The Impact of CEO Career Concerns on Accruals Based and Real Earnings Management *

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December 2009

Abstract

We investigate the role of implicit career concerns based incentives over accruals and real activities earnings management. Our study is motivated by the disconnect between the extant literature's emphasis on explicit contracting based incentives over earnings management and the results of a recent survey by Graham, Harvey and Rajgopal (2005) that documents that most executives consider upward mobility in the labor market to be more important than short-run current compensation benefits in influencing their earnings management decisions. With respect to accruals, we develop a model of earnings management that is rooted in career concerns by extending the seminal work of Holmstrom (1982, 1999) to incorporate features of the accrual accounting performance measurement system. As a consequence of the reversing nature of accruals, our model leads to the surprising prediction (i.e., relative to Holmstrom (1982, 1999) and other career concerns models) that, in the absence of explicit compensation contracts, managers who maximize lifetime compensation in a perfectly competitive labor market would have little incentive to engage in income-increasing accruals manipulation in the early stages of their careers. By contrast, managers in the later stages of their careers are "trapped" into managing earnings upward in order to influence their post-retirement labor market value even though the market correctly foresees this type of "signal jamming" and does not ultimately overpay them. With respect to real earnings management, we hypothesize that younger managers are less likely to engage in sub-optimal, potentially value-destroying real activities because these are likely to have greater adverse career consequences for younger managers who are both at an earlier stage in their careers as well as less entrenched in their current positions. Controlling for the factors known to affect earnings management, our empirical results support the hypotheses that younger managers engage in less accruals-based and real earnings management. For a subsample of firms that are presumed to be under heightened pressure to manage earnings, we find that younger managers choose the "lesser of two evils" by managing accruals rather than undertaking real activities that have direct adverse (i.e., value-destroying) consequences. Our findings are both statistically and economically significant and are robust across alternative proxies for career stage and controls for direct compensation- and ownership-based incentives for earnings management.

JEL Classification: M40, M41.
Keywords: earnings management; career concerns; discretionary accruals; real activities management.

*We thank Ana Albuquerque, Bill Baber, Ken Euske, Jennifer Francis, Joe San Miguel, DJ Nanda, Marco Trombetta, Moqi Xu, Neng Wang, as well as participants of the 6th Accounting Research Workshop in Bern and the AAA meetings in NYC for helpful comments on an earlier version of this paper.

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1 Introduction

Earnings management is a topic of enormous interest to academics, practitioners, regulators, and the financial press.[1] Executives seem to face intense incentives to manage earnings, either in the form of accruals manipulations or by undertaking (or avoiding) real activities to attain an earnings benchmark. Most of the extant academic literature links these incentives for earnings management, directly or indirectly, to explicit debt or compensation contracts.[2] While these explicit contracting-based incentives undoubtedly play an important role in driving earnings management behavior, the empirical literature has been almost silent on the effects of implicit contracts and implicit incentives over earnings management.[3] This disregard for implicit incentives is surprising given that a recent survey by Graham, Harvey and Rajgopal (2005) documents that more than three quarters of responding executives consider upward mobility in the labor market (i.e., an implicit career concerns based incentive) to be more important than short-run current compensation benefits in influencing their earnings management decisions. It is this disconnect between the explicit contracting type of incentives underlying most prior academic studies and practitioners' own representations of the implicit incentives influencing their behavior that leads us to investigate the role of executive career concerns in the determination of corporate earnings management activities.

We investigate both accruals-channeled and real-activity-based earnings management. With respect to accruals, we start by developing a theoretical model to motivate our subsequent empirical tests. Our earnings management model extends the seminal career concerns work of Holmstrom (1982, 1999) to incorporate features of the accrual accounting performance measurement system. The model consists of three distinct periods, when the manager is *young* (or early career stage), *mature*, and *retired* from the executive suite but available for board

[1] Some examples of non-academic sources of attention include Levitt (1998, 2003), the Washington Post (2006), and the Wall Street Journal (2007), amongst many others.

[2] Contracting-based motives for earnings management that have been examined include executive current cash bonus maximization (Healy 1985), the avoidance of debt covenant violations (Defond and Jiambalvo 1994), more favorable equity pricing (Teoh, Welch and Wong 1998a and 1998b), political cost considerations (Key 1997), and executive equity compensation (Cheng and Warfield 2005).

[3] One exception is the study by Bowen, DuCharme and Shores (1995). These authors consider the impact of various stakeholders' implicit claims, notably excluding managerial career concerns, on accounting *method* choices (i.e., not accruals management *per se*). We discuss this related study at greater length in Section 2.

service.[4] We predict that, in the absence of explicit compensation contracts, managers who maximize lifetime compensation in a perfectly competitive labor market would have little incentive to engage in income-increasing accruals manipulation during the early stages of their careers and would face significant pressure to manage earnings upward in the mature period.[5] The model generates a "signal jamming" equilibrium (Stein (1989)) that is characterized by efficient markets and inefficient managers; in the established stage of her career, the executive engages in income-increasing earnings management in order to influence post-retirement (i.e., board service) labor market value. Although the market correctly foresees this opportunistic behavior on the part of the manager and does not over-compensate her in the post-retirement period, the manager is nevertheless "trapped" into managing earnings in this way since any failure to do so will be punished by the market.

We empirically test the primary hypothesis generated by our theoretical model, which is that younger managers will engage in less income-increasing accruals manipulation than their older counterparts. Consistent with these theoretical predictions, we find that more established CEOs undertake more income-increasing accruals than do younger CEOs. Our results are robust across alternative age-based proxies for career stage, and to controlling for other known determinants of discretionary accruals, including numerous proxies for explicit compensation- and stock-ownership-based wealth incentives.

We also empirically investigate the role of implicit career based incentives on *real activity* earnings management. In efficient markets, managers undertaking value-destroying real activities are disciplined through job loss either by direct removal by the firm's board of directors or through eventual dismissal when the sub-optimally managed firm is taken over (see, e.g., Jensen and Ruback (1983) and Jensen (1986)). We therefore hypothesize that younger managers, who are likely to be less entrenched in their positions and thus at greater threat of

[4]Throughout the text, we treat age and career stage as synonymous. Thus, we use the terms "mature," "older" and "more established," and respectively, "younger" and "earlier career stage," interchangeably.

[5]The intuition for this result is that the executive receives only a fraction of the benefit of the managed accruals in the early stage of her career because some portion of the superior performance is attributed to noise or luck, whereas she is punished fully in the later years when the accruals reverse. By contrast, at least some portion of the accruals that are managed by the older executive will reverse after she has retired, and hence the benefits of accruals manipulation exceed the costs of earnings management for mature executives up to a certain optimal level.

removal, will have lower propensities to undertake real activities earnings management than their older counterparts. Our empirical results are consistent with this hypothesis. We find that younger managers undertake less real activity earnings management across two dimensions of real activities suggested by Roychowdhury (2006); abnormal production costs and abnormal discretionary expenses. Overall, our empirical results are consistent with the notion that implicit (i.e., non-contractual) career concerns impact executives' earnings management behavior incremental to explicit incentives and other controls for earnings management.

We extend our empirical analyses along two further dimensions. First, we explore and refute an alternative "ratchet effect" explanation for our primary empirical findings. Second, we investigate the behavior of younger executives who are faced with substantial incentives to manage earnings. For a sub-sample of firms that are close to missing analyst estimates, we find that younger managers seem to choose the "lesser of two evils" by managing accruals rather than undertaking real, potentially value-destroying actions to meet the earnings threshold. Specifically, we find that younger CEOs do not exhibit different propensities than their older counterparts with respect to accruals management when their firms are close to missing an earnings benchmark. By contrast, the younger executives do engage in less real activities management than older CEOs who are within similar proximity to missing analyst expectations.

Overall, our study contributes to the literature by documenting the importance of non-contracting-based, implicit incentives for earnings management that are based upon executives' career concerns. As far as we are aware, this is the first study to investigate the role of career concerns in the context of accruals and real activities earnings management. We provide both theoretical and empirical support for the notion that younger executives have stronger disincentives to engage in income-increasing accruals based and real activities earnings management relative to their more established counterparts. Our findings of differential earnings management propensities for young versus established CEOs are robust across alternative proxies for career stage, as well as to numerous controls for direct CEO compensation-related incentives and other factors previously documented to influence earnings management behavior.

The remainder of the paper is organized as follows. Section 2 reviews the literature, develops a theoretical model, and generates our hypotheses. Section 3 describes our sample selection and data. Section 4 presents the empirical tests and Section 5 concludes.

2 Literature Review, Model Development, and Hypotheses

2.1 Career Concerns: Extant Theoretical Models and Empirical Evidence

Career concerns arise whenever the labor market first uses the manager's current output to update its belief about the manager's ability, and then bases the manager's future wages upon these updated beliefs. Fama (1980) first discusses career concerns and proposes that explicit incentive contracts are not necessary to motivate managers since a manager can be disciplined through career concern based implicit incentives; better output links to better future managerial pay, while poor performance lowers the future labor market value of the manager. Holmstrom (1982, 1999) formally addresses the issue of implicit incentives in the early versus late stages of a manager's career. The Holmstrom (1982, 1999) model suggests that career concerns are greater for younger versus older managers; in the absence of contracts, managers work too hard in the early years of their careers (while the market is still assessing the manager's type) in order to influence the market's beliefs about their ability, and not hard enough in later years. Although in equilibrium the market is not fooled regarding the manager's type, the manager is nevertheless compelled to exert more effort in the early years of her career in order to avoid being negatively assessed.[6]

An extensive empirical literature examines various career concern predictions following from Holmstrom's career concerns model. For example, Gibbons and Murphy (1992) document that older CEOs' cash compensation is more sensitive to their firms' stock market performance, consistent with older executives being more motivated by explicit rather than implicit incentives in the years preceding retirement. Elsaid et al (2008) find that abnormal returns to CEO succession announcements are negatively related to the percentage of performance-based

[6]This notion of efficient markets with inefficient managers is referred to as "signal jamming" (see, e.g., Stein (1989)).

pay awarded to the newly hired (and presumed earlier career stage) CEOs, consistent with the notion that it is more efficient for earlier career stage CEOs to be paid in human capital increases from the managerial labor market rather than to have their current pay tied closely to performance. Brickley et al (1999) document that implicit performance incentives remain present even during the later years of executives' careers, as evidenced by pre-retirement accounting and stock market performance being important determinants of whether executives serve on their own or other boards after retirement. Applying the career concerns model in a non-executive context, Chevalier and Ellison (1999) document that younger mutual fund managers face different implicit incentives relative to older managers since they are more likely to be fired for poor performance and for taking bold actions. Hong et al (2000) similarly document that, because of career concerns, younger stock analysts are much more likely to herd in their earnings forecasts.

More tightly linked to our setting, and a motivating factor for our study, is the descriptive evidence on career concern motivations for earnings management presented by Graham et al (2005). The authors survey more than 400 CFOs and document that over three quarters of the respondents report that upward mobility in the labor market matters more than short-run compensation in driving the desire to hit earnings benchmarks. Graham et al (2005) provide evidence of an important disconnect in the earnings management literature in relation to executive compensation incentives for earnings management; while the survey evidence strongly suggests that *implicit* career concern incentives play the most important role in motivating earnings management, the existing earnings management literature typically links earnings management incentives to *explicit* contracts such as contemporaneous cash bonuses.

One exception that we are aware of is a study by Bowen et al (1995) related to firm stakeholders' implicit claims on the firm's accounting method choice. The authors empirically document that variables intended to proxy for the extent to which a firm depends upon the implicit claims of its customers, suppliers, employees, and short-term creditors are significant in explaining cross-sectional variation in inventory and depreciation methods. Bowen et al (1995) thus provide evidence of the potential importance of implicit claims on the firm's reported

earnings, however the authors do not specifically examine either CEO career concerns as an implicit motivation for earnings management nor do they examine the impact of implicit claims on discretionary accruals or real activity choices as we do in the current study.

2.2 A Model of Earnings Management Based Upon Career Concerns

2.2.1 Model Setup and Assumptions

We develop a model of accruals channeled earnings management based upon managerial career concerns by building on the seminal work of Holmstrom (1982, 1999). To illustrate the effects of career concerns we adopt the simplest possible three-period setting, where the manager is *young*, *established*, and *retired* in each of the three respective periods. In periods 1 and 2, the executive is responsible for managing the firm, while in period 3 the manager serves as a board member during retirement. The labor market is assumed to be competitive, and the manager is paid, at the beginning of each period, the expected output that she will deliver in the current period given her history of outputs.[7]

Let η denote the manager's productivity, which, as in Holmstrom (1982, 1999), is not observable. For simplicity, assume that managerial productivity remains constant over time, and let the prior for the manager's productivity be given by

$$\eta \sim \mathcal{N}(m_0, 1/h_0) \tag{1}$$

where h_0 is the precision of the prior, the inverse of its variance.

Let x_t denote the reported outputs (i.e., x_1 and x_2 are the earnings reported by the manager when she is *young* and *established* respectively, while x_3 is the value added from the manager's post-retirement board service). During periods $t = 1, 2$ the manager may manipulate accruals intertemporally. The period 1 reported earnings are therefore given by

$$x_1 = \eta + \alpha_1 + \epsilon_1, \tag{2}$$

[7] As in other career concerns models, we do not consider optimal dynamic contracting, a significantly more difficult problem.

where α_1 is the earnings management through accruals manipulation in period 1 and ϵ_1 is the shock, which is uncorrelated with the manager's productivity η. Shocks in each period are assumed to be normally distributed with precision h_ϵ, such that

$$\epsilon_t \sim \mathcal{N}(0, 1/h_\epsilon). \tag{3}$$

We assume that η, ϵ_1, ϵ_2 and ϵ_3 are jointly independent.

In period 1, when the manager is *young*, it is apparent that she can "impress" the labor market in the short term by boosting earnings via accruals manipulation. However, the amount of earnings manipulation in period 1 must be fully reversed in period 2.[8] Furthermore, earnings manipulation is costly to the manager.[9] Let $c(\alpha)$ denote the cost function of earnings manipulation with the standard properties of $c'(\alpha) > 0$, $c''(\alpha) > 0$, and $c'(0) = 0$.

In period 2, when the manager is at the *established* stage of her career, the period 1 earnings manipulations are reversed and the manager has the option to engage in a second round of earnings manipulation. Let α_2 denote the amount of "new" earnings manipulation in period 2. Reported output in period 2 is given by

$$x_2 = \eta + \alpha_2 - \alpha_1 + \epsilon_2, \tag{4}$$

where ϵ_2 is a normally distributed shock uncorrelated with managerial productivity η. Note that the net earnings manipulation in period 2 is given by $\alpha_2 - \alpha_1$. The second period's accruals manipulations are also fully reversing in the subsequent period, after the manager is retired. Because the period 2 manipulations will reverse only when the firm is under new management, however, the retired manager will bear no "direct" consequences from her period 2 earnings manipulation. Therefore, the only mitigating force for our manager not to engage

[8] This assumption states that earnings cannot be indefinitely managed upward via accruals without triggering a forced earnings restatement or fraud investigation, both of which are assumed to be associated with extreme penalties to the manager. In other words, the manager needs to balance the books via accruals reversals "eventually." Since the manager only works for two periods in our model, full reversal in period 2 of the period 1 earnings manipulation is the natural assumption.

[9] Liang (2004) discusses these costs at greater length. In general, the costs include the potential impacts on managerial reputation as well as the intrinsic personal dislike of "lying."

in excess manipulation in period 2 is the convex cost of manipulating earnings. Note that this simplifying assumption can be relaxed. The key assumption is that the reversal costs of manipulating earnings decrease when the manager is in her mature career stage.

Lastly, the retirement period 3 output, x_3, is given by

$$x_3 = \eta + \epsilon_3, \tag{5}$$

where ϵ_3 is a normally distributed shock uncorrelated with managerial productivity η.

2.2.2 Solving the Executive's Optimization Problem

Let w_t denote the executive's wage in period t. The executive's optimization problem is to maximize the discounted present value of her lifetime compensation, net of the cost of earnings management, as follows:

$$\mathbb{E}\left[w_1 - c(\alpha_1) + \beta(w_2 - c(\alpha_2)) + \beta^2 w_3\right], \tag{6}$$

where $0 < \beta < 1$ is the executive's subjective discount rate.

Given the competitive labor market conditions assumed above, we have:

$$w_2(x_1) = \mathbb{E}(x_2|x_1), \tag{7}$$

$$w_3(x_1, x_2) = \mathbb{E}(x_3|x_1, x_2). \tag{8}$$

Substituting (5) into (8) yields:

$$w_3(x_1, x_2) = \mathbb{E}(\eta|x_1, x_2). \tag{9}$$

Let $\overline{\alpha}_1$ and $\overline{\alpha}_2$ denote the labor market's conjectures of α_1 and α_2, respectively. z_1 and z_2 represent the market's conjectures of unmanaged earnings, defined as:

$$z_1 \equiv x_1 - \overline{\alpha}_1 = \eta + \epsilon_1 \tag{10}$$

$$z_2 \equiv x_2 - \overline{\alpha}_2 + \overline{\alpha}_1 = \eta + \epsilon_2. \tag{11}$$

We apply the standard belief updating formula to obtain the conditional distribution of η given z_1 and z_2 as follows:

$$\eta|(z_1, z_2) \sim \mathcal{N}\left(m_0 + \frac{h_\epsilon}{h_0 + 2h_\epsilon}(z_1 + z_2 - 2m_0), \frac{1}{h_0 + 2h_\epsilon}\right). \tag{12}$$

Thus, the market begins with prior m_0, and adjusts its beliefs about η based upon the information conveyed by z_1 and z_2. Similar to the insights in Holmstrom (1982, 1999), the market correctly anticipates the level of earnings management (i.e., "effort" in the Holmstrom models) in equilibrium. Therefore, z_1 and z_2 are known in equilibrium given the observed outputs in periods 1 and 2, x_1 and x_2, respectively.

The period-3 wage w_3 is given by:

$$w_3(x_1, x_2) = \mathbb{E}(\eta|x_1, x_2) = m_0 + \frac{h_\epsilon}{h_0 + 2h_\epsilon}(x_1 + x_2 - \overline{\alpha}_2 - 2m_0). \tag{13}$$

Similarly, the period-2 wage w_2 is given by

$$w_2(x_1) = \mathbb{E}(\eta|x_1) + \alpha_2^* - \alpha_1 = \frac{h_0 m_0 + h_\epsilon(x_1 - \overline{\alpha}_1)}{h_0 + h_\epsilon} + \alpha_2^* - \alpha_1. \tag{14}$$

Solving the first order conditions for period 2, we choose α_2 to maximize (6) using (13) and obtain:

$$\frac{\partial U}{\partial \alpha_2} = -\beta c'(\alpha_2) + \beta^2 \frac{h_\epsilon}{h_0 + 2h_\epsilon} = 0. \tag{15}$$

This gives a closed-form solution for α_2.

The first order condition for the choice of α_1 is:

$$\frac{\partial U}{\partial \alpha_1} = -c'(\alpha_1) + \beta\left(\frac{h_\epsilon}{h_0 + h_\epsilon} - 1\right) < 0. \tag{16}$$

Note that the solution suggests that there is no benefit to earnings manipulation in period 1. This result is due to the combined effects of the full reversal of the period 1 accruals in period

2, together with the cost of manipulation, all adjusted for discounting.

We therefore have the result that the manager engages in no manipulation in period 1 when she is young (i.e., $\alpha_1^* = 0$), but that she does engage in income-increasing earnings manipulation in period 2 (i.e., $\alpha_2^* > 0$) when she is established.

2.2.3 Discussion of the Model

A number of key observations from our model merit being pointed out. The first two issues derive from assumptions that are fundamental to career concerns models in general rather than being specific to our particular accruals management setting. First, career concerns models assume that both the market and the manager are equally informed about managerial ability in all periods. All participants learn about the manager's type in the same way, and there is no information asymmetry. In other words, these are not adverse selection models. The manager does try to influence the market's inference about her type, and consequently a moral hazard issue will arise. In equilibrium, however, no one is fooled.

Second, recall that the wages paid to the executive are assumed to be determined at the *beginning* of each period based upon *expected* output. As a consequence of this feature, the model effectively assumes away the role of *explicit* compensation contracts, where the latter entail compensation being paid at the *end* of the period based upon *realized* output. Accordingly, all of the model's predictions derive solely from *implicit* incentives and *implicit* contracts. This point is fundamental to our study, and should clarify the notion that career concerns models are fundamentally different from a manager's horizon problem. As the most authoritative studies on the subject make clear, the "horizon problem" is inextricably linked to *explicit* contracts and incentives.[10] By contrast, such explicit incentives are totally absent from

[10]For example, Smith and Watts (1982, p. 146) first describe the horizon problem in relation to bonus compensation as follows, "Bonus plans can affect the real investment and financing decisions of the firm. For example, because they are typically tied to annual profits, bonus plans give managers incentives to turn down positive NPV projects with long pay back and to take negative value projects that impose expenses only after the manager retires." Similarly, Dechow and Sloan (1991) empirically investigate the horizon problem by testing the hypothesis that *earnings-based performance measures* provide executives with incentives to focus on short-term performance. In terms of its academic study, the "horizon problem" also tends to be linked to opportunistic behavior in altering optimal *real* activity (such as cutting R&D), rather than being associated with accruals manipulation. One exception is the recent study of Kalyta (2009), who finds evidence consistent with his hypothesis that CEOs whose pensions are based upon pre-retirement firm performance are more likely to manage earnings upwards using discretionary accruals.

our model; the incentives in our model are entirely *implicit*. Alternatively stated, a manager with a horizons problem is apt to state that he "could care less about the future" (because he will have left the firm and the labor force), whereas a manager with career concerns has the opposite mentality; he cares very much about the future and his career prospects.

The final commentary to be made on our model relates to the economic intuition behind its predictions, which are particular to our setting. Specifically, our career concerns model's predictions are being driven by the closed-ended, reversing nature of the accrual accounting system. The intuition is that, for each dollar of accruals-based earnings management in the first period, the impact on the executive's second period wage is $\frac{h_\epsilon}{h_0+h_\epsilon}$, which is less than one dollar. In other words, there is a "leakage" that the executive does not capture as a result of the noise in the system such that younger managers only receive a fraction of the benefit of the first period's discretionary accruals in their second period wage because some of the accruals-induced above-expectations performance is attributed to noise or luck. By contrast, the manager's second period wage is penalized on a dollar-for-dollar basis (i.e., for the full amount) of the first period's accruals reversal. Hence, in the formal model the manager's utility is maximized by taking zero income-increasing discretionary accruals in the first period, when she is young. For the established executive, however, income-increasing accruals do not reverse during her tenure and the market fully expects the mature executive to choose the optimal level of discretionary accruals (i.e., subject to a cost-benefit analysis) so as to influence her post-retirement board service compensation. Consistent with other career concerns models, in equilibrium the market is not fooled about the manager's choice of discretionary accruals (or, equivalently, the choice of "effort" in Holmstrom (1982, 1999) and others). Rather, the market correctly conjectures the amount of earnings management in period 2 and appropriately adjusts downward the third period wage such that the executive is not overpaid. The manager is nevertheless trapped into introducing income-increasing accruals in the second period since any failure to do so will drive the market valuation against her. This equilibrium deviates from the first-best solution in the sense that introducing discretionary accruals into earnings involves a cost to the manager (that is captured by the convex cost function in the model),

but without a corresponding increase in market valuation (i.e., this corresponds to the "signal jamming" result of Stein (1989)).[11]

2.2.4 Career Concerns and Accruals Management Hypothesis

The theoretical model developed in the previous section involves an executive who is either *young* or *established* during her active (i.e., pre-retirement) career, and accruals that reverse entirely in the period subsequent to when they were initially taken. Although this is clearly a simplified representation of the executive setting, the model's empirical prediction is robust to relaxing the condition related to the accruals reversals. The key assumption is that accruals manipulations undertaken in the earlier career stage are more likely to reverse during the executive's tenure than the accruals that she manages at the later stages of her career. Following the model's predictions, but recognizing that the practical world involves additional incentives that are not explicitly specified in our necessarily simplified formal representation,[12] we test the following empirical hypothesis:

H1: Ceteris paribus, younger managers use less income-increasing discretionary accruals than their older counterparts.

2.3 Career Concerns and Real Activities Earnings Management

2.3.1 The Extant Literature on Real Activities Management

In contrast to accrual earnings management, which occurs when management manipulates reported earnings by exploiting the discretion allowed under GAAP, real activities management involves managers taking actions to adjust the timing and/or scale of the firm's underlying business activities. Thus, a key distinction between accruals-based and real activities earnings

[11] In a related context, but addressing a different research question and using a different model set-up, Stein (1989) demonstrates that a manager concerned about "short-run" stock prices will behave myopically in order to boost current earnings so as to mislead the market. In equilibrium, the market is not fooled by this signal jamming but managers are nevertheless "trapped" to behave myopically, similar to the Nash equilibrium in the classical prisoner's dilemma.

[12] For example, explicit bonus contracts and/or capital markets consequences of reporting earnings that fall below expectations may motivate managers to do some accrual earnings management even in the earlier stages of their careers. Accordingly, our empirical prediction is that younger managers will use *less*, but not necessarily *zero*, income-increasing discretionary accruals, on average.

management is that the latter has direct cash flow consequences and accordingly it is generally perceived to be more costly for shareholders.

Most of the early empirical research related to real activities management considers the opportunistic reduction of R&D spending in order to achieve earnings targets (e.g., Baber et al (1991), Dechow and Sloan (1991), Bushee (1998), and Bens et al (2002)).[13] Other empirical studies related to real operational activities management investigate firms' opportunistic propensities to dip into LIFO layers (Dhaliwal et al (1994)), cut sales prices (Jackson and Wilcox (2000)), or sell long-term assets and marketable securities (Bartov (1993), Black et al (1998), Hermann et al (2003), and Gunny (2005)) to meet earnings benchmarks.[14] Roychowdhury (2006) extends this literature by focusing on three significant operational activities through which earnings can be managed, including: 1) acceleration of sales through limited time price discounts or more favorable credit terms (e.g., zero-interest financing); 2) excessive production to reduce cost of goods sold by inventorying part of the overhead; and 3) decreases of discretionary expenses.[15]

2.3.2 Career Concerns and Real Activities Management Hypothesis

The undertaking of opportunistic real activities may provide managers with private gains (e.g., by way of continued employment, and thus salary and bonus income, perks consumption, fame, power, and/or influence), however these gains are derived at the expense of shareholders if the real activity behavior is suboptimal in the sense of being value-destroying to the firm in the longer run. In well-functioning markets, such managerial value-destroying rent extractions, if carried too far, may lead to executive job loss. The disciplining role of the markets in

[13] In a related theoretical study, Baber (1985) models the relation between managerial discretionary spending and explicit budget-based compensation. He shows that if a lump-sum bonus is paid for meeting budgets, then managers prefer more discretionary expenditures when budgets are tight. Baber (1985) does not consider implicit career stage incentives, but rather models the explicit bonus-based compensation incentives over discretionary expenses that are expected to yield an uncertain future payoff.

[14] See Xu et al (2007) for an extensive review of the real earnings management literature.

[15] Real financing activities have also been documented to be a means used to achieve earnings-related reporting objectives. Such financing-type transactions include debt-equity swaps (Hand (1989)) and in-substance defeasance transactions (Hand et al (1990)), debt structurings (Marquardt and Weidman (2005)), share buybacks (Bens et al (2003), Hribar et al (2006)), and stock-for-stock mergers that enable firms to use the earnings-advantageous pooling of interests method (Ayers et al (2002)). Large financing transactions are often only undertaken with the approval of the board of directors and hence are not investigated in the context of our CEO career stage hypotheses.

this context may take one of several forms, including CEO removal by the board of directors or CEO firing subsequent to a merger or acquisition of the firm. We argue that, although the market for corporate control disciplines managers regardless of their age or tenure, the disciplining forces are stronger in countering real activities management by younger managers relative to established executives.

Our argument proceeds as follows. First, more established managers have, on average, held their jobs longer than younger managers. Accordingly, established managers tend to be more entrenched and have stronger ties to their boards. Thus, it is less likely that boards remove the older CEOs from their posts. Consistent with this, Dikolli, Mayew and Nanda (2009) document that the performance-turnover relation is decreasing in CEO tenure, while Chevalier and Ellison (1999) provide evidence that younger fund managers are more likely to be fired for poor performance. Furthermore, following from the classic career concerns model, younger managers have more to lose as a result of dismissal due to the combined effect of the labor market's greater uncertainty regarding their quality type and the longer working horizon that the younger managers have before them.

As a consequence of the greater ease of removal from office and the greater costs associated with job loss, younger, less established managers have stronger incentives to avoid value-destroying real activity earnings management that leads to dismissal. Thus we hypothesize:

H2: Ceteris paribus, younger managers tend to use less real activity earnings management than their older counterparts.

In their study of real earnings management in the context of career horizon concerns, Dechow and Sloan (1991) document that CEOs reduce discretionary expenditures, such as R&D and advertising, in their last years in office in order to boost earnings and maximize cash bonuses. While their results are consistent with $H2$, their hypothesized reason for this finding is quite different. While Dechow and Sloan (1991) conjecture that the documented cuts in discretionary expenditures derive from the *explicit* incentives of compensation contracts, we investigate whether real activities management is undertaken in response to *implicit* incentives.[16] Our empirical tests, discussed further below, are designed to identify the incremental

[16]Inconsistent with Dechow and Sloan (1991)'s interpretation of the evidence, Murphy and Zimmerman

effects of implicit incentives due to age (our empirical proxy for career stage) over the explicit incentives of pay-for-performance compensation documented to be relevant for earnings management by Dechow and Sloan (1991) and other prior studies.

2.4 Early Career Stage Earnings Management Trade-Offs

It has been well documented that there are strong capital markets pressures for managers to meet earnings benchmarks, particularly in the U.S. (Burgstahler and Dichev (1997); Degeorge, Patel, and Zeckhauser (1999); Skinner and Sloan (2002), amongst many others) and that the capital markets reward firms for meeting analysts' earnings forecasts (Bartov, Givoly, and Hayn (2002); Kasnik and McNichols (2002); among others). Accordingly, we expect that even younger executives manage earnings under extreme circumstances; for example, when their firm is close to missing analysts' consensus earnings forecasts.[17] Relative to accruals management, real earnings management involves actions that are potentially long-term value destroying. We therefore expect that, in circumstances where earnings pressures seem to be most intense, younger managers who have longer-term career concerns are less likely to undertake real activities earnings management than to manage accruals to meet earnings benchmarks. Thus we investigate younger managers' propensities to manage accruals and real activities, respectively, relative to their older counterparts in such high earnings pressure situations.[18] Formally, we hypothesize the following:

(1993) find little support for the notion that discretionary expenses are cut for bonus maximizing purposes after controling for both firm performance and endogenous CEO turnover. Furthermore, Gibbons and Murphy (1992) and Smith and Watts (1992) provide evidence that the potential short horizon problems associated with cash bonus maximization are limited because equity-based incentives as well as deferred compensation can be used to mitigate the agency problems of retiring managers.

[17]Reporting a loss or earnings that are less than the prior year's same quarter earnings per share are also considered to be important earnings benchmarks that may induce earnings management, however the evidence suggests that meeting (or beating) analysts' estimates is the single most compelling earnings target (Brown and Caylor (2005)) and accordingly we focus on this benchmark in our primary career concerns based earnings management tests.

[18]Durtschi and Easton (2005) suggest that the discontinuity in analyst forecast errors around zero does not provide ipso facto evidence of earnings management. If one were to believe their interpretation of the data, then this would imply that some of the firms that we and prior researchers consider to be earnings management "suspects" may not actually have greater propensities to manage earnings. Similarly, Payne and Thomas (2003) claim that ex post I/B/E/S adjustments for stock splits may lead some firms to appear as having just beat analyst estimates, whereas at the time of reporting the forecast error was greater than a penny. Any such misclassifications of firms that were not more likely to have managed earnings into our "suspects" sample works against our finding evidence of differential behavior within the suspected set of firms.

H3A: When their firm is close to missing an earnings target, younger managers, like their more established peers, feel pressured to manage accruals in order to meet the analysts' benchmark.

H3B: When their firm is close to missing an earnings target, younger managers are less likely than their more established peers to undertake real earnings activities in order to meet the analysts' benchmark.

Taken together, evidence in support of both Hypotheses 3A and 3B is consistent with the notion that younger managers choose the "lesser of two evils" (i.e., accruals over real activities management) when pressured by the capital and/or labor markets to manage earnings to meet analyst benchmarks.

3 Sample Selection and Data Description

3.1 Data Sources and Sample Selection Process

The sample selection is summarized in Table 1. Data are derived from public sources. We obtain financial statement data from Compustat and stock market metrics from the CRSP database. For a subset of our tests, we rely upon analyst forecast estimates derived from I/B/E/S. Data related to executives' compensation, age, tenure with their firm, and stock and option holdings are derived from the ExecuComp database. We restrict our sample to CEOs rather than other, lower level executives (e.g., CFOs) for several reasons. First, although the CFO is presumably actively involved in the firm's accounting and financial reporting (and thus in the determination of abnormal accruals), the CEO has the ultimate authority over the firm's management (including, e.g., decisions regarding real activities) as well as its financial reporting. Second, focusing on any other single executive position such as the CFO substantially reduces the sample size due to the more restricted ExecuComp coverage of non-CEO executives' income, ownership, and age data. Finally, focusing on CEOs enables us to relate our findings to an extensive prior literature related to these executives.

We begin our sample selection with the intersection of the ExecuComp database with the Compustat annual industrial and research files for the period of 1992 (the inception of Execu-

Comp data) through 2006. We exclude financial firms and REITs (SIC codes 6000-6999) and all firm-year observations for which sales or total assets are negative. In order to be included in the sample, we require each firm-year observation to have at least eight Compustat observations available from the same 2-digit SIC industry-year so that we can estimate the earnings accrual and real activities management models described below. Excluding observations missing data required to estimate the modified Jones accrual model and/or the abnormal expense models (discussed below) leaves 18,247 firm-year observations (2,148 unique firms, 4,196 unique CEOs), which is the primary sample.

3.2 Descriptive Statistics

Panel A of Table 2 provides descriptive statistics for the sample firms used in our hypotheses tests. Detailed definitions of these variables are provided in the Appendix. Untabulated results reveal that our sample contains firms that are, on average, larger (in terms of sales, market capitalization, and total assets), than the mean firm from the CRSP-Compustat universe. In this respect, our study suffers the same large firm bias that is known to affect all research that is subject to the ExecuComp data availability constraint. Relative to the non-financial firm CRSP-Compustat universe, sample firms are significantly more leveraged, but have approximately the same book-to-market ratios. Virtually all are audited by one of the Big-5 auditors. Mean and median CEO age is 56 years; their bonuses account for approximately 22% of compensation, on average, and option and stock holdings represent a small fraction of the shares outstanding. *Implicit claim*, NOA_{t-1}, *Litigation*, and the *SOX dummy* variable, all of which are defined in detail in the Appendix, are factors that prior studies have documented to be associated with earnings management behavior. We therefore include these variables as controls in our multivariate tests.

3.3 The Estimation of Discretionary Accruals

We use the entire Compustat universe to estimate discretionary accruals for each of our firm-year observations. For each 2-digit SIC industry-year with at least 8 observations, we model

total accruals using the cross-sectional modified Jones model (Dechow et al (1995)) as follows:

$$TA_{j,t} = \alpha_1(1/A_{j,t-1}) + \alpha_2(\Delta REV_{j,t} - \Delta REC_{j,t}) + \alpha_3 PPE_{j,t} + \epsilon_{j,t} \quad (17)$$

where $TA_{j,t} = EBX_{j,t} - CFO_{j,t}$, with EBX being earnings before extraordinary items and discontinued operations (Compustat data123) and CFO being the operating cash flow from continuing operations (Compustat data308 minus data124). $A_{j,t-1}$ is the prior period's total assets (Compustat data6), and each of $TA_{j,t}$ (total accruals), $\Delta REV_{j,t}$ (change in sales, Compustat data12), $\Delta REC_{j,t}$ (change in net receivables, Compustat data2) and $PPE_{j,t}$ (gross PP&E, Compustat data7) are all scaled by this lagged total assets measure.

Estimation of equation (17) produces industry-year specific coefficients that in turn yield fitted values and residuals for each firm-year observation included in our sample. Following the extensive prior literature, we interpret the fitted values from these regressions to be normal accruals and the residuals to be the discretionary accruals metrics that will be used in the formal hypothesis tests. As reported in Table 2B, these procedures yield mean (median) discretionary accruals of 0.016 (0.001), and there is a considerable amount of cross-sectional variation in this variable. Estimated discretionary accruals for the firms in our sample are broadly comparable to those of prior studies such as Cheng and Warfield (2005) and Cohen, Dey and Lys (2008).

3.3.1 Alternative Measures of Discretionary Accruals

We alternatively estimate discretionary accruals using the modified Jones model applied to the Fama-French (1997) industry classifications instead of those based upon 2-digit SIC codes and, separately, the performance-matching technique proposed by Kothari, Leone and Wasley (2005). In untabulated results, we find that all of the hypothesis test results reported below are robust to either of these two alternative measures of discretionary accruals, and often the results are slightly stronger.[19]

[19] Detailed results are available from the authors upon request.

3.4 The Estimation of Real Activities Management

Roychowdhury (2006) uses three empirical measures to detect real activities manipulation, one each corresponding to the three real activities subject to management discussed above. The empirical measures consist of abnormal cash flows from operations, abnormal production costs, and abnormal discretionary expenses. If a firm is engaging in all three forms of real activities management, the effect on cash flows from operations is ambiguous (Roychowdhury 2006, p. 340-341). In light of this, and especially given the primacy of earnings in CEO performance evaluation, compensation, and retention decisions, we focus on the two real activities measures developed by Roychowdhury (2006) that are most directly tied to earnings, abnormal production costs and abnormal discretionary expenses, and that have unambiguous performance measurement implications. Price discounts, more favorable credit terms, and overproduction all induce abnormally high production costs relative to sales. Following from Hypothesis 2, we therefore expect that abnormal production costs bear a positive association with managerial age. Cutting discretionary expenses such as R&D and advertising leads to abnormally *low* discretionary expenses, and therefore Hypothesis 2 leads us to expect that younger managers will be associated with higher abnormal discretionary expenses.

Following the methodology developed by Roychowdhury (2006), we estimate the following two cross-sectional regressions for each industry-year:

$$\frac{Prod_{j,t}}{A_{j,t-1}} = \beta_1 \frac{1}{A_{j,t-1}} + \beta_2 \frac{Sales_{j,t}}{A_{j,t-1}} + \beta_3 \frac{\Delta Sales_{j,t}}{A_{j,t-1}} + \beta_4 \frac{\Delta Sales_{j,t-1}}{A_{j,t-1}} + \epsilon_{j,t} \tag{18}$$

where $Prod_{j,t}$ = COGS (Compustat data41) + ΔINV (Compustat data3), $Sales_{j,t}$ (Compustat data12) is the current year's sales, $\Delta Sales_{j,t}$ is the current year's change in sales, $\Delta Sales_{j,t-1}$ is last year's change in sales, and $A_{j,t-1}$ is the lagged value of total assets, and

$$\frac{DisExp_{j,t}}{A_{j,t-1}} = \gamma_1 \frac{1}{A_{j,t-1}} + \gamma_2 \frac{Sales_{j,t-1}}{A_{j,t-1}} + \epsilon_{j,t} \tag{19}$$

where $DisExp_{j,t}$ is the sum of advertising expense (Compustat data45), R&D (Compustat data46) and SG&A (Compustat data189), and the other variables are as previously defined.

The coefficients derived from industry-year estimations of (18) and (19) produce fitted values for each firm-year which correspond to normal production costs and normal discretionary expenses, respectively, and the residuals from each of these two models provide measures of abnormal production costs and abnormal discretionary expenses, respectively. Summary statistics for each of these measures are presented in Table 2B. As shown, the mean abnormal production costs and average abnormal discretionary expenses are approximately 7% of total assets, which are broadly comparable to the estimates reported by Cohen et al (2008).[20]

3.5 Estimation of Explicit Earnings Management Incentives

Although explicit incentives do not play a role in our theoretical model, multivariate empirical tests of the career stage hypothesis must necessarily control for CEOs' explicit earnings management incentives in order to avoid a possible correlated omitted variables bias. As no single generally accepted empirical proxy for this construct exists, we estimate multiple specifications that include alternative "state-of-the-art" measures for the CEOs' explicit wealth- and compensation-based earnings management incentives. The general predictions from theory and prior empirical literature are that higher levels of cash bonus (or performance-based-pay otherwise determined) lead to higher levels of earnings management as managers have incentives to push the envelope in order to meet performance thresholds. By contrast, CEO stock and option ownership lead to longer-term managerial perspectives and thus are predicted to be associated with lower levels of short-term-oriented earnings management.

Our first measure of an explicit compensation-based incentive for earnings management is captured by the percentage of CEO pay derived from cash bonus compensation (see, Cheng and Warfield (2005), amongst many other studies that have adopted a similar measure). As a second alternative, we use the CEO's compensation-earnings coefficient suggested by Bushman, Engel, and Smith (2006). We measure separately the CEO's wealth-based incentives. First, we use, respectively, the CEOs' percentage ownership of the company via equity and option holdings (Cheng and Warfield (2005) and Cohen et al (2008)). Second, we use the composite

[20]Roychowdhury (2006) does not report descriptive statistics for estimates of abnormal discretionary expenses and production costs.

wealth-based incentive measure proposed by Bergstresser and Philippon (2006) to capture in a single variable the combined stock- and options-based CEO incentives over earnings. Estimations of the Bushman et al (2006) and Bergresser and Philippon (2006) measures are each described below.

3.5.1 Pay-Earnings Sensitivity Measure

We develop a measure of the CEO's pay-earnings sensitivity by adopting the regression-based compensation-earnings coefficient ("CEC") metric suggested by Bushman, Engel and Smith (2006, equation 3), which is as follows:

$$COMP_t = \alpha + CEC * \Delta EARN_t + CRC * RET_t + \varepsilon_t \tag{20}$$

where $COMP_t$ is the percentage change in the CEO's cash compensation in year t; $\Delta EARN_t$ is the change in earnings before extraordinary items and discontinued operations between year t and year $t-1$, deflated by the total assets at the beginning of year t; RET_t is the firm's cumulative stock market return over the 12-month period of the firm's fiscal year t; CEC is the compensation-earnings coefficient; and CRC is the compensation returns coefficient. We estimate the regression represented by equation (20) on a firm-specific basis, and we adopt the estimated CECs as measures of the CEOs' explicit earnings-based incentives over earnings management activities, which we refer to as the pay-earnings sensitivity parameter. We require greater than ten observations per firm in order to estimate the CEC.[21] Descriptive statistics

[21] Although Bushman et al (2006) require 20 observations per firm in order to compute their CEC estimates, they use compensation data gathered from the Forbes annual survey and thus have a much longer potential time series to work with than that which is available to us from the ExecuComp database. Furthermore, as Bushman et al (2006) recognize, the timeseries specification imposes assumptions related to the stationarity of the relationship between pay and performance that are more likely to be violated as the length of the timeseries is extended. Our research design choice maximizes the number of observations available for the second stage test regressions of interest in our study and imposes lighter stationarity assumptions on the CEC estimates, but at the potential expense of greater measurement error being embedded in the CEC estimates. Because the pay-sensitivity estimates are merely control rather than test variables in our second stage regressions of interest, and also recognizing that we have alternative proxies for the same construct, we are willing to accept this trade-off. To eliminate the effects of any extreme outliers, we winsorize the top and bottom 1% of the CEC estimates. As a further specification check, we again follow Bushman et al (2006) and alternatively measure the CEC at the two-digit industry level, requiring a minimum of 20 observations per industry, and including year fixed effects in the regressions. All of the results from the second stage analyses related to our age-based test variables of interest as reported below are robust to the inclusion of this alternative industry-based pay-sensitivity measure.

related to the estimated firm-specific pay-earnings sensitivity coefficients to be used as control variables in our subsequent tests are provided in Table 2A. The mean and median of our estimates are broadly similar, albeit slightly larger, than those reported by Bushman et al (2006), the distribution of our estimates is somewhat wider, and we have approximately the same percentage of negative-valued estimates as the prior authors (i.e., 22% for our sample as compared to their 20%).

3.5.2 Composite Equity-Based Incentives Measure

Bergstresser and Philippon (2006) provide a composite measure of the CEOs' equity-based wealth incentives, calculated as the dollar change in the value of a CEO's stock and options holdings that correspond to a one percent increase in the company's stock price, normalized by the CEO's total compensation. Specifically,

$$ONEPCT_{i,t} = 0.01 * PRICE_{i,t} * (SHARES_{i,t} + OPTIONS_{i,t}) \tag{21}$$

and

$$IncentiveRatio_{i,t} = ONEPCT_{i,t}/(ONEPCT_{i,t} + SALARY_{i,t} + BONUS_{i,t}). \tag{22}$$

where SHARES is the number of shares owned by the CEO and OPTIONS is the number of options held by the CEO. The *IncentiveRatio* variable thus captures the share of the CEO's total compensation coming from a one percentage point increase in the value of the equity of her company. Descriptive statistics for the estimated *IncentiveRatio* variable are provided in Table 2A and are broadly consistent with those reported by Bergstresser and Philippon (2006).

Pairwise correlations between accruals and real activities earnings management variables, together with CEO age, executive ownership and other explicit earnings management wealth- and compensation-based incentive variables, as well as other factors known to influence earnings management to be included as control variables in our multivariate regressions, are pre-

sented in Table 3. As shown, although CEO age (i.e., a proxy for career stage) is most often statistically significantly correlated with the explicit earnings management incentive variables defined above, the correlations between age and these contract-oriented incentives are not of economically interesting magnitudes. The preliminary results therefore suggest that the empirical proxies that capture implicit career-stage incentives are quite distinct from those related to explicit pay- and wealth-based incentives.

4 Hypotheses Testing

4.1 Univariate Relations

In Table 4 we present descriptive statistics for our sample firm-year observations stratified into two groups, labeled "young" and "established" CEOs, respectively, where "established" executives are operationally defined to be those CEOs who are more than 55 years of age in the sample year. The univariate statistics provide preliminary support for our first hypothesis that younger managers use less discretionary accruals, on average, than their more established peers ($p=0.007$). Consistent with our second hypothesis, on a univariate basis we find that younger managers have lower mean levels of abnormal production costs ($p<0.0001$) and higher mean levels of abnormal discretionary expenses ($p<0.0001$). Overall, the univariate evidence provides preliminary support for our hypotheses that younger managers will engage in less real and accruals earnings management than more established CEOs.

The univariate relations also suggest that younger versus more established executives self-select into managerial positions with firms that have somewhat different characteristics. Younger CEOs are associated with significantly smaller firms, whether size is measured in terms of total assets, market capitalization, or sales. In addition, the firms of established CEOs are slightly more leveraged, have higher book-to-market ratios, higher return-on-assets, and lower betas. We control for all of these firm characteristics in our multivariate regressions in order to isolate the effect of executive career stage on earnings management choices.

4.2 Multivariate Analyses: Model Specification

In order to control for correlated variables that have been omitted from the univariate analyses, our formal hypotheses tests are based upon multivariate regressions of the three alternative measures of earnings management on two alternative proxies for career stage, together with a set of variables designed to control for firm characteristics, as well as explicit contracting-based and other earnings management incentives.

Our first empirical proxy for career stage is the CEO's age, measured as a continuous variable. We also consider that there may be a non-linear relation between earnings management and career stage, and thus we develop a second age-based proxy for career stage by setting an indicator variable equal to one for CEOs whose age is less than 56, the median age for the sample, and zero otherwise.

The control variables that we consider are those suggested by Cheng and Warfield (2005), and Cohen, et al (2008). Cheng and Warfield investigate the link between equity incentives and accruals-channeled earnings management. Cohen, et al (2008) examine how each of accruals and real activity earnings management varies from the pre- to post-Sarbanes-Oxley ("SOX") period. They treat the Cheng and Warfield (2005) equity interest variables as control variables in their regressions, as we do in our tests. Given the results of Cohen, et al (2008), we also include an indicator variable for the post-SOX period as a control variable in our regressions.

We estimate the following regression of earnings management activities on the control variables suggested by the prior literature, controls for the CEO's explicit earnings-based pay and equity incentives, and each of our two alternative age-based proxies for career stage:

$$\begin{aligned} EM\_Proxy_{i,t} &= \gamma_0 + \beta CareerStage_{i,t} + \gamma_1 CompensationIncentive_{i,t} \\ &+\gamma_2 EquityIncentive_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Leverage_{i,t} + \gamma_5 Risk_{i,t} + \gamma_6 Growth_{i,t} \\ &+\gamma_7 NOA_{i,t-1} + \gamma_8 Litigation_{i,t} + \gamma_9 ImplicitClaim_{i,t} + \gamma_{10} Big5\_Auditor_{i,t} \\ &+\gamma_{11} \Delta GDP + \gamma_{12} Time + \gamma_{13} SOX + \epsilon_{i,t} \end{aligned} \tag{23}$$

where $EM\_Proxy_{i,t}$ represents the dependent variable, $DA_{i,t}$, $Abnormal\_Prod\_Costs_{i,t}$, and

$Abnormal\_Disc\_Exps_{i,t}$ each in turn. $CareerStage_{i,t}$ is defined alternatively as either the executive's age or a "young" indicator variable set equal to one if the executive's age is less than the median age of CEOs in our sample, which is 56 years, and zero otherwise. $CompensationIncentive_{i,t}$ is defined alternatively as either the percentage of the CEO's total pay that is comprised of cash bonus compensation ($Bonus\%$) or the Bushman et al (2006) compensation-earnings coefficient (*pay-earnings sensitivity*) previously described in Section 3.5.1. Our empirical measures for the equity incentive construct include the stand alone composite measure due to Bergstresser and Philippon (2006), $IncentiveRatio_{i,t}$ as described in section 3.5.2, or alternatively the contemporaneous inclusion of three separate measures capturing the percentage of the firm's common equity represented by the CEO's stock holdings ($Owner\%$), exercisable options ($Ex\_Option\%$), and unexercisable options ($Un\_Option\%$), respectively. The proxies for $Size$, $Risk$ and $Growth$ are market capitalization, beta, and book-to-market, respectively, and SOX is an indicator variable for the Sarbanes-Oxley era that is set equal to one for fiscal periods ending after 2002. The remaining control variables are those suggested by the prior literature, detailed definitions of which are provided in the Appendix.[22]

4.3 Multivariate Analyses: Empirical Results

4.3.1 Career Concerns and Earnings Management Via Accruals

In Table 5 we present the results from regressions of equation (23) using discretionary accruals as the dependent variable. We present regressions using each of our two alternative age-based proxies for career stage, the test variable of interest, as well as each of two alternative controls for compensation- and equity-based incentives, respectively. Thus we display eight regression

[22]In untabulated results, we also separately include the number of restricted shares held by the CEO as a percentage of the firm's total shares outstanding and a variable measuring the CEO's tenure in the top post, measured as the difference between the observation year and the year that the CEO became the CEO of his/her current firm. The coefficients on our *age* and *young* indicator test variables retain their signs, magnitudes, and significance levels across all of the regression permutations. The restricted stock variable is never significant. The tenure variable is only significant in one of the abnormal discretionary expense regressions, suggesting that our age proxy best captures the notion of career stage in our setting. Tabulated results are available upon request.

permutations.[23]

As shown in Table 5, both of the age variables are significant in each of the eight specifications. The positive coefficient on *age*, the continuous measure, indicates that older CEOs are associated with higher levels of discretionary accruals, consistent with Hypothesis 1. The negative coefficient on the age indicator variable, which is set equal to one for CEOs that are younger than the sample median of 56, is also consistent with the H1 prediction that younger CEOs undertake less accruals earnings management than their more established counterparts. In the first four regressions, the percentage of compensation earned in the form of cash bonuses is positively and (at least weakly) significantly associated with accruals management, consistent with a long prior literature dating back to Healy (1985). With *Bonus*% in the regression, none of the stock or option ownership variables are significant. When we control for earnings-based compensation incentives using the *pay-earnings sensitivity* coefficient, neither this variable nor any of the ownership variables is significant. Notably, the magnitudes and significance of the coefficents on the age variables of interest are stable across all of the regression specifications. Overall, our findings suggest that career stage is a significant determinant of CEOs' propensities to manage accruals, even after controlling for more direct CEO compensation and equity incentives as well as other known determinants of earnings management. Our results are consistent with the hypothesis generated from the earnings management model based upon career concerns that more established executives tend to engage in higher levels of discretionary accruals.

4.3.2 Career Concerns and Real Activities Management

Table 6 presents the results of regressions of our real activities earnings management variables on the same career stage, compensation- and equity-based incentives, and other control variables considered in the previous section. In Panel A the dependent variable is abnormal production costs. Abnormal production costs arise because firms have overproduced relative

[23]We require data availability for each of the dependent and independent variables in the Bushman et al (2006) compensation regressions (i.e., our equation (20)) for more than ten fiscal years for each firm in order to estimate the firm-specific compensation earnings coefficients. This data requirement results in the the loss of almost half of our sample, which explains the reduced sample size reported for regression specifications that include this variable.

to the current period's sales levels, with the result that some of the production costs incurred this period will be inventoried. Thus, higher abnormal production costs are presumed to result from a real activity that has been managed to increase the current period's income. Hence, under Hypothesis 2 we predict a positive association between CEO maturity and abnormal production costs. The results in Table 6A are consistent with this; real earnings management activities in the form of increased abnormal production costs are an increasing function of executive maturity, as evidenced by the positive coefficient on the *age* variable across all specifications. We find similarly strong support for Hypothesis 2 when we use the alternative indicator variable for *young* executives as our proxy for career stage, as evidenced by the significant negative coefficient in each of the specifications that includes the young indicator variable in Panel A of Table 6. Unlike in the abnormal accruals regressions, we find that $Bonus\%$ is insignificant when it is included with the decomposed proxy for equity-based incentives, while each of the ownership variables is significant with the predicted sign. $Bonus\%$ regains significance when equity-based incentives are measured using the composite $IncentiveRatio$ variable, and the composite variable itself is also significant. The negative coefficients on the ownership and $Incentive_ratio$ variables are consistent with the notion that, conditional on age and bonus pay being in the model, higher levels of equity-based incentives lead executives to take more of a long-term view with respect to the management of the firm's real activities.

When compensation-based earnings management incentives are captured by using the *pay-earnings sensitivity* measure as in Models 5 through 8 in Table 6A, this incentive pay variable is significant and its coefficient takes the expected sign across all specifications. All of the equity-based incentive measures are also significant across the last four specifications, with the exception of $Owner\%$. Once again the magnitudes of the coefficients on the age variables of interest are stable across the various alternative combinations of controls for performance pay and ownership incentives, although the significance levels naturally decline somewhat as our sample size is reduced for the estimations of Models 5 through 8. Taken together, the evidence suggests that executives respond significantly to both explicit equity- and compensation-based incentives, as well as to implicit career stage incentives, when arriving at real activities man-

agement decisions in the context of abnormal production costs.

Panel B reports the results from regressions that use abnormal discretionary expenses as the dependent variable. Discretionary spending on R&D or marketing, e.g., is expected to be reduced by more mature CEOs in order to maximize the current period's reported income. Alternatively stated, younger executives are expected to incur higher levels of discretionary expenses as they continue to invest in the firm's intellectual capital (e.g., patents, process improvements, name brands, etc.) so as to maximize the firm's long-term value. Hence, under Hypothesis 2 we predict a negative relationship between CEO maturity and discretionary expenses. The findings reported in Table 6B are consistent with these expections across all eight alternative specifications; the coefficient on *age* is negative and significant whereas that on the young indicator variable is consistently positive and significant.

Bonus% is marginally significant only when the decomposed equity-based incentives are included in the regression, but not in the presence of the *IncentiveRatio*, while the *pay-earnings sensitivity* variable is insignificant in each of the discretionary expense regression specifications. The composite *IncentiveRatio* variable is statistically significant and carries the expected sign across all specifications, consistent with executives responding to this comprehensive measure of equity-based incentives when making real discretionary expense decisions. By contrast, the *Owner*% is never significant, although the options-related variables are significant with the expected sign in three out of four cases.

Overall, we find strong support for Hypothesis 2 that more established CEOs engage in more real activities earnings management, and our findings are robust to using two different age-based proxies for career stage, to controlling for two alternative measures each for explicit compensation-based incentives and equity-based incentives for earnings manipulation using state-of-the-art methods, and across two different types of real activities management.

4.3.3 Earnings Management Trade-Offs of Younger Executives

Hypothesis 3 proposes that younger executives tend to manage accruals rather than real activities in circumstances where the pressures to undertake some form of earnings management

are sufficiently intense. In order to identify a subset of firms where these pressures are likely to be binding, we follow Roychowdhury (2006) and develop a "suspects" sample of earnings management candidate firms which includes firm-year observations having analyst forecast errors in the range of zero to one-cent per share.[24] Consistent with Roychowdhury (2006), we use the mean of all analysts' final forecasts that were outstanding prior to the earnings announcement date to define our analyst consensus forecast measure. In untabulated specification checks, we find that using the median final analyst forecast as the consensus leads to higher levels of significance on all of our earnings management test variables.

Table 7 reports the results from regressions using 2,618 firm-year observations that qualify as "suspects" for analyst earnings target induced earnings management as defined above. The results shown in the first two columns indicate no significant difference in accruals earnings management activities for younger versus older managers in cases where pressures for meeting or beating analyst expectations are presumed to be intense. This finding contrasts with the results presented above for the unconstrained general sample of firms, wherein we find that younger managers undertake less discretionary accruals than older executives. For the case of real earnings management, the significant coefficients on the age variables in the regressions reported in the last four columns of Table 7 indicate that older managers undertake more real activities management than younger managers in circumstances of suspected heightened earnings performance pressures.[25] In untabulated results, we find that specifications using the Bergstresser and Philippon (2006) composite measure of equity incentives are entirely consistent with those reported in Table 7. We conclude from these results that, under circumstances in which younger executives are presumed to face intense pressures to manage earnings to meet

[24]We acknowledge the possibility that, similar to prior researchers, we may have a noisy identification of "suspect" firms. This ultimately works against our finding differential behavior for this group relative to the unconstrained sample underlying our primary tests. As further support for our research design choice, however, we note that Keung, Lin and Shih (2009) provide evidence that is consistent with the notion that earnings that are just above analyst estimates are more likely to have been managed. They show that the earnings response coefficients ("ERCs") for earnings surprises that are in the range of zero to one cent are significantly lower than for earnings surprises in adjacent ranges, suggesting that the market considers these earnings to be of lower quality. The authors also conclude that investors are right to be skeptical about earnings in the zero to one-cent range based upon the relation between these earnings and future earnings, and they further show that analysts react negatively to earnings surprises within this range.

[25]Although the coefficient on the continuous age variable is marginally insignificant in the abnormal discretionary expenses regression, it is fully significant ($p < .01$) in tests that rely on the median rather than the mean analyst forecast in characterizing the consensus-based forecast error.

analyst earnings forecasts, they tend to chose the "lesser of two evils" by managing accruals rather than undertaking real activities that may involve longer-term value destruction.

4.3.4 Alternative Explanations

The results reported in the previous sections, in addition to being supportive of our career stage based hypotheses for earnings management, may also be broadly consistent with a "ratchet effect" explanation for earnings management. Milgrom and Roberts (2002) define the ratchet effect as "the tendency for performance standards to increase after a period of good performance" (p. 233). Applied to our setting, concerns over ratcheting potentially induce younger managers to avoid income-increasing accruals in order to decrease the chances of missing next year's ratcheted up earnings target.

In order to differentiate between our hypothesized career concerns explanation and the alternative ratchet effect explanation, we investigate differential earnings management behavior of younger versus more established executives in a setting that is most conducive to the ratchet effect; a sample of firms that just beat the prior year's reported earnings. Specifically, we consider ratchet effect candidates to be firms with current year's earnings per share within one cent of the prior year's earnings per share.[26] Using the sample of ratcheting candidates, we estimate regressions of equation (23) using each of our three alternative earnings management dependent variables. In untabulated results we find that neither the continuous *age* nor the *young indicator* proxy for career stage are significant in any of the earnings management regressions.[27] Given that the ratchet effect does not appear to be differentially present for more established CEOs in the year-over-year small earnings change setting that is most descriptive of a ratchet effect scenario, we conclude that the ratchet effect is unlikely to be driving our career stage results in either of the unconstrained or earnings-management-to-beat-analyst-estimates settings considered in our main tests.

[26] Using one cent per share as our threshold generates a sample of 117 observations. We alternatively consider ratcheting candidates to be those firms whose current year's earnings per share are within two and three cents per share, resulting in increased samples sizes of 214 and 319 observations, respectively. The results are unchanged when we broaden the definition to expand the sample in this way.

[27] There is an almost even split of *young* and *established* CEOs in the ratchet candidate sample, suggesting that lack of cross-sectional variation on this variable is not the reason for the insignificant results.

Another alternative explanation for our findings is that, rather than being motivated by career concerns and accruals reversals as our model would suggest, younger CEOs are simply less savvy; they engage in less earnings management because they are less aware of the opportunities and benefits of doing so. Although we cannot empirically distinguish between this alternative and the career concerns explanation that we propose for our results, we consider the alternative to be unlikely. The descriptive statistics for the executives in our sample suggest that the CEOs have a substantial number of years of experience, presumably in increasingly important managerial positions before arriving to the top post. Thus, it seems to us unlikely that these talented and successful executives who become CEOs of the largest 1500 publicly-traded US firms are unaware of the earnings management "games" (see, e.g., Levitt (1998)), and thus the potential "benefits" to be derived therefrom, that have been the focus of considerable discussion and debate in academic research, MBA classrooms, and the financial press throughout the period surrounding our study.

5 Conclusion

This study explores the role of CEO career concerns on earnings management activities. Prior literature relating earnings management to executive incentives considers primarily explicit contracting (e.g., bonus compensation), CEO wealth (e.g., CEO stock and options holdings), or capital markets consequences that are indirectly tied to contracts (e.g., takeover risk) as motivations for earnings manipulations. In contrast, recent survey evidence suggests that career prospects are the most important determinant of earnings management decisions (Graham et al (2005)). We extend the literature by investigating the role of one important form of implicit contract, executive career concerns, in earnings management decisions.

Our application and modification of the classic Holmstrom (1982, 1999) career concerns model to fit an accrual earnings management context leads to the prediction that younger managers will have greater disincentives to undertake income-increasing accruals than their older counterparts. This result derives from the reversing nature of the accounting accruals that are embedded in an earnings-based performance measurement system. With respect to

real activity earnings management, we predict that younger managers will engage in less of such potentially value-destroying behavior as a result of their lack of establishment in the labour market and generally lower levels of job security.

Our empirical findings support the hypotheses that younger CEOs undertake lower levels of income-increasing accruals and real activities earnings management relative to older executives. When we investigate differential propensities for earnings management in circumstances that are consistent with intense pressures to meet an earnings benchmark, we find that younger executives seem to choose the "lesser of two evils" by managing accruals rather than undertaking real activities that could potentially have longer-term value-destroying results. Additional tests suggest that the ratchet effect is not a likely alternative explanation for the findings that we document.

Overall, we provide economically and statistically significant evidence to support the hypothesis that non-contractual, implicit career stage incentives are important determinants of accruals based and real activities earnings management, and our findings are robust to alternative empirical proxies for career stage and to the inclusion of explicit compensation- and equity-based incentives, as well as other variables known to be associated with earnings management.

Appendix
Variable Definitions

A.1 Firm Characteristics:

Total Assets: Compustat data6

Market cap: Market capitalization, calculated as the price per share (Compustat data199) multiplied by the number of shares outstanding (Compustat data25)

Sales: Compustat data12

Leverage: Long-term debt (Compustat data9) divided by total assets (Compustat data6)

Book-to-Market: Book value of equity (Compustat data60) divided by market capitalization

A.2 Dependent Variables:

DA: Discretionary accruals calculated using the modified Jones model described in Section 3.1

Abnormal prod costs: Abnormal production costs as defined in Section 3.2

Abnormal disc expenses: Abnormal discretionary expenses as defined in Section 3.2

A.3 Independent Test Variables:

Age The CEO's age during the year

Young indicator: 1 if the CEO's age is less than the median, 0 otherwise

A.4 Compensation- and Wealth-based Incentive Variables:

Bonus%: Bonus compensation divided by total compensation

Pay-earnings sensitivity: A firm-specific estimate of the compensation-earnings coefficient ("CEC") as defined in Equation 20 in Section 3.5.1

Ex_options%: Unexercised exercisable options divided by total outstanding shares

Un_options%: Unexercised un-exercisable options divided by total outstanding shares

Owner%: The sum of restricted stock grants this period plus the total number of shares held by the CEO at year end (excluding stock options) divided by total outstanding shares

Number of options held: Total number of unexercised options

Value of options held: Dollar value of unexercised options as reported by the company

Incentive ratio: defined by Equation (22) in Section 3.5.2

A.5 Other Control Variables:

Implicit claim: A proxy for labor intensity, equals 1 minus the ratio of gross PP&E (Compustat data7) to total assets (Compustat data6)

NOA(t-1): Prior year net operating assets = Shareholders' equity (Compustat data216) minus cash and marketable securities (Compustat data1) plus total liabilities (Compustat data181) at the end of fiscal year t-1, all scaled by sales of fiscal year t-1 (Compustat data12)

Litigation: An indicator set equal to 1 if the firm belongs to a high litigation risk industry (pharmaceutical/biotechnology, SIC codes 2833-2836, 8731-8734; computers, SIC codes 3570-3577, 7370-7374; electronics, SIC codes 3600-3674; or retail, SIC cdoes 5200-5961), and zero otherwise

Big 5 auditor: An indicator set equal to one if the firm is audited by a big-5 audit firm, and zero otherwise

Delta_GDP: The % change in the real GDP from the previous year

Beta: Value-weighted, firm-specific beta calculated from the contemporaneous year's daily returns

Time: The difference between the observation year and 1987

SOX_dummy: An indicator set equal to one for post-2002 observation years, and 0 otherwise

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