002)	1.015*** (0.001)
Firm Size Squared	-0.017** (0.012)	-0.013** (0.033)	-0.018** (0.036)	-0.017** (0.026)
Market-to-Book Ratio t-1	0.001** (0.024)	0.001 (0.139)	0.002** (0.025)	0.001 (0.165)
Past Returns	-1.714*** (0.000)	-1.394*** (0.000)	-2.543*** (0.000)	-2.231*** (0.000)
Past Returns t-1	0.188 (0.649)	0.339 (0.356)	-0.850 (0.282)	-0.468 (0.416)
Return on Assets	0.649*** (0.000)	0.456*** (0.000)	0.892*** (0.000)	0.430*** (0.003)
Return on Assets t-1	0.234* (0.085)	0.463*** (0.004)	0.375* (0.068)	0.717*** (0.005)
Stock Returns Volatility	0.526* (0.062)	0.453* (0.094)	0.121 (0.779)	0.026 (0.945)
CEO Fixed Effects	YES	YES	NO	NO
Firm Fixed Effects	NO	NO	YES	YES
Industry Dummies	YES	YES	NO	NO
Year Dummies	YES	YES	YES	YES
Only Earning Management is Instrumented	YES	YES	NO	NO
Observations	6,163	6,324	6,163	6,324
Number of CEOs/Firms	1,403	1,430	922	941

Panel C: IV Regressions First Stage and Tests

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Perf.-Adj. Modified Jones Model	Perf.-Adj. Modified Jones Model* Tenure	Perf.-Adj. Modified Jones Model* Tenure Squared	Operating Accruals	Operating Accruals*Tenure	Operating Accruals*Tenure Squared	Tenure	Tenure Squared
Operating Volatility	3.187*** (0.000)	13.492*** (0.000)	61.559*** (0.000)	6.526*** (0.000)	23.438*** (0.000)	94.767*** (0.000)	-2.312 (0.742)	-8.592 (0.895)
Operating Volatility*Tenure IV	6.918*** (0.000)	20.216*** (0.000)	41.664** (0.038)	16.704*** (0.000)	47.434*** (0.000)	106.230*** (0.000)	16.315 (0.110)	129.026 (0.172)
Operating Volatility*Tenure Squared IV	-0.765*** (0.000)	-1.856*** (0.000)	-1.063 (0.712)	-1.971*** (0.000)	-5.048*** (0.000)	-7.340*** (0.003)	-2.680* (0.068)	-21.105 (0.120)
Special Items	-0.053*** (0.000)	-0.183*** (0.005)	-1.033** (0.024)	-0.103*** (0.000)	-0.398*** (0.000)	-2.077*** (0.000)	0.221 (0.343)	1.078 (0.617)
Special Items*Tenure IV	-0.007 (0.732)	-0.287*** (0.001)	-2.061*** (0.001)	-0.040** (0.026)	-0.410*** (0.000)	-3.116*** (0.000)	-0.031 (0.918)	0.832 (0.769)
Special Items*Tenure Squared IV	0.001 (0.501)	0.022** (0.013)	0.138** (0.026)	0.004* (0.055)	0.030*** (0.000)	0.214*** (0.000)	-0.027 (0.392)	-0.317 (0.278)
Tenure IV	-0.001 (0.394)	0.046*** (0.000)	0.035 (0.206)	-0.003*** (0.001)	0.031*** (0.000)	0.057** (0.015)	1.069*** (0.000)	0.624*** (0.000)
Tenure Squared IV	0.000 (0.184)	0.000 (0.967)	0.041*** (0.000)	0.000*** (0.003)	-0.000 (0.695)	0.024*** (0.000)	0.001 (0.675)	1.005*** (0.000)
Control Variables	YES	YES	YES	YES	YES	YES	YES	YES
Firm Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	6,208	6,208	6,208	6,370	6,370	6,370	6,370	6,370
Number of Firms	923	923	923	942	942	942	942	942
First Stage Tests:								
R-squared of OLS Regressions including only Instruments								
R-squared	0.157	0.193	0.212	0.080	0.175	0.237	0.651	0.645
Adj. R-squared	0.156	0.192	0.211	0.0790	0.174	0.236	0.651	0.645
F-test of Excluded Instruments								
F-test	27.71	136.06	246.14	169.13	180.03	187.62	4745.25	6173.34
P-value	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 4
CEO Compensation, Earnings Management and Tenure – CEOs with Contracts versus CEOs without Contracts

This Table reports multivariate analyses for the relationship between CEO compensation and earnings management over the CEO's tenure for CEOs with an explicit employment agreement (CEOs with Contracts) and CEOs that have been appointed without a contract (CEOs without Contracts). The table reports instrumental variables regressions in columns from (1) to (4) and panel regressions with CEO fixed in columns (5) and (6). In each regression, the dependent variable is the logarithm of total compensation (Total Compensation). The table shows results using two different measures of earnings management as independent variables: (a) Performance-adjusted Modified Jones Model calculated including year dummies in the model in columns (1), (3), (5) and (6) and Operating Accruals calculated using the firm's cash-flow statement in columns (2) and (4). As instruments for earning management, we use both Special items, extraordinary items, restructuring charges and Operating Earnings Volatility (Hazarika et al (2012)). As instrument for tenure and tenure squared we use the deviation of the tenure and tenure squared variables around their means for each job match spell (Altonji and Shakotko (1987)). All the variables of earnings management are unsigned. All regressions exclude the year in which the CEO was appointed. Variable definitions are found in the Appendix. Variables are winsorized at the 1% level. All regressions include the constant term, but the coefficient is not reported. P-values are in parentheses. * indicates significance at 1% (**), 5% (**), 10% (*).

	(1)	(2)	(3)	(4)	(5)	(6)
	Instrumental Variables Regressions				Panel OLS Regressions with CEO Fixed Effects	
	CEOs with Contracts		CEOs without Contracts		CEOs with Contracts	CEOs without Contracts
Perf.-Adj. Modified Jones Model	0.921 (0.920)		31.705*** (0.005)		0.716 (0.417)	2.101*** (0.003)
Perf.-Adj. Modified Jones Model *Tenure	0.122 (0.978)		-12.903** (0.011)		-0.212 (0.600)	-0.787*** (0.009)
Perf.-Adj. Modified Jones Model *Tenure Squared	-0.060 (0.907)		1.237** (0.017)		0.015 (0.748)	0.059** (0.035)
Operating Accruals		30.213 (0.171)		41.502** (0.046)		
Operating Accruals* Tenure		-14.506 (0.182)		-16.162* (0.061)		
Operating Accruals* Tenure Squared		1.616 (0.194)		1.444* (0.070)		
Tenure	-0.002 (0.991)	0.516 (0.183)	0.546** (0.012)	0.502* (0.059)	-0.115*** (0.000)	0.103*** (0.000)
Tenure Squared	0.003 (0.890)	-0.055 (0.199)	-0.052** (0.018)	-0.043* (0.068)	-0.001 (0.777)	-0.002 (0.348)
Firm Size	0.685 (0.120)	0.565 (0.251)	0.746** (0.041)	1.280*** (0.005)	0.682 (0.358)	0.537 (0.667)
Firm Size Squared	-0.007 (0.489)	-0.004 (0.728)	-0.009 (0.294)	-0.024** (0.034)	-0.008 (0.682)	-0.004 (0.889)
Market-to-Book Ratio t-1	0.001 (0.158)	0.000 (0.778)	0.002* (0.069)	0.000 (0.877)	0.001 (0.332)	0.001*** (0.002)
Past Returns	-1.960*** (0.002)	-3.255** (0.015)	-2.171*** (0.002)	-1.405** (0.015)	-1.782** (0.027)	-1.233 (0.151)
Past Returns t-1	1.162* (0.089)	0.057 (0.956)	-0.604 (0.333)	-0.542 (0.425)	1.465** (0.029)	0.269 (0.695)
Return on Assets	0.391** (0.039)	0.306 (0.107)	0.878*** (0.000)	0.668*** (0.001)	0.476*** (0.001)	0.511*** (0.005)
Return on Assets t-1	0.181 (0.307)	0.622* (0.093)	0.255 (0.242)	0.742** (0.050)	0.139 (0.412)	-0.175 (0.226)
Stock Returns Volatility	1.111* (0.073)	0.917 (0.132)	0.588 (0.113)	-0.284 (0.573)	0.892 (0.202)	0.709** (0.038)
CEO Fixed Effects	NO	NO	NO	NO	YES	YES
Firm Fixed Effects	YES	YES	YES	YES	NO	NO
Industry Dummies	NO	NO	NO	NO	YES	YES
Year Dummies	YES	YES	YES	YES	YES	YES
Robust Standard Errors	NO	NO	NO	NO	YES	YES
Cluster	NO	NO	NO	NO	CEO	CEO
Observations	1,853	1,875	4,310	4,449	1,922	4,488
Adj. R-squared					0.165	0.167
Number of CEOs/Firms	394	397	697	718	492	960

Table 5**CEO Compensation, Earnings Management and Tenure – Insiders CEOs with and without Contracts**

This Table reports multivariate analyses for the relationship between CEO compensation and earnings management over the CEO's tenure for insider CEOs with an explicit employment agreement (Insider CEOs with Contracts) and insider CEOs that have been appointed without a contract (Insider CEOs without Contracts). An insider CEO is a CEO that has spent at least 5 years in the firm before being appointed. The table reports instrumental variables regressions in columns from (1) to (4) and panel regressions with CEO fixed in columns (5) and (6). In each regression, the dependent variable is the logarithm of total compensation (Total Compensation). The table shows results using two different measures of earnings management as independent variables: (a) Performance-adjusted Modified Jones Model calculated including year dummies in the model in columns (1), (3), (5) and (6) and Operating Accruals calculated using the firm's cash-flow statement in columns (2) and (4). As instruments for earning management, we use both Special items, extraordinary items, restructuring charges and Operating Earnings Volatility (Hazarika et al (2012)). As instrument for tenure and tenure squared we use the deviation of the tenure and tenure squared variables around their means for each job match spell (Altonji and Shakotko (1987)). All the variables of earnings management are unsigned. All regressions exclude the year in which the CEO was appointed. Variable definitions are found in the Appendix. Variables are winsorized at the 1% level. All regressions include the constant term, but the coefficient is not reported. P-values are in parentheses. * indicates significance at 1% (**), 5% (**), 10% (*).

	(1)	(2)	(3)	(4)	(5)	(6)
	Instrumental Variables Regressions			Panel OLS Regressions with CEO Fixed Effects		
	Insiders with Contracts		Insiders without Contracts		Insiders with Contracts	Insiders without Contracts
Perf.-Adj. Modified Jones Model	23.100 (0.495)		29.192*** (0.001)		0.480 (0.778)	2.145** (0.046)
Perf.-Adj. Modified Jones Model *Tenure	-17.720 (0.492)		-11.735*** (0.004)		-0.351 (0.727)	-1.124*** (0.005)
Perf.-Adj. Modified Jones Model *Tenure Squared	2.576 (0.544)		1.042** (0.011)		-0.034 (0.733)	0.093*** (0.005)
Operating Accruals		-11.778 (0.527)		47.894* (0.087)		
Operating Accruals* Tenure		1.897 (0.804)		-18.897 (0.105)		
Operating Accruals* Tenure Squared		0.147 (0.815)		1.635 (0.121)		
Tenure	0.714 (0.460)	0.006 (0.981)	0.541*** (0.006)	0.569 (0.108)	0.089 (0.111)	0.133*** (0.000)
Tenure Squared	-0.097 (0.537)	-0.007 (0.777)	-0.051** (0.010)	-0.050 (0.109)	0.001 (0.892)	-0.004* (0.072)
Firm Size	0.323 (0.799)	-0.309 (0.715)	0.196 (0.712)	0.612 (0.352)	0.231 (0.713)	-0.499 (0.418)
Firm Size Squared	-0.002 (0.961)	0.019 (0.376)	0.002 (0.847)	-0.010 (0.541)	0.004 (0.811)	0.020 (0.187)
Market-to-Book Ratio t-1	0.000 (0.949)	0.000 (0.951)	0.001 (0.188)	-0.000 (0.924)	0.000 (0.908)	0.001*** (0.001)
Past Returns	-0.961 (0.796)	-4.301** (0.014)	-0.336 (0.671)	-0.154 (0.872)	-2.527*** (0.004)	0.048 (0.955)
Past Returns t-1	0.899 (0.644)	0.480 (0.671)	0.390 (0.611)	0.198 (0.857)	0.612 (0.430)	1.505** (0.014)
Return on Assets	0.809 (0.330)	0.841* (0.078)	0.932*** (0.003)	0.692* (0.051)	1.014** (0.011)	0.441* (0.064)
Return on Assets t-1	-0.482 (0.713)	0.101 (0.807)	0.331 (0.256)	0.859* (0.100)	0.153 (0.730)	-0.159 (0.345)
Stock Returns Volatility	0.971 (0.696)	2.731** (0.011)	0.650 (0.237)	-0.165 (0.782)	1.853** (0.038)	0.333 (0.466)
CEO Fixed Effects	NO	NO	NO	NO	YES	YES
Firm Fixed Effects	YES	YES	YES	YES	NO	NO
Industry Dummies	NO	NO	NO	NO	YES	YES
Year Dummies	YES	YES	YES	YES	YES	YES
Robust Standard Errors Cluster	NO	NO	NO	NO	YES	YES
Cluster	NO	NO	NO	NO	CEO	CEO
Observations	536	536	1,993	2,041	549	2,042
Adj. R-squared					0.291	0.212
Number of CEOs/Firms	124	124	379	388	131	442

Table 6**CEO Compensation, Earnings Management, Tenure, and CEO's age**

This Table reports multivariate analyses for the relationship between CEO compensation and earnings management over the CEO's tenure for young CEOs (Young CEOs) and old CEOs (Old CEOs). A CEO is defined as young if she was no older than 59 years when appointed and old if she was more than 59 years old when appointed as CEO. The table reports instrumental variables regressions in columns from (1) to (4) and panel regressions with CEO fixed in columns (5) and (6). In each regression, the dependent variable is the logarithm of total compensation (Total Compensation). The table shows results using two different measures of earnings management as independent variables: (a) Performance-adjusted Modified Jones Model calculated including year dummies in the model in columns (1), (3), (5) and (6) and Operating Accruals calculated using the firm's cash-flow statement in columns (2) and (4). As instruments for earning management, we use both Special items, extraordinary items, restructuring charges and Operating Earnings Volatility (Hazarika et al (2012)). As instrument for tenure and tenure squared we use the deviation of the tenure and tenure squared variables around their means for each job match spell (Altonji and Shakotko (1987)). All the variables of earnings management are unsigned. All regressions exclude the year in which the CEO was appointed. Variable definitions are found in the Appendix. Variables are winsorized at the 1% level. All regressions include the constant term, but the coefficient is not reported. P-values are in parentheses. * indicates significance at 1% (**), 5% (**), 10% (*).

	(1)	(2)	(3)	(4)	(5)	(6)
	Instrumental Variables Regressions				Panel OLS Regressions with CEO Fixed Effects	
	Old CEOs		Young CEOs		Old CEOs	Young CEOs
Perf.-Adj. Modified Jones Model	8.957 (0.231)		31.517 (0.102)		1.841* (0.091)	1.508** (0.036)
Perf.-Adj. Modified Jones Model *Tenure	-3.767 (0.295)		-14.456* (0.073)		-0.646 (0.139)	-0.565* (0.074)
Perf.-Adj. Modified Jones Model *Tenure Squared	0.391 (0.311)		1.522* (0.052)		0.059 (0.142)	0.042 (0.156)
Operating Accruals		28.994 (0.202)		24.679** (0.023)		
Operating Accruals* Tenure		-12.684 (0.268)		-12.072** (0.011)		
Operating Accruals* Tenure Squared		1.359 (0.305)		1.468*** (0.006)		
Tenure	0.064 (0.535)	0.438 (0.308)	0.473* (0.078)	0.570** (0.011)	-0.093*** (0.002)	-0.040 (0.351)
Tenure Squared	-0.007 (0.489)	-0.047 (0.341)	-0.047* (0.059)	-0.069*** (0.006)	0.001 (0.673)	-0.002 (0.320)
Firm Size	0.116 (0.748)	0.589 (0.336)	1.263*** (0.003)	1.021** (0.012)	-0.374 (0.437)	1.081 (0.395)
Firm Size Squared	0.004 (0.606)	-0.007 (0.620)	-0.024** (0.021)	-0.016 (0.104)	0.018 (0.124)	-0.018 (0.571)
Market-to-Book Ratio t-1	0.001 (0.359)	0.001 (0.584)	0.001* (0.089)	0.002*** (0.006)	0.002 (0.159)	0.001 (0.102)
Past Returns	0.219 (0.683)	-0.095 (0.919)	-2.930*** (0.002)	-2.906*** (0.000)	-0.780 (0.368)	-1.597* (0.056)
Past Returns t-1	0.840* (0.089)	0.260 (0.779)	-0.690 (0.477)	-0.761 (0.348)	0.143 (0.816)	0.872 (0.205)
Return on Assets	0.264* (0.052)	0.291 (0.129)	0.930*** (0.000)	1.243*** (0.000)	0.262** (0.037)	0.613*** (0.000)
Return on Assets t-1	0.414** (0.031)	0.260 (0.281)	0.561 (0.141)	0.298 (0.157)	-0.216 (0.246)	0.016 (0.914)
Stock Returns Volatility	0.246 (0.552)	-0.622 (0.523)	0.306 (0.532)	0.754* (0.081)	0.033 (0.947)	0.790* (0.067)
CEO Fixed Effects	NO	NO	NO	NO	YES	YES
Firm Fixed Effects	YES	YES	YES	YES	NO	NO
Industry Dummies	NO	NO	NO	NO	YES	YES
Year Dummies	YES	YES	YES	YES	YES	YES
Robust Standard Errors Cluster	NO	NO	NO	NO	YES	YES
	NO	NO	NO	NO	CEO	CEO
Observations	2,063	2,011	4,261	4,152	2,093	4,317
Adj. R-squared					0.213	0.142
Number of CEOs/Firms	565	553	861	840	718	1,174