CEO Age and the Persistence of Internal Control Deficiencies

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Upper Echelon theory (Hambrick and Mason, 1984) allows researchers to investigate executives' decision-making process through their personal traits. This paper investigates the impact of CEO age on the long-term internal control quality. We examine the association between CEO age and the persistence of internal control deficiency. Using the number of material weaknesses in the future (one to five years) as the proxy of persistence of internal control deficiency, we find that companies with older CEOs tend to have less material weaknesses in the future. Furthermore, we also examine the impact of other CEO characteristics and CEO turnover on the persistence of internal control deficiencies. These results indicate that management, especially CEO's personal traits have significant impact on a company's policies regarding to internal control.

INTRODUCTION

After a series of accounting scandals in the early 2000s, regulators, professionals, and researchers have emphasized the importance of an effective internal control. In August 2002, the U.S. Securities and Exchange Commission (SEC) adopted the Sarbanes-Oxley Act (SOX) Section 302, which requires top management to be responsible for the establishment, evaluation, and reporting of the effectiveness of the internal control structure. In addition, SOX Section 404 also requires management make annual assessment and report on the effectiveness of the internal control over financial reporting and further requires auditors attest management's assessment and issue their opinion on whether the internal control over financial reporting is effective. Therefore, top management plays an essential role in designing, establishing, and maintaining an effective internal control. Consistent with the regulatory requirement, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) updated their Internal Control – Integrated Framework in year 2013 and reemphasized the importance of top management in establishing an effective internal control system. Management's integrity and ethical values, as well as their ability and oversight, have a pervasive impact on the quality of internal control (COSO, 2013). This study provides empirical evidence on the effects of top management on internal control deficiencies.

Specifically, we explore how CEOs at different ages remediate the material weaknesses in their internal controls systems differently and therefore affects the persistence of internal control deficiencies.

A deficiency in internal control over financial reporting exists when management fails to prevent or detect misstatements in a timely manner. According to PCAOB Auditing Standard No. 5, a material weakness is "a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis". Internal control material weaknesses are related to lower financial reporting quality and remediation of the material weakness results in increased quality of the financial statements (Ashbaugh-Skaife et al., 2008). Goh (2009) argues that an efficient remediation of internal control material weaknesses sends a strong signal to investors that the firm is committed to improve their financial reporting quality. In addition, the major bond rating institutions, such as Moody's, also indicate that the persistence of internal control problems may cause a negative change in the firms' rating (Moody's, 2006). This study uses the long-term reporting of material weaknesses as a proxy of the persistence of internal control deficiencies and examines the relationship between CEO age, along with other CEO characteristic, and the number of material weaknesses reported in future years (in a range of 1 to 5 years).

The relationship between the CEO age and the persistence of internal control deficiency is important for two reasons. First, Lin et al. (2014) find evidence that CEO characteristics, such as management ownership, tenure, and age, are significantly related to the disclosure of internal control material weaknesses. However, prior literature documents evidence that companies disclosing material weaknesses tend to be smaller and younger, have lower profitability, and grow more rapidly (Ge and Mcvay, 2005; Doyle et al., 2007). Therefore, the disclosure of a material weakness in internal control may be driven by firm characteristics, rather than CEO's characteristics, especially in the early years of the implementation of SOX. In the meantime, future disclosure of material weaknesses better captures the CEO's effort to remediate the control problem, given that firm characteristics may not change much year by year. After SOX of 2002, the importance of internal control attracted attention from regulators, professionals, and investors. Internal control material weakness is found to be related to higher auditor fees (Hogan and Wilkins, 2008), negative stock reaction (Hammersley et al., 2008), and higher cost of equity (Ashbaugh-Skaife et al., 2009). Therefore, managers have high incentives to fix the problem once a material weakness in internal control is disclosed. Future disclosure of internal control material weakness captures CEO's effort and attitude to remediate a deficient internal control system.

Second, prior literature documents mixed results about the relationship between CEO age and CEO's performance. On one hand, psychological research shows evidence that older individuals are commonly more ethical, conservative, and committed to organizations (Steers, 1977; Stevens et al., 1978; Mudrack, 1989; Twenge and Campbell, 2008). Consistently, prior studies find evidence that older CEOs are less likely to engage in accrual-based or real earnings management behavior (Huang et al., 2012; Kouaib and Jarboui, 2016). On the other hand, Fama (1980) argues that managers' behavior is disciplined by their labor market. Managers are aware that their current good performance may lead to better future job on the market. These career concerns may restrict managers' earnings management behavior and therefore decrease the agency costs. Consistent with this notion, pre-retirement managers have less career concern and are found to me more engaged in earnings management behavior (Dechow and Sloan, 1991; Davidson et al., 2007; Chen et al., 2017). The mixed results may due to different incentives for CEOs. For example, older CEOs who pursue personal wealth may have more incentives to manipulate earnings than older CEOs who have cumulated enough personal wealth. The latter may focus more on their reputation and may provide better quality financial statements because of their abilities and ethical values. The survival of older CEOs implies their ability and performance (Hambrick and Fukutomi, 1991). Deshpande (1997) documents evidence that older managers are more ethical in perceiving certain business behaviors. The requirement of the report on the effectiveness of internal control provides a good setting. If a material weakness in the internal control is disclosed, managers generally have incentives to remediate the problem given the potential financial costs related to the disclosure of the material weakness (i.e. increased audit fees and cost of equity, negative stock reaction, as discussed above). Then the future

disclosure of internal control material weaknesses better captures CEOs' effort and attitude to fix the problems, and therefore, provides a good setting to examine the effects of CEO age on corporate governance.

In this study, we collected 10,489 firm-year internal control opinions from 2003 to 2013 in AuditAnalytics. We find a significantly negative relationship between CEO age and the count of internal control material weaknesses in the future, suggesting that companies with older CEOs tend to have less internal control deficiencies in the future. Furthermore, we also find a negative relationship between the interaction term *CEO age* × *number of material weaknesses in current period* and the number of internal control material weaknesses in the future periods. That indicates that CEO age has a marginal effect on the persistence of internal control deficiencies. For companies with internal control deficiencies already, older CEOs better reduce the deficiencies in the future.

We then run a series of additional tests regarding to other possible determinants of long-term internal control quality. In the test of the impact of other CEO characteristics on the persistence of internal control deficiencies, the results show that CEO age is the dominating factor among all the tested characteristics. We next test the relationship between CEO turnover and the future internal control deficiencies. After a company replaces its current CEO with a new CEO, there are more uncertainties and it is more likely to have internal control deficiencies in the future. The results also indicate that the impact of the replaced CEO lingers over a long period of time. Lastly, we test the impact of CFO, another important member in the management team. We find that older CEOs can mitigate the influence of powerful CFOs on the persistence of internal control deficiencies.

The main contribution of this study is three folds. First, we extend Lin et al. (2014) on the effects of CEO age on internal control quality. We find evidence that CEO age is negatively related to future internal control material weaknesses, suggesting older CEOs are better at remediating internal control systems once a deficiency is detected. The results contribute to the literature on the determinants of internal control. Second, our findings also contribute to the corporate governance literature. Our results provide new evidence to upper echelon theory on how managerial personal traits affect corporate policies and organizational outcomes. Third, this study has important practical implications. Since non-accelerated filers are not required to provide auditors' opinion on the effectiveness of internal control, CEO age may serve as a signal on the internal control quality for regulators, practitioners, and investors.

The remainder of the paper is organized as follows. Section 2 provides the background information, discusses the prior literature, and develops the hypothesis. Section 3 describes the sample and research method. The main results are presented in section 4. Section 5 presents the additional tests as well as the results. Section 6 concludes.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Upper Echelon Theory

Upper echelon theory states that organizational performances reflect the values and cognitive bases of powerful players in the organization (Hambrick and Mason, 1984). Hambrick (2007) further explains that top executives interpret situations differently and make different decisions based on their experiences, personal values, as well as personalities. Therefore, the demographic information of top management may reflect the managing styles of different executives and serve as the proxies of cognitive bases. Although the demographics do not completely and precisely align with the real psychological and decision-making process, this information still can provide reliable predictions of strategic actions.

Consistently, prior empirical studies have provided substantial evidence that demographic profiles of top management are significantly related with their strategic decisions and business performance outcomes. For example, Boeker (1997) examines the influence of managerial characteristics and organizational growth and finds various managerial characteristics are significantly related with the levels of strategic change. Wu et al. (2005) indicate a curvilinear, inverted U-shaped overall relationship between CEO tenure and invention. Ge et al. (2011) find that CFO's individual characteristics affect their companies' accounting choice.

CEO Age

CEO's characteristics affect management's decision-making process, thus affect a company's strategic decisions and the effectiveness of the decisions. As an intrinsic characteristic, CEO's age has long been a focus in academic researches. Prior studies suggest that CEO age may affect risk preferences in the decision-making process. Younger CEOs tend to invest more aggressively and take greater risk to appear more talented (Prendergast and Stole, 1996). In addition, CEO age is found to be associated with firm performance. Companies with older CEOs have a lower stock return volatility, lower R&D expenditure, and higher diversity of investments (Serfling, 2014).

Regarding the relationship between CEO age and CEO performance, prior studies find mixed results. On one hand, psychological literature demonstrate that older managers are more committed to their organizations and are more conservative in their decision making process than younger managers (Steers, 1977; Stevens et al., 1978; Thomas et al., 1991). Consistently, a series of prior literature finds evidence that CEO age is negatively related to earnings manipulation behavior. For example, Cornett et al. (2008) and Demers and Wang (2010) report evidence that younger CEOs are more likely to perform accrual-based earnings management. Huang et al. (2012) examines the association between CEO age and the financial reporting quality of firms proxied by analyst forecast goal and restatements. They find that companies with older CEOs are associated with higher quality of financial reporting. Kouaib and Jarboui (2016) find that younger CEOs are positively related to real earnings management behavior. Specifically, younger CEOs cut more R&D expenditures, resulting in higher net income.

On the other hand, Fama (1980) suggest that managers' career concerns are able to restrict management behavior and therefore reduce agency costs. Therefore, older CEOs with less career concerns are more likely to make decisions that align with their own interests as the costs of the shareholders (Liu et al. 2018; Chen et al. 2018). Prior studies also find evidence that older CEOs are related to lower earnings quality. Specifically, Dechow and Sloan (1991) and Barker and Mueller (2002) both find evidence that firms with pre-retirement CEOs cut more R&D expenditures than firms with younger CEOs, suggesting that older CEOs are more likely to engage in real earnings management. Moreover, Davidson et al. (2007) and Kalyta (2009) report further evidence that pre-retirement managers are related to higher accrual-based earnings management. Chen et al. (2017) also report that CEOs are less conservative in their final years of employment.

To conclude, older CEOs are generally more committed and more conservative (Steers, 1977; Stevens et al., 1978; Thomas et al., 1991), as well as more capable and more ethical (Hambrick and Fukutomi, 1991; Deshpande, 1997). However, older CEOs have less career concerns, and therefore, are less constrained from aggressive behaviors.

Internal Control Quality

After the enactment of SOX in 2002, a series of studies examined the determinants of internal control quality. In terms of company characteristics, Doyle et al. (2006) finds that internal control quality is significantly related to firm size, development phase, financial health, complexity, growth rate, and firm restructure. Related to firms' monitoring function, Zhang et al. (2007) report that firms are more likely to disclose internal control material weaknesses if there is a lack of financial expert on their audit committee. Furthermore, the authors find that internal control material weaknesses are positively related to auditor independence. Hoitash et al. (2009) provide further evidence that disclosure of internal control material weakness is significantly associated with board and audit committee quality. Hua et al. (2016) find a negative relationship between busy audit committee members and internal control deficiencies. For management characteristics, Jha et al. (2010) document evidence that the performance-based compensation of the CEOs and the CFOs is significantly associated with the disclosure of material weaknesses. Lin et al. (2014) suggests that the characteristics of CEO have a significant influence on the disclosure of internal control material weaknesses. Specifically, the authors find that CEO entrenchment, CEO power, CEO age, and CEO's compensation are significantly associated with internal control quality. CEO gender is not found to be significantly related to internal control material weaknesses.

In our study, we extend Lin et al. (2014) by investigating how CEO characteristics affect the future persistence of internal control material weaknesses. Future material weaknesses reflect firms' remediation of the deficiency found in the internal control systems. Goh (2009) and Johnstone et al. (2011) report evidence that the number and the severity of current material weaknesses affect the future disclosure of internal control deficiency. Klamm et al. (2012) find company characteristics, such as profitability, firm complexity, information technology, and the choice of auditors, are associated with the likelihood of future internal control material weaknesses.

The effects of CEO age on the persistence of internal control material weaknesses are two- sided. On one hand, since older CEOs are more committed to the organization, more ethical, and more capable, they may be more efficient to take rigorous action to improve the internal control system once a material weakness is detected. On the other hand, if older CEOs have less concern about their reputation or future career opportunity, they may take advantage of the internal control deficiency to achieve their personal goal at the costs of shareholders. Therefore, we do not predict the direction of the effects of CEO age on future internal control quality. Our hypothesis is presented as follows:

Hypothesis: *CEO age is significantly associated with the persistence of internal control material weaknesses in the future.*

SAMPLE AND VARIABLES

Sample

We start formulating the sample by downloading SOX 404 internal control deficiencies during fiscal year 2003-2013 from Audit Analytics. Company financial information is retrieved from Compustat. Age information of CEOs is obtained from Execucomp. Finally, we go to BoardEx to download board characteristics. The final sample is composed of 10,489 firm-years from fiscal year 2003 to 2013. The change of number of observations is tabulated on Table 1.

TABLE 1
SAMPLE SELECTION

Merging Procedure	Data Source	Remaining No. Firm-years
1.SOX 404 internal control data fiscal year 2003-2013	Audit Analytics	73,871
2. Financial information	Compustat	33,023
3. Auditor characteristics	Audit Analytics	32,942
4. CEO age	Execucomp	12,322
5. Board characteristics	BoardEx	10,489

Table 2 shows the distribution of our sample by fiscal year and industries defined by Ge and McVay (2005). Our sample varies slightly (10-12%) across the testing period except the beginning (2003 and 2004) and the terminal (2013) years because of the limited data in Execucomp and BoardEx. Half of our observations are in Computers (14.96%), Banks (12.41%), Services (8.71%), Equipment (6.82%), Retail (6.27%), and Industrial (6.12%). The other industries each takes around 2.16 to 5.86 percentage, and only 41 observations are from agriculture and public administration industries.

TABLE 2
YEAR AND INDUSTRY DESCRIPTION

FYEAR	No. Firm-years	Percent	Industry	No. Firm-years	Percent
2003	1	0.01	Agriculture	30	0.29
2004	839	8	Banks	1,302	12.41
2005	1,092	10.41	Chemicals	424	4.04
2006	1,143	10.90	Computers	1,569	14.96
2007	1,236	11.78	Drugs	415	3.96
2008	1,274	12.15	Electrical	227	2.16
2009	1,211	11.55	Equipment	715	6.82
2010	1,195	11.39	Food	234	2.23
2011	1,236	11.78	Industrial	642	6.12
2012	1,153	10.99	Medical Device	333	3.17
2013	109	1.04	Mining	310	2.96
Total	10,489	100.00	Public	11	0.10
			Refining	511	4.87
			Retail	658	6.27
			Rubber	532	5.07
			Services	914	8.71
			Textiles	462	4.40
			Transportation	585	5.58
			Utilities	615	5.86
			Total	10,489	100.00

Control Variables

We are primarily interested in the effect of CEO age on the persistence of internal control deficiencies. We adopt the framework of Klamm et al. (2012) and add a few more controls according to the prior literature. A usual variable prior literature uses to capture CEO power is whether the CEO is also chairman of the board of directors (*CEOCHAIR*) (Core et al., 1999; Hermalin and Weisbach, 1998; Hill and Phan, 1991). Since the CEO chairs the board of directors, he/she has power to direct the policy of the organization as well as the financial reporting process. Therefore, we expect this variable to be positively correlated with future number of internal control deficiencies. Beasley (1996) finds a lower likelihood of fraud when boards are more independent, and DeFond et al. (2005) concludes the level of independent members of the board (*INDEP*) may help offset the potential influence of management. We expect to find a negative association with independence. The passage of SOX increased the importance of financial experts in the proper functioning of the audit committee and thus we control for the number of financial experts serving on the audit committee (*FINEXP*). Studies show that more number of financial experts on the audit committees improves financial reporting quality (Bruynseels and Cardinaels, 2014; Krishnan, 2005; Abbott et al., 2004; Carcello et al., 2002). Therefore, we expect a negative association with the level of financial experts and the presence of material internal control weaknesses in the next year(s). The auditor literature shows that big four/five accounting firms have much greater resources and specialties compared to their industry peers and is proxy for auditor quality (Ferguson and Stokes, 2002). A big-4 auditor is more likely to be hired by larger and more profitable companies than smaller and less profitable companies, since larger and more profitable companies are less likely to have internal control problems (Doyle et al., 2007a), a negative relationship between auditor quality (*BIG4*) and future number of internal control deficiencies may be anticipated. However, greater resources and specialties also allow big-4 auditors to capture internal control weaknesses more easily, hence a positive relationship between *BIG4* and future internal control deficiencies is possible (Zhang et al., 2007). Therefore, we do not predict the direction of the association between *BIG4* and future internal control weaknesses. Francis and Yu

(2009) reports that bigger firms tend to have better financial reporting quality, and thus we use the natural log of total assets (*LOGASSETS*) to proxy for firm size and expect a negative association to number of internal control deficiencies in the next year. Klamm et al. (2012) finds that less profitable companies are associated with more number of internal control deficiencies in the future. We include returns on assets (*ROA*) to control profitability of companies and expect a negative association as well. In the same paper, Klamm et al. (2012) uses acquisition (*ACQ*) as proxy for operational complexity of companies and finds negative association between *ACQ* and future internal control weaknesses, therefore, we follow Klamm et al. (2012) to include a dummy variable *ACQ* as a control variable and expect a negative coefficient in the results. Ashbaugh et al. (2008) also suggest more complex operations are associated with poor financial reporting quality while Carcello et al. (2005) and Doyle et al. (2007b) agree and suggest there is a greater need for better monitoring as a firm becomes more complex. We expect a positive association between our proxies for firm complexity which include the number of operating segments (*SEGNUM*) and geographic segments (*GEONUM*), and restructuring activities (*RESTRUCT*) as suggested by Doyle et al. (2007b). As firms become more globalized there is increasing demand for control systems (Ditello, 2004) and thus our proxy exposure to international operations using foreign currency gains or losses (*FOR*) and expect a positive association to future internal control deficiencies.

Empirical Model

We follow Klamm et al. (2012) to develop a Poisson regression model of future internal control deficiencies on current internal control deficiencies:

$$FutureMWNUM = \beta_0 + \beta_1 MWNUM + \beta_2 CEOAGE + \beta_3 MWNUM * CEOAGE + \beta_4 CEOCHAIR + \beta_5 INDEP + \beta_6 FINEX + \beta_7 BIG4 + \beta_8 LOGASSETS + \beta_9 ROA + \beta_{10} ACQ + \beta_{11} SEGNUM + \beta_{12} GEONUM + \beta_{13} RESTRUCT + \beta_{14} FOR + \beta_{15} Industry\_Dummy + \varepsilon \quad (1)$$

The detailed definition of the variables are described in Appendix.

Table 3 reports descriptive statistics of our variables. We separate sample using the median age of CEO of the entire sample, 55 years-old. Companies with younger CEO's exhibit more average number of internal control deficiencies than companies with older CEO's both in the current year (*MWNUM*) and next one to five years (*FutureMWNUM1~5*), and the differences in means are significant at least 0.05 level. When we use dummy variable, *MW_Dummy*, to represent whether the company has any internal control deficiencies in the current year, we find that companies with younger CEO's are more likely to report internal control deficiencies (5%) than companies with older CEO's (4%). Using another measure for persistence of internal control deficiencies, number of years (one to five years) exhibiting at least one internal control deficiency (*FutureMWYRS1~5*), companies with younger CEO's also show more years of reporting internal control deficiencies than companies with older CEO's. Both groups of companies reveal increasing trend of number of internal control weaknesses (*FutureMWNUM*) and number of years with at least one internal control deficiency (*FutureMWYRS*) from the next two to five years. However, the yearly increased number of internal control deficiencies of companies with younger CEO's are generally larger than those of companies with older CEO's (i.e., 0.030, 0.022, 0.015, and 0.012 vs. 0.022, 0.018, 0.014, and 0.010 for younger group and older group respectively). Companies with older CEO's appear to be able to remediate internal control deficiencies quicker than those with younger CEO's do. Our hypothesis receives initial confirmation from descriptive statistics.

From the perspective of corporate governance, younger CEO's do not have as much power over the board as older CEO's as seen by lower likelihood of dualship among younger CEO's (57%) than older CEO's (72%). Younger CEO's generally lead companies with more independent directors on the board (79%) and more financial experts on the audit committees (21%) than older CEO's (78% and 17% respectively). It is interesting to know that even though prior literature documents that more independent boards which are composed of more financial experts are associated with better internal control results, when the CEO is relatively young, the number of material weaknesses in internal controls of his company is relatively high and persistent compared with those of companies led by relatively old CEO's. Younger CEO's are not more likely to hire *BIG4* auditors than older CEO's. Companies led by younger CEO's are

on average smaller (*LOGASSETS*) and less profitable (*ROA*) than companies led by older CEO's. As far as complexity of business transactions' concern, younger CEO's are not necessarily more likely to undergo merger and acquisitions (*ACQ*) than older CEO's. While younger CEO's have fewer number of segments (*SEGNUM*) than older CEO's do, they are more likely to engage in restructuring activities (*RESTRUCT*) and foreign operations (*FOR*) than older CEO's are.

Pair-wise correlations are displayed in Table 4. For brevity, we only display number of internal control deficiencies in the current year (*MWNUM*) and in the next year (*FutureMWNUM1*). Untabluated matrix with variables of more years of internal control deficiencies (*FutureMWNUM2~5* and *FutureMWYRS1~5*) shows similar correlations as Table 4. *FutureMWNUM1* is positively correlated with *MWNUM*, which indicates the persistence of internal control deficiencies. Consistent with our expectation, *FutureMWNUM1* is negatively correlated with *CEOAGE*. Independence of the board (*INDEP*), company size (*LOGASSETS*), and profitability of company (*ROA*) are negatively correlated with *FutureMWNUM1*. Number of geographic operations (*GEONUM*) and foreign operations (*FOR*) are positively correlated with *FutureMWNUM1*, implying that internal control deficiencies persists when the operation of the business is complex. Except *BIG4*, correlations between *FutureMWNUM1* and the other independent variables are all less than 0.8, which does not pose mutltollenearity issue (Gujarati, 2003). Furthermore, untabulated variance inflation factors (VIF) show all of the variables exhibit VIF less than 2.0 thus, multicollenearity is not a concern with our model.

TABLE 3
DESCRIPTIVE STATISTICS

		CEOAGE<=55				
Variable	**N**	**Mean**	**Med.**	**Min.**	**Max.**	**Std Dev**
CEOAGE	5,293	49.81	51.00	31	55	4.11
MWNUM	5,293	0.12	0.00	0	20	0.76
MW_Dummy	5,293	0.05	0.00	0	1	0.22
FutureMWNUM1	5,293	0.10	0.00	0	20	0.70
FutureMWNUM2	5,293	0.17	0.00	0	40	1.13
FutureMWNUM3	5,293	0.22	0.00	0	56	1.38
FutureMWNUM4	5,293	0.25	0.00	0	58	1.48
FutureMWNUM5	5,293	0.27	0.00	0	58	1.54
FutureMWYRS1	5,293	0.04	0.00	0	1	0.20
FutureMWYRS2	5,293	0.07	0.00	0	2	0.31
FutureMWYRS3	5,293	0.09	0.00	0	3	0.38
FutureMWYRS4	5,293	0.11	0.00	0	4	0.42
FutureMWYRS5	5,293	0.12	0.00	0	5	0.45
CEOCHAIR	5,293	0.57	1.00	0	1	0.50
INDEP	5,293	0.79	0.82	0.11	1	0.11
FINEXP	5,293	0.21	0.25	0	1	0.21
BIG4	5,293	0.92	1.00	0	1	0.27
LOGASSETS	5,293	7.49	7.41	2.30	14.48	1.64
ROA	5,293	0.04	0.05	-0.53	0.20	0.10
ACQ	5,293	0.07	0.00	0	1	0.25
SEGNUM	5,293	3.32	3.00	1	24	2.49
GEONUM	5,293	3.46	3.00	1	33	2.99
RESTRUCT	5,293	0.40	0.00	0	1	0.49
FOR	5,293	0.37	0.00	0	1	0.48

*,**,*** indicate that a group means are significantly different at the 0.10,0.05, and 0.01 levels, respectively, two-tailed from the mean. Definition of variables are described in Appendix.

TABLE 3 (CONTINUED)
DESCRIPTIVE STATISTICS

Variable	N	Mean	Med.	Min.	Max.	Std Dev	Diff.	t stat	
CEOAGE	5,196	61.43	60.00	56	96	4.99	-11.62	-130.09	***
MWNUM	5,196	0.09	0.00	0	18	0.59	0.03	2.5	**
MW_Dummy	5,196	0.04	0.00	0	1	0.20	0.01	2.54	**
FutureMWNUM1	5,196	0.06	0.00	0	10	0.44	0.04	3.1	***
FutureMWNUM2	5,196	0.10	0.00	0	25	0.70	0.06	3.45	***
FutureMWNUM3	5,196	0.14	0.00	0	34	0.91	0.08	3.42	***
FutureMWNUM4	5,196	0.16	0.00	0	34	1.03	0.08	3.36	***
FutureMWNUM5	5,196	0.18	0.00	0	34	1.07	0.09	3.49	***
FutureMWYRS1	5,196	0.03	0.00	0	1	0.18	0.01	2.8	***
FutureMWYRS2	5,196	0.05	0.00	0	2	0.26	0.02	3.23	***
FutureMWYRS3	5,196	0.07	0.00	0	3	0.32	0.02	3.24	***
FutureMWYRS4	5,196	0.09	0.00	0	4	0.36	0.02	3.04	***
FutureMWYRS5	5,196	0.10	0.00	0	4	0.38	0.02	3.03	***
CEOCHAIR	5,196	0.72	1.00	0	1	0.45	-0.15	-16.47	***
INDEP	5,196	0.78	0.82	0.20	0.94	0.12	0.01	2.52	***
FINEXP	5,196	0.17	0.00	0	1	0.20	0.04	10.36	***
BIG4	5,196	0.92	1.00	0	1	0.28	0.00	0.6	
LOGASSETS	5,196	7.82	7.64	2.34	14.60	1.74	-0.33	-9.87	***
ROA	5,196	0.04	0.05	-0.53	0.20	0.09	0.00	-1.65	*
ACQ	5,196	0.06	0.00	0	1	0.23	0.01	1.58	
SEGNUM	5,196	3.83	4.00	1	22	2.66	-0.51	-10.17	***
GEONUM	5,196	3.49	3.00	1	32	3.01	-0.02	-0.41	
RESTRUCT	5,196	0.37	0.00	0	1	0.48	0.03	3.41	***
FOR	5,196	0.35	0.00	0	1	0.48	0.02	1.95	*

*,**,*** indicate that a group means are significantly different at the 0.10,0.05, and 0.01 levels, respectively, two-tailed from the mean. Definition of variables are described in Appendix.

TABLE 4
PEARSON/SPEARMAN CORRELATIONS (N=10,489)

	FutureMWNUM1	*MWNUM*	*CEOAGE*	*CEOCHAIR*	*INDEP*
FutureMWNUM1	1	**0.463**	**-0.030**	-0.018	**-0.061**
MWNUM	**0.327**	1	-0.019	**-0.040**	**-0.054**
CEOAGE	**-0.038**	**-0.032**	1	**0.187**	**-0.067**
CEOCHAIR	**-0.022**	**-0.049**	**0.186**	1	**-0.075**
INDEP	**-0.057**	**-0.052**	**-0.024**	**-0.051**	1
FINEXP	-0.004	-0.004	**-0.121**	**-0.114**	**0.088**
BIG4	-0.011	**-0.028**	-0.013	**0.029**	**0.167**
LOGASSETS	**-0.079**	**-0.087**	**0.088**	**0.172**	**0.260**
ROA	**-0.085**	**-0.121**	**0.023**	**0.081**	-0.015
ACQ	-0.005	**-0.037**	-0.016	0.011	**0.034**
SEGNUM	0.003	0.006	**0.115**	**0.066**	**0.152**
GEONUM	**0.031**	**0.050**	-0.011	0.003	**0.101**
RESTRUCT	**0.030**	**0.032**	**-0.043**	**-0.056**	**0.165**
FOR	**0.031**	**0.047**	-0.013	-0.014	**0.062**

The upper right-hand portion of the table presents Pearson correlation coefficients, while the lower presents Spearsman correlation coefficients. Bold text indicates significance of at least 0.05. Variable definitions are described in Appendix.

	FINEXP	*BIG4*	*LOGASSETS*	*ROA*	*ACQ*
FutureMWNUM1	-0.009	0.001	**-0.04**	**-0.051**	-0.011
MWNUM	**-0.019**	-0.006	**-0.037**	**-0.088**	**-0.026**
CEOAGE	**-0.117**	-0.007	**0.09**	**0.021**	-0.015
CEOCHAIR	**-0.111**	**0.029**	**0.179**	**0.088**	0.011
INDEP	**0.101**	**0.155**	**0.194**	-0.002	**0.032**
FINEXP	1	**0.02**	**-0.072**	-0.017	0.015
BIG4	0.014	1	**0.328**	**0.045**	**0.023**
LOGASSETS	**-0.076**	**0.328**	1	**0.095**	**0.08**
ROA	-0.008	-0.008	**-0.046**	1	**0.036**
ACQ	0.012	**0.023**	**0.073**	**0.033**	1
SEGNUM	-0.002	**0.141**	**0.38**	**-0.06**	0.027
GEONUM	**0.055**	**0.029**	**0.021**	**0.105**	**0.051**
RESTRUCT	**0.089**	**0.082**	**0.113**	**-0.154**	**0.035**
FOR	**0.095**	0.01	**-0.023**	**0.058**	**0.033**

The upper right-hand portion of the table presents Pearson correlation coefficients, while the lower presents Spearsman correlation coefficients. Bold text indicates significance of at least 0.05. Variable definitions are described in Appendix.

TABLE 4 (CONTINUED)
PEARSON/SPEARMAN CORRELATIONS (N=10,489)

	SEGNUM	*GEONUM*	*RESTRUCT*	*FOR*
FutureMWNUM1	0.008	**0.028**	**0.021**	**0.027**
MWNUM	0.018	**0.038**	**0.021**	**0.039**
CEOAGE	**0.092**	-0.002	**-0.047**	-0.017
CEOCHAIR	**0.062**	-0.007	**-0.056**	-0.014
INDEP	**0.114**	**0.091**	**0.152**	**0.057**
FINEXP	0.003	**0.025**	**0.086**	**0.087**
BIG4	**0.133**	0.014	**0.082**	0.01
LOGASSETS	**0.386**	**0.051**	**0.107**	**-0.022**
ROA	-0.002	**0.033**	**-0.153**	0.018
ACQ	**0.024**	**0.046**	**0.035**	**0.033**
SEGNUM	1	**0.142**	**0.12**	**0.06**
GEONUM	**0.12**	1	**0.199**	**0.359**
RESTRUCT	**0.131**	**0.288**	1	**0.203**
FOR	**0.045**	**0.466**	**0.203**	1

The upper right-hand portion of the table presents Pearson correlation coefficients, while the lower presents Spearsman correlation coefficients. Bold text indicates significance of at least 0.05. Variable definitions are described in Appendix.

MULTIVARIATE RESULTS

Table 5 shows the effect of CEO age on the persistence of internal control deficiencies. Panel A reports that number of internal control deficiencies in the current year (*MWNUM*) positively predicts the number of internal control deficiencies in the future, while CEO age (*CEOAGE*) significantly decreases the number of internal control deficiencies in the future. The significant negative coefficient on interaction term, *MWNUM*CEOAGE*, tells that CEO age can mitigate the persistence of internal control deficiencies. As expected, more independent board (*INDEP*) is associated with fewer internal control weaknesses in the future. Proportion of financial experts on audit committees (*FINEXP*) is useful in deterring number of internal control deficiencies in the next three and five years. Big-4 auditors (*BIG4*) are associated with more internal control deficiencies in the future than non-big-4 auditors. We suspect that big-4 auditors are more capable in detecting internal control weaknesses because of relatively abundant resources and industry specialty. Larger companies (*LOGASSETS*), and more profitable companies (*ROA*) are associated with fewer internal control deficiencies in the next five years. Proxies for complex operations (*SEGNUM, GEONUM,* and *FOR*) generally reveal signs consistent with our expectation, indicating that operating in more segments of markets, geometric areas, and more frequently foreign currency translation result in more internal control deficiencies in the future. The unexpected signs appear in merger and acquisition dummy variable (*ACQ*) and restructuring (*RESTRUCT*) dummy variable. According to empirical findings of Cheng, Dhaliwal, and Zhang (2013), companies invest more efficiently after disclosing internal control deficiencies. Because the acquiring company can take advantage of the new company's operations and markets, acquisition usually can enhance the acquiring company's market value (Stettner and Lavie, 2014). We suspect that our sample companies operate more efficiently and result in fewer internal control deficiencies after the acquisition and restructuring.

Panel B of Table 5 displays the results of using number of years reporting internal control deficiencies (*FutureMWYRS1~5*) as dependent variable. Current number of internal control deficiencies (*MWNUM*) is associated with future internal control deficiencies up until two years. CEO age is still

significantly negatively associated with future years of internal control deficiencies across all models. Nonetheless, we fail to find evidence that CEO age decreases the positive association between number of internal control deficiencies in the current year and number of years with at least one internal control deficiencies in the future years. Similar to Panel A, more independent board (*INDEP*), larger firms (*LOGASSETS*), and more profitable earnings (*ROA*) are associated with fewer years disclosing internal control deficiencies. Big-4 auditors (*BIG4*) are associated with more years of internal control deficiencies than non-big-4 auditors. As the company grows its segments (*SEGNUM*) and foreign operations (*FOR*), the internal control deficiencies may prolong. We also find restructuring activities (*RESTRUCT*) are negatively associated with future internal control deficiencies in the future, which implies the company remediates internal control weaknesses through restructuring process.

TABLE 5
POISSON REGRESSION OF FUTURE INTERNAL CONTROL DEFICIENCIES AND CEO AGE (N=10,489)

Panel A: *FutureMWNUM1~5* as Dependent Variable

Variables	Expected Sign	*FutureMWNUM1*		*FutureMWNUM2*		*FutureMWNUM3*	
MWNUM	+	0.642	***	0.628	***	0.539	***
CEOAGE	-	-0.023	***	-0.021	***	-0.019	***
*MWNUM*CEOAGE*	-	-0.006	***	-0.006	***	-0.004	***
CEOCHAIR	+	0.010		-0.002		0.003	
INDEP	-	-2.657	***	-2.550	***	-2.487	***
FINEXP	-	-0.109		-0.175		-0.211	*
BIG4	?	0.486	***	0.638	***	0.747	***
LOGASSETS	-	-0.259	***	-0.269	***	-0.279	***
ROA	-	-1.104	***	-0.936	***	-1.100	***
ACQ	+	-0.116		-0.171		-0.217	*
SEGNUM	+	0.075	***	0.086	***	0.085	***
GEONUM	+	0.045	***	0.043	***	0.040	***
RESTRUCT	+	-0.324	***	-0.244	***	-0.159	***
FOR	+	0.232	***	0.191	***	0.170	***
Intercept		3.007	***	3.469	***	3.291	***
Industry Dummies		Included		Included		Included	
Log Likelihood		-2,262		-3,322		-3,995	
Deviance		4,667		7,706		9,758	
Pearson Chi-square		28,332		41,125		49,624	

*,**,and *** indicates (two-tailed) significance at the 0.10,0.05,and 0.01 levels, respectively. Dependent variables in Panel A are *FutureMWNUM1~5*, number of internal control deficiencies in the next one to five years. Dependent variables in Panel B are *FutureMWYRS1~5*, number of years reporting internal control deficiencies in the next one to five years. *MWNUM* is number of internal control deficiencies in the current year. Definition of the other variable can be found in Appendix.

TABLE 5 (CONTINUED)
POISSON REGRESSION OF FUTURE INTERNAL CONTROL DEFICIENCIES AND CEO AGE (N=10,489)

Panel A: *FutureMWNUM1~5* as Dependent Variable

Variables	Expected Sign	*FutureMWNUM4*		*FutureMWNUM5*	
MWNUM	+	0.070	***	0.492	***
CEOAGE	-	-0.018	***	-0.019	***
*MWNUM*CEOAGE*	-	-0.004	***	-0.004	***
CEOCHAIR	+	0.046		0.030	
INDEP	-	0.179	***	-2.203	***
FINEXP	-	0.109	*	-0.181	*
BIG4	?	0.092	***	0.810	***
LOGASSETS	-	0.018	***	-0.302	***
ROA	-	0.179	***	-1.260	***
ACQ	+	-0.315	***	-0.390	***
SEGNUM	+	0.009	***	0.073	***
GEONUM	+	0.007	***	0.035	***
RESTRUCT	+	-0.110	**	-0.077	
FOR	+	0.050	***	0.200	***
Intercept		0.555	***	3.153	***
Industry Dummies		Included		Included	
Log Likelihood		-4,420		-4,678	
Deviance		11,039		11,789	
Pearson Chi-square		52,022		52,649	

*,**,and *** indicates (two-tailed) significance at the 0.10,0.05,and 0.01 levels, respectively. Dependent variables in Panel A are *FutureMWNUM1~5*, number of internal control deficiencies in the next one to five years. Dependent variables in Panel B are *FutureMWYRS1~5*, number of years reporting internal control deficiencies in the next one to five years. *MWNUM* is number of internal control deficiencies in the current year. Definition of the other variable can be found in Appendix.

Panel B: *FutureMWYRS1~5* as Dependent Variable

Variables	Expected Sign	*FutureMWYRS1*		*FutureMWYRS2*		*FutureMWYRS3*	
MWNUM	+	0.417	**	0.350	**	0.201	
CEOAGE	-	-0.016	**	-0.015	***	-0.013	***
*MWNUM*CEOAGE*	-	-0.003		-0.002		0.001	
CEOCHAIR	+	0.032		0.033		0.032	
INDEP	-	-1.751	***	-1.739	***	-1.716	***
FINEXP	-	-0.253		-0.236		-0.249	
BIG4	?	0.391	**	0.496	***	0.598	***
LOGASSETS	-	-0.283	***	-0.283	***	-0.294	***
ROA	-	-1.440	***	-1.254	***	-1.406	***
ACQ	-	0.100		0.058		-0.008	
SEGNUM	+	0.069	***	0.070	***	0.067	***
GEONUM	+	0.018		0.015		0.011	
RESTRUCT	+	-0.305	***	-0.200	**	-0.130	*
FOR	+	0.168		0.147	*	0.143	*
Intercept		2.331	***	2.855	***	2.738	***
Industry Dummies		Included		Included		Included	
Log Likelihood		-1,511		-2,249		-2,744	
Deviance		2,235		3,469		4,331	
Pearson Chi-square		8,786		11,485		13,068	

*,**,and *** indicates (two-tailed) significance at the 0.10,0.05,and 0.01 levels, respectively. Dependent variables in Panel A are *FutureMWNUM1~5*, number of internal control deficiencies in the next one to five years. Dependent variables in Panel B are *FutureMWYRS1~5*, number of years reporting internal control deficiencies in the next one to five years. *MWNUM* is number of internal control deficiencies in the current year. Definition of the other variable can be found in Appendix.

Variables	Expected Sign	*FutureMWYRS4*		*FutureMWYRS5*	
MWNUM	+	0.136		0.164	
CEOAGE	-	-0.012	***	-0.011	***
*MWNUM*CEOAGE*	-	0.002		0.002	
CEOCHAIR	+	0.043		0.053	
INDEP	-	-1.664	***	-1.590	***
FINEXP	-	-0.230		-0.240	
BIG4	?	0.647	***	0.652	***
LOGASSETS	-	-0.304	***	-0.315	***
ROA	-	-1.452	***	-1.411	***
ACQ	-	-0.125		-0.205	
SEGNUM	+	0.066	***	0.065	***
GEONUM	+	0.007		0.005	
RESTRUCT	+	-0.096		-0.067	
FOR	+	0.171	**	0.201	***
Intercept		2.639	***	2.618	***
Industry Dummies		Included		Included	
Log Likelihood		-3,077		-3,300	
Deviance		4,892		5,278	
Pearson Chi-square		13,912		14,426	

*,**,and *** indicates (two-tailed) significance at the 0.10,0.05,and 0.01 levels, respectively. Dependent variables in Panel A are *FutureMWNUM1~5*, number of internal control deficiencies in the next one to five years. Dependent variables in Panel B are *FutureMWYRS1~5*, number of years reporting internal control deficiencies in the next one to five years. *MWNUM* is number of internal control deficiencies in the current year. Definition of the other variable can be found in Appendix.

ADDITIONAL ANALYSES

In this section, we examine three popular factors other than CEO age that could affect persistence of internal control deficiencies to check whether our main results are robust. These potential factors are CEO tenure, CEO turnover, and CFO incentive. We discuss each factor and report the relative results as follows.

As the CEO serves the company longer, his/her age increases as well. Ali and Zhang (2015) find that a CEO tends to overstate earnings during early stage and has less incentive to overstate earnings in the later stage of his/her tenure, because the market is uncertain about the CEO's ability when he/she first begins the job (Hermalin and Weisbach, 2012). As the CEO's ability is proven by the years he/she has served the company, the incentive of manipulating earnings is lessened. Since CEO age is closely correlated with CEO tenure, we add CEO tenure (*CEOTENURE*) in the model to test whether our main results still hold. Table 6 reports that after *CEOTENURE* being added to the model, our variables of interest, *MWNUM*, *CEOAGE*, and *MWNUM*CEOAGE* remain significant across all future five years, supporting our main conclusion that CEO age attenuates the persistence of internal control deficiencies.

TABLE 6
CEO TENURE AND THE EFFECT OF CEO AFE ON PERSISTENCE OF INTERNAL CONTROL DEFICIENCIES (N=10,489)

Variables	Expected Sign	*FutureMWNUM1*		*FutureMWNUM2*		*FutureMWNUM3*	
MWNUM	+	0.642	***	0.625	***	0.537	***
CEOAGE	-	-0.023	***	-0.022	***	-0.020	***
*MWNUM*CEOAGE*	-	-0.006	***	-0.006	***	-0.004	***
CEOTENURE	-	-0.001		0.004		0.003	
CEOCHAIR	+	0.011		-0.009		-0.003	
CEOCHAIR		0.000		0.000		0.000	
INDEP	-	-2.656	***	-2.552	***	-2.487	***
FINEXP	-	-0.110		-0.173		-0.209	*
BIG4	?	0.486	***	0.642	***	0.751	***
BIG4		0.000		0.000		0.000	
LOGASSETS	-	-0.259	***	-0.268	***	-0.278	***
ROA	-	-1.102	***	-0.948	***	-1.110	***
ACQ	+	-0.116		-0.173		-0.218	*
ACQ		0.000		0.000		0.000	
SEGNUM	+	0.075	***	0.086	***	0.085	***
GEONUM	+	0.045	***	0.043	***	0.040	***
RESTRUCT	+	-0.324	***	-0.248	***	-0.162	***
RESTRUCT		0.000		0.000		0.000	
FOR	+	0.232	***	0.191	***	0.171	***
Intercept		3.003	***	3.492	***	3.311	***
Industry Dummy		Included		Included		Included	
Log Likelihood		-2,262		-3,321		-3,995	
Deviance		4,667		7,705		9,757	
Pearson Chi-Square		28,354		40,960		49,507	

*,**,and *** indicates (two-tailed) significance at the 0.10,0.05,and 0.01 levels, respectively. Dependent variables are *FutureMWNUM1~5*, number of internal control deficiencies in the next one to five years. CEOTENURE is number of years the CEO serves as CEO in the company. Definition of the other variable can be found in Appendix.

TABLE 6 (CONTINUED)
CEO TENURE AND THE EFFECT OF CEO AFE ON PERSISTENCE OF INTERNAL CONTROL DEFICIENCIES (N=10,489)

Variables	Expected Sign	*FutureMWNUM4*		*FutureMWNUM5*	
MWNUM	+	0.504	***	0.494	***
CEOAGE	-	-0.018	***	-0.018	***
*MWNUM*CEOAGE*	-	-0.004	***	-0.004	***
CEOTENURE	-	-0.001		-0.005	
CEOCHAIR	+	0.015		0.038	
CEOCHAIR		0.000		0.000	
INDEP	-	-2.380	***	-2.203	***
FINEXP	-	-0.182	*	-0.183	*
BIG4	?	0.818	***	0.806	***
BIG4		0.000		0.000	
LOGASSETS	-	-0.291	***	-0.304	***
ROA	-	-1.265	***	-1.245	***
ACQ	+	-0.314	***	-0.387	***
ACQ		0.000		0.000	
SEGNUM	+	0.079	***	0.073	***
GEONUM	+	0.037	***	0.034	***
RESTRUCT	+	-0.109	**	-0.073	
RESTRUCT		0.000		0.000	
FOR	+	0.177	***	0.200	***
Intercept		3.160	***	3.123	***
Industry Dummy		Included		Included	
Log Likelihood		-4,420		-6,980	
Deviance		11,039		11,787	
Pearson Chi-Square		52,050		52,766	

*,**,and *** indicates (two-tailed) significance at the 0.10,0.05,and 0.01 levels, respectively. Dependent variables are *FutureMWNUM1~5*, number of internal control deficiencies in the next one to five years. CEOTENURE is number of years the CEO serves as CEO in the company. Definition of the other variable can be found in Appendix.

Research documents that firm performance significantly affects boards' decision in changing executives (Kang and Shivdasani, 1995; Engel et al., 2003; Jenter and Kanaan, 2015). It is possible that our finding of effect of CEO age on persistence of internal control deficiencies is due to turnover of CEO. To ensure our main results are not driven by CEO turnover, we add a dummy variable of *CEOTURNOVER*, equaling one if the firm changes CEO in the current year and zero if not. We expect that change of CEO would enhance the firm performance which includes internal control. Table 7 reports that even though *CEOTURNOVER* is significantly positively associated with future number of internal control deficiencies, the interaction term of *MWNUM*CEOAGE* continues to be significantly negatively associated with number of internal control deficiencies in the future. Our finding that CEO age decreases persistence of internal control weaknesses still holds.

TABLE 7
CEO TURNOVER AND THE EFFECT OF CEO AGE ON PERSISTENCE OF INTERNAL CONTROL DEFICIENCIES (N=10,108)

Variables	Expected Sign	*FutureMWNUM1*		*FutureMWNUM2*		*FutureMWNUM3*	
MWNUM	+	0.651	***	0.641	***	0.537	***
CEOAGE	-	-0.018	***	-0.019	***	-0.019	***
*MWNUM*CEOAGE*	-	-0.006	***	-0.006	***	-0.004	***
CEOTURNOVER	+	0.234	**	0.222	***	0.175	**
CEOCHAIR	+	0.025		0.046		0.041	
INDEP	-	-2.698	***	-2.634	***	-2.603	***
FINEXP	-	-0.080		-0.171		-0.201	*
BIG4	?	0.613	***	0.779	***	0.879	***
LOGASSETS	-	-0.265	***	-0.282	***	-0.293	***
ROA	-	-1.223	***	-1.010	***	-1.144	***
ACQ	+	-0.087		-0.151		-0.208	*
SEGNUM	+	0.074	***	0.081	***	0.082	***
GEONUM	+	0.045	***	0.045	***	0.042	***
RESTRUCT	+	-0.306	***	-0.246	***	-0.154	***
FOR	+	0.234	***	0.198	***	0.176	***
Intercept		2.781	***	3.452	***	3.367	***
Industry Dummies		Included		Included		Included	
Log Likelihood		-2,155		-3,148		-3,803	
Deviance		4,480		7,336		9,340	
Pearson Chi-square		27,576		39,382		47,561	

*,**,and *** indicates (two-tailed) significance at the 0.10,0.05,and 0.01 levels, respectively. Dependent variables are *FutureMWNUM1~5*, number of internal control deficiencies in the next one to five years. CEOTURNOVER=1 if the company changes CEO in the current year; 0 otherwise. Definition of the other variable can be found in Appendix.

Variables	Expected Sign	*FutureMWNUM4*		*FutureMWNUM5*	
MWNUM	+	0.504	***	0.490	***
CEOAGE	-	-0.018	***	-0.019	***
*MWNUM*CEOAGE*	-	-0.004	***	-0.004	***
CEOTURNOVER	+	0.166	**	0.173	***
CEOCHAIR	+	0.056		0.074	
INDEP	-	-2.489	***	-2.296	***
FINEXP	-	-0.157		-0.167	
BIG4	?	0.918	***	0.914	***
LOGASSETS	-	-0.307	***	-0.319	***
ROA	-	-1.298	***	-1.286	***
ACQ	+	-0.301	***	-0.374	***
SEGNUM	+	0.080	***	0.075	***
GEONUM	+	0.037	***	0.036	***
RESTRUCT	+	-0.112	**	-0.079	
FOR	+	0.185	***	0.206	***
Intercept		3.275	***	3.264	***
Industry Dummies		Included		Included	
Log Likelihood		-4,183		-4,416	
Deviance		10,528		11,210	
Pearson Chi-square		49,890		50,320	

*,**,and *** indicates (two-tailed) significance at the 0.10,0.05,and 0.01 levels, respectively. Dependent variables are *FutureMWNUM1~5*, number of internal control deficiencies in the next one to five years. CEOTURNOVER=1 if the company changes CEO in the current year; 0 otherwise. Definition of the other variable can be found in Appendix.

CFO's primary responsibility is financial reporting, and the soundness of internal control system determines the quality of disclosed financial information. Even though the charge of reviewing and the improving internal control system mainly falls on the audit committee, it is CFO and CEO who certify on the financial statements. Although prior literature documents that CEO power can push CFO to do according to CEO's desire (Bergstresser and Philippon, 2004; Friedman, 2014), we should not assume that situations where CFO is powerful and contributes to the internal control system do not exist. To address the circumstances where the CFO is powerful and able to determine the quality of internal controls, we create a compensation ratio variable (*COMPRATIO*) to capture the strength of CFO power. The ratio is calculated by taking CFO's total compensation divided by the sum of total CEO and CFO's compensation. When the compensation ratio is relatively large, CFO's incentive is relatively strong, and CFO has more power to drive the outcome of internal controls. A powerful CFO, like a powerful CEO, can either enhance or deteriorate usefulness of financial information, therefore, we do not predict the sign of *COMPRATIO*. Table 8 displays the results. We only report the results with *FutrueMWNUM1* as dependent variable, because dependent variables of *FutureMWNUM2~5* demonstrate very similar results as *Future MWNUM1*. In the third column, the interaction term *MWNUM*CEOAGE* becomes positive when we add *COMPRATIO* to the model. We then separate sample into two groups: observations with *COMPRATIO* larger than the median belongs to subsample of "Strong" CFO incentive; observations with *COMPRATIO* equal to or smaller than the median are in the "Non-Strong" subsample. We find that interaction term is significantly negative in the "Strong" group, and the interaction term is significantly

positive in the "Non-Strong" group. Our interpretation is that when CFO is powerful, an older CEO mitigates the persistence of internal control deficiencies; when CFO is not so powerful, an older CEO's is not able to affect internal controls in the positive direction.

TABLE 8
CFO INCENTIVE AND EFFECT OF CEO AGE ON PERSISTENCE OF INTERNAL CONTROL DEFICINCIES

				CFO Incentive			
Variables	**Expected Sign**	***FutureMWNUM1***		**Strong**		**Non-Strong**	
MWNUM	+	0.026		2.173	***	-0.362	
CEOAGE	-	-0.029	***	-0.011		-0.045	***
*MWNUM*CEOAGE*	-	0.009	**	-0.029	**	0.018	***
COMPRATIO	?	-0.370		0.177		1.957	
CEOCHAIR	+	-0.252	**	-0.426	***	0.025	
INDEP	-	-1.284	***	-1.524	**	-1.187	
FINEXP	-	0.135		-0.051		0.109	
BIG4	?	0.630	***	0.377		0.843	**
LOGASSETS	-	-0.259	***	-0.191	***	-0.367	***
ROA	-	-1.434	***	-1.322	**	-1.308	*
ACQ	+	0.082		0.158		0.224	
SEGNUM	+	-0.014		0.015		-0.030	
GEONUM	+	0.034	*	0.000		0.065	***
RESTRUCT	+	-0.030		-0.154		0.044	
FOR	+	-0.005		0.182		-0.157	
Intercept		-18.289	***	-20.305	***	2.897	**
n		8,035		3,978		4,057	
Industry Dummy		Included		Included		Included	
Log Likelihood		-1,300		-659		-579	
Deviance		2,463		1,251		1,089	
Pearson Chi-square		17,291		20,112		6,391	

*,**,and *** indicates (two-tailed) significance at the 0.10,0.05,and 0.01 levels, respectively. Dependent variables is *FutureMWNUM1*, number of internal control deficiencies in the next year. *COMPRATIO*=Total CFO Compensation/(Total CFO Compensation + Total CEO Compensation). Subsample of "Strong" CFO incentive includes companies whose COMPARATIO exceeds median of the entire sample; subsample of "Non-Strong" includes companies whose COMPRATIO smaller or equal to median of the entire sample. Definition of the other variable can be found in Appendix.

CONCLUSION

In this paper, we document that age of CEO's significantly decreases the persistence of internal control deficiencies of the company, with board and financial characteristics of companies being controlled. Following prior literature that treats CEO age as a proxy for conservativeness of CEO's, we contribute to the literature by examining the effect of executive's career objectives on persistence of

internal controls of companies. We show that even though many corporate governance mechanisms can be used to prevent CEO's from manipulating financial reporting process, the personal goal of the CEO is still dominating the internal controls and ultimately the quality of financial reporting. We also find such relationship is contingent on CFO power. When CFO's power is relatively strong, CEO age attenuates persistence of internal control weaknesses; when CFO's power is relatively weak, CEO age may not effectively prevent internal control weaknesses from persisting.

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APPENDIX: DEFINITION OF VARIABLES

Variable	Description	Calculation and Source
ACQ	Merger and acquisition dummy	1 if the company undergoes merger and acquisition in the current fiscal year; 0 otherwise. SDC Platium.
BIG4	Dummy variable for auditor.	1 if the auditor is PricewaterhouseCoopers, Deloitte, Ernst & Young, or KPMG; 0 otherwise. Audit Analytics.
CEOAGE	Age of the CEO	Age of the CEO in the current fiscal year. Execucomp.
CEOCHAIR	Dummy variable for dualship of the CEO and the chairman of the board.	1 if the CEO is also the chair of the board; 0 otherwise. BoardEx.
CEOTENURE	Tenure of CEO.	Number of years the CEO serves the company as the CEO. BoardEx.
CEOTURNOVER	Dummy variable for CEO turnover in the current year.	1 if the CEO this year is different from the CEO last year; 0 otherwise. BoardEx.
COMPRATIO	Proportion of CFO's compensation to sum of CFO's and CEO's compensation.	Total CFO compensation divided by sum of total CEO compensation and total CFO compensation. Execucomp.
FOR	Dummy variable for foreign operations.	1 if "Foreign Exchange Income (FCA)" not equal to 0; 0 otherwise. Compustat.
FINEX	Proportion of financial experts on the audit committee.	Number of financial experts divided by the size of audit committee. BoardEx.
FutureMWNUM1~5	Number of internal control deficiencies in the next 1 ~ 5 years.	Number of internal control deficiencies (COUNT_WEAK) in the next 1~5 fiscal years. Audit Analytics.
FutureMWYRS1~5	Number of years reporting at least one internal control deficiency in the next 1 ~ 5 years.	Number of years reporting internal control deficiencies in the next 1 ~ 5 years. Audit Analytics.
GEONUM	Number of geographic segments.	Number of distinct Segment Name (GNMS). Compustat.
INDEP	Proportion of independent directors on the board.	Number of independent directors divided by the size of the board. BoardEx.
Industry Dummy	Dummy variables for industries defined by Ge and McVay (2005).	1 if the company is in certain industry's SIC code; 0 otherwise. Compustat.
LOGASSETS	Natural log of total assets.	Natural log of total assets (AT) at the end of the fiscal year. Compustat.

Variable	Description	Calculation and Source
MWNUM	Number of internal control deficiencies.	Number of internal control deficiencies (COUNT_WEAK) reported in the current fiscal year. Audit Analytics.
RESTRUCT	Dummy variable for restructuring costs.	1 if the company reports restructuring costs (RECT); 0 otherwise. Compustat.
ROA	Return on assets.	Net income (NI) divided by average total assets (AT) at the beginning and at the end of the fiscal year. The variable is winsorized at top and bottom 5% of the entire sample. Compustat.
SEGNUM	Number of segments.	Number of distinct Segment Identifier (SID). Compustat.