Job Security and Earnings Management *

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Abstract
In firms where CEOs are faced with a higher risk of dismissal there may be disciplinary and opportunistic effects on earnings management. The disciplinary effect gives CEOs an incentive to undertake actions to improve real performance, which reduces the need for earnings management, especially the need to overstate the firm’s performance, while CEOs with opportunistic motives may choose to exaggerate earnings information. With a large sample, we show that, on average, the disciplinary effect dominates; that is, a higher dismissal hazard is associated with fewer earnings-inflating accruals and less real earnings management; the opportunistic effect is still possible but exists only when the dismissal risk is very high; moreover, the disciplinary function of job security is important mainly when other monitoring mechanisms (e.g., boards of directors, financial analysts, and institutional investors) are weak.

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1 Introduction

For any firm, having an accurate picture of its financial information is crucial in many regards, including project planning, corporate management, and managerial evaluation. The market and investors use a firm’s financial information to make decisions about valuations and investments. Yet the managers of a firm often have incentives and some discretion to influence the reported earnings. This can significantly undermine the quality of a firm’s financial information.

In this paper, we examine the extent to which CEOs engage in earnings management when they face different levels of job termination threat. The prior research has focused on earnings management surrounding CEO turnovers, and the conclusions are mixed. Murphy and Zimmerman (1993) and Pourciau (1993) find little evidence that departing CEOs engage in a greater degree of earnings management, but more recent studies (e.g., Guan, Wright, and Leikam, 2005; Liu and Xuan, 2014) document more aggressive use of discretionary accruals prior to non-routine CEO turnovers and right before employment contract renewals. As a disciplinary mechanism, forced turnover is a severe ex-post penalty; more important, the threat of it can also effectively motivate employees, including CEOs, to exert greater effort and deter them from engaging in wrongdoing ex ante. By focusing on events where the probability of CEO turnover is high, the prior research largely overlooks this ex ante effect in the normal situation where dismissal risk is average. We hence aim to extend the study to investigate the effects of different levels of managerial job security on earnings management.

For a CEO who cares about his job status, an incremental increase in the probability of job termination warns the CEO to exert greater effort and take actions to improve the firm’s real performance. The improved performance in turn reduces the need to manipulate the accounting information. Furthermore, from a cross-sectional point of view, ceteris paribus, a CEO faces higher dismissal risk than other CEOs mostly because his firm’s evaluation and monitoring standards for CEOs are stricter. Normally, the costs of information manipulation are also high in such a firm. Earnings management is thus very likely to decrease following a moderate rise in the probability of forced CEO turnover. We call this negative relation the “disciplinary effect.” On the other hand, an “opportunistic effect” is also possible, at least in extreme situations, as some prior studies find. That is, facing a threat of immediate dismissal, a CEO must demon-
strate quick improvement, at the minimum, in the reported performance in order to postpone being terminated from his job. This compelling need for turnaround exceeds the costs of distorting the quality of information. As a result, lower job security may entice a CEO to take on income-inflating earnings management. In the end, which effect is more important requires closer examination.

To measure the continuous variation in CEO job security, we follow Jenter and Kanaan (2015) to estimate the dismissal hazard for each CEO in each year. Roughly speaking, this hazard indicates the likelihood of forced CEO turnover in the next year, assuming that the CEO is still employed. Therefore, the greater the hazard, the worse the job security. This measure has three main advantages. First, we are able to estimate it for a large sample of firms and CEOs. Because of this, our empirical evidence is more representative than those used in prior research, which has relied on smaller samples around CEO turnovers or contract renewals. Second, this measure of job security exhibits both cross-sectional and time-series variation along with varying firm and CEO characteristics. This allows us to take advantage of the panel data and control for various fixed effects. Our results are hence more immune to bias caused by omitted variables that are invariant in certain dimensions. Last but not least, this measure is continuous and spans a wide range of job security from normal to highly insecure, which enables us to investigate its two plausible effects as discussed above.

We follow the prior literature and measure earnings management using discretionary accruals. Accruals represent the discrepancy between reported accounting cash flows and actual cash flows; discretionary accruals are the component over which a manager has discretion but are unexplained by normal economic factors. Their magnitude often manifests the extent to which income information is manipulated. In addition, the greater the positive (negative) discretionary accruals, the higher the propensity of income-inflating (deflating) earnings management. For succinctness, hereinafter, we use the abbreviation “DA” for discretionary accruals.

We relate DA to the CEO dismissal hazard to examine the effects of CEO job security on earnings management. To correctly identify the true relation, we adopt the following schemes: (a) we ensure that the timing is correct by matching the hazard with the DA that follow; (b) in addition to the covariates commonly included in the regressions of earnings management, we
control for the measure of firm performance to address the potential bias from simultaneity;\(^1\) and (c) to strengthen identification, we include two predicting variables, i.e., forced CEO turnovers in industry-peer firms and industry stock return volatility, in the estimation of the CEO dismissal hazard. These two variables are highly correlated with the likelihood of forced CEO turnover but do not directly explain the subsequent earnings management activities other than through the CEO’s concern about job security. The test for overidentifying restrictions supports the orthogonality claim.

Consistent with the discipline hypothesis, the regression results indicate that greater CEO dismissal risk is followed by reduced accrual-based earnings management. This relation is both statistically significant and economically important. All else equal, an increase in the hazard from the 25th to the 75th percentile is associated with a reduction in DA by a magnitude that is equal to 30% of its sample mean. Moreover, this relation is largely driven by the effect of the dismissal hazard on positive DA, i.e., the income-inflating earnings management. We find that the coefficient of the hazard is significant only in the regression of positive DA, and it is small in magnitude and statistically insignificant in the regression of negative DA. The findings continue to hold after we correct for the bias from the truncation in the dependent variables.

We further confirm this finding by estimating the coefficients of the hazard in quantile regressions for each percentile of DA. Our results indicate that the sensitivity of the hazard is more pronounced and statistically significant in the range of higher percentiles where DA are positive. In fact, such a finding is not surprising since income-inflating earnings management is more relevant to CEO job security, and it is unclear why a CEO would want to conceal the firm’s true performance when he faces different levels of termination risk.\(^2\) Therefore, in this paper, we mainly focus on the impact of the dismissal hazard on income-inflating earnings management.

One important channel of the discipline hypothesis is that the deterioration of job security cautions the CEO and motivates him to improve the firm’s real performance, which subsequently enhances his job security and reduces the need for earnings manipulation. Therefore, if the

\(^1\) The concern is that firm performance may determine CEO turnover and simultaneously influence earnings management (e.g., Murphy and Zimmerman, 1993).

\(^2\) One popular view of conservative income-deflating earnings management is that incoming CEOs may want to underreport their firms’ earnings in their first years (i.e., “big bath”) and shift part of those concealed earnings to the reports for the following years to generate image of improvement under their management (see e.g., Guan, Wright, and Leikam, 2005; Pourciau, 1993).
disciplinary effect is important, we should expect better firm performance following relatively weak CEO job security. To test this prediction, we regress two measures of the firm’s subsequent performance, Tobin’s $Q$ and stock return, on CEO dismissal hazard. We find supporting evidence for our expectation. The coefficients of the hazard are indeed positive and statistically significant.

We then turn to the possibility of opportunistic earnings management. Manipulating earnings information is not risk-free, so managers should do it only when the benefits exceed the potential costs. Opportunistic activities are more likely when a dismissal threat is imminent. To separate out this opportunistic effect, we introduce the interaction term of the hazard with a dummy variable indicating such a situation. We consider two candidates for the dummy variable, one based on the forced turnover hazard and the other based on the current stock return. By varying the severity of the risk of dismissal, we find that the coefficient of the interaction term is indeed positive, but it is statistically significant only when the situation is really urgent, for example, when the dismissal hazard is within the top 20 percent or when the current stock return is within the bottom 20 percent in the sample.

So far, our empirical results suggest that, on average, the concern over job security plays a disciplinary role in the normal situation, which helps align the incentives of managers and shareholders and reduces income-inflating earnings management. However, in the extreme situation, mostly when the CEO faces immediate threat of job termination, his worsening job security instead entices him to engage in opportunistic earnings manipulation.

Next we strengthen the evidence for the disciplinary effect with a set of subsample analyses. If the threat of forced turnover is an effective mechanism for discipline or monitoring, its effect should be stronger when other monitoring mechanisms are weak. We hence partition the sample based on various proxies for internal and external monitoring, including board independence, board size, CEO-chairman duality, firm size, financial analysts’ coverage, and a few measures of institutional ownership, and then we repeat the baseline regression for the subsamples. Overall, we find consistent results that the coefficients of the hazard are statistically significant only for the subsamples in which other monitoring proxies are weak, except for CEO-chairman duality.

Finally, we extend our analysis to study the relation between CEO job security and real-activities-based earnings management. The recent literature finds that, in addition to manipu-
lating earnings information through accruals, managers can achieve the same objective of misleading shareholders by distorting real economic activities, such as engaging in overproduction and reducing R&D. Following Roychowdhury (2006) and Cohen, Dey, and Lys (2008), we consider three measures of real earnings management: abnormal cash flow from operations (Ab CFO); abnormal production costs (Ab PROD); and abnormal discretionary expenses (Ab DISC-EXP). Similar to accrual-based earnings management, we find that, on average, higher dismissal hazard is associated with significantly lower Ab PROD and higher Ab DISC-EXP, both of which mean that the managers have a smaller propensity for engaging in income-inflating earnings management through real activities.

This paper adds to the large body of literature that studies earnings management. In particular, we look at the impact of CEOs’ job security on earnings management from a new perspective. That is, the threat of job insecurity can play a role in disciplining managers and reduce inefficient income-inflating earnings management. This effect is different from the popular view of opportunism in the extant literature (e.g., Guan, Wright, and Leikam, 2005; Liu and Xuan, 2014; Murphy and Zimmerman, 1993; Pourciau, 1993). We find that the opportunistic effect is important only in extreme situations, such as when a CEO faces the prospect of immediate dismissal.

This study contributes to the emerging literature about the effect of CEO job security on corporate policies. Cziraki and Xu (2014) find that CEOs are willing to undertake more risky investment when their jobs are secure. Li and Zhao (2015) find that the likelihood of corporate acquisitions is lower when the acquiring CEO enjoys weaker job security; among firms that make acquisitions, performance is better if the CEO’s dismissal hazard is greater. Liu and Xuan (2014) document similar evidence for the merger performance of CEOs before their employment contract renewals.

Our work also complements the literature on CEO turnover as an ex-post discipline. Lehn and Zhao (2006) find a higher incidence of forced CEO turnover following poor acquisition performance. Similarly, Hazarika, Karpoff, and Nahata (2012) find that CEOs who engage in more earnings management are more likely to be fired. We find supporting evidence for the ex-ante disciplinary effects of the threat of forced CEO turnover.
2 Literature and Hypotheses

Managers often have the flexibility to choose the accounting method they use to report financial information to shareholders and to the public. They may craft the information quality to serve their own purposes. Such managerial action is broadly called “earnings management.” Healy and Wahlen (1999) define earnings management as follows:

“Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.”

A typical conjecture is that managers have an incentive to overstate their firms’ performance because their compensation and other benefits are closely tied to how well they perform, at least as reported. Sloan (1996) finds that managers can increase their firm’s stock price at least temporarily by inflating current earnings using aggressive accruals assumptions; and Beneish and Vargus (2002) find that periods of abnormally high accruals (which temporarily inflate earnings) are associated with increases in insider sales of shares. Moreover, Bergstresser and Philippon (2006) and Cheng and Warfield (2005) document that the magnitude of discretionary accruals is greater and earnings management is more prevalent in firms in which managers’ wealth is more closely tied to the value of the stock, most notably via stock options.

However, the benefits and costs of discretionary accruals management or the manipulation of earnings information vary with the different levels of monitoring and discipline imposed by corporate governance. Klein (2002) shows that audit committee independence is related to lower magnitudes of discretionary accruals. Xie, Davidson III, and DaDalt (2003) find that the sophistication and financial expertise of the board and audit committee members are important in constraining managerial discretionary accruals. They also find that the meeting frequency of the board and audit committee is associated with less earnings management. Cornett, Marcus,

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3 Earnings management has been intensively studied in the accounting and finance literature. A comprehensive literature review of earnings management can be found in Healy and Wahlen (1999) and Dechow, Ge, and Schrand (2010).

4 See Healy and Wahlen (1999), pp.368.
and Tehranian (2008) show that earnings management through the use of discretionary accruals is lower when there is more monitoring of management discretion from sources such as institutions that own large blocks of shares, institutional representation on the board, and independent outside directors on the board.

Job security, to a great extent, is an important discipline mechanism that deters managers from engaging in wrongdoing. It serves as an alarm such that an incremental increase in the likelihood of dismissal alerts managers that their performance does not meet the evaluation metrics. Given the large loss to their lifetime wealth associated with dismissal, this ex-ante alarm gives managers an incentive to exert greater effort and undertake actions to improve the firm’s real performance so as to alleviate their concerns about job security. In this way, the benefits of engaging in earnings management (in particular, by inflating earnings) are reduced. Moreover, the distortion of earnings information is by no means cost-free. It is subject to the risk of being detected, and managers may face severe punishment if such activities are caught and deemed unacceptable by monitoring bodies such as boards of directors, audit committees, and regulators. In fact, Hazarika, Karpoff, and Nahata (2012) find that earnings management leads to a higher subsequent likelihood of forced CEO turnover. In addition, all else equal (such as past performance), a higher dismissal hazard indicates more restrictive internal control, stricter monitoring, and/or higher standards of evaluation. Overall, the disciplinary function of job security lowers the benefits of earnings management and raises its costs. Moreover, since overstating income is more of an agency concern, we expect this function to be more effective in the deterrence of income-inflating earnings management. We summarize such an effect as the “discipline hypothesis” below.

**Hypothesis 1 (Discipline Hypothesis)** Incrementally worsening job security has an disciplinary effect

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5 Using an early sample (1974-1986), Jensen and Murphy (1990) estimate the loss of compensation and wealth of dismissed CEOs to range from hundreds of thousands to millions of dollars. The numbers must be much larger in recent years given the substantial increase in CEO compensation. Eckbo, Thorburn, and Wang (2016) show that the present value of the compensation losses to CEOs of bankrupt companies who drop out from the executive labor market can be as large as $7 million (or five times pre-departure compensation). In addition, the dismissed CEOs may lose substantial value in unexercised stock options (Dahiya and Yermack, 2008). These estimates do not even count the damage to their reputations and the associated losses. If they had not been fired, the CEOs could have bright opportunities as corporate directors even after they retire (Brickley, Linck, and Coles, 1999).

6 Weisbach (1988) shows that CEO turnover is more sensitive to performance when the board is more independent. The model of Laux (2008) predicts higher CEO turnover and more generous severance packages associated with higher board independence.
on managers and motivates them to reduce earnings management. Specifically, the incentive to overstate current earnings is constrained.

There also exists alternative view about the relation between job security and earnings management. That is, the deterioration of managerial job security, often following poor performance, may entice managers to exaggerate current earnings information. The reason is that the manipulation of earnings information can boost the reported performance and hence improve the situation in a short time. However, this trick works only if it successfully deceives the monitoring bodies. More important, shareholders and the public will not be fooled indefinitely and will eventually learn the truth. When the truth is revealed, managers who engage in earnings manipulation must pay their debt (as documented by Hazarika, Karpoff, and Nahata, 2012). In some sense, the exaggeration of the current earnings is in fact a trade-off between immediate and future consequences. Therefore the managers should only undertake this opportunistic activity when they face immediate threat of dismissal. The opportunism hypothesis below summarizes such a relation.

**Hypothesis 2 (Opportunism Hypothesis)** When the risk of dismissal is high, the continued deterioration of job security may motivate managers to engage in more opportunistic earnings management, particularly overstating current earnings.

In reality, both the disciplinary and the opportunistic motives may exist. It is the purpose of this paper to empirically examine which effect is more prominent on average, and under what circumstances each effect is more likely to prevail.

3 Data

3.1 Sample Description

Our main sample includes all firms in the ExecuComp database from 1993 to 2011. We then identify the forced CEO turnovers following the classification method of Parrino (1997). Specifically, Fudenberg and Tirole (1995) show that managers have an incentive to distort reported earnings to extend their tenure. Iossa and Rey (2014) develop a theoretical model showing that contractors have the window-dressing incentive to improve current performance in later stage of the contract in order to deceive the principal.
for each CEO turnover record in the ExecuComp database, we search on Google and Factiva for its reason. A CEO departure record is regarded as a forced turnover if the reason is described as policy differences with the board, being forced out or fired, and/or resignation due to bad performance or fraud. Departures due to health reasons or death are classified as voluntary. However, we classify the cases as forced turnovers if the CEO leaves the firm but there is no pre-announcement at least six months before the departure unless the departing CEO keeps the title of chairman of the board or takes an executive position in another company. Following the prior literature, we exclude cases when the turnover is due to acquisition by another firm or firm bankruptcy.

In order to estimate the forced CEO turnover hazard, we further require firms in our sample to have available stock return information from the Center for Research in Security Prices (CRSP) and information for CEO-chairman duality, board size, and board independence from ISS (formerly RiskMetrics). With these restrictions, we are able to calculate the hazard for 14,702 firm-year observations.

For the analysis of earnings management, we merge the sample with Compustat and construct the discretionary accruals. This results in a sample of 13,732 observations, in which 6,025 firm-years have positive discretionary accruals. In the extended analysis of real earnings management, we require additional Compustat information for the calculation of abnormal levels of cash flow from operations, production costs, and discretionary expenses, and this reduces the sample to 12,373 firm-year observations.

For control variables, we retrieve firms’ financial information from Compustat, information about analysts from I/B/E/S, and information about institutional investors’ ownership from Thomson Reuters. The definitions of all the relevant variables are listed in Table A.1 of Appendix A. The summary statistics of the main variables are reported in Table 1 and are comparable to those in the prior literature.

### 3.2 Measure of CEO Job Security

**Hazard Model**

We measure CEO job security with the hazard of forced turnover. Since the hazard is not an
observational item, we must estimate it based on the CEO’s duration on the job. To perform the estimation, we assume that the CEO’s job duration follows a distribution characterized by a proportional hazard function:

$$h_{t}^{i+1}(x_{i,t}) = h_{0}(t) \exp(\delta'x_{i,t}),$$

where $h_{t}^{i+1}$ is the hazard (i.e., the likelihood) of losing the job during year $t+1$ given that the CEO is still on the job in year $t$, which is determined by a baseline hazard function $h_{0}(t)$ and a set of covariates $x$. The baseline hazard function only depends on the job duration $t$ and represents the natural evolution of the hazard over time. We allow the hazard of CEO dismissal to also depend on firm and CEO characteristics through the covariates $x$. In our analysis, only forced CEO turnovers are classified as triggers that terminate the CEO’s job, while voluntary CEO departures are viewed as truncations of CEOs’ job duration.\(^8\) In this sense, hereafter we refer to the continuation of a CEO on the job as “not being dismissed” whenever there is unambiguity.

We follow Cox (1972) and leave the baseline hazard $h_{0}(t)$ unspecified. This semiparametric approach has the advantage of being flexible in the shape of the baseline hazard. This reduces the potential bias in the estimation of $\delta$ caused by the misspecification of $h_{0}(t)$. As a robustness check, we also estimate the hazard using the Weibull model, in which the baseline hazard function is assumed to be $h_{0}(t) = pt^{p-1}$, where $p$ is an auxiliary parameter that controls the shape of the baseline hazard. The results are similar if we use the hazard estimated based on the Weibull model.\(^9\)

**Main Explanatory Variables**

The most important determinant of CEO dismissal is firm performance. Prior literature finds that CEOs are more likely to be replaced following poor performance (Jenter and Lewellen, 2014). In addition, Jenter and Kanaan (2015) show that factors beyond the control of CEOs, such as industry performance, also have impact on forced CEO turnovers. Therefore, we follow Jenter and Kanaan (2015) to include both the industry-induced stock return (the stock return

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\(^8\) As long as the unobserved determinants of voluntary CEO turnovers are not correlated with the determinants of forced CEO turnovers, the duration analysis of forced CEO turnovers with truncation of voluntary CEO departures should not be largely affected.

\(^9\) Results based on the Weibull model are available from the authors upon request.
predicted by the industry’s average stock return) and the firm’s idiosyncratic stock return (i.e., the residual of the prediction regression) from the prior year in the covariates \( x_{i,t} \) of the hazard function. Throughout this paper, we define the industries using the two-digit standard industrial classification (SIC) code.\(^{10}\)

Table 2 presents the estimation of the hazard function. Consistent with the findings of Jenter and Kanaan (2015), both the industry-induced and firm idiosyncratic stock returns are negatively associated with the CEO dismissal hazard. That is, an improvement in (industry or firm) performance reduces the likelihood of CEO dismissal and the coefficients of both measures are statistically significant at the 1% level.

CEO characteristics may affect the duration of their jobs. Similar to Jenter and Kanaan (2015), we control for whether the CEOs are of retirement age (between 63 and 66 years old) and whether the CEOs own more than 5% of their firms’ shares. As expected, we find that CEOs close to retirement and those with more than 5% of their firms’ shares are less likely to be dismissed. In addition, forced CEO turnover is also affected by internal corporate governance structures. Given the same performance, a CEO faces higher dismissal risk mostly because the standards of internal control are higher than those in other firms. To capture these effects, we include in the covariates the variables about board structure (such as board size and board independence) and a dummy variable that indicates whether the CEO is also the chairman of the board. We find that the CEO faces higher dismissal risk when he works with a larger or more independent board; and the CEO who is also the board chairman is less likely to be dismissed.

**Endogeneity and Identification Variables**

One potential concern about the estimated hazard is that some determinants (such as firm performance) also affect the earnings management decision. One easy way to address this endogeneity is to control for firm performance in the main regressions. Beyond this, we can further sharpen the identification by including additional covariates in the hazard estimation that are not directly related to the dependent variable of the main regressions (i.e., earnings management). The events of forced CEO turnovers in other firms of the same industry may influence the domestic CEO’s

\(^{10}\) Alternatively, we also use the Fama and French (1997) 48-industry classification (FF48) and the results are similar. The results based on FF48 are available from the authors upon request.
dismissal hazard because such events can activate the radar of internal control.\textsuperscript{11} Also, Peters and Wagner (2014) find that CEOs in industries with higher stock return volatility are more likely to lose their jobs. We indeed find that both the industry-peer dismissals and industry stock return volatility have a significantly positive effect on the hazard of CEO dismissal. However, these two variables should not have a direct effect on earnings management other than through the CEO turnover channel. We statistically examine this conjecture. In Panel B of Table 5, we show that these two identification variables survive the overidentifying restrictions test (Hansen, 1982).\textsuperscript{12}

With all covariates discussed above included, we estimate the CEO dismissal hazard function and predict the relative hazard for every CEO in each year.\textsuperscript{13} The estimated relative hazard does not include the baseline hazard $h_0(t)$ because the Cox model does not parameterize its functional form. However, this does not materially affect our analysis for three reasons. First, we include CEO tenure in the regressors of all regressions below, which absorbs the effect of the baseline hazard since it only depends on CEO tenure. Second, we are more interested in the effect of the dismissal hazard that is caused by performance and the factors related to corporate governance. And finally, the results are similar if we use the full hazard estimated based on the Weibull model.\textsuperscript{14}

3.3 Measures of Earnings Management

Accrual-Based Earnings Management

Following the literature, our main measure of earnings management is discretionary accruals (DA). Since performance is related to CEO job security, we follow Kothari, Leone, and Wasley (2005) and use the performance-adjusted discretionary accruals measure to address the issue of omitted correlated variables (see the review paper Dechow, Ge, and Schrand, 2010, for detailed

\textsuperscript{11}Coles, Li, and Wang (2015) and Kale, Reis, and Venkateswaran (2009) also use industry-peer turnovers as one instrumental variable.

\textsuperscript{12}The null hypothesis of the overidentification test, or Hansen’s $J$ test, is that the identifications variables are statistically uncorrelated with the residuals of the main regressions. A large $p$-value for this test means that we cannot reject the null hypothesis.

\textsuperscript{13}Hazard estimation is also performed excluding the identification variables and/or the variables that proxy for internal monitoring. The results are qualitatively similar and available upon request.

\textsuperscript{14}Note that the Weibull model specifies the parametric form of the baseline hazard, which allows us to estimate the full hazard function. The results based on the full hazard from the Weibull model are available from the authors upon request.
The model is
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\frac{TA_{i,t}}{Total\ Assets_{i,t-1}} = \beta_1 \frac{1}{Total\ Assets_{i,t-1}} + \beta_2 \frac{\Delta Sales_{i,t}}{Total\ Assets_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{Total\ Assets_{i,t-1}} \\
+ \beta_4 ROA_{i,t} + \epsilon_{i,t},
\]
where we define total accruals (TA) as the change in non-cash current assets minus the change in current liabilities excluding the current portion of long-term debt, minus depreciation and amortization; \(\Delta Sales\) is change in sales net of the change in accounts receivable; \(PPE\) is net property, plant and equipment; and \(ROA\) is return on assets. Here, we use the lagged assets as the deflator to mitigate the issue of heteroscedasticity in residuals. We estimate the above model in each two-digit SIC industry-year group and use the residuals of these regressions as the measure of discretionary accruals. A large magnitude of DA is conventionally interpreted as an indication of earnings management. Specifically, a large positive (negative) measure of DA often indicates a higher likelihood that earnings is manipulated upward (downward).

**Real Earnings Management**

In addition to the accrual-based earnings management in which managers discretionarily choose how to report earnings information from the same real activities, managers can also manipulate the real activities to avoid reporting unfavorable outcomes without bending the accounting rules. For example, Roychowdhury (2006) finds that managers can temporarily increase sales by offering more price discounts, lower the average cost of goods sold by overproduction, and improve the profit margin by reducing discretionary expenditures such as R&D and advertising expenses. In the extended analysis, we also consider the effect of CEO job security on real earnings management.

We follow Roychowdhury (2006) and Cohen, Dey, and Lys (2008) to construct three measures of real earnings management that reflect the manipulative activities documented in Roychowdhury (2006): the abnormal levels of cash flow from operations, production costs, and discretionary expenses. The details of constructing these variables can be found in Appendix B.
4 Empirical Analysis

4.1 Univariate Analysis

Before thoroughly examining the relation between managerial job security and earnings management and testing the hypotheses discussed in Section 2, we provide straightforward evidence in a simple univariate analysis. In Table 3, we show that the CEO dismissal hazard is negatively correlated with subsequent discretionary accruals (DA) and that this correlation is statistically significant at the 1% level, suggesting that, on average, a CEO with relatively weak job security engages in less earnings management. And it is important to note that such a correlation seems to be driven by positive DA. Positive DA indicates managerial overstatement of current performance; and the greater the magnitude of positive DA, the higher the propensity of CEOs to inflate current earnings. The correlations hence suggest that the disciplinary effect of managerial job security is more important in preventing the overstatement of performance.

To further preview the relation between CEO job security and earnings management, we implement a portfolio analysis. Specifically, we first sort our sample firms into four portfolios based on CEO dismissal hazard at the beginning of each year, where CEOs in the first portfolio have the lowest hazard and those in the fourth portfolio face the highest hazard. Then, for each hazard portfolio, we calculate the average value of DA, positive DA, and negative DA for that year. Finally, we report the time-series average of the portfolio DA in Table 4. We show that, in general, discretionary accruals decrease with the increase in the dismissal hazard, and the reduction of DA is mostly from the reduced positive DA, while the negative DA exhibits a slightly positive (though statistically insignificant) relation with CEO dismissal hazard. Overall, these findings from the portfolio analysis are consistent with the correlation analysis.

One intriguing finding from the portfolio analysis is that not only is the relation between CEO job security and earnings management driven by positive DA, but it is also mostly within the first three hazard portfolios. That is, positive DA decreases from the first to the third hazard portfolio, but that pattern disappears between the last two portfolios. We offer more discussion on this pattern in Section 4.3 below.

Overall, the preliminary evidence for DA and positive DA is consistent with the discipline
hypothesis that a CEO facing job insecurity is motivated to improve the firm’s subsequent performance and therefore relies less on the manipulation of earnings information. A caveat related to the above analysis is that it ignores the effects of other attributes. In fact, Table 3 indicates that, consistent with the prior literature, DA, positive, and negative DA are highly correlated with many other variables, such as firm size, leverage, market-to-book ratio, ROA, and analyst coverage. More important, these variables are also simultaneously correlated with CEO dismissal hazard. Therefore, in the absence of these covariates, the relation between CEO job security and subsequent earnings management more or less reflects the correlations between earnings management and these variables. To address this issue, we undertake more rigorous multivariate analysis in the next subsections.

4.2 Multivariate Analysis

4.2.1 Regression Results

In order to test the hypotheses regarding the relation between CEO job security and earnings management, we estimate the following regression:

$$EM_{i,t} = \alpha_0 + \alpha_1 h_{i,t-1} + \beta' x_{i,t-1} + \alpha_j + \alpha_t + \epsilon_{i,t},$$

where $EM_{i,t}$ is earnings management in year $t$ measured either by DA, positive DA, or negative DA; $h_{i,t-1}$ is CEO dismissal hazard in year $t$ measured at the end of year $t - 1$ (i.e., the beginning of year $t$); and $x_{i,t-1}$ is a vector of covariates including firm and CEO characteristics that affect earnings management. In all regressions, we control for industry fixed effects ($\alpha_j$) and year fixed effects ($\alpha_t$) to mitigate potential concern about the omitted variables that are invariant either in an industry or in specific years. In all regressions, we winsorize the top and bottom 1 percent of the dependent and all continuous independent variables to control for the influence of potential outliers, and we correct the coefficients’ standard errors for firm clustering.

We present the baseline results in Table 5. First, we examine the hazard-EM relation using an OLS regression with EM measured by DA. The results show that, controlling for other covariates, the CEO dismissal hazard exhibits a negative association with the subsequent DA. The coefficient
is statistically significant ($t$-statistic $= -3.09$). To further assess the economic significance of the result, we set the hazard to its 25th and 75th percentile values, respectively, and compare DA at these two percentiles while holding all other variables at their mean values. The decrease in DA corresponding to a shift from the 25th to the 75th percentile of the distribution of the hazard amounts to 30% of its sample mean. Therefore the effect of the hazard on earnings management is also economically significant.

The prior univariate analysis shows that the hazard-EM relation is mostly driven by positive DA. To confirm this finding, we undertake the same OLS regressions for positive and negative DA, respectively. Indeed, even after controlling for the covariates, we continue to find that CEO dismissal hazard is negatively related to earnings management. The coefficient of the hazard in the OLS of positive DA has almost the same magnitude as that in the OLS of DA and is statistically significant ($t$-statistic $= -3.45$). On the contrary, the coefficient of the hazard in the OLS of negative DA is much smaller in magnitude and is statistically insignificant ($t$-statistic $= -0.58$).

However, the coefficients of the OLS regressions for positive and negative DAs may be biased since they violate one fundamental assumption of the OLS, i.e., $E[\varepsilon_{i,t} | h_{i,t-1}, x_{i,t}] = 0$. While this assumption is valid for the whole sample, it is generally not true for either of the subsamples.\footnote{In the positive DA subsample, $E[\varepsilon_{i,t} | DA_{i,t} > 0, h_{i,t-1}, x_{i,t}]$ is in general not equal to zero given $E[\varepsilon_{i,t} | h_{i,t-1}, x_{i,t}] = 0$. The same applies to the negative DA subsample.} Essentially, the bias arises because of truncation in the distribution of DA in the subsamples. To address this issue, we repeat the multivariate analysis of positive and negative DA using the truncated regressions; the results are reported in the last two columns of Table 5. The findings are qualitatively similar to the OLS regressions. That is, an increase in the dismissal hazard is followed by less overstatement of the subsequent performance ($t$-statistic $= -2.81$). Moreover, after the correction of the bias from truncation, the economic significance of this effect becomes even more pronounced. The shift of the hazard from the 25th to the 75th percentile is associated with a decrease in positive DA by 58% of the magnitude at its sample mean. Again, the relation between the hazard and negative DA is statistically and economically insignificant ($t$-statistic $= -1.15$).

Our multivariate results overall suggest that, on average, there is a negative relation between...
CEO dismissal hazard and subsequent earnings management. This finding is consistent with the prediction of the discipline hypothesis but is opposite to the opportunism hypothesis.

4.2.2 Discussion

The discipline hypothesis states that a CEO who faces relatively weak job security is primarily motivated by this disciplinary warning to exert more effort to improve real performance so as to mitigate his job insecurity. If this channel is indeed one of the driving forces of the findings in our baseline regressions, we should also find better subsequent performance in the firm whose CEO faces a relatively higher dismissal hazard. To further test the discipline hypothesis, we run the following OLS regression of firm performance:

\[ PFM_{i,t} = \alpha_0 + \alpha_1 h_{i,t-1} + \beta' z_{i,t-1} + \alpha_j + \alpha_t + \epsilon_{i,t}, \]

where \( PFM_{i,t} \) is a measure of firm performance and \( z_{i,t-1} \) is a vector of firm characteristics that are related to firm performance. Similar to the baseline regressions of earnings management, we include industry and year fixed effects to control for the invariant omitted variables.

Since managers can distort reported performance through earnings management, we are careful not to use accounting-based performance measures, such as return on assets or return on equity, as dependent variables. Instead, we consider stock-based performance measures, \( Q \) ratio and stock return, which are less subject to direct manipulation.\(^{16} \) We report the estimation results in Table 6. Consistent with our prediction, we find that an incremental increase in CEO dismissal hazard is significantly and positively associated with subsequent firm performance, no matter whether it is measured by \( Q \) ratio or by stock return (with \( t \)-statistics of 3.64 and 4.01, respectively). Therefore these hazard-performance findings provide a strong foundation for the discipline hypothesis. That is, CEOs with relatively higher dismissal hazard at the beginning of the year are motivated to improve real performance in that year, which reduces the benefits of information manipulation and hence the need for earnings management.

Regarding firm performance, we show that it is negatively associated with the current dis-

\(^{16}\) We admit that these measures are not completely free of the impact of earnings management. In fact, Sloan (1996) shows that the stock price is at least temporarily influenced by earnings management.
missal hazard (see Table 2). And good performance reduces the need to manipulate earnings information subsequently. Therefore, as discussed in Section 3.2, omission of the measures of firm performance in the regressions of earnings management may lead to a simultaneity bias. For that, we include a couple of control variables for past performance in regression (1), including lagged ROA, lagged sales growth, and lagged operating cash flow. Overall, we find that these measures of firm performance are negatively related to the overstatement of subsequent earnings. As long as good past performance reduces the incentive to inflate subsequent earnings, the estimated coefficients of the hazard in the baseline regressions could have been smaller in magnitude if the performance control variables were omitted.

In terms of the other control variables for the main regression (1), consistent with the literature (e.g., Ali and Zhang, 2015; Watts and Zimmerman, 1986), the coefficients on firm size are significantly negative for DA and positive DA and are significantly positive for negative DA, suggesting that larger firms are subject to greater political costs and thus use earnings management less aggressively to distort information quality. In consonance with the argument that growth firms are more likely to inflate earnings to meet or beat earnings benchmarks (Frankel, Johnson, and Nelson, 2002), the coefficients on market-to-book (M/B) are significantly positive for positive DA. Meanwhile, we find the coefficients of M/B are also significantly negative for negative DA, suggesting that growth firms use earnings management more aggressively to distort information. In a similar vein, the coefficients on firm age are significantly negative for positive DA but positive for negative DA.

Finally, our evidence indicates that the hazard-EM relation is important only for the firms with positive DA. Therefore CEO dismissal risk seems to be relevant only to the incentive to inflate reported performance. To further confirm this finding, we conduct quantile regressions on the dismissal hazard for each percentile of discretionary accruals (DA). We then plot the estimated coefficients of the dismissal hazard and their 95% confidence intervals in Figure 1. The effect of CEO dismissal hazard is overall negative for every percentile of DA. However, such

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17 The positive coefficient of ROA in the regression of DA is driven by negative DA.
18 In other words, the omission of the control variables for past performance does not bias the results to favor the discipline hypothesis.
19 In the quantile regressions, we control for the same covariates as in the baseline regression (1) except for the fixed effects. The quantile regression with fixed effects is still a challenging topic in the research of econometrics.
an effect is not statistically significantly different from zero at the left end, where the inflation of earnings is most unlikely. And as the percentile of DA increases gradually, the magnitude of the coefficient of the hazard increases, and the coefficient becomes more statistically significant. Clearly, the average effect of the hazard on DA is driven mostly by those on the higher percentiles of DA where discretionary accruals are positive and income-inflating earnings management is more prominent. This finding is not surprising since the inflation and deflation of current earnings are caused by different incentives. Overstating performance is more relevant to issues related to compensation and career concerns. On the contrary, the motives for underreporting performance, such as building a cushion for new CEOs, are in general not directly relevant to job security concerns. Therefore, in the remainder of the paper, we focus only on the effect of the hazard on income-inflating earnings management (i.e., positive DA).

4.3 Opportunistic Earnings Management

So far, our empirical evidence strongly supports the discipline hypothesis. However, we cannot completely rule out opportunistic motives that result in more earnings management in some situations, especially when the dismissal risk is high. In fact, Guan, Wright, and Leikam (2005) find that CEOs who exit for non-routine reasons engage in more income-increasing earnings management in the year prior to termination. Liu and Xuan (2014) document higher discretionary accruals for CEOs with a fixed-term contract around the renewal year. Their evidence suggests that CEOs may behave opportunistically and undertake income-inflating earnings management more aggressively when they face an immediate threat of job termination. Below we try to identify this opportunistic effect of CEO job security on earnings management and separate it from the disciplinary effect.

First, inspired by findings of Guan, Wright, and Leikam (2005) and Liu and Xuan (2014) that the opportunistic effect is more likely when the dismissal risk is high, we augment the baseline truncated regression (1) of positive DA with an interaction term of the hazard and a dummy variable that indicates whether the dismissal hazard is among the top $P$ percent of firms in the year, where we allow $P$ to be respectively 50, 40, 30, 20, and 10 to demonstrate the different opportunistic effects when job security situation varies. With the presence of the interaction term,
to a great extent, the coefficient of the hazard represents the average effect of CEO dismissal risk in a regular situation, and the coefficient of the interaction term shows the additional effect of the hazard when job termination likelihood is high. We expect the coefficient of the hazard to remain negative, which is in line with the dominant disciplinary effect, but we expect the coefficient of the interaction term to be positive, especially when $P$ is low (i.e., when the hazard is high), which demonstrates an opportunistic motive.

The results are presented in Panel A of Table 7. Consistent with our prediction, we find that indeed the coefficient of the hazard is still negative and statistically significant when the interaction term is added to the regression. More important, the coefficient of the interaction term is positive, meaning that for a firm whose CEO’s job security is poor, an increase in dismissal hazard weakens the disciplinary effect. This effect becomes even stronger and statistically significant in the last two columns, where the hazard is interacted with the dummies that indicate a very high dismissal risk (top 20 and 10 percent). This finding is largely consistent with the findings of Guan, Wright, and Leikam (2005) and Liu and Xuan (2014), whose samples likely overlap with the CEOs with dismissal hazard among the top 20 or 10 percent of the sample.

Poor performance is often viewed as the most important reason for forced CEO turnover. Therefore, if the current performance is very poor, the likelihood of job termination is very high, and opportunistic earnings management is also more likely. Similar to the above exercise, we augment the baseline truncated regression (1) of positive DA with an interaction term of the hazard and a dummy variable that indicates whether the current stock return of the firm is among the bottom $P$ percent of firms in the year. We allow $P$ to take the respective values of 10, 20, 30, 40, and 50 to show the differences in the opportunistic effect when current performance varies. Following the same idea, we expect the coefficient of the hazard to be negative but the coefficient of the interaction term to be positive, especially when $P$ is small (i.e., when current performance is very poor).

Again, we find results consistent with our prediction. While the dismissal hazard has a negative effect on income-inflating earnings management, this effect is greatly weakened when current performance is so poor that the CEO faces an immediate threat of job termination. Intriguingly, we find that the coefficient of the interaction term (i.e., the opportunistic effect) is large.
and statistically significant in the first two columns when \( P \) is small, and it gradually reduces in magnitude and becomes statistically insignificant with an improvement in performance.

In sum, our evidence shows that both the discipline hypothesis and the opportunism hypothesis are valid. However, the disciplinary effect of job security is dominant, and the opportunistic effect is important only when CEOs face a severe threat of dismissal.

### 4.4 Subsample Analysis

Our hypothesized relation between CEO job security and earnings management is conceptually based on agency conflict, that is, the misalignment of interests between managers and shareholders. Job security (i.e., the dismissal hazard) serves as a monitoring device to mitigate agency conflict. However, it is not the only monitoring tool in a firm’s arsenal. Actually, there are many other internal and external monitoring mechanisms available to monitor corporations. Therefore, if discipline is the dominant function of CEO dismissal hazard, we expect CEO job security to play a more salient role in determining earnings management for firms with weak monitoring by other mechanisms.

Specifically, we look at both internal and external monitoring mechanisms. Internal monitoring bodies can access to the daily operations of a firm and hence can intervene in a CEO’s decisions in a timely fashion. One important internal monitoring body is the board of directors, and the structure of the board determines the effectiveness of its monitoring.

It is well accepted that a more independent board can better monitor the CEO. Borokhovich, Parrino, and Trapani (1996) and Weisbach (1988) show that a more independent board makes better decisions from the shareholders’ perspective on such issues as hiring and firing of the CEO. Recently, Knyazeva, Knyazeva, and Masulis (2013) documented that board independence has a positive effect on firm value, operating performance, fraction of a CEO’s incentive-based compensation, and CEO turnover. In addition, Guo and Masulis (2015) show that more independent boards and fully independent nominating committees lead to more effective CEO monitoring and discipline. Therefore we consider two subsamples based on the percentage of independent directors on the board. Specifically, for each year, we keep the firms whose proportion of independent directors is among the top (bottom) 25 percent of a two-digit SIC industry, and then we
repeat the baseline truncated regression of positive DA for the resulting subsamples. If the hazard’s disciplinary effect is important, we expect that such an effect is relevant only in the bottom subsample, where firms have the least independent boards. The estimation results are reported in Panel A of Table 8. Consistent with our expectation, the coefficient of the hazard is statistically significant only in the subsample with the least independent boards. As a robustness check, we also use the subsamples whose proportion of independent directors is above (below) the median of the firms in the same industry in the same year. The results are similar and are presented in the last two columns in Panel A of Table 8.

The size of the board (i.e., the number of directors on the board) can affect monitoring too. On the one hand, a smaller board can work more efficiently; on the other hand, a larger board has more manpower and expertise to better monitor the CEO. In fact, in Table 2, we show that, all else equal, board size is significantly and positively associated with the likelihood of forced CEO turnover, which seems to suggest that, in our sample, a larger board on average can monitor the CEO more effectively. Following the same idea about board independence, we repeat the baseline regression of positive DA in the subsamples of firms whose board size is among the top and bottom 25 (50) percent of their industries in the year. We report the results in Panel B of Table 8. Again, we find that the coefficient of the hazard is statistically significant only in the subsample of firms with the smallest boards. As long as size is a good measure of monitoring effectiveness of the board, our results suggest that the disciplinary function of CEO job security is important only when the board is weak in monitoring.

When a CEO is also the chairman of the board, the monitoring function of the board may be undermined. We thus divide our sample based on CEO-chairman duality and then repeat the baseline regression of positive DA for each subsample. However, we do not find a significant substitutive relation between CEO-chairman duality and CEO job (in)security. In Panel C of Table 8, we show that the coefficients of the hazard are significantly negative for both subsamples.

Monitoring can also be done from outside of a firm. Firm size is often used as one proxy

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20 Lipton and Lorsch (1992) and Jensen (1993) argue that larger boards may be less effective because of coordination and free-riding problems. Yermack (1996) and Eisenberg, Sundgren, and Wells (1998) provide evidence that firms with smaller boards have higher firm value.

21 Lehn, Patro, and Zhao (2009) and Coles, Daniel, and Naveen (2008) show that large firms and growing firms demand more board members to help oversee managers’ performance.
for external monitoring because large firms draw more attention from the media and the public and they are followed by more analysts. Miller (2006) and Blankespoor, Miller, and White (2014) suggest that investors have low-cost access to information about highly visible firms (usually large firms) because these firms tend to receive broad news coverage. Thus it is expected that large firms are more subject to external monitoring than small firms. Similarly, we consider two subsamples of firms whose size is among the top and bottom 25 (50) percent of their industries in the year. Then we repeat the baseline regression of positive DA for each subsample. The results are presented in Panel A of Table 9. We find a negative and statistically significant coefficient of the hazard in the subsample in which firm size is smaller. In the subsample in which firm size is larger, this coefficient is much smaller in magnitude and is statistically insignificant. These results are hence consistent with our prediction.

Previous research suggests that financial analysts play an external monitoring role. For example, Yu (2008) finds that firms with high analyst coverage engage less in opportunistic earnings management, a finding consistent with the monitoring role of analysts. In Panel B of Table 9, we repeat the baseline regression of positive DA in the two subsamples based on the number of financial analysts who follow the firm. Not surprisingly, we find that the coefficient of the hazard is significantly negative in the subsample of firms with the least coverage of financial analysts while the coefficient of the hazard in the other subsample is small and statistically insignificant.

Prior studies indicate that institutional investors play an important role in monitoring managers to maximize shareholder interests. Brickley, Lease, and Smith Jr. (1988) indicate that large institutional investors and other blockholders vote more actively on antitakeover amendments than non-blockholders, and opposition by institutions is greater when the proposal appears to harm shareholders. Agrawal and Mandelker (1990) provide empirical evidence lending support to the “active monitoring hypothesis” proposed by Demsetz (1983) and Shleifer and Vishny (1986) that the existence of large shareholders leads to better monitoring of managers. Further, Baysinger, Kosnik, and Turk (1991) find that a high concentration of equity among institutional investors has a positive effect on corporate R&D spending. Also, Bushee (1998, 2001) provides evidence suggesting that institutions with long-term investment in a firm serve a monitoring role in reducing myopic investment behavior by managers. Similarly, Chen, Harford, and Li (2007)
argue that stable institutional investors, who have better knowledge of the firm and thus larger influence on management, are more likely to engage in monitoring efforts than other institutions. They find empirically that monitoring of acquisitions is facilitated by long-term institutional investors and dedicated institutions with concentrated holdings. In addition, Callen and Fang (2013) show that long-term institutional ownership is negatively related to risk of a future stock price crash, consistent with the monitoring theory of institutional investors in managerial bad news hoarding.

Following this literature, we utilize a series of institutional-ownership-based measures to proxy for external monitoring mechanisms. Specifically, we focus on three measures of institutional ownership: (a) Top 5 Ownership, defined as the percentage of shares outstanding held by the five largest institutional investors of a firm; (b) Ownership HHI, which is the Herfindahl (1950) and Hirschman (1945) index of institutional ownership concentration; and (c) Dedicated Ownership, defined in Bushee (1998, 2001) as the percentage of shares outstanding held by dedicated institutions at the end of the year.

Similar to the previous subsample analysis, we split the sample based on one of these three measures of institutional ownership using their industry-year-specific 25th and 75th (or 50th) percentiles. Then we repeat the baseline regression of positive DA for each subsample. The results are reported in Panels C (for Top 5 Ownership), D (for Ownership HHI), and E (for Dedicated Ownership), respectively. Across the board, we find that the coefficient of the hazard is negative and statistically significant for the subsamples of firms facing the least monitoring by institutional investors, but not for the other subsamples.

Overall, the findings in Tables 8 and 9 are consistent with our conjecture that CEO job security plays a more pronounced role in reducing earnings management for firms with weak monitoring mechanisms. These findings imply that CEO job security functions as a substitute for internal and external monitoring in curbing managerial exaggerative reporting behaviors. Our contextual findings corroborate the agency perspective of our main results. That is, the negative relation between CEO job security and earnings management is driven by the disciplinary function of CEO dismissal hazard that mitigates agency conflict between managers and shareholders.
4.5 Real Earnings Management

Accrual-based earnings management is not the only way managers can choose to mislead shareholders or the public. Roychowdhury (2006) and Cohen, Dey, and Lys (2008) document that managers can distort real activities to achieve similar outcomes. Specifically, they can temporarily increase sales by offering more price discounts, lower the average cost of goods sold by engaging in overproduction, and improve the profit margin by reducing discretionary expenditures such as R&D and advertising expenses. Therefore, a natural question to ask is whether CEO job security has similar effects on real-activities based earnings management.

A series of recent studies suggest that managers use real-activity manipulation and accrual-based earnings management as substitutes. Graham, Harvey, and Rajgopal (2005) imply that managers prefer real earnings management to accruals-based earnings management because they view real earnings management as being less likely to be scrutinized or detected by auditors and regulators. Consistent with Graham, Harvey, and Rajgopal (2005), Cohen, Dey, and Lys (2008) find that managers have shifted away from accrual-based to real earnings management in the post Sarbanes-Oxley Act (SOX) period because of higher litigation risk imposed by regulators. Similarly, Cohen and Zarowin (2010) show that a firm’s choice between real and accrual-based earnings management activities around seasoned equity offerings is a function of its ability to use accrual management and the costs of doing so. Zang (2012) further documents large-sample evidence consistent with the view that managers trade off real and accrual-based earnings management methods based on their relative costs and use real-activity manipulation and accrual-based earnings management as substitutes. Therefore, we expect that CEO job security has similar effects on real earnings manipulation as on accrual-based earnings management.

To measure real earnings management, we follow the literature (e.g., Cohen, Dey, and Lys, 2008; Cohen and Zarowin, 2010; Roychowdhury, 2006) and estimate abnormal levels of cash flow from operations (Ab CFO), abnormal production costs (Ab PROD), and abnormal discretionary expenses such as advertising, R&D, and SG&A (Ab DISCEXP). Firms that engage in real earnings management are likely to have at least one of the following characteristics: abnormally low cash flow from operations, and/or abnormally high production costs, and/or abnormally low discretionary expenses.
We run the baseline OLS regression (1) with $EM$ substituted by either of the three measures of real earnings management. Table 10 presents the estimation results, with Column (1) showing abnormal cash flow from operations, Column (2) showing abnormal production costs, and Column (3) showing abnormal discretionary expenses, respectively. Consistent with the discipline hypothesis, Columns (2) and (3) show that higher dismissal hazard is associated with lower subsequent real earnings management (i.e., lower abnormal production costs and higher abnormal discretionary expenses) and the coefficients of the hazard are statistically significant at less than the 10% level (with $t$-statistics of $-1.72$ and $2.12$, respectively). Although Column (1) shows that the coefficient of the hazard is negative, opposite to the prediction of the discipline hypothesis, the coefficient is highly insignificant statistically.

In sum, we find a relation between CEO job security and real earnings management that is similar to that with accrual-based earnings management.

5 Conclusion

In this paper, we empirically examine the relation between CEO job security, measured by the risk of CEO dismissal, and subsequent earnings management. In particular, we test two plausible hypotheses—(1) the discipline hypothesis that predicts lower earnings management following an incremental increase in the dismissal hazard, and (2) the opportunism hypothesis, which predicts the opposite. Using discretionary accruals as the measure of earnings management, we find that the disciplinary effect of CEO job security is generally dominant, especially for income-inflating earnings management. However, we also find that opportunistic earnings management is likely when managers face an immediate threat of job termination. We strengthen our findings with a subsample analysis showing that the disciplinary function of CEO dismissal hazard substitutes for other internal and external monitoring mechanisms such as boards of directors, financial analysts, and institutional investors. Finally, our results are robust if earnings management is measured by real-activities-based measures.
References


Appendix

A Variable Definition

All continuous variables are winsorized at 1% and 99%. All dollar values are in millions and are adjusted by the Consumer Price Index to year 2011 dollars.

Table A.1: Definitions of the Variables Used in the Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
<th>Detailed Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A: Earnings Management Measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DA</td>
<td>Compustat</td>
<td>Discretionary accruals: The difference between total accruals and the estimated values calculated as in Kothari, Leone, and Wasley (2005).</td>
</tr>
<tr>
<td>Positive DA</td>
<td>Compustat</td>
<td>Positive discretionary accruals.</td>
</tr>
<tr>
<td>Negative DA</td>
<td>Compustat</td>
<td>Negative discretionary accruals.</td>
</tr>
<tr>
<td>Ab CFO</td>
<td>Compustat</td>
<td>Abnormal cash flow from operations calculated as the difference between the actual cash flows from operations (CFO) and the estimated values from the corresponding industry-year regression in Cohen, Dey, and Lys (2008).</td>
</tr>
<tr>
<td>Ab PROD</td>
<td>Compustat</td>
<td>Abnormal production costs calculated as the difference between the actual production costs and the estimated values from the corresponding industry-year regression in Cohen, Dey, and Lys (2008).</td>
</tr>
<tr>
<td>Ab DISCEXP</td>
<td>Compustat</td>
<td>Abnormal discretionary expenses calculated as the difference between the actual discretionary expense and the estimated values from the corresponding industry-year regression in Cohen, Dey, and Lys (2008).</td>
</tr>
<tr>
<td><strong>B: Firm Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total accruals</td>
<td>Compustat</td>
<td>Income before extraordinary items (data 18) minus cash flow from operations (data 308) divided by the book value of total assets (data 6).</td>
</tr>
<tr>
<td>CFO</td>
<td>Compustat</td>
<td>Cash flow from operations (data 308 − data 124) divided by the book value of total assets (data 6).</td>
</tr>
<tr>
<td>Production costs</td>
<td>Compustat</td>
<td>Cost of goods sold (data 44) plus change in inventory (Δdata 3) divided by the book value of total assets (data 6).</td>
</tr>
<tr>
<td>Discretionary expenses</td>
<td>Compustat</td>
<td>Sum of R&amp;D (data 46), advertising (data 45), and selling, general and administrative (SG&amp;A) expenses (data 189) divided by the book value of total assets (data 6). Advertising and R&amp;D are set to zero if they are missing as long as SG&amp;A is available.</td>
</tr>
<tr>
<td>Industry induced return</td>
<td>CRSP</td>
<td>Predicted value of the regression of firm returns on 2-digit SIC industry returns (Jenter and Kanaan, 2015).</td>
</tr>
<tr>
<td>Idiosyncratic return</td>
<td>CRSP</td>
<td>Residual value of the regression of firm returns on 2-digit SIC industry returns (Jenter and Kanaan, 2015).</td>
</tr>
<tr>
<td>Industry turnovers</td>
<td>ExecuComp</td>
<td>Number of forced CEO turnover events in the peer firms of the same 2-digit SIC industry in the past two years.</td>
</tr>
<tr>
<td>Industry volatility</td>
<td>CRSP</td>
<td>The standard deviation of stock returns in the 2-digit SIC industry.</td>
</tr>
<tr>
<td>Size</td>
<td>Compustat</td>
<td>Natural logarithm of the book value of total assets (data 6).</td>
</tr>
<tr>
<td>Leverage</td>
<td>Compustat</td>
<td>Long-term debt (data 9) plus debt in current liabilities (data 34) divided by the book value of total assets (data 6).</td>
</tr>
<tr>
<td>M/B (Q)</td>
<td>Compustat</td>
<td>Market value of assets (data 6 + data 199 − data 25 − data 60 − data 74) divided by the book value of total assets (data 6).</td>
</tr>
</tbody>
</table>

Continued on next page
### Table A.1 Continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Detailed Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>Compustat</td>
<td>Net income divided (data 172) by the book value of total assets (data 6).</td>
</tr>
<tr>
<td>Sales growth</td>
<td>Compustat</td>
<td>Annual percentage change in sales (data 12).</td>
</tr>
<tr>
<td>Operating CF</td>
<td>Compustat</td>
<td>Cash flow from operations (data 308) divided by the book value of total assets (data 6).</td>
</tr>
<tr>
<td>Capex</td>
<td>Compustat</td>
<td>Capital Expenditures (data 128) divided by the book value of total assets (data 6).</td>
</tr>
<tr>
<td>Firm age</td>
<td>CRSP</td>
<td>Number of years since the firm was listed on a stock exchange.</td>
</tr>
<tr>
<td>Analyst number</td>
<td>I/B/E/S</td>
<td>Number of analysts following the firm.</td>
</tr>
<tr>
<td>Analyst tenure</td>
<td>I/B/E/S</td>
<td>Number of years since the current auditor works with the firm.</td>
</tr>
<tr>
<td>Big 4 auditors</td>
<td>Compustat</td>
<td>Dummy variable indicating whether the company is audited by a big 4 auditor.</td>
</tr>
<tr>
<td>Board independence</td>
<td>ISS</td>
<td>Percentage of independent directors on the board.</td>
</tr>
<tr>
<td>Board size</td>
<td>ISS</td>
<td>Number of directors on the board.</td>
</tr>
<tr>
<td>Top 5 ownership</td>
<td>Thomson Reuters</td>
<td>Sum of the 5 largest institutional investors' ownership.</td>
</tr>
<tr>
<td>Ownership HHI</td>
<td>Thomson Reuters</td>
<td>The Herfindahl (1950) and Hirschman (1945) index of institutional ownership.</td>
</tr>
<tr>
<td>Dedicated ownership</td>
<td>Thomson Reuters</td>
<td>Ownership of the dedicated intuitional investors as classified in Bushee (2001).</td>
</tr>
<tr>
<td>Stock return</td>
<td>CRSP</td>
<td>Annual stock return.</td>
</tr>
<tr>
<td>Stock volatility</td>
<td>CRSP</td>
<td>Annual stock return volatility.</td>
</tr>
</tbody>
</table>

**C: CEO Characteristics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Detailed Explanation</th>
</tr>
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<td>CEO tenure</td>
<td>ExecuComp</td>
<td>Number of year on the position of CEO.</td>
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<tr>
<td>Retirement age</td>
<td>ExecuComp</td>
<td>A dummy variable that is equal to one if the CEO is between 63 and 66 years old.</td>
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<tr>
<td>Ownership ≥ 5%</td>
<td>ExecuComp</td>
<td>A dummy variable that is equal to one if CEO owns at least 5% of the shares outstanding.</td>
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<tr>
<td>CEO duality</td>
<td>ISS</td>
<td>A dummy variable that is equal to one if the CEO is also the chairperson of the board.</td>
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</table>
B Construction of Real Earnings Management Measures

Same as in Cohen, Dey, and Lys (2008) and Roychowdhury (2006), we consider three types of real earnings management that are reflected respectively in the abnormal levels of cash flow from operations, production costs, and discretionary expenses.

Abnormal cash flow from operations (Ab CFO) is the actual cash flow from operations (CFO) minus the normal CFO calculated using the estimated coefficients from the following regression for each 2-digit SIC industry-year group:

\[
\frac{CFO_{i,t}}{Total\ Assets_{i,t-1}} = \beta_1 \frac{1}{Total\ Assets_{i,t-1}} + \beta_2 \frac{Sales_{i,t}}{Total\ Assets_{i,t-1}} + \beta_3 \frac{\Delta Sales_{i,t}}{Total\ Assets_{i,t-1}} + \epsilon_{i,t}.\]

Production costs (PROD) are defined as the sum of cost of goods sold and change in inventory during the year. Abnormal production costs (Ab PROD) is the actual production costs minus the normal production costs calculated using the estimated coefficients from the following regression for each 2-digit SIC industry-year group:

\[
\frac{PROD_{i,t}}{Total\ Assets_{i,t-1}} = \beta_1 \frac{1}{Total\ Assets_{i,t-1}} + \beta_2 \frac{Sales_{i,t}}{Total\ Assets_{i,t-1}} + \beta_3 \frac{\Delta Sales_{i,t}}{Total\ Assets_{i,t-1}} + \beta_4 \frac{\Delta Sales_{i,t-1}}{Total\ Assets_{i,t-1}} + \epsilon_{i,t}.\]

Discretionary expenses (DISCEXP) are defined as the sum of R&D expenses, advertising expenses, and selling, general and administrative expenses (SG&A). R&D expenses and advertising expenses are set to zero if they are missing as long as SG&A is available. Abnormal discretionary expenses (Ab DISCEXP) is the actual discretionary expenses minus the normal discretionary expenses calculated using the estimated coefficients from the following regression for each 2-digit SIC industry-year group:

\[
\frac{DISCEXP_{i,t}}{Total\ Assets_{i,t-1}} = \beta_1 \frac{1}{Total\ Assets_{i,t-1}} + \beta_2 \frac{Sales_{i,t}}{Total\ Assets_{i,t-1}} + \epsilon_{i,t}.\]
Figure 1: Effects of CEO Job Security on Quantiles of Discretionary Accruals

This figure presents the coefficients of CEO dismissal hazard in the quantile regressions of discretionary accruals (DA). The solid line depicts the estimated coefficients of the hazard and the dashed lines indicate the 95% confidence intervals of the estimated coefficients. The dash-dot line presents the values of discretionary accruals at each quantile. The scale of the estimated coefficients of the hazard is given on the left vertical axis and the scale of discretionary accruals is given on the right vertical axis.
Table 1: Summary Statistics

The table reports the summary statistics. Hazard is the hazard rate of CEO forced turnover (see Section 3.2 for details) estimated using Cox (1972) model, DA is discretionary accruals, Positive DA and Negative DA are the positive and negative values of discretionary accruals, respectively, Ab CFO, Ab PROD, and Ab DISCEXP are respectively the levels of abnormal cash flow from operations, abnormal production cost, and abnormal discretionary expenses (Cohen, Dey, and Lys, 2008), Size is the logarithm of the book value of total assets, Leverage is long-term debt plus debt in current liabilities divided by the book value of total assets, Market-to-Book is market value of assets divided by the book value of total assets, ROA is net income divided by the book value of total assets, Sales Growth is change in sales divided by lagged sales, Operating Cash Flow is operating cash flows divided by the book value of total assets, Firm Age is the number of years since the firm was listed on a stock exchange, CEO Tenure is the number of year since the CEO is on the position, Analyst Number is the number of analysts following the firm, Auditor Tenure is the number of years since the current auditor works with the firm, and Big 4 Auditors is a dummy variable that indicates that the auditor is one of the four largest auditing firms.

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Table 2: Forced CEO Turnover and Dismissal Hazard

The table reports the estimation of CEO dismissal hazard. Column (1) is based on the Cox (1972) model and Column (2) is based on the Weibull model. Industry induced return and Idiosyncratic return are the industry peer-induced return and the firm’s idiosyncratic return, respectively. Jenter and Kanaan (2015), Retirement age is a dummy variable that is equal to one if the CEO is between 63 and 66 years old, Ownership ≥ 5% is a dummy variable that is equal to one if the CEO owns at least 5% of the shares outstanding, CEO duality is a dummy variable that is equal to one if the CEO is also the chairperson of the board, Board size is the number of directors on the board, Board independence is the percentage of independent directors on the board, Industry turnovers is the number of forced CEO turnovers in peer firms in the same 2-digit SIC industry, and Industry volatility is the return volatilities of stocks in the same 2-digit SIC industry. t-statistics are presented in parentheses. Superscripts ***, **, and * indicate statistical significance at 0.01, 0.05, and 0.10, respectively.

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<td>(2)</td>
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<td>$-1.554^{***}$</td>
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<td>$(-7.09)$</td>
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<td>$-1.409^{**}$</td>
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<td>$(-2.42)$</td>
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<td>Ownership ≥ 5%</td>
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<td>$0.060^{***}$</td>
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<td>$0.051^{**}$</td>
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<td>Constant</td>
<td>12.933^{***}</td>
<td>$(27.57)$</td>
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</table>

Observations 14,072 14,072
Table 3: Pearson Correlation

This table presents the Pearson correlation among the main variables used in the analysis. Hazard is the hazard rate of CEO forced turnover (see Section 3.2 for details), DA is discretionary accruals, Positive DA (PDA) and Negative DA (NDA) are the positive and negative values of discretionary accruals, respectively, Ab CFO (ABC), Ab PROD (ABP), and Ab DISCEXP (ABD) are respectively the levels of abnormal cash flow from operations, abnormal production cost, and abnormal discretionary expenses (Cohen, Dey, and Lys, 2008). Size is the logarithm of the book value of total assets, Leverage (Lev) is long-term debt plus debt in current liabilities divided by the book value of total assets, Market-to-Book (M/B) is market value of assets divided by the book value of total assets, ROA is net income divided by the book value of total assets, Sale Growth (SG) is change in sales divided by lagged sales, Operating Cash Flow is operating cash flows divided by the book value of total assets, Firm Age (FA) is the number of years since the firm was listed on a stock exchange, CEO Tenure (CT) is the number of year since the CEO is on the position, Analyst Number (AN) is the number of analysts following the firm, Auditor Tenure (AT) is the number of years since the current auditor works with the firm, and Big 4 Auditor (Big4) is a dummy variable that indicates that the auditor is one of the four largest auditing firms.

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<th>Hazard</th>
<th>DA</th>
<th>PDA</th>
<th>NDA</th>
<th>ABC</th>
<th>ABP</th>
<th>ABD</th>
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<td>-0.02</td>
<td>0.01</td>
<td>0.00</td>
<td>0.03***</td>
<td>-0.02***</td>
<td>0.19***</td>
<td>0.10***</td>
<td>0.00</td>
<td>-0.02***</td>
<td>0.00</td>
<td>0.00</td>
<td>0.14***</td>
<td>0.05***</td>
<td>-0.11***</td>
<td>0.19***</td>
</tr>
</tbody>
</table>
Table 4: CEO Job Security and Earnings Management – Univariate Analysis

This table presents the univariate results of the effect of CEO dismissal hazard on accrual-based earnings management. For each year, firms are first sorted into 4 groups based on CEO dismissal hazard. We calculate the average discretionary accruals (DA), positive discretionary accruals (Positive DA), and negative discretionary accruals (Negative DA), respectively, for each group and for each year. Then we compute the time-series averages for each group over time.

<table>
<thead>
<tr>
<th>Group</th>
<th>DA</th>
<th>Positive DA</th>
<th>Negative DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>−0.0083</td>
<td>0.0449</td>
<td>−0.0503</td>
</tr>
<tr>
<td>2</td>
<td>−0.0057</td>
<td>0.0389</td>
<td>−0.0429</td>
</tr>
<tr>
<td>3</td>
<td>−0.0087</td>
<td>0.0383</td>
<td>−0.0442</td>
</tr>
<tr>
<td>4</td>
<td>−0.0117</td>
<td>0.0383</td>
<td>−0.0474</td>
</tr>
<tr>
<td>1−4</td>
<td>0.0034</td>
<td>0.0066</td>
<td>−0.0030</td>
</tr>
<tr>
<td>t-statistic</td>
<td>1.46</td>
<td>3.20</td>
<td>−0.96</td>
</tr>
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</table>
### Table 5: CEO Job Security and Accrual-Based Earnings Management – Multivariate Analysis

This table presents the results for the multivariate analysis of the effects of CEO job security on accrual-based earnings management. Panel A reports the results of the baseline regressions. In the OLS and truncated regressions of positive DA, the analysis is carried out for the subsample of positive discretionary accruals. In the OLS and truncated regressions of negative DA, the analysis is conducted for the subsample of negative discretionary accruals. In the OLS of DA, the whole sample is used for the analysis. The definitions of the regressors can be found in Table A.1. Standard errors are clustered at the firm level. *t*-statistics are presented in parentheses. Superscripts ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10, respectively. Panel B presents the test statistics for the hypothesis that the identification variables, that is, Industry turnovers (number of forced CEO turnover in the same 2-digit SIC industry) and Industry volatility (return volatility of stocks in the 2-digit SIC industry), are uncorrelated with the residuals of the baseline regressions.

#### Panel A: Baseline Regressions

<table>
<thead>
<tr>
<th></th>
<th>OLS Positive DA</th>
<th>Negative DA</th>
<th>Truncated Regression Positive DA</th>
<th>Negative DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
<td>−0.0007***</td>
<td>−0.0007***</td>
<td>−0.0001</td>
<td>−0.0066***</td>
</tr>
<tr>
<td></td>
<td>(−3.09)</td>
<td>(−3.45)</td>
<td>(−0.58)</td>
<td>(−2.81)</td>
</tr>
<tr>
<td>Size</td>
<td>−0.0021***</td>
<td>−0.0038***</td>
<td>0.0024***</td>
<td>−0.0507***</td>
</tr>
<tr>
<td></td>
<td>(−3.07)</td>
<td>(−6.03)</td>
<td>(3.41)</td>
<td>(−5.31)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.0070</td>
<td>−0.0047</td>
<td>0.0132***</td>
<td>−0.0814**</td>
</tr>
<tr>
<td></td>
<td>(1.62)</td>
<td>(−1.21)</td>
<td>(3.01)</td>
<td>(−2.12)</td>
</tr>
<tr>
<td>M/B</td>
<td>−0.0014*</td>
<td>0.0028***</td>
<td>−0.0032***</td>
<td>0.0122***</td>
</tr>
<tr>
<td></td>
<td>(−1.84)</td>
<td>(3.65)</td>
<td>(−4.71)</td>
<td>(2.77)</td>
</tr>
<tr>
<td>ROA</td>
<td>0.0691***</td>
<td>−0.0135</td>
<td>0.0550***</td>
<td>−0.0344</td>
</tr>
<tr>
<td></td>
<td>(6.26)</td>
<td>(−1.27)</td>
<td>(5.78)</td>
<td>(−0.44)</td>
</tr>
<tr>
<td>Sales growth</td>
<td>−0.0005</td>
<td>0.0025</td>
<td>−0.0071**</td>
<td>0.0249</td>
</tr>
<tr>
<td></td>
<td>(−0.19)</td>
<td>(1.16)</td>
<td>(−2.46)</td>
<td>(1.38)</td>
</tr>
<tr>
<td>Operating CF</td>
<td>−0.1081***</td>
<td>−0.0295**</td>
<td>−0.0292**</td>
<td>−0.2040**</td>
</tr>
<tr>
<td></td>
<td>(−8.15)</td>
<td>(−2.39)</td>
<td>(−2.37)</td>
<td>(−2.03)</td>
</tr>
<tr>
<td>Ln(Firm age)</td>
<td>0.0013</td>
<td>−0.0023***</td>
<td>0.0031***</td>
<td>−0.0297**</td>
</tr>
<tr>
<td></td>
<td>(1.20)</td>
<td>(−2.12)</td>
<td>(3.07)</td>
<td>(−2.38)</td>
</tr>
<tr>
<td>Ln(Analyst number)</td>
<td>0.0009</td>
<td>−0.0006</td>
<td>0.0003</td>
<td>0.0040</td>
</tr>
<tr>
<td></td>
<td>(0.81)</td>
<td>(−0.57)</td>
<td>(0.23)</td>
<td>(0.38)</td>
</tr>
<tr>
<td>Ln(Auditor tenure)</td>
<td>−0.0003</td>
<td>0.0005</td>
<td>−0.0006</td>
<td>0.0077</td>
</tr>
<tr>
<td></td>
<td>(−0.37)</td>
<td>(0.55)</td>
<td>(−0.73)</td>
<td>(0.80)</td>
</tr>
<tr>
<td>Big 4 auditors</td>
<td>0.0021</td>
<td>0.0031</td>
<td>0.0005</td>
<td>0.0168</td>
</tr>
<tr>
<td></td>
<td>(0.57)</td>
<td>(1.03)</td>
<td>(0.16)</td>
<td>(0.62)</td>
</tr>
<tr>
<td>Ln(CEO tenure)</td>
<td>0.0002</td>
<td>0.0002</td>
<td>0.0006</td>
<td>0.0053</td>
</tr>
<tr>
<td></td>
<td>(0.22)</td>
<td>(0.18)</td>
<td>(0.71)</td>
<td>(0.54)</td>
</tr>
<tr>
<td>Constant</td>
<td>−0.0207**</td>
<td>0.0709***</td>
<td>−0.1039***</td>
<td>0.1123**</td>
</tr>
<tr>
<td></td>
<td>(−1.96)</td>
<td>(7.12)</td>
<td>(−8.68)</td>
<td>(2.04)</td>
</tr>
</tbody>
</table>

#### Industry Dummies
- Yes

#### Year Dummies
- Yes

#### Observations
- 13,732

#### Adj. $R^2$
- 0.037

#### Panel B: Orthogonality Test for Identification Variables

<table>
<thead>
<tr>
<th></th>
<th>J-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Dummies</td>
<td>0.062</td>
<td>0.184</td>
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<tr>
<td>Year Dummies</td>
<td>0.804</td>
<td>0.668</td>
</tr>
</tbody>
</table>

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Table 6: CEO Job Security and Subsequent Performance

This table presents the effects of CEO job security on subsequent firm performance. In columns (1) and (2), firm performance is measured by Tobin’s $Q$ and annual stock return, respectively. Lagged dep. var. is the lagged dependent variable, Capex is capital expenditure divided by the book value of total assets, and stock volatility is the annual volatility of stock return. The definitions of the other variables can be found in Table A.1. Standard errors are clustered at the firm level. $t$-statistics are presented in parentheses. Superscripts $^{***}$, $^{**}$, and $^*$ indicate statistical significance at the 0.01, 0.05, and 0.10, respectively.

<table>
<thead>
<tr>
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<th>Q</th>
<th>Stock Return</th>
</tr>
</thead>
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<tr>
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</tr>
<tr>
<td>Hazard</td>
<td>0.0092***</td>
<td>0.0084***</td>
</tr>
<tr>
<td></td>
<td>(3.64)</td>
<td>(4.01)</td>
</tr>
<tr>
<td>Lagged dep. var.</td>
<td>0.7032***</td>
<td>−0.0817***</td>
</tr>
<tr>
<td></td>
<td>(58.48)</td>
<td>(−7.09)</td>
</tr>
<tr>
<td>Size</td>
<td>−0.0035</td>
<td>−0.0083**</td>
</tr>
<tr>
<td></td>
<td>(−0.57)</td>
<td>(−2.46)</td>
</tr>
<tr>
<td>Leverage</td>
<td>−0.0655</td>
<td>0.1045***</td>
</tr>
<tr>
<td></td>
<td>(−1.32)</td>
<td>(3.39)</td>
</tr>
<tr>
<td>ROA</td>
<td>0.0303</td>
<td>−0.3809***</td>
</tr>
<tr>
<td></td>
<td>(0.21)</td>
<td>(−3.50)</td>
</tr>
<tr>
<td>Sales growth</td>
<td>−0.1311***</td>
<td>−0.1323***</td>
</tr>
<tr>
<td></td>
<td>(−3.35)</td>
<td>(−5.70)</td>
</tr>
<tr>
<td>Operating CF</td>
<td>1.1960***</td>
<td>0.4589***</td>
</tr>
<tr>
<td></td>
<td>(7.94)</td>
<td>(5.12)</td>
</tr>
<tr>
<td>Ln(Firm age)</td>
<td>−0.0198*</td>
<td>−0.0032</td>
</tr>
<tr>
<td></td>
<td>(−1.77)</td>
<td>(−0.46)</td>
</tr>
<tr>
<td>Capex</td>
<td>−0.2992</td>
<td>−0.7585***</td>
</tr>
<tr>
<td></td>
<td>(−1.52)</td>
<td>(−7.17)</td>
</tr>
<tr>
<td>Stock volatility</td>
<td>−0.1559***</td>
<td>0.2724***</td>
</tr>
<tr>
<td></td>
<td>(−2.97)</td>
<td>(7.16)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.5752***</td>
<td>−0.1375</td>
</tr>
<tr>
<td></td>
<td>(3.39)</td>
<td>(−1.42)</td>
</tr>
</tbody>
</table>

Industry Dummies | Yes            | Yes            |
Year Dummies      | Yes            | Yes            |
Observations      | 13,666         | 13,538         |
Adj. $R^2$        | 0.710          | 0.166          |
Table 7: CEO Job Security and Accrual-Based Earnings Management – Opportunistic Motives

This table presents the results for the multivariate analysis of the effects of CEO job security on accrual-based earnings management when the dismissal risk is high and when performance is poor. The dependent variable is the positive values of discretionary accruals, and the results are based on the truncated regressions. In Panel A, Top 50%, Top 40%, Top 30%, Top 20%, and Top 10% are dummy variables that indicate the CEO’s dismissal hazard is among the top 50%, 40%, 30%, 20%, and 10% in the year, respectively. In Panel B, Bottom 10%, Bottom 20%, Bottom 30%, Bottom 40%, and Bottom 50% are dummy variables that indicate current stock return is among the bottom 10%, 20%, 30%, 40%, and 50% in the year, respectively. The control variables are the same as in Table 5. For brevity, the control variables are omitted in the table. Standard errors are clustered at the firm level. t-statistics are presented in parentheses. Superscripts ‘***’, ‘**’, and ‘*’ indicate statistical significance at the 0.01, 0.05, and 0.10, respectively.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
<td>-0.0121*</td>
<td>-0.0116**</td>
<td>-0.0117**</td>
<td>-0.0130***</td>
<td>-0.0108***</td>
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<tr>
<td></td>
<td>(-1.92)</td>
<td>(-2.13)</td>
<td>(-2.43)</td>
<td>(-3.06)</td>
<td>(-3.14)</td>
</tr>
<tr>
<td>Hazard × Top 50%</td>
<td>0.0049</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.97)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard × Top 40%</td>
<td></td>
<td>0.0045</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(1.04)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard × Top 30%</td>
<td></td>
<td>0.0047</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.29)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard × Top 20%</td>
<td></td>
<td>0.0064**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.97)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard × Top 10%</td>
<td></td>
<td>0.0055*</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(1.86)</td>
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<table>
<thead>
<tr>
<th></th>
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<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
<td>-0.0035***</td>
<td>-0.0035***</td>
<td>-0.0034***</td>
<td>-0.0034***</td>
<td>-0.0035***</td>
</tr>
<tr>
<td></td>
<td>(-3.30)</td>
<td>(-3.24)</td>
<td>(-3.11)</td>
<td>(-3.06)</td>
<td>(-2.97)</td>
</tr>
<tr>
<td>Hazard × Bottom 10%</td>
<td>0.0051***</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(2.65)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard × Bottom 20%</td>
<td></td>
<td>0.0027*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(1.84)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Hazard × Bottom 30%</td>
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<td>0.0016</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>(1.25)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard × Bottom 40%</td>
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<td>0.0013</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>(1.11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard × Bottom 50%</td>
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<td></td>
<td></td>
<td></td>
<td>0.0011</td>
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<td></td>
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Regression Control Variables

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<th>Yes</th>
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<td>Control Variables</td>
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<td>Industry Dummies</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year Dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
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<td>6,025</td>
<td>6,025</td>
<td>6,025</td>
<td>6,025</td>
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</table>
This table presents the effects of CEO job security on accrual-based earnings management when firms face different levels of internal monitoring. The dependent variables is the positive values of discretionary accruals, and all results are based on the truncated regression. In Panel A, subsamples are partitioned based on the percentage of independent board members; in Panel B, subsamples are partitioned based on board size; and in Panel C, subsamples are based on whether the CEO is also the chairman of the board of directors. In panels A and B, the subsample cutoff points are industry-year specific. In all panels, the control variables (including industry and year dummies) are included and their definitions can be found in Table A.1. For brevity, the control variables are omitted in the table. Standard errors are clustered at the firm level. *t*-statistics are presented in parentheses. Superscripts ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10, respectively.

### Panel A: Board Independence

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Bottom 25%</th>
<th>Top 25%</th>
<th>Bottom 50%</th>
<th>Top 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>−0.0095***</td>
<td>−0.0072</td>
<td>−0.0075***</td>
<td>−0.0031</td>
</tr>
<tr>
<td></td>
<td>(−2.26)</td>
<td>(−1.16)</td>
<td>(−2.66)</td>
<td>(−0.87)</td>
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<td>Observations</td>
<td>1,893</td>
<td>1,843</td>
<td>3,348</td>
<td>2,678</td>
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</table>

### Panel B: Board Size

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Bottom 25%</th>
<th>Top 25%</th>
<th>Bottom 50%</th>
<th>Top 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>−0.0128***</td>
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<td>−0.0089***</td>
<td>−0.0014</td>
</tr>
<tr>
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<td>(−2.85)</td>
<td>(0.50)</td>
<td>(−3.33)</td>
<td>(−0.33)</td>
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<td>Observations</td>
<td>2,244</td>
<td>2,111</td>
<td>3,686</td>
<td>2,340</td>
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### Panel C: CEO-Chairperson Duality

<table>
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<th>Hazard</th>
<th>CEO Duality = 1</th>
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<tbody>
<tr>
<td></td>
<td>−0.0067*</td>
<td>−0.0071**</td>
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### Regression Control Variables

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<th>Yes</th>
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<th>Yes</th>
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</thead>
<tbody>
<tr>
<td>Industry Dummies</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year Dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Table 9: CEO Job Security and Accrual-Based Earnings Management – Subsample Analysis Based on External Monitoring

This table presents the effects of CEO job security on accrual-based earnings management when firms face different levels of external monitoring. The dependent variables is the positive values of discretionary accruals, and all results are based on the truncated regression. In Panel A, subsamples are partitioned based on firm size; In Panel B, subsample are partitioned based on the number of analysts covering the firm; In Panel C, subsamples are partitioned based on the ownership of the top 5 institutional investors; in Panel D, subsamples are partitioned based on the concentration (HHI) of the ownership of institutional investors, and in Panel E, subsamples are partitioned based on the ownership of dedicated institutional investors. The subsample cutoff points are industry-year specific. In all panels, the control variables (including industry and year dummies) are included and their definitions can be found in Table A.1. For brevity, the control variables are omitted in the table. Standard errors are clustered at the firm level. $t$-statistics are presented in parentheses. Superscripts $^{***}$, $^{**}$, and * indicate statistical significance at the 0.01, 0.05, and 0.10, respectively.

<table>
<thead>
<tr>
<th></th>
<th>Panel A: Firm Size</th>
<th>Panel B: Number of Analysts</th>
<th>Panel C: Top 5 Ownership</th>
<th>Panel D: Ownership HHI</th>
<th>Panel E: Dedicated Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bottom 25%</td>
<td>Top 25%</td>
<td>Bottom 50%</td>
<td>Top 50%</td>
<td>Bottom 25%</td>
</tr>
<tr>
<td>Hazard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>−0.0107***</td>
<td>−0.0006</td>
<td>−0.0101***</td>
<td>−0.0016</td>
<td>−0.0097**</td>
</tr>
<tr>
<td></td>
<td>(−2.81)</td>
<td>(−0.21)</td>
<td>(−2.95)</td>
<td>(−0.57)</td>
<td>(−2.56)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,541</td>
<td>1,439</td>
<td>3,087</td>
<td>2,939</td>
<td>1,894</td>
</tr>
</tbody>
</table>

|          | Regression Control Variables |          |                          |                        |                             |                          |                          |                        |                             |                             |                          |                        |
|          | Control Variables         | Yes      | Yes                      | Yes                    | Yes                      |                             |                          |                        |                             |                             |                          |                        |
|          | Industry Dummies          | Yes      | Yes                      | Yes                    | Yes                      |                             |                          |                        |                             |                             |                          |                        |
|          | Year Dummies              | Yes      | Yes                      | Yes                    | Yes                      |                             |                          |                        |                             |                             |                          |                        |
### Table 10: CEO Job Security and Real Earnings Management

This table presents the effects of CEO job security on real earnings management. In column (1), the dependent variable is abnormal cash flow from operations (Ab CFO), in column (2), the dependent variable is abnormal production costs (Ab PROD), and in column (3), the dependent variable is abnormal discretionary expenses (Ab DISCEXP). Definitions of the independent variables can be found in Table A.1. Standard errors are clustered at the firm level. *t*-statistics are presented in parentheses. Superscripts ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10, respectively.

<table>
<thead>
<tr>
<th></th>
<th>Ab CFO</th>
<th>Ab PROD</th>
<th>Ab DISCEXP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
<td>−0.0002</td>
<td>−0.0016*</td>
<td>0.0023**</td>
</tr>
<tr>
<td></td>
<td>(−0.55)</td>
<td>(−1.72)</td>
<td>(2.12)</td>
</tr>
<tr>
<td>Size</td>
<td>0.0025***</td>
<td>0.0123***</td>
<td>−0.0231***</td>
</tr>
<tr>
<td></td>
<td>(2.25)</td>
<td>(3.06)</td>
<td>(−4.97)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.0182***</td>
<td>−0.0317</td>
<td>−0.0936***</td>
</tr>
<tr>
<td></td>
<td>(2.64)</td>
<td>(−1.17)</td>
<td>(−2.73)</td>
</tr>
<tr>
<td>M/B</td>
<td>0.0156***</td>
<td>−0.0431***</td>
<td>0.0518***</td>
</tr>
<tr>
<td></td>
<td>(12.96)</td>
<td>(−14.20)</td>
<td>(14.46)</td>
</tr>
<tr>
<td>ROA</td>
<td>0.1767***</td>
<td>−0.0676*</td>
<td>−0.4293***</td>
</tr>
<tr>
<td></td>
<td>(9.90)</td>
<td>(−1.75)</td>
<td>(−10.99)</td>
</tr>
<tr>
<td>Sales growth</td>
<td>0.0010</td>
<td>0.0406***</td>
<td>0.0042</td>
</tr>
<tr>
<td></td>
<td>(0.27)</td>
<td>(4.50)</td>
<td>(0.40)</td>
</tr>
<tr>
<td>Operating CF</td>
<td>0.4203***</td>
<td>−0.4215***</td>
<td>−0.1343**</td>
</tr>
<tr>
<td></td>
<td>(19.95)</td>
<td>(−9.19)</td>
<td>(−2.57)</td>
</tr>
<tr>
<td>Ln(Firm age)</td>
<td>−0.0050***</td>
<td>0.0077</td>
<td>−0.0178**</td>
</tr>
<tr>
<td></td>
<td>(−2.99)</td>
<td>(1.18)</td>
<td>(−2.35)</td>
</tr>
<tr>
<td>Ln(Analyst number)</td>
<td>0.0034**</td>
<td>−0.0171***</td>
<td>0.0306***</td>
</tr>
<tr>
<td></td>
<td>(2.19)</td>
<td>(−2.99)</td>
<td>(4.56)</td>
</tr>
<tr>
<td>Ln(Auditor tenure)</td>
<td>0.0010</td>
<td>−0.0051</td>
<td>0.0033</td>
</tr>
<tr>
<td></td>
<td>(0.77)</td>
<td>(−0.99)</td>
<td>(0.57)</td>
</tr>
<tr>
<td>Big 4 auditors</td>
<td>−0.0012</td>
<td>0.0239</td>
<td>−0.0109</td>
</tr>
<tr>
<td></td>
<td>(−0.25)</td>
<td>(1.61)</td>
<td>(−0.63)</td>
</tr>
<tr>
<td>Ln(CEO tenure)</td>
<td>0.0000</td>
<td>0.0006</td>
<td>0.0064</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.13)</td>
<td>(1.15)</td>
</tr>
<tr>
<td>Constant</td>
<td>−0.0244*</td>
<td>0.0021</td>
<td>0.0531</td>
</tr>
<tr>
<td></td>
<td>(−1.76)</td>
<td>(0.04)</td>
<td>(0.91)</td>
</tr>
<tr>
<td>Industry Dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year Dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>12,373</td>
<td>12,373</td>
<td>12,373</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.420</td>
<td>0.207</td>
<td>0.178</td>
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</tbody>
</table>