CEO AGE, CEO TENURE, AND INTERNAL CONTROL OVER FINANCIAL REPORTING

by

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Abstract

The general business problem was no consensus regarding how CEO age and CEO tenure characteristics relate to the effectiveness of internal control over financial reporting. The purpose of this quantitative, nonexperimental study was to examine the relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting among U.S. publicly held companies. Three research questions were What is the relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies? What is the relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies? and What is the predictive relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting among U.S. publicly held companies? Upper echelons theory was the organizing framework for examining the research questions. Descriptive statistics, the chi-square test of independence, and binary logistic regression were the approach for answering the research questions. Secondary data from 2,149 U.S. publicly held nonfinancial firms with an audit opinion on the effectiveness of internal control over financial reporting under Sarbanes–Oxley Act Section 404(b) in 2017 were the basis for the statistical analysis. Audit Analytics was the data source for auditors' attestations on the effectiveness of internal control over financial reporting. The Electronic Data Gathering, Analysis and Retrieval database was the source for CEO age and CEO tenure data. Study results do not support a statistically significant relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting among U.S. publicly held companies. The study findings do not support the use of CEO age and CEO tenure characteristics as proxies for management financial reporting decisions in auditors' assessments of the control environment.

Dedication

This dissertation is dedicated to my family. First is a special dedication to my mom, Patricia Wiandt (1940–2018). My mom was my biggest supporter in life. She taught me my first phrase, *smart girl Wiandt*. She tried to teach me to drive a car although she could not drive well herself. She prayed for me, called me, forgave me, and said she was proud of me. She believed in me when I did not believe in myself. She pretended to like my cats. Sometimes she pretended to hear what I was saying. She was always glad to see me and always said I looked nice, even when I did not. She showed me how to handle hard times. She taught me to go to church, send thank-you notes, laugh a lot, avoid sugar, love others, not borrow trouble, attend Peterson family picnics, and keep myself together. Mom, you were my best friend. None of this means anything compared to you. I hope you know how much I love and miss you. I wish you were here. Mom, I wish you the love and peace you shared with me throughout your life. This is for you.

This dissertation is also dedicated to many other family members. My husband, Greg, is my favorite part of life. His love for and belief in me encouraged my spirit, and his relentless sense of humor sustained me. Our children, Jonathon and Noah, are my inspiration. My parents, Loren and Patricia Wiandt, were my first teachers. My dad taught me to never give up, and my mom never let me down. My in-laws, Loren and Muriel Dausey, welcomed me into their lives and hearts. My sister, Jean Sanborn, was my first friend. My grandparents, Henry and Gladys Wiandt and Edwin and Alice Peterson, gave me roots, and their memory lives on in my heart. They are all a part of me, and I am proud of who I am.

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CHAPTER 1. INTRODUCTION

Introduction

After a series of high-profile accounting scandals involving U.S. publicly held companies, the Sarbanes–Oxley Act of 2002 (SOX) was enacted to repair societal trust in the financial reports of public companies (Lee, 2016). The SOX law and regulations increased financial reporting responsibilities for CEOs and chief financial officers (CFOs; Lee, 2016). CEOs are responsible for creating and upholding effective internal control over financial reporting (ICFR) in accordance with SOX Section 302 (SOX, 2012). CEOs and external auditors file annual reports related to the effectiveness of ICFR in accordance with SOX Section 404(a) and 404(b), respectively (SOX, 2012). The Public Company Accounting Oversight Board (PCAOB) publicly reports material weaknesses in ICFR (Public Company Accounting Oversight Board [PCAOB], 2017a).

Auditors are obligated to evaluate the control environment because of its importance to the effectiveness of ICFR (PCAOB, 2017a). Given the subjectivity involved to make this challenging assessment of management tone, auditor judgment errors may arise (Schmidt, 2014). Auditor judgment errors in the control environment assessment process are threats to audit effectiveness and audit quality (Schmidt, 2014). The control environment emphasis on top management is consistent with upper echelons theorists' suggestion that organizational outcomes mirror executives' principles and cognitions (Hambrick & Mason, 1984). Scholars reported an association between executive traits and financial reporting quality using demographic proxies

for upper echelons behaviors and attitudes in the literature (Habib & Hossain, 2013; Patelli & Pedrini, 2015; Plöckinger, Aschauer, Hiebl, & Rohatschek, 2016).

Researchers showed an association exists between CEO age and risk and firm performance (Serfling, 2014) as well as the integrity of financial reports (H. Huang, Rose-Green, & Lee, 2012). Scholars associated CEO tenure with earnings management (Ali & Zhang, 2015) and disclosed control weaknesses (Yazawa, 2015). Because effective ICFR is more likely to deter young, less experienced CEOs from earnings management behaviors, such CEOs may be less inclined to maintain effective ICFR.

The objective of the research study was to examine the relationship between CEO age, CEO tenure, and the effectiveness of ICFR. The objective of Chapter 1 is to present the context for the business problem, research purpose, and research questions. The theoretical framework for examining the research questions is introduced. The 10 sections of Chapter 1 are (a) Background, (b) Business Problem, (c) Research Purpose, (d) Research Questions, (e) Rationale, (f) Theoretical Framework, (g) Significance, (h) Definition of Terms, (i) Assumptions and Limitations, and (j) Organization of the Remainder of the Study.

Background

Senior management expectations about the importance of internal control manifest as the control environment and exert a pervasive influence on financial reporting (Lee, 2015; Patelli & Pedrini, 2015). The control environment consists of entity-level controls and indicates senior management's philosophy, style, integrity, and values (PCAOB, 2017a). Many organizations exhibit control environment deficiencies, succumb to significant market pressures, and engage in financial misreporting despite increased penalties imposed by SOX legislators (Lightle, Baker, & Castellano, 2015). In compliance with auditing standards, auditors must assess an entity's ICFR,

including the control environment. The nature of the control environment necessitates a high degree of auditor judgment (PCAOB, 2017a). Adverse SOX Section 404(b) opinions issued by auditors related to material weaknesses in internal control signify potential material financial statement misstatements (DeFond & Zhang, 2014).

Upper echelons theorists posited that organizational outcomes are reflections of senior executive values and cognitions (Hambrick & Mason, 1984). Though capturing CEO values and cognitions is challenging, observable upper echelon characteristics such as age and career experience are reasonable proxies (Hambrick & Mason, 1984). Consistent with upper echelons theory, scholars found a connection between executive characteristics and measures of financial reporting quality (Habib & Hossain, 2013; Patelli & Pedrini, 2015; Plöckinger et al., 2016) as well as the quality of ICFR (Hanmei Chen, Hua, & Sun, 2018; Lin, Wang, Chiou, & Huang, 2014; Lee, 2015, 2016). Leaders of audit firms may experience increased control risk related to executive characteristics associated with the effectiveness of ICFR.

The association between executive characteristics and financial reporting quality is relevant for auditor assessment of ICFR, including the control environment (Hanmei Chen et al., 2018; Sun, Kent, Qi, & Wang, 2017). External auditor consideration of executive demographic characteristics was found to aid the assessment of material misstatement risk in the audit planning process (Sun et al., 2017). CEO age has been posited as a potential indicator of internal control over financial reporting (Hanmei Chen et al., 2018). Despite the implications for control risk assessment, few scholars explored how CEO traits impact the effectiveness of ICFR (Lee, 2016). Accordingly, some audit firms may misjudge control risk factors relating to executive demographics, such as CEO age and CEO tenure, as part of the calculation of audit risk.

Auditor judgment deficiencies related to the control environment undermine audit effectiveness and audit quality (Committee of Sponsoring Organizations of the Treadway Commission, 1992, 2013). The ramifications of control risk judgment errors for audit firms include increased audit risk (Knechel & Salterio, 2016), litigation risk (Udeh & Epps, 2013), and firm reputation risk (Löhlein, 2016) as well as an increased potential for PCAOB intervention (Udeh & Epps, 2013). The identification of CEO demographic characteristics associated with the effectiveness of ICFR could provide auditors additional factors useful for control environment assessment, subsequent audit judgments, and related audit quality.

Business Problem

The general business problem is no consensus regarding how CEO age and CEO tenure characteristics relate to the effectiveness of ICFR. The specific business problem is the lack of a consensus about how CEO age and CEO tenure relate to the effectiveness of ICFR may expose audit firms to increased audit risk as well as risks related to PCAOB intervention, litigation, and reduced firm reputation. Executive characteristics have been associated with the quality of ICFR (Hanmei Chen et al., 2018; Lee, 2015, 2016; Lin et al., 2014). Few scholars examined CEO age and CEO tenure in the context of internal control, and a general agreement about how CEO age and CEO tenure characteristics relate to the effectiveness of ICFR has not been established. Specifically, some scholars evidenced the influence of CEO entrenchment (Lin et al., 2014), managerial ability (Lee, 2015), and overconfidence (Lee, 2016) on internal control quality; however, the study of executive characteristics including CEO age and CEO tenure demographics as proxies for management decisions in accounting contexts is developing (Hiebl, 2014; Plöckinger et al., 2016).

Scholars conducted two studies about CEO age, CEO tenure, and internal control quality (Hanmei Chen et al., 2018; Lin et al., 2014). One study pertained to the influence of executive characteristics, including CEO age and CEO tenure, on the effectiveness of ICFR (Lin et al., 2014). Young CEOs were significantly associated with SOX Section 404 material weaknesses (Lin et al., 2014). A significant and direct association between long-tenured CEOs and SOX Section 404 material weaknesses was shown (Lin et al., 2014). The sample consisted of firm years between 2006 and 2009, and some scholars suggested that firm characteristics better explained material weakness disclosures than CEO traits in the initial period after SOX Section 404 legislation was enacted (Hanmei Chen et al., 2018). In another study, CEO age affected the continuance of internal control deficiencies over time, and CEO age was a more significant influence on internal control quality than CEO tenure, CEO turnover, and CFO incentives (Hanmei Chen et al., 2018).

Executive characteristics may be indicators of internal control quality and relevant considerations in audit practitioner assessment of the control environment (Hanmei Chen et al., 2018; Lin et al., 2014). A consensus about the relationship between CEO age, CEO tenure, and the effectiveness of ICFR has not been established. Auditors are challenged to incorporate CEO age and CEO tenure characteristics in the assessment of the control environment, which may expose audit firms to increased risks.

The control environment is executives' beliefs, tone, integrity, and ethics as well as the level of Board or audit committee oversight related to internal control and financial reporting (PCAOB, 2017a). Given the subjective, non-transactional nature of control environment assessment, auditors experience challenges in evaluating management philosophy, operating style, integrity, and ethical values (Schmidt, 2014). Significant control environment weaknesses,

accounting irregularities, and external auditor failures were factors related to the collapse of corporations and the subsequent passage of SOX legislation (Soltani, 2014). With the implementation of Auditing Standard (AS) 5, *An Audit of Internal Control Over Financial Reporting That Is Integrated with An Audit of Financial Statements*, the PCAOB reduced audit procedures and expressed that the audit process is a function of the underlying risk assessment including control risk assessment (PCAOB, 2007). Although post-SOX audit quality improved with increased PCAOB oversight, peer reviews (Löhlein, 2016), and the implementation of AS 5 (Draeger, Herrmann, & Lawson, 2016), the PCAOB identified audit deficiencies related to testing ICFR and the assessment and response to the risk of material misstatement (PCAOB, 2019). In its 2016 inspection report, the PCAOB attributed ICFR audit deficiencies to auditor shortcomings related to PCAOB standards knowledge, audit firm methodologies, and auditor bias about the effectiveness of ICFR (PCAOB, 2017b). The PCAOB identified barriers to the detection of weaknesses in ICFR, including auditor cognitive bias and overreliance on client-provided documentation and narrative audit programs (Asare et al., 2013).

The implications of judgment errors in auditor control risk assessment include increased audit risk (Knechel & Salterio, 2016) as well as risks related to PCAOB intervention, litigation (Udeh & Epps, 2013), and firm reputation (Löhlein, 2016). Control risk assessment is a factor in the calculation of audit risk or the risk that an auditor issues an incorrect opinion on the financial statements (Knechel & Salterio, 2016). Weaknesses in an audit firm's quality control practices are discoverable upon PCAOB inspection (Löhlein, 2016). If not corrected on a timely basis, the PCAOB publishes quality control weaknesses in audit firm practices (Löhlein, 2016). Publication of quality control weaknesses related to audit firm practices could negatively affect audit firm reputation, public perception, and investor confidence (King & Case, 2014). Since the

enactment of SOX Section 404, audit firms have experienced increased litigation related to the failure to detect financial reporting fraud (Udeh & Epps, 2013). The risk of financial reporting fraud increases in the presence of weak internal controls (Udeh & Epps, 2013).

Given the incidence of post-SOX dishonesty in financial reporting and the ability of senior executives to disregard controls, the issue of financial misreporting remains a concern (Lightle et al., 2015; Lin et al., 2014). Leaders of audit firms experience challenges in detecting material weaknesses in ICFR (Schmidt, 2014). Executive demographics such as CEO age and CEO tenure may be important indicators of internal control quality; however, a consensus about the relationship between CEO age, CEO tenure, and the effectiveness of ICFR has not been established. Consequently, audit firms may experience increased audit risk and risks related to PCAOB intervention, litigation, and reduced firm reputation.

Research Purpose

The purpose of this quantitative, nonexperimental study was to examine the relationship between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies. Scholars associated CEO demographic factors with the effectiveness of ICFR (Lee, 2015, 2016) as well as financial reporting quality (Ali & Zhang, 2015; Cormier, Lapointe-Antunes, & Magnan, 2016; Habib & Hossain, 2013). CEO age is inversely correlated with restatements in financial reporting (H. Huang et al., 2012), firm risk (Serfling, 2014), and material weaknesses in U.S. publicly held nonfinancial firms (Lin et al., 2014). Studies showed an association between CEO tenure, earnings management (Ali & Zhang, 2015) and internal control weaknesses in Japanese firms (Yazawa, 2015).

The study of executive demographic proxies for management decision making, such as CEO age and CEO tenure, is emerging in the field of accounting (Hiebl, 2014; Plöckinger et al.,

2016). The research enhanced existing knowledge about the relationship between CEO demographics and the effectiveness of ICFR. The relationship between CEO demographics and the effectiveness of ICFR may interest regulators and lawmakers responsible for developing financial reporting policies (Lin et al., 2014). The variables are also of principal interest to academic researchers to understand the connection between upper echelons predictions and financial reporting decisions. Financial statement users may find the study variables important for the evaluation of the quality of a firm's financial statements. The study may provide useful implications for corporate governance practices because top executives are responsible for setting the tone related to internal control procedures. Finally, CEO characteristics may serve as indicators of potential financial misstatements (Lin et al., 2014). Scholars demonstrated a link between financial reporting quality and audit quality (Gaynor, Kelton, Mercer, & Yohn, 2016). This study is important because the study might contribute to audit profession practices through understanding the relevance of CEO characteristics for control environment assessment.

Research Questions

Upper echelons theorists posited that observable manager demographics are strong predictors of firm strategies and performance levels (Hambrick & Mason, 1984). Hambrick and Mason (1984) suggested that executive age is an indicator of risk propensity. Hambrick and Mason posited that executive career experiences influence perspectives on strategic choices and problems. Hiebl (2014) studied upper echelons theory in the context of accounting activities (Hiebl, 2014). Executive demographics are reflected in reported financial information, supportive of upper echelons predictions (Plöckinger et al., 2016). H. Huang et al. (2012) identified CEO age as a factor associated with the integrity of financial reports. Ali and Zhang (2015) suggested that earnings overstatement is higher in a CEO's final tenure year. Lee (2015)

found a negative association between managerial ability and material weaknesses in ICFR. CEO age and CEO tenure upper echelons characteristics are implications for financial reporting quality. Based on previous studies, the research questions reflected the potential relationship between CEO age and CEO tenure characteristics and the effectiveness of ICFR among U.S. publicly held companies.

RQ1: What is the relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

RQ2: What is the relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

RQ3: What is the predictive relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

Rationale

The rationale for examining the relationship between CEO age, CEO tenure, and the effectiveness of ICFR was motivated by existing scholarly research related to the association between management characteristics and financial reporting quality. Given management's responsibility for the effectiveness of ICFR under SOX requirements, the associations between financial reporting quality and executive characteristics, including turnover, overconfidence, and gender have been studied (Plöckinger et al., 2016). Studies about CEOs involved in accounting manipulation indicated that misreporting CEOs exhibited robust features of power and hubris (Cormier et al., 2016). CEOs often pressured CFOs who engaged in accounting manipulations (Friedman, 2014).

Senior executive age and tenure upper echelon demographics represent observable proxies for management values and cognitions (Plöckinger et al., 2016). Serfling (2014) evidenced an association between CEO age and risk-taking behavior. Peni (2014) found inconsistent results for the association among CEO age and organizational performance. Ali and Zhang (2015) ascertained an association between CEO tenure and earnings management in early and final tenure years. Yazawa (2015) evidenced an inverse association between executive tenure and disclosed material weaknesses by Japanese listed companies. In a sample of nonfinancial firms, Lin et al. (2014) found a correlation among CEO entrenchment, CEO age, and material weaknesses.

Scholars documented firm characteristics associated with material weaknesses, including firm size, management guidance, corporate governance, and accruals (DeFond & Zhang, 2014). Ragothaman and Cornelsen (2017) found that firms with material weaknesses were smaller and posted lower gross margins than control firms. Jahmani and Dowling (2013) found that investment in assets and income generated from assets were significant to determine material weaknesses for large, accelerated filers under SOX. DeFond and Zhang (2014) reviewed auditing research and noted that firms with adverse SOX Section 404 opinions had less qualified CFOs and less independent audit committees.

Lee (2016) found an association between CEO traits and internal control quality. Sun et al. (2017) suggested that executive factors, such as age, gender, and education level are associated with financial reporting quality and could benefit control environment audit judgments, audit processes, and audit quality. CEO age and CEO tenure are factors connected to organizational outcomes and earnings quality. Similar implications may exist for the relationship between CEO age, CEO tenure, and the effectiveness of ICFR. Plöckinger et al. (2016) called for

additional research to garner new insight into the potential relevance of upper echelons theory in the field of accounting and emphasized the importance of manager-specific research designs. In accordance with these studies, the relationship between CEO age, CEO tenure, and the effectiveness of ICFR will be examined in the study.

Theoretical Framework

The theoretical framework for this study was upper echelons theory. The central notion of upper echelons theory is that corporate strategic decisions can be anticipated based on individual executive demographics (Hambrick & Mason, 1984). The tenets of upper echelons theory are a contrast to the neoclassical theory perspective that managers are interchangeable (Lieberson & O'Connor, 1972; Swanson, 1996) and the agency theory view that individual managers' idiosyncrasies are a limited influence on corporate decisions (Jensen & Meckling, 1976). According to upper echelons theory, organizational outcomes are manifestations of the values, cognitions, and beliefs of senior executives (Hambrick & Mason, 1984). Because psychological indicators present measurement difficulties for empirical research, upper echelons theorists employ demographics as proxies for psychological factors (Plöckinger et al., 2016).

Hambrick and Mason (1984) first researched the connection between organizational outcomes and the dynamics affecting the attitudes and dispositions of a firm's most powerful actors. In complex situations, an executive attempts to reduce and simplify elements through the perspective of his or her values and cognitive bases (Hambrick & Mason, 1984). Resulting decisions are reflections of the individual executive's characteristics and features (Hambrick & Mason, 1984). Hambrick and Mason recommended using demographic proxies for executive values and cognitions to reduce uncertainty in measuring the psychological factors of individual executives. For example, an executive's educational background is an indicator of the

executive's socioeconomic background, motivation, and risk propensity (Hambrick & Mason, 1984).

Scholars refined upper echelons theory through the identification of two moderators (Hambrick, 2007). First, managerial discretion is a moderator of upper echelons theory predictions (Hambrick, 2007). Specifically, management characteristics are reflected in strategy and performance when managers can exercise discretion (Hambrick, 2007). In situations without substantial management discretion, management characteristics are less relevant (Hambrick, 2007). A second moderator of upper echelons theory predictions is executive job demands (Hambrick, 2007). In the presence of significant task challenges, performance challenges, or executive aspirations, executives are more likely to pursue mental shortcuts reflecting their experiences and nature (Hambrick, 2007).

Since Hambrick and Mason's (1984) original work, researchers have mostly given attention to how management demographics influence organizational strategy and performance (Bromiley & Rau, 2016); however, the theory has also been applied in financial reporting contexts (Habib & Hossain, 2013; Patelli & Pedrini, 2015; Plöckinger et al., 2016). Specifically, scholars examined the relationship between executive demographics and accounting choices (Plöckinger et al., 2016). Executive demographics included traits such as gender, tenure, age, compensation, education, and managerial ability (Plöckinger et al., 2016). Accounting choices were represented by misstatements, earnings management, accounting conservatism, and disclosure quality (Plöckinger et al., 2016). Though upper echelons theory was pertinent for a spectrum of financial reporting situations, the purpose of this study is to understand the relationship between CEO age, CEO tenure, and the effectiveness of ICFR.

An upper echelons theory perspective was appropriate for the examination of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR. Lee (2016) noted that CEO characteristics are critical for creating and maintaining ICFR. CEO age and CEO tenure represent upper echelon demographic characteristics (Hambrick & Mason, 1984), and the effectiveness of ICFR is reflective of senior management accounting choices (Committee of Sponsoring Organizations of the Treadway Commission, 2013). Disclosed material weaknesses are financial reporting outcome indicators related to the effectiveness of ICFR (Lee, 2016). Figure 1 illustrates the theoretical framework for the variables used in this study, including the expected relationship between CEO age, CEO tenure, and the effectiveness of ICFR.

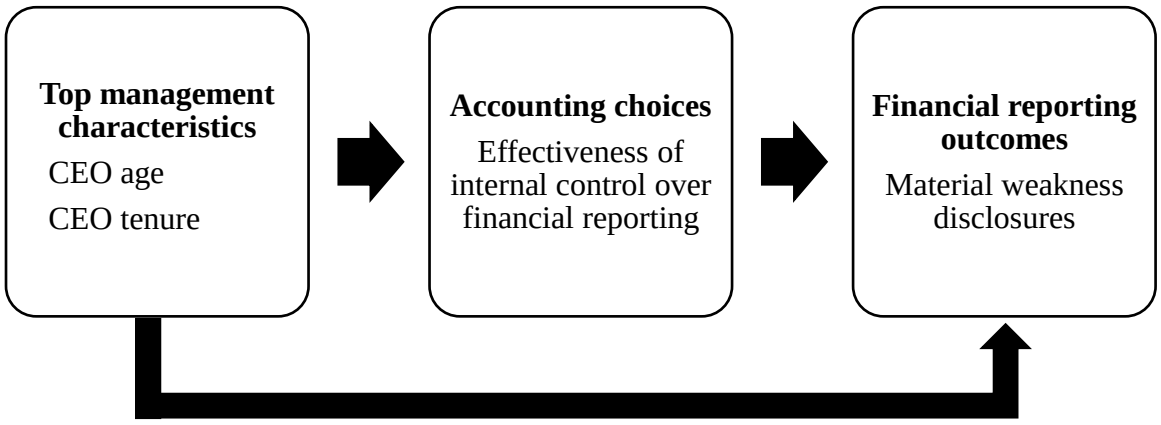

Figure 1. Theoretical framework. Consistent with an upper echelons theory perspective, CEO age and CEO tenure characteristics may influence accounting choices about the effectiveness of internal control over financial reporting and financial reporting outcomes as evidenced by material weakness disclosures.

Significance

The research study was important because an investigation into the relationship between CEO age, CEO tenure, and the effectiveness of ICFR added value to the body of knowledge on

internal control and upper echelons theory. Some scholars examined upper echelons predictions in the context of accounting decisions (Hiebl, 2014; Plöckinger et al., 2016); however, the area of research is emerging. Study implications for audit practitioners were also central to the significance of the study. Scholars suggested that CEO demographics may be useful factors in auditors' risk assessments (Hanmei Chen et al., 2018; H.; Schmidt, 2014; Sun et al., 2017). Following, the implications for scholarship and the implications for business practice are detailed.

Implications for Scholarship

Executive characteristics are associated with a variety of financial reporting indicators (Ali & Zhang, 2015; Habib & Hossain, 2013; H. Huang et al., 2012; Sun et al., 2017). Researchers who studied the application of upper echelons theory to financial reporting contexts found that senior executives wielded substantial power over choices related to financial reporting (Plöckinger et al., 2016). Findings from various studies related to individual executive demographic traits sometimes conflicted (Besar, Ali, & Ghani, 2017; Lin et al., 2014; Plöckinger et al., 2016). An examination of the relationship between CEO age and CEO tenure upper echelon characteristics and the effectiveness of ICFR was an opportunity for contribution to scholarly research.

The examination of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR was also a contribution to the corporate governance literature. Additional insights into how upper echelon characteristics affect organizational outcomes were gained. The effects of CEO age and CEO tenure on the effectiveness of ICFR were valuable contributions to the internal control literature.

Implications for Business Practice

The control environment is a manifestation of executives' influence over financial reporting decisions including the influence of top management's philosophy, operating style, integrity, and ethicality on the effectiveness of ICFR (PCAOB, 2007). In accordance with AS 5, auditors must evaluate and assess the control environment (PCAOB, 2007). Given the association between the control environment and financial reporting quality (Patelli & Pedrini, 2015) and the beneficial effects of auditor accessibility to control environment knowledge in developing audit judgments (Schmidt, 2014), this study was relevant for audit practitioners. This study was important because auditors can use CEO demographics as inputs in decision models for determining acceptable risk during the audit planning stages (Hanmei Chen et al., 2018; H. Huang et al., 2012; Schmidt, 2014; Sun et al., 2017). CEO age and CEO tenure may be important indicators of the effectiveness of ICFR and useful to auditors in the assessment of control risk. By understanding the relationships between CEO age, CEO tenure, and the effectiveness of ICFR, audit firms can develop policies and procedures to support the assessment of the control environment and related audit quality.

Definition of Terms

Audit risk. Audit risk is the risk that an auditor expresses an incorrect opinion on the financial statements (PCAOB, 2010).

Chief executive officer (CEO). A CEO is the top-ranking company executive and managerial decision-maker whose position may be described with alternate titles, including president or managing director (CFI Education, Inc., 2019).

Chief executive officer age. CEO age is the CEO's chronological age; an independent variable and proxy for CEO values and cognitions influencing accounting choices; measured as

the CEO's chronological age at the time of the firm's Schedule 14A filing in 2017; for purposes of the chi-square test of independence, the CEO age variable was recoded using median CEO age (56 years) as a reference point (1 for CEOs over age 56 years and 0 for CEOs under age 56 years).

Chief executive officer tenure. CEO tenure is the length of time in years the CEO functioned in the company's CEO position; an independent variable and proxy for CEO values and cognitions influencing accounting choices; measured as the difference between the year in which the CEO began serving in the position of CEO, as reported in the firm's 2017 Schedule 14A filing, and the year 2017; for purposes of the chi-square test of independence, the CEO tenure variable was recoded 1 for CEO tenure ranking in the top 20% of the population (13 years or more) and 0 for CEO tenure not ranking in the top 20% of the population.

Control environment. The control environment is an entity-level control comprised of top management's integrity, ethical values, and philosophy and style related to effective internal control over financial reporting as well as the degree of Board or audit committee knowledge and oversight of financial reporting and internal controls (PCAOB, 2007).

Control risk. Control risk is a function of the effectiveness of internal control over financial reporting that represents the risk that a misstatement could alone, or together with other misstatements, not be timely prevented or detected timely through an organization's internal control activities (PCAOB, 2010).

Effectiveness of internal control over financial reporting. An indicator of financial reporting quality and reasonable assurance that company financial statements are reliable which is precluded by the presence of material weaknesses (PCAOB, 2007); a categorical dependent

variable reflective of CEO accounting choices; coded 1 for firms disclosing a material weakness under SOX Section 404(b) in 2017 and 0 otherwise.

Internal control over financial reporting (ICFR). ICFR is the basis for ensuring financial reporting system accounting information is reliable and timely (Lee, 2016).

Material weakness. A material weakness is the logical potential that because of internal control deficiencies, a material financial statement misstatement will not be timely deterred or identified (PCAOB, 2017a).

Sarbanes–Oxley Act of 2002 (SOX). SOX is federal legislation enacted to deter securities fraud, increase regulation of U.S. public companies, create the Public Company Accounting Oversight Board, improve corporate governance regulations, and strengthen financial reporting quality among public companies (SOX, 2012).

Assumptions and Limitations

Assumptions and limitations are factors which may influence a study (Roberts & Hyatt, 2019). Three forms of assumptions and two forms of limitations applied to this study. Following is an explanation of assumptions and limitations pertinent to this study.

Assumptions

Assumptions are factors a researcher accepts as true with regard to the study (Roberts & Hyatt, 2019). Following, several types of assumptions relevant for this study are examined. Pertinent assumptions are general methodological assumptions, theoretical assumptions, and topic-specific assumptions.

General methodological assumptions. Data retrieved from the Audit Analytics database, a secondary source of data, were accurate, consistent, and complete. SOX Section 404(b) auditor disclosures reported to the U.S. Securities and Exchange Commission contained

no material omissions. CEO age and CEO tenure data reported to the U.S. Securities and Exchange Commission and maintained in the U.S. Securities and Exchange Commission Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database were accurate.

Theoretical assumptions. The relationship between CEO age, CEO tenure, and the effectiveness of ICFR was examined in this study using an upper echelons theory perspective. A primary tenet of upper echelons theory is that individual executives influence organizational outcomes (Hambrick & Mason, 1984). It was assumed that CEOs individually influence organizational outcomes including financial reporting outcomes.

Topic-specific assumptions. In accordance with SOX Section 404(b), external auditors file annual reports related to the effectiveness of ICFR (SOX, 2012). Scholars have gauged the effectiveness of ICFR using SOX Section 404(b) material weakness disclosures (Hanmei Chen et al., 2018; Jarvinen & Myllymäki, 2016; Lee, 2016). It was assumed that SOX Section 404(b) material weakness disclosures are a measure for the effectiveness of ICFR.

Limitations

Limitations are aspects of a study over which a researcher may have little control and which could impact study results or the generalizability of the study results (Roberts & Hyatt, 2019). Following, design limitations related to the research approach are described. Delimitations representing areas not examined in the study are discussed.

Design limitations. Data related to SOX Section 404(b) material weakness disclosure requirements were limited to public companies; therefore, study findings may not be generalizable to other entity types, such as private companies, governmental agencies, and not-for-profit organizations. Proxies for CEO values and cognitions related to the control environment were limited to CEO age and CEO tenure variables; however, CEO age and CEO

tenure may be incomplete proxies for executive values, cognitions, and perceptions. The effectiveness of ICFR may be related to other CEO characteristics, such as education, experience, ethnicity, nationality, personality, or cultural factors.

Delimitations. The research was designed to examine the relationship between the CEO age, CEO tenure, and the effectiveness of ICFR variables. The research was not designed to investigate the perspective of auditors judging the risk assessment process. Although the research is useful to determine relationships among the study variables, the research was not designed to determine causal relationships among the measured variables.

Organization of the Remainder of the Study

Chapter 1 is an introduction to the study including the study background, business problem, research purpose, research questions, rationale, theoretical framework, significance, and assumptions and limitations. Chapter 2 is a review of the scholarly literature relevant to the present study including literature about executive characteristics associated with financial reporting quality. Upper echelons theory, relating to financial reporting, is also discussed in Chapter 2. The quantitative research methodology for the explanatory study using inferential statistics and correlational research design are presented in Chapter 3. The results are presented in Chapter 4. Conclusions related to the research questions and purpose are discussed in Chapter 5 as well as suggested avenues for prospective research.

CHAPTER 2. LITERATURE REVIEW

Introduction

The objective of the research study was to examine the relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting (ICFR) among U.S. publicly held companies. The following research questions were guidance for the research study:

RQ1: What is the relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

RQ2: What is the relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

RQ3: What is the predictive relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

Central to the study background, purpose, and research questions was the influence of CEO age and tenure characteristics on internal controls and the potential implications for audit firms in the conduct of control risk judgments and related audit risk. Individual manager idiosyncrasies were thought to be of little influence on corporate outcomes according to the neoclassical theory of management (Lieberson & O'Connor, 1972) and agency theory (Jensen & Meckling, 1976; Ross, 1973). Upper echelons theorists have posited that individual manager

demographics can serve as proxies for management values, thoughts, and beliefs (Hambrick & Finkelstein, 1987; Hambrick & Mason, 1984).

Whereas early studies about the influence of individual executives on organizational outcomes were conducted in commercial and economic settings (Plöckinger et al., 2016), scholars have begun to examine upper echelons theory in the context of finance and accounting (Hiebl, 2014; Plöckinger et al., 2016). The investigation of the use of CEO demographic characteristics as proxies for CEO influence on the effectiveness of ICFR necessitated an interdisciplinary approach to the literature review.

According to Creswell and Creswell (2018), the literature review is a means for integrating, organizing, and summarizing prior research through the identification of major concepts. The design of the literature review is a thoughtful evaluation and synthesis of prior seminal works and core and practitioner literature about the theories and the study variables. The literature review process facilitated an understanding and critical analysis of existing seminal, core, and practitioner literature. Major concepts were ascertained and a research gap identified. An appropriate theoretical framework through which to evaluate the research questions was determined.

Methods of Searching

The strategy for identifying seminal, core, and practitioner literature relevant for the study consisted of targeted keyword identification, library database searches, and review and organization of the literature. Keywords identified for use in online library searches included the following: *control environment*, *internal controls*, *Sarbanes–Oxley Act*, *SOX*, *material weaknesses*, *chief executive officer age*, *chief executive officer tenure*, *effectiveness of internal control over financial reporting*, *upper echelons theory*, *financial reporting*, and *internal control*

audit. Databases searched included Business Source Complete, Google Scholar, Nexis Uni, and ProQuest. Journals searched included academic and practitioner journals in the fields of accounting, business, finance, criminology, and psychology. Sources determined relevant for the study were skimmed, summarized, and categorized by major concepts in a spreadsheet. Major concepts distinguished for theories and study variables comprise the structure for Chapter 2. Specifically, the Chapter 2 sections are (a) Theoretical Framework, (b) Review of the Literature, and (c) Conclusions.

The theoretical framework section is a critical evaluation of seminal and core literature about the neoclassical theory of management, agency theory, and upper echelons theory in the context of a framework for the research study. The review of the literature section is organized by the CEO age, CEO tenure, and the effectiveness of ICFR study variables. An overview of research methodologies examining the qualities of the research reviewed and a synthesis of the research findings also comprised in the review of the literature section.

The literature about CEO age and organizational commitment, risk preferences, ethicality, and financial reporting quality was the basis for the review of the seminal literature about CEO age. The literature about CEO age and firm performance, financial risk, and financial reporting quality was the basis for the review of the core and practitioner literature about CEO age. The literature about CEO tenure and firm performance, decision making, and ethical conduct was the basis for the review of the seminal literature about CEO tenure. The literature about CEO tenure and firm strategy and innovation as well as financial reporting quality, were the bases for the review of the core and practitioner literature about CEO tenure. The review of the literature related to the effectiveness of ICFR study variable consisted of a review of the seminal literature about firm characteristics, financial reporting quality, and the effectiveness of

ICFR, and the core and practitioner literature about the effectiveness of ICFR and earnings management, fraud, and CEO characteristics.

The quality of previous research about the relationship between CEO characteristics and the effectiveness of internal control was considered and assessed. The literature about the theoretical framework, CEO age, CEO tenure, and the effectiveness of ICFR was synthesized. The research gap and strategic fit for the study related to the influence of CEO age and CEO tenure on the effectiveness of ICFR were identified and analyzed. The conclusions section is a concise recapitulation of the literature as applied to the research.

Theoretical Framework

Scholars have examined the role of managers in affecting firm outcomes through major theoretical frameworks, including neoclassical, agency, and upper echelons perspectives. The following section is an analysis and evaluation of the competing theories for purposes of identifying a theoretical framework for the research study. Seminal and core literature about the three theories were the basis for the analysis.

The Neoclassical Theory of Management

Neoclassical theorists derived neoclassical theory tenets from economic theory (Teece & Winter, 1984). Four articles were the basis for the review of the seminal and core literature about the neoclassical theory of management. Table 1 depicts the seminal and core literature sources about the neoclassical theory of management.

Table 1. Seminal and Core Literature About the Neoclassical Theory of Management

Study	Type	Journal
Lieberson and O'Connor (1972)	Seminal	*American Sociological Review*
Swanson (1996)	Seminal	*Human Relations*
Teece and Winter (1984)	Seminal	*Economic Theory and Management Education*
Jones et al. (2016)	Core	*Academy of Management Review*

Note. Seminal and core literature sources about the neoclassical theory of management were identified in the literature review process.

Seminal literature. Neoclassical economic theorists posited that managers are virtually interchangeable and that distinctive management traits or idiosyncrasies do not influence corporate outcomes (Lieberson & O'Connor, 1972; Swanson, 1996). Lieberson and O'Connor (1972) noted that the influence of senior executives arises from the effects of constraints within and outside the organization as well as executive aptitude. Lieberson and O'Connor examined the impact of the company and environmental forces alongside the influence of leadership on corporate performance. Specifically, the effects of economic, industry, and company dynamic as well as leadership changes on corporate financial outcomes were analyzed (Lieberson & O'Connor, 1972). Changes in leadership were not found to explain variances in sales, earnings, or profit margins (Lieberson & O'Connor, 1972). Lieberson and O'Connor suggested that environmental factors were more potent determinants of organizational performance than the influence of senior executives.

Teece and Winter (1984) and Swanson (1996) questioned the applicability of the neoclassical economic theory and its presumption of rational self-interest to business settings. Teece and Winter considered the shortcomings of managers in the area of strategic decision making and suggested that neoclassical economic theory, designed for homogeneous entities

operating in equally depersonalized markets, was ill-suited for application in dynamic business environments. From an analysis of the connotations of neoclassical economic theory for organizational leadership, Swanson similarly posited that the theory was not well matched to senior management of hierarchical businesses.

Core literature. According to Jones et al. (2016), trends toward organizational concerns beyond economic motivations to include social welfare concerns have created calls for a more integrated approach than premised under traditional economic theories of management. Jones et al. suggested three problems with neoclassical management theory frameworks: lack of market consistency with perfect competition assumptions, faulty assumptions that social welfare improves with firm profits, and faulty logic that enhanced shareholder wealth improves social welfare. From a review of six management theory articles, Jones et al. suggested that economic theories do not adequately explain the multifaceted issues of social welfare.

Agency Theory

Agency theorists acknowledge the limited influence of managers on organizational outcomes (Jensen & Meckling, 1976). Six articles were the basis for the review of the seminal and core literature about agency theory. Table 2 identifies the seminal and core literature sources about agency theory.

Table 2. Seminal and Core Literature About Agency Theory

Study	Type	Journal
Eisenhardt (1989)	Seminal	*Academy of Management Review*
Jensen and Meckling (1976)	Seminal	*Journal of Financial Economics*
Lan and Heracleous (2010)	Seminal	*Academy of Management Review*
Bendickson, Muldoon, Liguori, and Davis (2016)	Core	*Management Decision*
Bosse and Phillips (2016)	Core	*Academy of Management Review*
Ross (1973)	Core	*The American Economic Review*

Note. Seminal and core literature sources about agency theory were identified in the literature review process.

Seminal literature. Agency theorists acknowledge that individual manager idiosyncrasies could impact corporate decisions, but to a limited degree (Jensen & Meckling, 1976). Ross (1973) and Jensen and Meckling (1976) developed early works on agency theory. Ross posited that managers function as agents of shareholders and that an agency problem arises in the context of differences between the parties' goals and risk inclinations. Similarly, Jensen and Meckling synthesized theories related to property rights, agency, and finance and noted that the concept of a principal-agent relationship explains the connection between corporate stockholders and executives. According to Jensen and Meckling, a problem arises because of the self-interest of principals and agents.

In response to discourse about the tenets and usefulness of agency theory, Eisenhardt (1989) conducted a comprehensive review of the agency theory literature and identified support for the theory of a principal-agent relationship. Eisenhardt noted that agency theory is a valid perspective in a variety of diverse principal–agent contexts among organizations. Through the lens of legal theory, Lan and Heracleous (2010) contended that a new perspective, or legal

agency theory, marked by a corporate principal and an independent board was worthy of further theoretical consideration and empirical research.

Core literature. Concerns about agency theory assumptions and applicability in complex situations were evident in the literature (Bendickson et al., 2016; Bosse & Phillips, 2016). Bendickson et al. (2016) noted that because of the influence of people and events over time, including economic, informational, and technological changes, agency theory applications are limited. Bendickson et al. considered the influence of industry, financial markets, the workforce, science, and the Hawthorne studies about the relevance of agency theory in contemporary settings. Specifically, Bendickson et al. noted that agency theory is not practical for explaining entrepreneurship or family-owned business situations. Bendickson et al. suggested that agency theory falls short in the context of digital social platforms and contemporary dealings with stakeholders.

Bosse and Phillips (2016) examined agency theory in the context of CEO compensation and acknowledged that the agency theory assumption of self-interest warranted reconsideration. Bosse and Phillips proposed an alternative theory of bounded self-interest to explain better the actions of individuals who are amenable to sacrificing advantages for the sake of fairness. According to the theory of bounded self-interest, CEOs may perform above or below expectations in response to perceptions of fairness in interactions with the board (Bosse & Phillips, 2016). Bosse and Phillips noted that the theory of bounded self-interest better explains the actions of CEOs in the context of social welfare.

Upper Echelons Theory

In contrast to the proponents of the neoclassical theory of management and agency theory, upper echelons theorists acknowledge the influence of individual managers on

organizational outcomes (Hambrick & Mason, 1984). The review of the seminal and core literature about upper echelons theory traced its application from the realms of management literature to its use in the field of accounting. Table 3 reflects the seminal and core literature sources about upper echelons theory.

Table 3. Seminal and Core Literature About Upper Echelons Theory

Study	Type	Journal
Carpenter, Geletkanycz, and Sanders (2004)	Seminal	*Academy of Management Review*
Chin, Hambrick and Trevino (2013)	Seminal	*Journal of Financial Economics*
Hambrick (2007)	Seminal	*Academy of Management Review*
Hambrick and Finkelstein (1987)	Seminal	*Management Decision*
Hambrick, Finkelstein, and Mooney (2005)	Seminal	*Academy of Management Review*
Hambrick and Mason (1984)	Seminal	*The American Economic Review*
R. Davidson, Dey, and Smith (2015)	Core	*Journal of Financial Economics*
Soltani (2014)	Core	*Journal of Business Ethics*
Buchholz, Lopatta, and Maas (2019)	Core	*Journal of Business Ethics*
Epstein and Ramamoorti (2016)	Core	*The CPA Journal*
Hiebl (2014)	Core	*Journal of Management Control*
Jia, Van Lent, and Zeng (2014)	Core	*Journal of Accounting Research*
Majors (2016)	Core	*Accounting Review*
Olsen, Dworkis, and Young (2014)	Core	*Journal of Management Accounting Research*
Plöckinger, Aschauer, Hiebl, and Rohatschek (2016)	Core	*Journal of Accounting Literature*
Vladu (2019)	Core	*Eurasian Journal of Economics and Finance*

Note. Seminal and core literature sources about upper echelons theory were identified in the literature review process.

Seminal literature. Scholars initially developed upper echelons theory in the management literature. Hambrick and Mason (1984) pioneered the upper echelons theory concept that managers are unique and that organizational outcomes mirror manager values and cognitions. In the context of complex strategic decisions, Hambrick and Mason noted that decision-makers could not understand the entire experience. Decision-maker perspectives are limited, and cognitive bases and values further filter perceptions influencing strategic choice (Hambrick & Mason, 1984). Recognizing the inherent challenges in measuring manager values and cognitive bases, Hambrick and Mason used managerial characteristics as proxy indicators.

Upper echelon characteristics derived from the literature and employed by scholars included factors related to managerial age, work experience, education, functional track, and economic status (Hambrick & Mason, 1984). Hambrick and Mason (1984) found that manager demographic data were strong predictors of strategic decisions influencing organizational outcomes. Firm performance outcomes influenced by upper echelons characteristics affect company financial prosperity, changes in financial prosperity, growth, and continued existence (Hambrick & Mason, 1984). For example, through reliance upon prior literature and some degree of speculation, Hambrick and Mason associated executive age with risk-taking behaviors. Hambrick and Mason found that executive career experience and socioeconomic background were indicators of strategic perceptions and firm growth and profitability variations, respectively (Hambrick & Mason, 1984).

In summary, three tenets were the basis for upper echelons theory (Carpenter et al., 2004). First, firm strategies reflect the values and cognitions of powerful actors (Carpenter et al., 2004). Second, powerful actor standards and cognitions are the results of their observable

characteristics (Carpenter et al., 2004). Third, organizational outcomes are associated with powerful actor characteristics (Carpenter et al., 2004).

Initial concerns regarding inconsistencies in the relevance of upper echelons theory to managerial decisions and firm outcomes were posited by Carpenter et al. (2004) and remain unresolved (Bromiley & Rau, 2016). In a review of upper echelons literature, Carpenter et al. surmised that the upper echelons viewpoint functioned as a theory and a methodology with interdisciplinary applicability. Carpenter et al. also noted that despite significant empirical support for the influence of executives in organizations, results across studies were not entirely congruent. Finally, Carpenter et al. summarized concerns about the efficacy of upper echelons theory for the prediction of managerial decisions. The concerns included questionable applicability to complex decision processes, potential determinants of executive mindset beyond executive background traits, institutional and environmental influences as well as industry and environmental contingencies (Carpenter et al., 2004).

Scholars extended Hambrick and Mason's (1984) seminal upper echelons theory research related to moderating influences (Hambrick, 2007; Hambrick & Finkelstein, 1987; Hambrick et al., 2005). Hambrick and Finkelstein (1987) identified the influence of managerial discretion on managerial decision making. Hambrick et al. (2005) found that executive job demands moderated managerial decision making. Hambrick (2007) suggested that upper echelon traits were more predictive of strategic choice in the context of significant managerial discretion and significant executive job demands. Chin, Hambrick, and Trevino (2013) analyzed CEOs' prehire political contributions and corporate social responsibility practices and found evidence that CEO's expressed their political values in firm outcomes.

Core literature. In the core literature, scholars explicitly and implicitly studied upper echelons characteristics in the context of executive fraud, executive accounting choices, and financial reporting outcomes. Two articles were the basis for the examination of upper echelons theory in relation to executive fraud, while eight articles were sources for the analysis of upper echelons theory in connection with executive accounting choices and financial reporting outcomes. The core literature supported the research questions.

Upper echelons theory and executive fraud. Implicit to upper echelons theory research, scholars conducted studies related to the influence of CEOs on corporate fraud (R. Davidson, Dey, & Smith, 2015; Soltani, 2014). In an analysis of six major U.S. and European corporate failures, Soltani (2014) found that CEO dominance was a contributing factor in the corporate deviancies. R. Davidson et al. (2015) evaluated fraud firms from U.S. Securities and Exchange Commission accounting and auditing enforcement releases. R. Davidson et al. determined senior executives with a history of legal infractions, such as driving while intoxicated, other drug offenses, domestic violence disturbances, and traffic violations were more likely to engage in financial reporting fraud.

Upper echelons theory, executive accounting choices, and financial reporting outcomes. Scholars examined the relevance of upper echelons theory to managerial accounting choices (Hiebl, 2014; Plöckinger et al., 2016). Through a review of the extant literature, Hiebl (2014) analyzed the application of upper echelons theory in the context of managerial accounting and systems of control. Hiebl identified an association between chief financial officer (CFO) age and tenure characteristics and management accounting and control systems; however, the association between CEO characteristics and management systems was contradictory. Hiebl

indicated that senior executives and their traits exert significant influence on management accounting and control systems.

Through the framework of upper echelons theory, Plöckinger et al. (2016) reviewed 60 archival, experimental, and survey research studies related to individual manager effects on corporate financial reporting. Explicitly, Plöckinger et al. examined the influence of CEO, CFO, and top management team/board of director demographics, behaviors, and psychological factors on accounting choices and consequences. Plöckinger et al. categorized accounting choices and consequences by type (Plöckinger et al., 2016). Aligning with upper echelons theory, the scholars postulated that top managers wield substantial sway over financial reporting decisions and disclosure quality (Plöckinger et al., 2016).

Scholars examined the influence of upper echelons dark triad psychological characteristics on financial reporting (Epstein & Ramamoorti, 2016; Jia et al., 2014; Majors, 2016; Olsen et al., 2014). Dark triad personality traits are narcissism, Machiavellianism, and psychopathy (Epstein & Ramamoorti, 2016). In a review of the extant literature about personality psychology, Epstein and Ramamoorti (2016) noted the pervasiveness of dark triad personalities in corporate executive ranks. Given the propensity of dark triad executives to commit fraud, the scholars suggested that external auditors integrate personality-based factors in audit risk assessment (Epstein & Ramamoorti, 2016). In an experiment involving manager- and investor-type participants, Majors (2016) found that managers exhibiting dark triad traits were more aggressive in financial reporting related to estimates in the absence of reference range disclosures. Vladu (2019) suggested that a CEO profile composite score aggregated from dark triad traits as well as demographic characteristics, reputation, and expertise is a useful indicator of unethical behavior. Executive narcissism was associated with CEO earnings management

(Buchholz, Lopatta, & Maas, 2019; Olsen et al., 2014), and CFO earnings management, aggressive financial reporting, compromised internal control systems, and financial restatements (Jia et al., 2014). Buchholz et al. (2019) demonstrated an association between narcissistic CEOs and accrual-based earnings management and suggested that narcissistic CEOs made accounting decisions motivated by selfishness rather than the financial reporting needs of the market.

Variables

Independent variables examined in the study were CEO age and CEO tenure. The dependent variable was the effectiveness of ICFR. Scholars explained the influence of individual senior executives and their idiosyncrasies on organizational performance by upper echelons theory (Bromiley & Rau, 2016; Finkelstein, Hambrick, & Cannella, 2009; Hambrick & Mason, 1984; Nielsen, 2010). Few scholars examined the application of upper echelons theory in accounting and finance because of the perception of minimal executive influence on accounting and reporting outcomes (Hiebl, 2014; Lin et al., 2014; Plöckinger et al., 2016). CEOs may exert significant influence over financial reporting despite Generally Accepted Accounting Principles and U.S. Securities and Exchange Commission regulations (Cormier et al., 2016; Friedman, 2014), and some scholars extended upper echelons theory to include the effects of CEOs and their characteristics on financial reporting results (Hiebl, 2014; Plöckinger et al., 2016).

Individual CEO age and tenure characteristics influence firm performance (Wang, Holmes, Oh, & Zhu, 2016). Upper echelons theory was an appropriate framework for examining the relationship between CEO age, CEO tenure, and the effectiveness of ICFR and superior to either neoclassical management theories or agency theory. In alignment with upper echelons theory, this study was an examination of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies. Specifically, CEO age and CEO

tenure were explored as proxies for CEO accounting choices and related financial reporting outcomes.

Review of the Literature

Following is a review of the seminal, core, and practitioner literature. The CEO age, CEO tenure, and the effectiveness of ICFR study variables were the basis for organizing the literature review. Major themes, variables, and research methodologies were discussed. The research findings were synthesized.

CEO Age Literature

The breadth of seminal, academic, and practitioner literature related to CEO age is broad and multidisciplinary. Pertinent studies included theoretical and empirical works as well as generational studies in the fields of psychology, management, and business. Scholars developed dominant lines of research including the relationship between executive age and organizational commitment (Steers, 1977; Stevens, Beyer, & Trice, 1978), risk preferences (Serfling, 2014; Taylor, 1975), ethicality (W. N. Davidson, Xie, Xu, & Ning, 2007), firm performance (Wang et al., 2016), and financial reporting quality (H. Huang et al., 2012). Synthesis of the lines of research was relevant for understanding the influence of CEO age on firm outcomes.

Seminal literature. Following are major themes in the seminal literature about CEO age. The association between age and organizational commitment was a prominent area of research in the seminal literature. Another area of interest was the relationship between age and risk preferences. The connection between age and ethicality and the relationship between CEO age and financial reporting quality were major themes in the seminal literature.

CEO age and organizational commitment. Scholars identified a direct relationship between age and organizational commitment in the extant psychology literature (Michaels &

Spector, 1982; Williams & Hazer, 1986). Organizational commitment is the intensity of a person's identification with and participation in an organization (Steers, 1977). Scholars investigated the influence of age on organizational commitment and job satisfaction in the context of turnover model studies (Bluedorn, 1980; Michaels & Spector, 1982; Williams & Hazer, 1986).

In a synthesis of several turnover models, Bluedorn (1980) proposed an integrated turnover model in which CEO age was found significantly and directly related to organizational commitment. Michaels and Spector (1982) examined whether individual characteristics lead to job satisfaction and commitment. In a sample of permanent employees, the scholars tested the Mobley, Griffeth, Hand, and Meglino (1979) turnover model modified for variables related to pre-employment expectancies and organizational commitment (Michaels & Spector, 1982). Consistent with the turnover model, age positively correlated with job satisfaction as well as job commitment (Michaels & Spector, 1982). Using structural equation methodology, Williams and Hazer (1986) reexamined data developed by Bluedorn as well as Michaels and Spector.

In contrast to Bluedorn, Williams and Hazer did not find a direct path from the age measure to turnover. The scholars identified a relationship between age and job satisfaction (Williams & Hazer, 1986). Job satisfaction was related to commitment (Williams & Hazer, 1986).

Support for the relationship between age and organizational commitment in the management literature was mixed (Steers, 1977; Stevens et al., 1978). Steers (1977) identified personal traits, including age as well as job characteristics and work experience antecedents to organizational commitment. Steers measured age as chronological age. Steers proposed and tested a two-part model, consisting of antecedents to and outcomes of commitment, to

investigate the possible link between the antecedents and organizational commitment. Steers investigated the relationship between organizational commitment and performance outcomes. Questionnaires were administered to two samples: a sample of hospital employees and a sample of research scientists and engineers (Steers, 1977). In a comparison of two regression models, Steers found a relationship between age and commitment only in the hospital employees' sample.

Stevens et al. (1978) also endeavored to explain the influence of age, gauged chronologically, and other personal and role factors on organizational commitment. Data collected from interviews with federal service managers were analyzed using intercorrelation and multiple regression methods (Stevens et al., 1978). Manager age was positively related to psychological and exchange commitment types in the intercorrelation matrix (Stevens et al., 1978). Manager age was not significantly related to organizational commitment (Stevens et al., 1978). Stevens et al. suggested that either a side-bet relation or moderating variables explained the effect of age on commitment.

In summary, implications for the effect of CEO age on organizational commitment were uncertain. Whereas scholars in the psychology literature found a positive relationship between age and organizational commitment (Michaels & Spector, 1982; Williams & Hazer, 1986), management study results were mixed (Steers, 1977; Stevens et al., 1978). Study results differed among diverse groups of employees (Steers, 1977) and data analysis methods (Stevens et al., 1978). Table 4 shows the seminal literature and findings about CEO age and organizational commitment.

Table 4. Seminal Literature and Findings About CEO Age and Organizational Commitment

Study	Journal	Findings
Bluedorn (1980)	*Academy of Management Proceedings*	CEO age significantly and directly related to organizational commitment.
Michaels and Spector (1982)	*Journal of Applied Psychology*	Age correlated positively with job satisfaction and job commitment.
Steers (1977)	*Administrative Science Quarterly*	Age significantly related to commitment in hospital employees. Research scientists' and engineers' ages were unrelated to organizational commitment.
Stevens, Beyer, and Trice (1978)	*Academy of Management Journal*	Manager age positively related to psychological and exchange commitment types in an intercorrelation matrix. Manager age was not significantly related to organizational commitment according to a multivariate analysis.
Williams and Hazer (1986)	*Journal of Applied Psychology*	CEO age directly related to job satisfaction. CEO age was unrelated to turnover.

Note. Seminal literature and findings about CEO age and organizational commitment were identified in the literature review process.

CEO age and risk preferences. Executive chronological age has also been studied in the context of risk preferences and related decision making. Findings in the literature were mixed. Whereas some scholars have contended that older executives are more disinclined to risk than younger managers (Hambrick & Mason, 1984; Vroom & Pahl, 1971), other scholars have put forth evidence of higher risk aversion in younger managers (Hirshleifer & Thakor, 1992; Holmström, 1999; Zwiebel, 1995). In a study of male managers employed at more than 200

corporations, Vroom and Pahl (1971) discovered an inverse relationship between age, measured chronologically, and risk in decision making.

Vroom and Pahl (1971) posited a negative relationship between age and the perceived importance of risk (Vroom & Pahl, 1971). Using individual scores related to a subset of the Kogan and Wallach (1964) Choice Dilemma Questionnaire, the correlation was determined to be weak but significant (Vroom & Pahl, 1971). The correlation increased substantially with the use of mean scores (Vroom & Pahl, 1971). The relationship between mean riskiness and age was strongest between the ages of 22 and 32 years and between the ages of 48 and 58 years (Vroom & Pahl, 1971). In a review of the literature, Hambrick and Mason (1984) proposed that organizations with younger executives are more apt to engage in risky tactics, achieve growth, and experience profitability volatility than organizations with older managers.

Taylor (1975) and Thomas, Litschert, and Ramaswamy (1991) studied the relationship between manager age and decision making. Taylor administered a decision-making exercise to male managers and conducted a correlational analysis. Compared with their younger counterparts, older managers were found to take more time to arrive at decisions and were also less confident in their decisions (Taylor, 1975). Older managers were more likely to seek additional information and better assess information usefulness than were younger managers (Taylor, 1975). Taylor concluded that manager age more profoundly explained decision making than prior decision-making experience. Taylor measured manager age as chronological age.

Thomas et al. explored firm performance effects of the coalignment between executive traits, including chronological age, and strategy. Firm strategies were classified as *prospector* or *defender* in accordance with the Miles and Snow (1978) framework (Thomas et al., 1991). Prospector firm strategic choices were characterized as innovative and externally focused

(Thomas et al., 1991). In contrast, defender firms demonstrated an internal orientation and strategic emphasis on the penetration of existing markets (Thomas et al., 1991). Thomas et al. conducted an empirical examination of publicly traded firms in the electronic computing equipment industry and found that prospector firm CEOs were significantly younger than CEOs of defender firms. Thomas et al. measured age as CEO chronological age.

Hitt and Tyler (1991) contradicted the findings of Taylor (1975) and Thomas et al. (1991) concerning the influence of executive age on strategic decisions. In a survey of senior executives, the scholars determined through moderated regression analysis that executive age did not significantly affect acquisition choices (Hitt & Tyler, 1991). An index derived from the combination of age and work experience significantly moderated acquisition decisions (Hitt & Tyler, 1991).

Yim (2013) posited that older CEOs were less likely to enter into acquisitions. Yim measured the CEO age variable in two ways. First, six age groups were defined: (a) ages 27-48, (b) ages 49–52, (c) ages 53–55, (d) ages 56–58, (e) ages 59–62, and (f) ages 63–92 (Yim, 2013). Second, young, middle-aged, and old CEOs were ages 27–52, 53–58, and 59–92, respectively (Yim, 2013). The variables were analyzed using logit regression (Yim, 2013).

In another line of literature, scholars posited that younger executives are more reluctant to take risks than older executives because of increased professional and reputation concerns (Hirshleifer & Thakor, 1992; Holmström, 1999; Zwiebel, 1995). Hirshleifer and Thakor (1992) examined a model related to managerial reputation building and project choice. The scholars suggested that younger CEOs were more concerned with reputation and may make more conservative decisions (Hirshleifer & Thakor, 1992). Similarly, Zwiebel (1995) investigated the effects of career concern on management antipathy for stochastically dominating innovations.

Younger managers experienced more career and reputation concerns and were less likely to make innovative investment decisions (Zwiebel, 1995). Holmström (1999) conducted a study about the relationship between career concerns and managerial risk preferences. Holmström theorized that younger managers are more concerned about their reputations than their older counterparts. Managers demonstrating a higher level of career concern were more risk averse (Holmström, 1999).

To summarize, some scholars suggested that older managers are more risk averse (Hambrick & Mason, 1984; Vroom & Pahl, 1971) and slower to arrive at decisions (Taylor, 1975). Older managers may be less confident in their decisions than younger managers (Taylor, 1975). Younger manager career and reputation concerns interfere with the generalization that older managers are more conservative decision makers and more risk-averse than younger managers is younger manager career and reputation concerns (Hirshleifer & Thakor, 1992; Holmström, 1999; Zwiebel, 1995). Table 5 shows the seminal literature and findings about CEO age and risk preferences.

Table 5. Seminal Literature and Findings About CEO Age and Risk Preferences

Study	Journal	Findings
Hambrick and Mason (1984)	*Academy of Management Review*	Older executives demonstrated less inclination to take risks than younger managers; younger managers demonstrated less inclination to make innovative investment decisions than older managers.
Hirshleifer and Thakor (1992)	*The Review of Financial Studies*	Younger CEOs showed more reputation concern and made more conservative decisions.
Hitt and Tyler (1991)	*Strategic Management Journal*	Executive age was not a significant influence on acquisition choices.
Holmström (1999)	*The Review of Economic Studies*	Younger managers demonstrated increased career concerns and more risk aversion than older managers.
Taylor (1975)	*Academy of Management Journal*	Manager age related to decision making; older managers displayed less confidence and an increased propensity for seeking additional information in making decisions than their younger counterparts.
Thomas, Litschert, and Ramaswamy (1991)	*Strategic Management Journal*	Younger CEOs characterized Prospector firms more than Defender firms.
Vroom and Pahl (1971)	*Journal of Applied Psychology*	CEO age inversely related to risk in decision making.
Yim (2013)	*Journal of Financial Economics*	Older CEOs showed a higher propensity for entering into acquisitions than younger CEOs.
Zwiebel (1995)	*Journal of Political Economy*	Younger managers demonstrated increased career concerns and a lower propensity for innovation than older managers.

Note. Seminal literature and findings about CEO age and risk preferences were identified in the literature review process.

***CEO age and ethicality*.** Beyond organizational commitment and risk preferences, scholars studied executive age in the context of ethical behavior. Scholars indicated that older individuals are generally more ethical than younger individuals in the extant accounting and psychology literature (Deshpande, 1997; Mudrack, 1989), generational studies (Twenge & Campbell, 2008), and business literature (Peterson, Rhoads, & Vaught, 2001). Mudrack (1989) found a negative relationship between age and measures of Machiavellianism, including cunning, deception, duplicity, and dishonesty, in a sample of adult survey respondents. Mudrack employed five age groups: (a) ages 17–21, (b) ages 22–24, (c) ages 25–29, (d) ages 30–37, and (e) ages 38–66 (Mudrack, 1989). The decline in Machiavellianism was most significant after age 37 (Mudrack, 1989). Mudrack noted several potential reasons for the age-related score decline. Older individuals may be more likely to achieve high-level organizational positions and demonstrate the ability to achieve goals without reliance upon Machiavellian behaviors (Mudrack, 1989). Alternatively, Mudrack theorized that conventional morality is either increasingly embraced with age or that Machiavellianism has become more prevalent through successive generations.

In another generational study, Twenge and Campbell (2008) found a higher propensity for unethical behavior in younger generations. Twenge and Campbell reviewed research reports with psychological scale data to determine workplace effects. Given the results of the 80-year data review, Twenge and Campbell implicated that Generation Y, or Millennials, exhibited narcissism and the potential to engage in ethical scandals. Deshpande (1997) also found that ethical attitude conservatism increased in workers with age according to ethical questionnaire responses from nonprofit organization managers. Deshpande measured age as either age 40 and under or over age 40. Specifically, managers over the age of 40 perceived quid pro quo gifts and

favors, confidential information disclosure, error concealment, report falsification, and deceptive sick day usage as more unethical than did younger managers (Deshpande, 1997).

Peterson et al. (2001) explored the influence of age on ethical beliefs. Peterson et al. administered an ethics survey to business professionals and examined the influence of gender and age on ethical conduct. Five of the 14 ethical survey questions were derived from Dawson's (1997) work (Peterson et al., 2001). Peterson et al. measured age as either age 30 and under or over age 30. Respondents over the age of 30 were found to demonstrate higher ethical standards than respondents under the age of 30 (Peterson et al., 2001).

Despite the implications for increased ethical conduct with advancing age, W. N. Davidson et al. (2007) challenged the theory of a direct association between CEO age and ethical conduct. Specifically, W. N. Davidson et al. suggested that the horizon problem complicates the relationship between CEO age and ethicality. The horizon problem is a result of shifting concerns from the long-term to the short-term as individuals approach retirement (W. N. Davidson et al., 2007). W. N. Davidson et al. found that CEOs were more likely to manage earnings as they neared retirement age. W. N. Davidson et al. measured CEO age as chronological age, and earnings management behavior by the incidence of discretionary accruals (W. N. Davidson et al., 2007).

In summary, scholars who studied the association between age and ethical conduct generally noted a positive association between age and ethical conduct in the accounting, psychology, and business literature (Deshpande, 1997; Mudrack, 1989; Peterson et al., 2001). W. N. Davidson et al. (2007) contradicted that older executives are more ethical. Specifically, W. N. Davidson et al. warned of the horizon problem CEOs experience near retirement age. Table 6 shows the seminal literature and findings about CEO age and ethicality.

Table 6. Seminal Literature and Findings About CEO Age and Ethicality

Study	Journal	Findings
W. N. Davidson, Xie, Xu, and Ning (2007)	*Journal of Management & Governance*	CEOs engaged in more earnings management behaviors near retirement because of the career horizon problem.
Deshpande (1997)	*Journal of Business Ethics*	Ethical attitude conservatism increased with age in nonprofit organization managers.
Mudrack (1989)	*Psychological Reports*	Age associated inversely with measures of Machiavellianism.
Peterson, Rhoads, and Vaught (2001)	*Journal of Business Ethics*	Business professionals over the age of 30 demonstrated higher ethical standards than business professionals under the age of 30.
Twenge and Campbell (2008)	*Journal of Managerial Psychology*	Generation Y demonstrated narcissism and potential to engage in ethical scandals.

Note. Seminal literature and findings about CEO age and ethicality were identified in the literature review process.

***CEO age and financial reporting quality*.** Another line of relevant seminal research was the study of the relationship between CEO age and measures of financial reporting integrity. Study findings documented in the seminal literature conflicted concerning the nature of the relationship between CEO age and financial reporting quality. In a study of top managers employed by a minimum of two separate S&P 1500 firms for at least three years, Bamber, Jiang, and Wang (2010) studied the influence of executives on voluntary financial disclosure choices. The propensity to make financial disclosures was measured based on frequency, precision, news, bias direction, and accuracy of management earnings forecasts (Bamber et al., 2010). CEO age was measured categorically as Pre-World War II or Generation Boomer/Generation X (Bamber

et al., 2010). CEOs born before World War II demonstrated a more conservative financial disclosure style (Bamber et al., 2010).

Similarly, H. Huang et al. (2012) found that CEO age was an important indicator of financial reporting quality. H. Huang et al. sampled firms between 2005 and 2008 and found a direct association between CEO age and financial reporting quality. H. Huang et al. measured CEO age as reported in the Compustat ExecuComp database as well as the natural log of the reported CEO age, and results were comparable between the measurement approaches (H. Huang et al., 2012). H. Huang et al. gauged financial misreporting based on the outperformance of earnings forecasts and the presence of financial restatements. CEO age was negatively associated with both financial misreporting measures (H. Huang et al., 2012). In a different study, Schrand and Zechman (2012) found no age disparity between CEOs of firms classified as financially misreporting and matched firms. Misreporting firms were those subject to auditing and enforcement releases for infractions which did not meet the U.S. Securities and Exchange Commission Rule 10b-5 criteria for fraud (Schrand & Zechman, 2012). Schrand and Zechman measured CEO age as executive age in the initial fraud year (Schrand & Zechman, 2012). Table 7 shows the seminal literature and findings about CEO age and financial reporting.

Table 7. Seminal Literature and Findings About CEO Age and Financial Reporting

Study	Journal	Findings
Bamber, Jiang, and Wang (2010)	*The Accounting Review*	Older CEOs demonstrated more conservative financial disclosure style.
H. Huang, Rose-Green, and Lee (2012)	*Accounting Horizons*	CEO age directly associated with financial reporting quality.
Schrand and Zechman (2012)	*Journal of Accounting and Economics*	The ages of CEOs at financial misreporting firms demonstrated no disparity with the ages of CEOs at matched firms.

Note. Seminal literature and findings about CEO age and financial reporting were identified in the literature review process.

Core and practitioner literature. Several major themes comprised the core and practitioner literature about CEO age. The first theme was the relationship between CEO age and measures of firm performance. The second theme was the relationship between CEO age and financial risk. The third theme was the relationship between CEO age and financial reporting quality.

CEO age and firm performance. In the extant academic and practitioner literature, scholars explored the relationship between CEO age and firm performance (Adams & Jiang, 2017; Andreou, Louca, & Petrou, 2017; Goergen, Limbach, & Scholz, 2015; Nguyen, Rahman, & Zhao, 2018; Oh, Chang, & Cheng, 2016; Wang et al., 2016). Adams and Jiang (2017) studied the influence of CEO traits on the financial results of firms in the U.K. property-casualty insurance industry. The scholars found no evidence of a connection between CEO age, measured as chronological age, and insurance organization performance (Adams & Jiang, 2017). In contrast, Nguyen et al. (2018) demonstrated a negatively significant association between CEO age and firm valuation across all quantiles of high- and low-growth firms in an examination of

Australian companies using quantile regressions. Wang et al. (2016) conducted a meta-analytic synthesis of upper echelons theory research and suggested a direct association between CEO age, measured as CEO chronological age at the time of data collection, and future organizational performance. CEO age was not associated with organizational strategy decisions (Wang et al., 2016). Wang et al. warned against sweeping CEO preference generalizations based on CEO age (Wang et al., 2016). The scholars suggested a nuanced connection between CEO age and organizational tactics. Specifically, the scholars posited that CEO age was not a general indicator of firm strategy because of the strong negative correlation between CEO age and firm risk-taking and product innovation (Wang et al., 2016).

Goergen et al. (2015) also posited a nuanced relationship between CEO age and firm outcomes. Goergen et al. collected data from member firms of the three largest German stock exchange indices and found that age dissimilarity between the CEO and the board chair was significantly related to firm value. CEO age was measured as the natural logarithm of the CEO's chronological age (Goergen et al., 2015). The scholars emphasized that the gap in age level, rather than age level, explained the association (Goergen et al., 2015). Goergen et al. theorized that the direct association between CEO-chair age dissimilarity and firm outcomes was the result of cognitive conflict between the parties and the related increase in board oversight.

Other measures of firm performance examined in the context of relationship to CEO age included firm stock price crash risk (Andreou et al., 2017) and corporate social responsibility (Oh et al., 2016). According to Andreou et al. (2017), firms employing younger CEOs were at a higher risk for stock price crashes, and managerial discretion increases the risk. Andreou et al. gauged CEO age in quartiles: (a) under age 51, (b) ages 51–55, (c) ages 56–60, and (d) over age 60. The scholars suggested that CEO compensation hikes related to stretches of firm profitability

incentivized withholding of earnings streak break information early in CEO careers (Andreou et al., 2017). The withholding of negative earnings information subsequently increases the risk for future stock price crashes (Andreou et al., 2017).

In a study of the influence of CEO career horizon on corporate social responsibility, Oh et al. (2016) also emphasized the influence of discretion on the decisions of CEOs of different age levels. Oh et al. measured CEO age as CEO chronological age. Oh et al. found a negative association between older CEOs with shorter career horizons and corporate social responsibility activities in the context of industry discretion and blockholder earnings pressures. Given the findings of Andreou et al. (2017) and Oh et al., managerial discretion is a noteworthy contingency of the association between CEO age and company performance.

In summary, despite evidence that CEO age is directly related to firm performance (Andreou et al., 2017; Wang et al., 2016), some scholars found evidence to the contrary (Adams & Jiang, 2017; Goergen et al., 2015; Nguyen et al., 2018). Rather than CEO age, a gap in age between the CEO and board chair may explain improved firm performance (Goergen et al., 2015). CEOs near retirement age may negatively affect firm performance because of the presence of a short career horizon (Oh et al., 2016). Table 8 shows the core and practitioner literature and findings about CEO age and firm performance.

Table 8. Core and Practitioner Literature and Findings About CEO Age and Firm Performance

Study	Journal	Findings
Adams and Jiang (2017)	*British Journal of Management*	CEO age did not relate to insurance firm performance.
Andreou, Louca, and Petrou (2017)	*Review of Finance*	Firms employing younger CEOs showed a higher risk for stock price crashes than firms employing older CEOs.
Goergen, Limbach, and Scholz (2015)	*Journal of Corporate Finance*	Age gaps between the CEO and board chair are nuances in the relationship between CEO age and firm performance.
Nguyen, Rahman, and Zhao (2018)	*Journal of Management & Governance*	CEO age inversely associated with firm valuation.
Oh, Chang, and Cheng (2016)	*Journal of Business Ethics*	Older CEOs with shorter career horizons more negatively associated with corporate social responsibility than younger CEOs.
Wang, Holmes, Oh, and Zhu (2016)	*Personnel Psychology*	CEO age directly associated with future organizational performance. CEO age showed no association with organizational strategy decisions.

Note. Core and practitioner literature and findings about CEO age and firm performance were identified in the literature review process.

CEO age and financial risk. Serfling (2014) and Iqbal (2015) conducted studies about the relationship between CEO age and financial risk preferences and found different results. Serfling posited an inverse connection between CEO age and risk preferences. Serfling examined firm years between 1992 and 2010 taken from the ExecuComp database. The scholar measured CEO age in two ways (Serfling, 2014). First, Serfling measured CEO age as the natural logarithm of CEO age for use in regression analysis. Second, Serfling measured CEO age discretely using terciles: young CEOs (ages 29–52), middle-aged CEOs (ages 53–58), and old

CEOs (ages 59–91). Serfling demonstrated congruent results with both measurement approaches. Serfling found reduced stock return unpredictability and research and development investments in firms managed by old CEOs (Serfling, 2014). Serfling evidenced an association between firms managed by old CEOs and operational diversity, outstanding debt, and diversifying acquisitions.

Iqbal (2015) contradicted the findings of previous scholars that old CEOs are more risk-averse than young CEOs. Iqbal examined the relationship between CEO age and hedging activities in the oil and gas industry. Hedging is a risk-reduction activity that is protective against industry price risk (Iqbal, 2015). Iqbal grouped oil and gas firms into hedge and nonheadge categories (Iqbal, 2015). Iqbal measured CEO age at the time of hiring and at the time of hedging introduction for purposes of determining paired differences between the groups (Iqbal, 2015). Iqbal found that younger CEOs demonstrated an increased propensity for hedging activities, or efforts to reduce price risk. Table 9 shows the core and practitioner literature and findings about CEO age and financial risk.

Table 9. Core and Practitioner Literature and Findings About CEO Age and Financial Risk

Study	Journal	Findings
Iqbal (2015)	*Journal of Economics and Finance*	Younger CEOs demonstrated a higher propensity for hedging activities in the oil and gas industry.
Serfling (2014)	*Journal of Corporate Finance*	Older CEOs reduced stock return unpredictability and research and development investments and employed increased operational diversity, outstanding debt, and diversifying acquisitions relative to younger CEOs.

Note. Core and practitioner literature and findings about CEO age and financial risk were identified in the literature review process.

***CEO age and financial reporting quality*.** Lin et al. (2014) conducted the only study of the relationship between CEO age and financial reporting quality in the core and practitioner literature. Lin et al. posited a link between CEO age and the quality of financial reports. Lin et al. gauged financial reporting by the Sarbanes–Oxley Act (SOX) Section 404 material weakness disclosures (Lin et al., 2014). Lin et al. conducted the study utilizing a sample of nonfinancial firms from the ExecuComp database and measured CEO age as the logarithm of CEO age. The study results showed a significant association between younger CEOs and SOX Section 404 material weaknesses (Lin et al., 2014). Older CEO firms maintained better internal controls than younger CEO firms (Lin et al., 2014). Lin et al. theorized that generational differences explained the negative association between CEO age and SOX Section 404 material weaknesses.

The scholars retested their model by replacing the CEO age variable with Silent Generation (born before 1944) and Baby Boomers (born between 1944 and 1960) dummy variables (Lin et al., 2014). Lin et al. set Generation X (born between 1961 and 1980) as the default variable (Lin et al., 2014). Lin et al. found that compared to Generation X, the Silent Generation and Baby Boomers associated more negatively with SOX Section 404 material weaknesses; however, the Baby Boomer effect was insignificant. Lin et al. excluded small firms from the study. Small firms were firms with a market value below $75 million (Lin et al., 2014).

Collectively, findings from the seminal, core and practitioner studies of the connection between CEO age and quality measures of financial reporting were contradictory. Financial reporting quality was determined using different measures among the studies, including SOX Section 404 material weakness disclosures (Lin et al., 2014), auditing and enforcement releases (Schrand & Zechman, 2012), and performance relative to earnings forecasts, and the number of financial restatements (H. Huang et al., 2012). Given the mixed findings and different measures

of financial reporting quality between the studies, a generalization about the influence of CEO age on financial reporting quality was not evident.

CEO Tenure Literature

Per Hambrick and Mason's (1984) upper echelons theory viewpoint, *years of inside service*, defined as executive years within one organization, are positively associated with firm profits and expansion in stable environmental conditions and negatively associated with strategic decisions in new areas, such as product innovation. Scholars drew upon upper echelons theory and developed significant lines of research pertaining to the influence of CEO tenure and firm performance (Hambrick & Fukutomi, 1991; Henderson, Miller, & Hambrick, 2006), decision-making attitudes (Goll & Rasheed, 2005; Musteen, Barker, & Baeten, 2006), ethical conduct, and financial reporting quality. A synthesis of relevant seminal, academic, and practitioner literature sources on CEO tenure supported the research questions.

Seminal literature. Three main lines of research comprised the literature about CEO tenure. The first line of research was the relationship between CEO tenure and measures of firm performance. The second line of research was the influence of CEO tenure on aspects of decision making. The third line of research was the connection between CEO tenure and ethical conduct.

***CEO tenure and firm performance*.** Scholars studied the relationship between CEO tenure and firm performance and produced inconsistent evidence. Murphy (1986) and Miller (1991) posited an association between longer-tenured CEOs and poor firm performance. In an analysis of managerial incentive contracts, Murphy identified a positive and significant relationship between firm outcomes and compensation modifications for CEOs clustered by tenure. Murphy measured CEO tenure as the number of years served in the position of CEO

(Murphy, 1986). The strength of the relationship weakened with longer CEO tenure (Murphy, 1986). Murphy used stock price activity to gauge firm performance (Murphy, 1986).

Miller (1991) surveyed CEOs and other senior executives to determine the degree of match between firm structure and strategy to the environment. Miller measured CEO tenure as the number of years in the CEO position. Miller determined long- and short-tenure based on the median sample CEO tenure. Study results showed an association between CEOs of longer tenure and a reduced match between the organization and its environment compared to CEOs of shorter tenure. Miller theorized that CEOs possessing a lengthy tenure might struggle to adapt to change over time. Miller measured firm performance by return on investment as well as by sales and net income growth. Miller conducted the study using correlational and multiple regression data analysis methods.

McClelland, Liang, and Barker (2010) found that CEO commitment to the status quo (CSQ) increased with CEO tenure duration. CEO tenure was measured as the number of years served in the CEO position (McClelland et al., 2010). The implications of CSQ for firm performance were dependent upon industry discretion (McClelland et al., 2010). Discretion was defined as the degree of autonomy available to CEOs within their respective operating environments (McClelland et al., 2010). High-discretion industries were industries in which CEOs were more able to bring about change (McClelland et al., 2010). CSQ was associated with poorer firm performance in high-discretion industries (McClelland et al., 2010). In low-discretion industry environments, CEOs were more hampered in the ability to influence change (McClelland et al., 2010). CSQ was associated with improved performance in low-discretion industries (McClelland et al., 2010). In a study of high-tech firm CEOs, Balkin, Markman, and

Gomez-Mejia (2000) found no evidence of an association linking CEO tenure and firm performance. Balkin et al. used return on assets to gauge firm performance.

Hambrick and Fukutomi (1991) suggested intercessors in the relationship between CEO tenure and firm performance because of seasonal phases in a CEO's tenure. Hambrick and Fukutomi found a curvilinear association concerning CEO tenure and firm performance in which firm performance improved early in a CEO's tenure years and declined during later CEO tenure years. The scholars noted that CEO values and cognitions change relative to five tenure seasons (Hambrick & Fukutomi, 1991). CEO commitment to paradigm, task knowledge, reliance upon diverse information, task interest, and power vary by tenure season, according to Hambrick and Fukutomi. The scholars posited that the concept of tenure seasons is an enhancement of upper echelons theory (Hambrick & Fukutomi, 1991). Expressly, the lengthier a CEO's tenure, the more an organization represents its CEO's experiences and personal traits (Hambrick & Fukutomi, 1991). Hambrick and Fukutomi warned that brief CEO tenure and extended CEO tenure are potentially detrimental to firm performance.

Henderson et al. (2006) disputed the seasonal concept explanation for changes in firm performance with CEO tenure. Study results showed an association between long-tenured CEOs and improved firm performance in the food industry (Henderson et al., 2006). Study results showed an association between long-tenured CEOs and deteriorating firm performance in the computer industry (Henderson et al., 2006). Henderson et al. theorized that industry dynamics were responsible for the differences in firm performance between CEO groups. In stable industries, such as the food industry, CEO tenure positively affected firm performance (Henderson et al., 2006). In the dynamic computer industry, CEO tenure was inversely related to firm performance (Henderson et al., 2006). Henderson et al. suggested that CEOs' adaptive

learning was eclipsed by paradigm obsolescence throughout their tenure in dynamic industries. Henderson et al. measured CEO tenure as years served in the CEO position. Table 10 shows the seminal literature and findings about CEO tenure and firm performance.

Table 10. Seminal Literature and Findings About CEO Tenure and Firm Performance

Study	Journal	Findings
Balkin, Markman, and Gomez-Mejia (2000)	*The Academy of Management Journal*	CEO tenure did not relate to firm performance.
Hambrick and Fukutomi (1991)	*Academy of Management Review*	Firm performance improved early in a CEO's tenure years and declined during later CEO tenure years.
Henderson, Miller, and Hambrick (2006)	*Strategic Management Journal*	The relationship between CEO tenure and firm performance varied by industry.
McClelland, Liang, and Barker (2010)	*Journal of Management*	CEO commitment to the status quo increased with CEO tenure duration.
Miller (1991)	*Management Science*	CEOs of longer tenure showed a closer association with a reduced match between the organization and its environment compared to CEOs of shorter tenure.
Murphy (1986)	*The RAND Journal of Economics*	Compensation for CEOs clustered by tenure positively and significantly associated with firm outcomes.

Note. Seminal literature and findings about CEO tenure and firm performance were identified in the literature review process.

CEO tenure and decision making. Scholars investigated the influence of CEO tenure on decision making (Goll & Rasheed, 2005; Musteen et al., 2006). Goll and Rasheed (2005) studied the connection between the traits of sizeable manufacturing company CEOs and rational decision making. Goll and Rasheed found a positive association between the average tenure length of the

top management team and rational decision making. Goll and Rasheed measured CEO tenure as years served in the company CEO position. Musteen et al. (2006) studied the effects of CEO demographic and experience characteristics on CEO attitudes toward change. Musteen et al. suggested that CEOs of longer tenure possessed poorer attitudes toward change than CEOS of shorter tenure. In alignment with the tenure season concept proposed by Hambrick and Fukutomi (1991) that CEO disposition changes over tenure duration, Musteen et al. found that CEOs became increasingly conservative as their tenure progressed. The influence of CEO tenure moderated the impact of other factors, including background diversity on attitudes toward change (Musteen et al., 2006). In the correlational study, Musteen et al. measure CEO tenure as the time a CEO occupied the CEO position. In alignment with upper echelons theory, Goll and Rasheed and Musteen et al. provided evidence that CEO tenure reflects CEO cognitions and values. Table 11 shows the seminal literature and findings about CEO tenure and decision making.

Table 11. Seminal Literature and Findings About CEO Tenure and Decision Making

Study	Journal	Findings
Goll and Rasheed (2005)	*Organization Studies*	Average tenure length of top management positively associated with rational decision making.
Musteen, Barker, and Baeten (2006)	*Journal of Business Research*	CEOs of longer tenure held poorer attitudes toward change than CEOs of shorter tenure.

Note. Seminal literature and findings about CEO tenure and decision making were identified in the literature review process.

CEO tenure and ethical conduct. Two studies highlighted the potential for CEOs to engage in unethical conduct in their early (Masters-Stout, Costigan, & Lovata, 2008) and late tenure years (Dechow & Sloan, 1991). Masters-Stout et al. (2008) suggested that CEOs impaired more goodwill in early tenure years than late tenure years. The measure of CEO tenure was years served in the position of CEO (Masters-Stout et al., 2008). Masters-Stout et al. speculated that goodwill impairment early in a CEO's tenure could be attributed to the preceding administration and would reflect favorably on future earnings. Dechow and Sloan (1991) examined research and development spending in firms characterized by substantial, perpetual research and development costs. Dechow and Sloan found that late-tenured CEOs of organizations typified by high research and development costs cut research and development charges. Dechow and Sloan measured CEO tenure as the length of time served in the company CEO position. Dechow and Sloan posited that the CEOs reduced research and development spending late in their tenure to influence earnings and related performance-based incentives favorably. Table 12 shows the seminal literature and findings about CEO tenure and ethical conduct.

Table 12. Seminal Literature and Findings About CEO Tenure and Ethical Conduct

Study	Journal	Findings
Dechow and Sloan (1991)	*Journal of Accounting and Economics*	CEOs reduced research and development spending in late tenure.
Masters-Stout, Costigan, and Lovata (2008)	*Critical Perspectives on Accounting*	CEOs impaired more goodwill in early and late tenure years.

Note. Seminal literature and findings about CEO tenure and ethical conduct were identified in the literature review process.

Core and practitioner literature. Two critical areas of research are the basis for the core and practitioner literature review on CEO tenure. The first area of research is the relationship between CEO tenure and indicators of firm strategy and innovation. The second area of research is the relationship between CEO tenure and financial reporting quality.

***CEO tenure, firm strategy, and firm innovation*.** Scholars examined CEO tenure in the context of firm strategy (Wang et al., 2016) and innovation (Hsiang-Lan Chen, 2013; Peng, 2017). In a meta-analytic study of prior upper echelons theory research, Wang et al. (2016) explored how CEO traits affect firm performance. Wang et al. posited that CEOs of longer tenure were less associated with strategic risk and strategic change than CEOs of shorter tenure. CEO tenure was directly correlated with the impending firm performance but was of minimal influence on the strategic scope (Wang et al., 2016). The period a CEO occupied the position as CEO was used to determine tenure length (Wang et al., 2016). Hsiang-Lan Chen (2013) identified a curvilinear association between CEO tenure and corporate innovation. Measurement of CEO tenure was the aggregate time in years following appointment to the position of CEO (Hsiang-Lan Chen, 2013). Short-tenured CEOs and long-tenured CEOs devoted fewer resources to corporate innovation (Hsiang-Lan Chen, 2013).

Similarly, Peng (2017) found that CEOs in early and late tenure years underinvested in research and development initiatives. Peng posited that CEOs of short-and long-tenure duration were innovatively inefficient as a consequence of self-interest in meeting performance expectations and maintaining job security. Hsiang-Lan Chen's (2013) and Peng's nonlinear findings support the tenure life cycle concept proposed by Hambrick and Fukutomi (1991). Scholars who have investigated the link between CEO tenure, organizational strategy, and innovation have evidenced support for upper echelons theory tenets. Specifically, firm strategy

(Wang et al., 2016) and innovation (Hsiang-Lan Chen, 2013; Peng, 2017) reflect the influence of CEO tenure. As suggested by Hambrick and Fukutomi, the connection between CEO tenure and company performance measures may be nonlinear and representative of seasonal tenure effects on CEO values and cognitions. Table 13 shows the core and practitioner literature and findings about CEO tenure, firm strategy, and firm innovation.

Table 13. Core and Practitioner Literature and Findings About CEO Tenure, Firm Strategy, and Firm Innovation

Study	Journal	Findings
Hsiang-Lan Chen (2013)	*Journal of Applied Finance and Banking*	The relationship between CEO tenure and corporate innovation was curvilinear.
Peng (2017)	*International Research Journal of Applied Finance*	CEOs in early and late tenure years underinvested in research and development initiatives.
Wang, Holmes, Oh, and Zhu (2016)	*Personnel Psychology*	CEOs of longer tenure associated less with strategic risk and strategic change than CEOs of shorter tenure.

Note. Core and practitioner literature and findings about CEO tenure, firm strategy, and firm innovation were identified in the literature review process.

***CEO tenure and financial reporting quality*.** Scholars explored the influence of CEO tenure on measures of financial reporting quality, including financial restatements (Besar et al., 2017), SOX 404 material weakness disclosures (Lin et al., 2014), and earnings manipulation (Herawaty & Solihah, 2019). Besar et al. (2017) studied executive upper echelons trait effects on financial restatements of Malaysian public firms and posited an association between longer CEO tenure and improved financial reporting. Besar et al. theorized that the phenomenon could be explained by increased CEO risk aversion over time. Besar et al. measured CEO tenure as the years served in the CEO position. Besar et al. also performed a logistic regression analysis,

which did not support a statistically significant relationship between CEO tenure and financial restatements. Lin et al. (2014) contradicted the findings of Besar et al. in an examination of the relationship between U.S. publicly held company CEO upper echelons traits and the effectiveness of ICFR. Specifically, Lin et al. suggested that long CEO tenure, increased CEO shareholdings, and a reduced proportion of CEO salary and bonus to total compensation associated positively with SOX 404 material weakness disclosures. Lin et al. excluded financial firms and small firms possessing under $75 million in market value. CEO tenure was measured in binary fashion based upon whether CEO tenure length ranked in the highest 20% of sample firms (Lin et al., 2014). Herawaty and Solihah (2019) examined Indonesian manufacturing companies and demonstrated a positive association between CEO tenure and earnings management using panel data and a probit model. Herawaty and Solihah used the years served by the CEO in the CEO position as the measure of CEO tenure.

Ali and Zhang (2015) demonstrated nuances in the relationship between CEO tenure and financial reporting quality. Ali and Zhang explored CEOs' earnings management incentives throughout their tenures. CEOs were more likely to manage earnings during the first three years of tenure (Ali & Zhang, 2015). Earnings overstatements were found to boost profitability by an average of 25% (Ali & Zhang, 2015). Ali and Zhang theorized that new CEOs' career apprehensions motivated earnings management activity during the initial years of their tenure. CEO tenure was measured based upon whether CEO tenure met criteria for early tenure years or final tenure year (Ali & Zhang, 2015). Specifically, Ali and Zhang defined early tenure years and final tenure year as the first three years in the CEO position or last year in the CEO position before CEO turnover, respectively (Ali & Zhang, 2015).

Upon controlling for earnings management during the first three years of CEOs' tenure, Ali and Zhang (2015) also identified an increased propensity for earnings management in the final year of CEOs' tenure. Ali and Zhang explained the findings in congruence with the career horizon problem of CEOs leaving their firms. Table 14 shows the core and practitioner literature and findings about CEO tenure and financial reporting quality.

Table 14. Core and Practitioner Literature and Findings About CEO Tenure and Financial Reporting Quality

Study	Journal	Findings
Ali and Zhang (2015)	*Journal of Accounting and Economics*	CEOs engaged in more earnings management behaviors in their first three years of tenure.
Besar, Ali, and Ghani (2017)	*Journal of International Studies*	CEO tenure and financial restatements were inversely related according to a correlation analysis. Binary logistic regression did not support a statistically significant relationship between CEO tenure and financial restatements.
Herawaty and Solihah (2019)	*Academy of Accounting and Financial Studies Journal*	CEO tenure positively associated with earnings manipulation.
Lin, Wang, Chiou, and Huang (2014)	*Corporate Governance*	CEO tenure positively associated with SOX Section 404 material weaknesses.

Note. Core and practitioner literature and findings about CEO tenure and financial reporting quality were identified in the literature review process.

The Effectiveness of Internal Control Over Financial Reporting Literature

The enactment of SOX legislation and related disclosure requirements was an effort to regulate executive and external auditor internal control reporting (SOX, 2012). Since the passage

of SOX, scholars, practitioners, and auditors exhibited increased interest in internal control quality (Chalmers, Hay, & Khlif, 2019).

Seminal literature. The examination of 13 studies was the basis for the seminal literature review about the effectiveness of internal control over financial reporting (ICFR). Scholars measured the effectiveness of ICFR by the occurrence of reported material weaknesses under SOX Section 302 or SOX Section 404. Table 15 shows the seminal literature about the effectiveness of ICFR and the measurement of the effectiveness of ICFR under SOX.

Firm characteristics and the effectiveness of internal control over financial reporting. Scholars extensively examined firm characteristics associated with material weaknesses in the post-SOX era (Schneider, Gramling, Hermanson, & Ye, 2009). In a correlational study of material weakness firms, Ge and McVay (2005) offered early evidence of firm variations associated with SOX Section 302 material weaknesses. Compared to firms not disclosing material weaknesses, SOX Section 302 material weakness firms were smaller, more complex, and less profitable (Ge & McVay, 2005). Material weaknesses were most commonly related to inferior revenue recognition policies and accounting complexities (Ge & McVay, 2005).

Similarly, Ashbaugh-Skaife et al. (2007) conducted a logistic regression analysis to determine the incidence and disclosure of internal control deficiencies before SOX Section 404 audits were required. Ashbaugh-Skaife et al. found that companies disclosing SOX Section 302 material weaknesses were smaller than firms without SOX Section 302 material weakness disclosures. According to Ashbaugh-Skaife et al., six factors associated with SOX Section 302 material weakness firms were (a) operating complexity; (b) merger, acquisition, and restructuring activities; (c) inventory levels; (d) growth rate; (e) accounting risk; and (f) auditor

resignations. Firms disclosing material weaknesses also demonstrated reduced ability to invest in internal control (Ashbaugh-Skaife et al., 2007).

Table 15. Seminal Literature About the Effectiveness of Internal Control Over Financial Reporting and the Measurement of the Effectiveness of Internal Control Over Financial Reporting Under the Sarbanes–Oxley Act

Study	Journal	Measurement of the effectiveness of internal control over financial reporting under the Sarbanes–Oxley Act
Ashbaugh-Skaife, Collins, and Kinney (2007)	*Journal of Accounting and Economics*	Section 302
Ashbaugh-Skaife, Collins, Kinney, and LaFond (2008)	*The Accounting Review*	Sections 302 and 404
Bedard, Hoitash, and Hoitash (2009)	*International Journal of Auditing*	Section 302
Chan, Farrell, and Lee (2008)	*Auditing*	Section 404
Doyle, Ge, and McVay (2007a)	*Journal of Accounting and Economics*	Sections 302 and 404
Doyle, Ge, and McVay (2007b)	*The Accounting Review*	Section 404
Epps and Guthrie (2010)	*Accounting Forum*	Section 404
Ge and McVay (2005)	*Accounting Horizons*	Section 302
Hoitash, Hoitash, and Bedard (2009)	*The Accounting Review*	Sections 302 and 404
Jahmani and Dowling (2013)	*Academy of Accounting and Financial Studies Journal*	Section 404
Naiker and Sharma (2009)	*The Accounting Review*	Section 404
Ogneva, Subramanyam, and Raghunandan (2007)	*The Accounting Review*	Section 404
Zhang, Zhou, and Zhou (2007)	*Journal of Accounting and Public Policy*	Sections 302 and 404

Note. Seminal literature and findings about the effectiveness of internal control over financial reporting and the measurement of the effectiveness of internal control over financial reporting under the Sarbanes–Oxley Act were identified in the literature review process.

In a correlational study, Doyle et al. (2007a) studied characteristics of firms which disclosed either SOX Section 302 material weaknesses or SOX Section 404 material weaknesses and demonstrated findings analogous to Ashbaugh-Skaife et al. (2007) and Ge and McVay (2005). Specifically, study results indicated an association between smaller, younger firms and SOX Section 302 material weaknesses as well as SOX Section 404 material weaknesses (Doyle et al., 2007a). Doyle et al. (2007a) evidenced an association between disclosed material weaknesses and firm segments, operating losses, foreign transactions, and bankruptcy.

Ogneva et al. (2007) conducted a regression analysis to investigate the relationship between first-time SOX Section 404 disclosures and the cost of equity. Ogneva et al. found a negative association between SOX Section 404 material weaknesses and firm size. Ogneva et al. identified a positive association between SOX Section 404 material weaknesses and four factors: (a) foreign operations, (b) restructuring efforts, (c) accounting application risk, and (d) resource limitations.

Jahmani and Dowling (2013) investigated the characteristics of firms with internal control weaknesses. Jahmani and Dowling compared material weakness firms to matched, nonmaterial weakness firms in the same industries using logistic regression and ANOVA analyses. Jahmani and Dowling found an association between SOX Section 404 material weaknesses reported by large accelerated filers and smaller firm size and reduced profitability as compared to matched firms operating in congruent sectors.

Other firm characteristics examined by scholars in the context of material weaknesses were governance and auditor factors. Scholars conducted several studies related to the association between audit committee financial expertise and material weaknesses (Hoitash et al., 2009; Zhang et al., 2007). Zhang et al. (2007) conducted a correlational study of material

weakness firms and matched control firms. Zhang et al. found a negative association between SOX Sections 302 or 404 material weaknesses and audit committee accounting and nonaccounting financial expertise. Hoitash et al. (2009) studied internal control quality in the context of the audit committee and board corporate governance mechanisms using descriptive statistics and logistic regression analysis. Hoitash et al. found that firms with audit committees possessing financial expertise were less likely to demonstrate SOX Section 404 material weaknesses, but not SOX Section 302 material weaknesses.

Bedard et al. (2009) and Naiker and Sharma (2009) studied the association between firm auditor characteristics and material weaknesses. Bedard et al. examined nonaccelerated filers with SOX Section 302 material weakness deficiencies between 2003 and 2005 using descriptive statistics and logistic regression analysis. Bedard et al. found a direct relationship between SOX Section 302 material weaknesses and large external audit firms as well as auditors with SOX Section 404 knowledge. Naiker and Sharma conducted a correlational study of nonfinancial firms with SOX Section 404 material weaknesses in the 2004 fiscal year. Naiker and Sharma similarly found a negative association among firms with prior audit partners on the audit committee and SOX Section 404 material weaknesses.

Financial reporting quality and the effectiveness of internal control over financial reporting. Scholars have studied the association between the effectiveness of ICFR and financial reporting quality, as gauged by earnings quality (Ogneva et al., 2007) and accruals quality (Doyle, Ge, & McVay, 2007b). Ogneva et al. (2007) investigated the relationship between unsigned discretionary accruals and SOX Section 302 material weaknesses using descriptive statistics and regression analysis. Ogneva et al. found that unsigned discretionary accruals were larger among firms with SOX Section 302 material weaknesses between 2004 and 2006, but no

evidence of an association between SOX Section 404 material weaknesses and prior subpar earnings quality. In a correlational study, Doyle et al. (2007b) examined companies with SOX Section 302 or SOX Section 404 material weaknesses in the context of accruals quality and found an association between material weaknesses and lower accruals quality. Doyle et al. evidenced that the poor-quality accruals were related to entity-level controls, which are more challenging for auditors to identify.

Similarly, Ashbaugh-Skaife et al. (2008) found that firms with SOX Section 302 or SOX Section 404 material weaknesses demonstrated a higher incidence of absolute abnormal total and working capital accruals. Chan et al. (2008) examined accruals in firms with and without SOX Section 404 material weaknesses. Material weakness firms were associated with higher absolute discretionary accruals than nonmaterial weakness firm counterparts (Chan et al., 2008). Epps and Guthrie (2010) found a negative association between SOX Section 404 material weaknesses and negative discretionary accruals and a positive association between SOX Section 404 material weaknesses and positive discretionary accruals.

Core and practitioner literature. Nine studies were the basis for the examination of the core and practitioner literature about the effectiveness of ICFR. The central line of research in the core and practitioner literature was the relationship between earnings management, fraud, and the effectiveness of ICFR. The second line of research in the core and practitioner literature was CEO characteristics and the effectiveness of ICFR. Scholars gauged the effectiveness of ICFR by the occurrence of reported material weaknesses under SOX Section 302 or SOX Section 404. Table 16 shows the core and practitioner literature about the effectiveness of ICFR and the measurement of the effectiveness of ICFR under SOX.

Table 16. Core and Practitioner Literature About the Effectiveness of Internal Control Over Financial Reporting and the Measurement of the Effectiveness of Internal Control Over Financial Reporting Under the Sarbanes–Oxley Act

Study	Journal	Measurement of the effectiveness of internal control over financial reporting under the Sarbanes–Oxley Act
Hanmei Chen, Hua, and Sun (2018)	*Journal of Accounting and Finance*	Section 404
Donelson, Ege, and McInnis (2017)	*Auditing: A Journal of Practice and Theory*	Section 404
Jarvinen and Myllymäki (2016)	*Accounting Horizons*	Section 404
Lee (2015)	*The Journal of Applied Business Research*	Section 404
Lee (2016)	*The Journal of Applied Business Research*	Section 404
Lenard, Petruska, Alam, and Bing (2016)	*Advances in Accounting*	Section 404
Lin, Wang, Chiou, and Huang (2014)	*Corporate Governance*	Section 404
Mitra, Jaggi, and Hossain (2013)	*Journal of Accounting, Auditing, and Finance*	Section 404

Note. Core and practitioner literature about the effectiveness of internal control over financial reporting and measurement of the effectiveness of internal control over financial reporting under the Sarbanes-Oxley Act were identified in the literature review process.

Earnings management, fraud, and the effectiveness of internal control over financial reporting. Scholars examined the relationship between earnings management (Jarvinen & Myllymäki, 2016; Lenard et al., 2016), fraud (Donelson et al., 2017), and the effectiveness of ICFR. Jarvinen and Myllymäki (2016) conducted a correlational study of nonfinancial firms with firm years between 2004 and 2012. Companies with current SOX Section 404 material weaknesses were more likely to engage in earnings management (Jarvinen & Myllymäki, 2016). Jarvinen and Myllymäki theorized that the efforts of management to reduce unfavorable public perceptions explained the effect. Jarvinen and Myllymäki chose to gauge earnings management

activities by measures of real earnings management, including abnormal production and discretionary costs, and unusual cash flows.

Similarly, Lenard et al. (2016) found an association between SOX Section 404 material weaknesses and real activities manipulation in a correlational study of firms with material weaknesses between 2004 and 2010. Financial and highly regulated industry firms were excluded from the sample (Lenard et al., 2016). Lenard et al. warned that real activities manipulation is more common in the post-SOX era and more difficult for auditors to detect.

Donelson et al. (2017) evidenced a positive association between SOX Section 404 material weaknesses and subsequent corporate fraud. Donelson et al. measured fraud based on credible evidence from class action lawsuits that an accounting-related fraud had been committed. The analysis was conducted using logistic regression and a propensity score matched-pairs test (Donelson et al., 2017). Donelson et al. attributed the findings to the general opportunity explanation for fraud.

Mitra et al. (2013) studied the relationship between SOX Section 404 material weaknesses and accounting conservatism. Accounting conservatism was based on factors related to ongoing fluctuations in earnings, the timeliness of earnings to news, and accrual-based loss recognition (Mitra et al., 2013). Mitra et al. posited that firms with SOX Section 404 material weaknesses exhibited increased accounting conservatism compared to nonmaterial weakness firm counterparts. The results were most pronounced in firms with entity-level internal control weaknesses (Mitra et al., 2013). The analysis was performed using descriptive statistics, correlation, and regression (Mitra et al., 2013). Mitra et al. attributed the findings to the effects of increased regulation in the post-SOX era.

CEO characteristics and the effectiveness of internal control over financial reporting. Four studies indicated a relationship between CEO traits and the effectiveness of ICFR. Lin et al. (2014), Lee (2015, 2016), and Hanmei Chen et al. (2018) identified CEO factors associated with SOX Section 404 material weaknesses. Lin et al. examined nonfinancial firms and found an association between CEO entrenchment, CEO age, and Sox Section 404 material weaknesses. Specifically, Lin et al. posited that companies with entrenched and younger CEOs are more prone to SOX Section 404 material weaknesses. CEO entrenchment was gauged as a function of CEO shareholdings, CEO dual board chair role, salary, bonus, and tenure (Lin et al., 2014). CEO age was measured as the logarithm of a CEO's age (Lin et al., 2014). SOX Section 404 material weaknesses were measured in a binary fashion (Lin et al., 2014). Lin et al. conducted the analysis using descriptive statistics and logistic regression.

Lee (2015, 2016) conducted two correlational studies about CEO characteristics and the effectiveness of ICFR. In a study of nonfinancial firms with firm years between 2004 and 2011, Lee (2015) found a negative association between managerial ability and SOX Section 404 material weaknesses. A second study over the same period indicated a positive association between CEO overconfidence and material weaknesses (Lee, 2016). Lee (2016) performed the analysis using descriptive statistics. Material weaknesses were measured in binary form, coded 1 if disclosed and 0 in the absence of a material weakness disclosure (Lee, 2015, 2016).

In a correlational study, Hanmei Chen et al. (2018) examined CEO age, CEO turnover, and CFO impact in the context of ongoing internal control deficiencies. Hanmei Chen et al. measured the degree of persistence in internal control deficiencies using the number of SOX Section 404 material weakness deficiencies over five years. Hanmei Chen et al. rationalized that future material weaknesses were indicative of CEOs' intent to mitigate control deficiencies.

Companies with younger CEOs and demonstrating higher CEO turnover were more likely to experience ongoing internal control deficiencies than companies employing older CEOs and demonstrating less CEO turnover (Hanmei Chen et al., 2018). Hanmei Chen et al. evidenced that CEOs can reduce the effects of CFOs on the continuance of material weaknesses. Hanmei Chen et al. conducted the analysis using descriptive statistics and Poisson regression.

Overview of Research Methodologies

Previous studies conducted by scholars who examined the relationship between CEO characteristics and internal control quality were typified by a quantitative methodology, correlational design, and inferential statistics as well as the use of secondary data sources and large sample size selection (Hanmei Chen et al., 2018; Lee, 2015, 2016; Lin et al., 2014). A quantitative methodology and correlational research design were useful for gaining insight about the relationship between CEO characteristics and internal control quality. Statistical testing included the chi-square test (Lin et al., 2014), logistic regression (Lee, 2015, 2016; Lin et al., 2014) and Poisson regression (Hanmei Chen et al., 2018). Binary measurement of SOX Section 404 material weaknesses was the favored approach for gauging the effectiveness of ICFR (Lee, 2015, 2016; Lin et al., 2014). Secondary data sources included Audit Analytics database (Hanmei Chen et al., 2018; Lee 2015, 2016; Lin et al., 2014) and the ExecuComp database (Hanmei Chen et al., 2018; Lee, 2016; Lin et al., 2014). The use of secondary data facilitated broad coverage of the study populations. Sample sizes ranged from 4,374 firm-year observations (Lin et al., 2014) to 17,901 firm-year observations (Lee, 2015). The sample period for each study consisted of firm years before and after the implementation of AS 5 (Hanmei Chen et al., 2018; Lee, 2015, 2016; Lin et al., 2014). Given the highly regulated environment in which

financial institutions operate, financial institution firms were excluded from the samples in some previous studies (Lee, 2015; Lin et al., 2014).

The strengths identified from the methodologies of previous studies about the relationship between CEO characteristics and internal control quality were applied in this study. The research design was a correlational design for this quantitative study using inferential statistics. The Audit Analytics database, a secondary data source, was used to procure SOX Section 404(b) material weakness data. Financial institution firms were excluded from the population. The effectiveness of ICFR variable was measured dichotomously based on SOX Section 404(b) material weakness disclosures.

The study period selected for this study is a difference from previous studies about the relationship between CEO characteristics and internal control quality. While the study period selected in each previous study was characterized by study periods with firm years before and after the implementation of AS 5 (Hanmei Chen et al., 2018; Lee, 2015, 2016; Lin et al., 2014), the study period examined in this study was the year 2017 representing a single year in the post-AS 5 period. The PCAOB reduced mandatory audit procedures with the implementation of AS 5 in 2007 (U.S. Securities and Exchange Commission, 2007). The results of this study may be useful for assessing the implications of AS 5 for internal control quality.

Synthesis of the Research Findings

The literature review is the basis for an appraisal and synthesis of the literature findings. Following is a synopsis of the literature review in a series of sections aligned with the theoretical framework and study variables. The literature review is briefly synthesized and the gap in knowledge ascertained to identify the strategic fit for the study.

Theoretical framework. Neoclassical theories of management (Lieberson & O'Connor, 1972), agency theory (Jensen & Meckling, 1976), and upper echelons theory (Hambrick & Mason, 1984) have been used to frame management decisions. According to neoclassical theories of management, managers are interchangeable and manager idiosyncrasies do not influence corporate outcomes (Lieberson & O'Connor, 1972). Agency theorists posited that the degree of influence individual managers and their traits exert on organizational outcomes is limited (Jensen & Meckling, 1976). Scholars questioned the relevance of economic theories (Teece & Winter, 1984) and agency theory assumptions (Bendickson et al., 2016) for complex business situations. Upper echelons theorists suggested that individual managers and their unique characteristics influence organizational outcomes (Hambrick & Finkelstein, 1987; Hambrick & Mason, 1984). Scholars extended upper echelons theory from management applications to the field of accounting (Hiebl, 2014; Plöckinger et al., 2016).

CEO age. Four primary lines of research on CEO age were the basis for the review of the seminal literature. In the first line of research, scholars posited conflicting results about the relationship between CEO age and organizational commitment (Michaels & Spector, 1982; Steers, 1977). In the second line of research, scholars found that older executives are more risk-averse than younger executives (Hambrick & Mason, 1984; Taylor, 1975; Vroom & Pahl, 1971). Career concerns contributed to risk aversion in younger CEOs (Hirshleifer & Thakor, 1992; Holmström, 1999; Zwiebel, 1995). In the third line of research, scholars identified older CEOs as more ethical than younger CEOs (Deshpande, 1997; Mudrack, 1989; Peterson et al., 2001; Twenge & Campbell, 2008). W. N. Davidson et al. (2007) suggested that CEOs near retirement might engage in earnings management. In the fourth line of research, older CEOs were

associated with better financial reporting quality (H. Huang et al., 2012) and a more conservative disclosure style than younger CEOs.

In the core and practitioner literature, scholars examined the influence of CEO age on firm performance, financial risk, and financial reporting quality. Study findings on the relationship between CEO age and firm performance were mixed (Adams & Jiang, 2017; Andreou et al., 2017; Nguyen et al., 2018). Similarly, study findings on the relationship between CEO age and financial risk were mixed (Iqbal, 2015; Serfling, 2014). Older CEOs were associated with better internal control quality (Lin et al., 2014).

CEO tenure. In the seminal literature, most scholars indicated an association between CEO tenure and firm performance; however, the nature of the association varied among studies (Balkin et al., 2000; Hambrick & Fukutomi, 1991). CEOs of longer tenure were more rational decision makers (Goll & Rasheed, 2005) and averse to change (Musteen et al., 2006) than CEOs of shorter tenure. Finally, CEOs in early and late tenure behaved more unethically (Dechow & Sloan, 1991; Masters-Stout et al., 2008).

Per the core and practitioner literature, CEOs in early and late tenure were less likely to engage in innovative activities (Hsiang-Lan Chen, 2013; Peng, 2017). Concerning financial reporting quality, scholars evidenced a direct (Herawaty & Solihah, 2019) and an inverse (Ali & Zhang, 2015) relationship between CEO tenure and earnings management as well as an inverse relationship between CEO tenure and financial statement restatements (Besar et al., 2017).

The effectiveness of internal control over financial reporting. Firm characteristics associated with the effectiveness of ICFR were the subject of early scholarly works on the effectiveness of ICFR. From the seminal literature about the effectiveness of ICFR, material weaknesses in ICFR are associated with smaller (Ashbaugh-Skaife et al., 2007), less profitable

(Jahmani & Dowling, 2013), more complex firms (Ge & McVay, 2005). Material weakness firms were less likely to have audit committees with financial expertise (Hoitash et al., 2009; Zhang et al., 2007). Material weaknesses in ICFR were associated with reduced accruals quality (Ashbaugh-Skaife et al., 2008; Doyle et al., 2007b).

Per the core and practitioner literature about the effectiveness of ICFR, scholars associated SOX Section 404 material weaknesses with earnings management (Jarvinen & Myllymäki, 2016) and subsequent corporate fraud (Lenard et al., 2016). Scholars found an association between SOX Section 404 material weaknesses and CEO entrenchment (Lin et al., 2014), CEO overconfidence (Lee, 2016), and younger CEOs (Hanmei Chen et al., 2018). Study findings indicated a negative association between managerial ability and SOX Section 404 material weaknesses (Lee, 2015). Scholars conflicted regarding the influence of CEO age on the effectiveness of ICFR (Hanmei Chen et al., 2018; Lin et al., 2014).

Synthesis. The identifiable link between the seminal, core, and practitioner sources was that executive demographic characteristics, including CEO age and CEO tenure, influence organizational outcomes (Hambrick & Mason, 1984; Lin et al., 2014; Plöckinger et al., 2016). The findings from the literature review were essential insights into this study. Because older CEOs are more ethical (Peterson et al., 2001) and demonstrate better measures of financial reporting quality (Bamber et al., 2010; H. Huang et al., 2012), an expected outcome was that CEO age will directly relate to the effectiveness of ICFR. Younger CEOs' career concerns (Holmström, 1999) and older CEO's career horizon problem (W. N. Davidson et al., 2007) may produce a curvilinear relationship between the variables. Given that longer-tenured CEOs are more rational (Goll & Rasheed, 2005) and less likely to engage in earnings management (Ali & Zhang, 2015), another expected outcome was that CEO tenure will directly relate to the

effectiveness of ICFR. The upper echelons theoretical framework was the most appropriate lens through which to examine the relationship between CEO age, CEO tenure, and the effectiveness of ICFR.

Gap in current knowledge. Figure 2 shows the strategic fit for the study. Per the literature review, scholars documented the influence of CEO age and CEO tenure on organizational outcomes (Hambrick & Mason, 1984; Lin et al., 2014; Plöckinger et al., 2016), consistent with upper echelons theory. Scholars examined accounting choices, including the effectiveness of ICFR, as types of organizational outcomes in the context of upper echelons theory (Hiebl, 2014; Plöckinger et al., 2016).

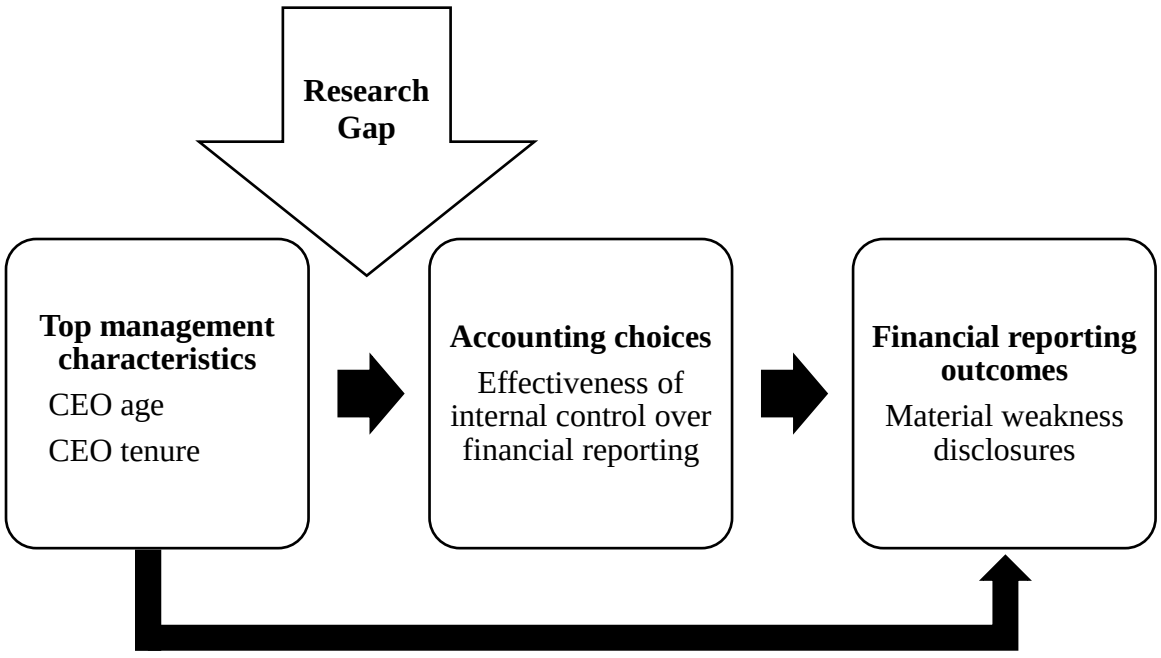

Figure 2. Strategic fit for the study. The relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting as evidenced by material weakness disclosures is a research gap.

Scholars frequently gauged the effectiveness of ICFR by the occurrence of SOX Section 404 material weaknesses. CEO age and CEO tenure characteristics are potential proxies for the effectiveness of ICFR. The influence of CEO age and CEO tenure on the effectiveness of ICFR and related financial reporting outcomes constituted a research gap.

Conclusions

The literature review process was a synthesis of the seminal, core, and academic literature and an evaluation of the theories as well as the CEO age, CEO tenure, and the effectiveness of ICFR study variables. The literature review supported the research questions and theoretical framework. The literature synopsis indicated the strategic fit for the study.

The research objective was to apply a quantitative explanatory research methodology using descriptive statistics and a correlational design to examine the relationship between CEO age, CEO tenure, and the effectiveness of ICFR among publicly held companies. A correlational design was useful for determining the relationship among variables (Ang, 2014). The review of the literature about the theories and study variables supported the following research questions concerning the relationship between CEO age, CEO tenure, and the effectiveness of ICFR that guided the study:

RQ1: What is the relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

RQ2: What is the relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

RQ3: What is the predictive relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

In Chapter 3, the quantitative research methodology for the explanatory study using descriptive statistics and a correlational design is presented to examine the relationship between CEO age, CEO tenure, and the effectiveness of ICFR. Included in Chapter 3 is a discussion of the study population, setting, data collection and analysis, validity and reliability, and ethical considerations.

CHAPTER 3. METHODOLOGY

Introduction

CEOs have engaged in financial reporting scandals despite their responsibility for effective internal control over financial reporting (ICFR; Soltani, 2014). Consistent with upper echelons theory regarding the power of individual executive characteristics on corporate strategic decisions, scholars associated executive demographics with accounting choices (Plöckinger et al., 2016). Scholars found an association between CEO age (H. Huang et al., 2012), CEO tenure (Besar et al., 2017) and firm outcomes, including financial reporting quality. Despite the studies about CEO age and CEO tenure demographics, few researchers explored how these variables relate to the effectiveness of ICFR.

The objective of Chapter 3 is to introduce the research methodology for this quantitative explanatory study using descriptive statistics and a correlational design. Regarding the relationship between CEO age, CEO tenure, and the effectiveness of ICFR, the research questions were

RQ1: What is the relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

RQ2: What is the relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

RQ3: What is the predictive relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

The applicability of a correlational design for the research questions was an important aspect of Chapter 3. The purpose of the research study was to examine the relationship between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies.

Nine sections comprise Chapter 3. The first section is an assessment and justification of the research design and methodology in the context of the research questions. The second section is an explanation, defense, and rationalization of the population criteria. The third section is the evaluation and support of the research setting and context. The fourth section is an explanation and justification of the data collection procedures. The fifth section is an explanation for the use of secondary data obtained from publicly available sources rather than survey instruments. The sixth section is a statement and justification of the hypotheses. The seventh section is an explanation for the data analysis process, such as hypotheses evaluation, assessment, and rationalization. The eighth section is the contemplation of data validity and reliability. The ninth section is a consideration of ethical issues.

Design and Methodology

The research design was a correlational design for this quantitative explanatory study using inferential statistics. According to Creswell and Creswell (2018), a quantitative method is appropriate when enlightenment about the relationship between variables is needed to manage the research problem. Given that the study purpose was to examine the relationship between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies, a quantitative methodology was warranted to address the research problem. Lin et al. (2014) and

Lee (2015, 2016) conducted studies investigating the relationship between CEO traits and the effectiveness of ICFR. Consistent with quantitative research designs, primary variables were the basis for the development of narrow research questions.

The degree of association between two or more quantifiable variables is determined by investigators using correlational research (Creswell, 2014; Gay, Mills, & Airasian, 2012). Correlational and causal-comparative research designs are used to describe existing conditions (Gay et al., 2012). In contrast to correlational research, reasons or causes for existing conditions are pursued in causal-comparative research (Gay et al., 2012). A high degree of correlation among variables is not implicative of causation (Gay et al., 2012).

Researchers interested in determining simple associations employ explanatory design, while researchers employ prediction design to facilitate the identification of variables which predict outcomes (Creswell, 2014). The direction, form, and strength of association between variables can be ascertained using correlational research (Creswell, 2014). In experimental designs, researchers manage or influence variables in order to determine the impact on different variables (Cooper & Schindler, 2014). This study was designed to determine the relationship between CEO age, CEO tenure, and the effectiveness of ICFR. Given that an explanation of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR was needed to answer the research questions, a quantitative methodology, nonexperimental design, and correlational approach were appropriate for the study. Following is a discussion of the population.

Population and Sampling

Population

The population for this study was U.S. publicly held nonfinancial firms with an audit opinion on the effectiveness of ICFR under SOX Section 404(b) in 2017. CEO age and CEO

tenure data are available only for U.S. companies in the EDGAR database; therefore, non-U.S. companies were excluded from this study. Of the 3,614 SOX 404(b) auditor attestations in 2017, approximately 600 represented foreign filers (T. Hardy, personal communication, February 10, 2019).

Financial institution firms are subject to more intense regulation and external monitoring than nonfinancial firms (Lin et al., 2014). SOX Section 404(b) audit opinions for financial institution firms are more likely to differ substantially from SOX Section 404(b) audit opinions for nonfinancial firms in the population (Lin et al., 2104). Consistent with prior studies (H. Huang et al., 2012; Lee, 2015; Lin et al., 2014), financial institution firms (standard industry classification codes 6000–6999) were excluded from the population in this study.

Given evidence that auditors outperform management in detecting internal control deficiencies (Bedard & Graham, 2011), the population was ascertained using SOX Section 404(b) audit opinions on the effectiveness of ICFR, rather than SOX Section 404(a) management assessments on the effectiveness of ICFR. Lee (2015, 2016) and Lin et al. (2014) reinforced the use of SOX Section 404(b) audit opinions as a population base in studies of the relationship between CEO characteristics and the effectiveness of ICFR.

This study population differed from populations identified in previous studies about the relationship between CEO demographics and the effectiveness of ICFR. The populations of prior studies included firms with SOX Section 404(b) audit opinions in the years 2006 through 2009 (Lin et al., 2014) and 2004 through 2011 (Lee, 2015, 2016). The populations of prior studies included firm years before and after the PCAOB superseded Auditing Standard (AS) 2 with AS 5 (reorganized as 2201). In accordance with AS 5, external auditors are obligated to report directly on the effectiveness of ICFR, rather than the fairness of management's SOX Section 404(a)

reports (PCAOB, 2017a). With the development of AS 5, the PCAOB reduced mandatory audit procedure requirements (U.S. Securities and Exchange Commission, 2007). AS 5 is effective for SOX Section 404 audits of ICFR for fiscal years ending on or after November 15, 2007 (PCAOB, 2007).

The U.S. Securities and Exchange Commission's approval of the PCAOB's proposed AS 5 on July 25, 2007, was guided by the goal of increased control audit quality (PCAOB, 2007), and material weakness rates declined following the implementation of AS 5 (Schroeder & Shepardson, 2016). Schroeder and Shepardson (2016) posited that the 2007 auditing standard change affected negatively internal control quality. This study population included firms with SOX Section 404(b) audit opinions in 2017 or the post-AS 5 period. Thus, the choice of the population for this study differed from populations selected in similar, previous studies.

Sampling

A census was applied in this study, rather than other sampling methods. A census is a study of all elements in a population (Gay et al., 2012) and is fitting when researchers need an account of all elements in a target population for the achievement of study objectives (Daniel, 2012). To avoid duplication of firms in the population, firm records with internal control reports that were subsequently restated were removed from the population. According to Cooper and Schindler (2014), a census is appropriate for studies of relatively small populations characterized by high variability. In the context of small, highly variable populations, any sample drawn may not be representative of the population (Cooper & Schindler, 2014). The U.S. publicly held nonfinancial firm population, which was identified for the present study, was small relative to the populations of previous similar studies conducted by Lin et al. (2014) and Lee (2015, 2016). The current heterogeneous study population was firms in diverse industries. Advantages of a census

to study a population are the avoidance of sampling error, availability of benchmark data for future studies, and potential accessibility of detailed subgroup information (Australian Bureau of Statistics, 2013). An accurate measure of a population is obtainable from a census without the potential for sampling error (Cooper & Schindler, 2014).

Power Analysis

A census was conducted in this study; therefore, a power analysis, for purposes of determining sample size, was not performed.

Setting

The setting for this study was U.S. publicly held nonfinancial companies required to submit annual independent auditor attestations on the effectiveness of ICFR in accordance with SOX Section 404(b). U.S. publicly held nonfinancial companies were selected in prior studies about the effectiveness of ICFR (Lin et al., 2014; Schroeder & Shepardson, 2016). The choice of setting was representative of the breadth of SOX Section 404(b) reporting requirements as well as the availability of secondary data. Approximately 50% of U.S. publicly held companies must submit SOX Section 404(b) audit opinions on the effectiveness of ICFR to the U.S. Securities and Exchange Commission (Levy, 2016). SOX Section 404(b) reports are submitted annually to the U.S. Securities and Exchange Commission.

U.S. publicly held companies not subject to SOX Section 404(b) reporting requirements include nonaccelerated filers and emerging growth companies (EGCs), a new category of public companies (Munsif, Raghunandan, & Rama, 2012). Nonaccelerated filers were not initially mandated to file SOX Section 404(b) reports (Audit Analytics, 2018). In accordance with the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank) enacted in 2010, nonaccelerated filers received a permanent exemption from SOX Section 404(b) reporting

requirements (Audit Analytics, 2018). EGCs are exempted from SOX Section 404(b) reporting requirements in accordance with the Jumpstart Our Business Startups Act of 2012 (Munsif et al., 2012). Nonaccelerated filers and EGCs were excluded from the study.

The setting was selected to investigate the relationship between CEO age, CEO tenure, and the effectiveness of ICFR. Of potential interest to scholars is study implications for upper echelons theory tenets in the accounting field. Whether CEO age and CEO tenure characteristics are indicators of potential financial statement misstatements is of interest to audit practitioners.

Data Collection

Data collection was a two-step process. The first step was the identification of U.S. publicly held nonfinancial firms with an audit opinion on the effectiveness of ICFR under SOX Section 404(b) in 2017 using the online Audit Analytics database. Audit Analytics is a private research company owned by Ives Group, Inc. and is engaged in the provision of data and intelligence on audits, regulation, and disclosures (Audit Analytics, n.d.). The second step was the retrieval of the CEO age and CEO tenure data for each firm. The source for CEO age and CEO tenure data was Schedule 14A (*Proxy Statement Pursuant to Section 14(a) of the Securities Exchange Act of 1934*) filed with the United States Securities and Exchange Commission, Washington, D.C. 20549. Schedule 14A filings were accessed from the EDGAR database available through the U.S. Securities and Exchange Commission website. In the absence of available CEO age or CEO tenure data in Schedule 14A filings, the data were retrieved from other publicly available sources such as Form 10-K (*Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934*) filed with the United States Securities and Exchange Commission. Retrieval of SOX Section 404(b) audit opinion data and CEO

characteristics from secondary data sources, including Audit Analytics, ExecuComp, and Compustat, was evidenced in prior studies (Lee, 2015, 2016; Lin et al., 2014).

A subscription was purchased for the Audit Analytics Audit + Compliance module. Within the online interface, filters were applied to refine the dataset. Specifically, the following four criteria were selected in the filtering process: firms with SOX 404 auditor attestations, 2017 fiscal year, U.S. company, and industries except financial firms (standard industry classification codes 6000–6999). Data were exported to Microsoft Excel. Central index key numbers, employer identification numbers, and company addresses were removed from the dataset and recorded. Data were labeled with a code. Linkage information was maintained separately in a secure location. The dependent variable, the effectiveness of ICFR, was coded 1 for firms disclosing a material weakness(es) under SOX Section 404(b), and 0 otherwise. Secondary data collection from Audit Analytics and the use of a dichotomous variable for material weakness disclosures under SOX Section 404(b) was consistent with prior studies about internal control quality (H. Huang et al., 2012; Lee, 2015, 2016; Lin et al., 2014).

The EDGAR database was accessed online for purposes of collecting CEO age and CEO tenure data. Schedule 14A filings for the fiscal year 2017 were accessed using central index key numbers for companies in the dataset. The independent variable, CEO age, was defined as the CEO's chronological age at the time of the firm's Schedule 14A filing. The measurement of CEO age as a CEO's chronological age in years was consistent with prior studies about CEO age (Adams & Jiang, 2017; H. Huang et al., 2012; Oh et al., 2016). CEO age was manually entered in the Excel spreadsheet.

CEO tenure information was obtained from Schedule 14A filings, which indicated the initial tenure year, or the 1st year an individual occupied the CEO position. The initial tenure

year was manually entered into the Excel spreadsheet. Using the initial tenure year reported in Schedule 14A, the independent variable, CEO tenure, was calculated and defined as the length of time in years the individual functioned in the company's CEO position. Measurement of the CEO tenure variable was consistent with prior studies about CEO tenure (Adams & Jiang, 2017; Baatwah, Salleh, & Ahmad, 2015; H. Huang et al., 2012) and conceptually superior to a dichotomous approach (MacCallum, Zhang, Preacher, & Rucker, 2002). Secondary CEO age and CEO tenure data were primarily collected from the S&P Compustat and ExecuComp databases in prior studies (Ali & Zhang, 2015; H. Huang et al., 2012; Lin et al., 2014; Serfling, 2014). Oh et al. (2016) acquired some CEO age data directly from proxy statements. Database access is cost prohibitive, and CEO age and CEO tenure data were available from Schedule 14A filings. In this study, CEO age and CEO tenure data were obtained from the EDGAR database.

Table 17 reflects the population selection process. The result of the data filtering from the Audit Analytics Audit + Compliance database provided an initial population of 2,205 nonfinancial U.S. firms with SOX Section 404(b) reports. An explanation for the difference between the initial population number and the total number of U.S. nonfinancial firms with SOX Section 404(b) reports for fiscal year 2017 is 42 restated internal control reports. The output was downloaded in Microsoft Excel spreadsheet format and further refined. The deletion of firm records with internal control reports that were subsequently restated was the method for avoiding the duplication of firms in the population. The deletion of foreign private issuers from the data set was the method for limiting the population to U.S. companies. Trusts are not administered by executives; therefore, trust firms were exclusions from the data set. The final population consisted of 2,149 firms.

Table 17. Population Selection

Selection criteria	Number
Initial population of U.S. nonfinancial firms listed in Audit Analytics with SOX Section 404(b) reports for fiscal year 2017	2,205
Less: Firms with internal control reports subsequently restated	(42)
Total U.S. nonfinancial firms listed in Audit Analytics with SOX Section 404(b) reports for fiscal year 2017	2,163
Less: Foreign private issuer firms	(8)
Less: Trust firms	(6)
Final population	2,149

Note. Data from Ives Group (2019).

Instrumentation

No survey instruments were used in this study; instead, the use of secondary data was obtained from publicly available sources. The Audit Analytics database was the data source for the census population of firms and associated SOX Section 404(b) audit opinions. CEO age and CEO tenure data for each firm were obtained from public company Schedule 14A filings archived in the EDGAR system by the U.S. Securities and Exchange Commission.

The Audit Analytics database and EDGAR system were the most appropriate data sources available for this study. The effectiveness of ICFR variable was measured using SOX Section 404(b) material weakness disclosures, which were obtained from Audit Analytics more efficiently than could be achieved through manual data collection. The collection of SOX Section 404(b) data by Audit Analytics was performed using automated data integration processes and manual analyst review and categorization of public company disclosures with the U.S. Securities and Exchange Commission (Audit Analytics, n.d.). The EDGAR system facilitates automated data collection and validation related to the submissions of publicly traded

companies to the U.S. Securities and Exchange Commission (U.S. Securities and Exchange Commission, 2010). The use of the EDGAR system and Audit Analytics database was consistent with previous similar studies conducted by Oh et al. (2016) and Lin et al. (2014), respectively.

Data privacy and security measures were employed in this study. Companies and CEOs were not contacted. CEO names were excluded from the dataset. Central index key numbers, employer identification numbers, and company addresses were removed from the dataset. Pseudonyms were used to identify each of the cases in the dataset. The data were protected from unauthorized access, inadvertent loss, and destruction. The dataset was stored electronically on a USB device in a locked cabinet, and physical and electronic access was limited. Data was aggregated for reporting purposes, and individual companies and CEOs were not identified. In accordance with Capella University policy, data will be stored securely for seven years after study completion and then destroyed.

Hypotheses

Cooper and Schindler (2014) noted that the study direction, relevant facts, appropriate research design, and organizing framework for conclusions should be ascertainable from the hypothesis. Consistent with the research questions in Chapter 1, this study was an examination of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies. The hypotheses for this study were formulated in association with the research questions. Specifically, the potential correlation between variables was described in relational null and alternative hypotheses statements, which were directly testable. Given the mixed findings in the literature regarding the direction of a potential relationship between CEO age, CEO tenure, and the effectiveness of ICFR, this study hypotheses were nondirectional.

Based on the hypotheses, a correlational research design was appropriate. Following are the null and alternative hypotheses for each research question in this study.

RQ1: What is the relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

$H1_0$: There is no statistically significant relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies.

$H1_A$: There is a statistically significant relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies.

RQ2: What is the relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

$H2_0$: There is no statistically significant relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies.

$H2_A$: There is a statistically significant relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies.

RQ3: What is the predictive relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting among U.S. publicly held companies?

$H3_0$: CEO age and CEO tenure are not significant predictors of the effectiveness of internal control over financial reporting among U.S. publicly held companies.

$H3_A$: CEO age and CEO tenure are significant predictors of the effectiveness of internal control over financial reporting among U.S. publicly held companies.

Data Analysis

Statistical software programs are helpful for conducting a variety of statistical analyses (McHugh, 2013). In this study, data were analyzed using IBM SPSS Statistics Premium Campus Edition (version 24.0) software. The use of IBM SPSS software facilitates speed and accuracy in statistical data analysis (Knapp, 2017). Although initially designed for the needs of social science researchers, the use of IBM SPSS software has evolved across disciplines ("Contribution of SPSS," 2016). Descriptive and inferential statistics are generatable from the software ("Contribution of SPSS," 2016). Chi-square and Cramér's V tests as well as logistic regression, are available output from IBM SPSS software (Knapp, 2017). The software scales the measurement of study variables downward from interval- or ratio-scale to ordinal- or nominal-scale ("Contribution of SPSS," 2016). Data analysis included the generation of descriptive statistics and testing of hypotheses with inferential statistics.

Descriptive Statistics

Descriptive statistics were presented. CEO age and CEO tenure were continuous variables. Summary statistics for CEO age and CEO tenure data included mean, median,

standard deviation, variance, minimum, maximum, range, skewness, and kurtosis. The effectiveness of ICFR variable was categorical as gauged by SOX 404(b) material weakness disclosures. A frequency table was used to analyze and present statistics for the effectiveness of ICFR variable. CEO age and CEO tenure variables were recoded from continuous to an ordinal measure for purposes of conducting the chi-square test of independence. Two cross-tabulation tables were used to assess and present the relationship between CEO age and the effectiveness of ICFR and CEO tenure and the effectiveness of ICFR. Clustered bar charts were presented for the recoded CEO age and CEO tenure variables.

Hypotheses Testing

The nature of the dependent variable was the basis for the determination of appropriate statistical approaches to hypotheses testing. The effectiveness of ICFR variable was measured using SOX Section 404(b) material weakness disclosures, and consistent with prior research, measured dichotomously (Lee, 2015, 2016; Lin et al., 2014). Firm years with and without a SOX Section 404(b) material weakness disclosure were coded 1 and 0, respectively. The chi-square test of independence (McHugh, 2013) and binary logistic regression (Gaur & Gaur, 2009) are statistical tests used in cases of a dichotomous dependent variable.

The chi-square test of independence was applied to address Research Questions 1 and 2. The chi-square statistical test is used to ascertain whether a statistically significant relationship exists between two variables (Gaur & Gaur, 2009). The chi-square statistical test is appropriate when the dependent variable is nominal (McHugh, 2013). Categorical dichotomous or polychotomous variables can be compared using the chi-square statistical function (Knapp, 2017). Six assumptions of the chi-square test are (a) cellular data expressed as frequencies, (b) mutually exclusive variable categories, (c) single-cell data for each subject, (d) group

independence, (e) categorical variables, and (f) random sample size large enough that the expected frequencies are not less than 1, and at least 80% is greater than 5 (McHugh, 2013).

CEO age and CEO tenure variables were converted from continuous to categorical (dichotomous) for purposes of the chi-square analysis, consistent with Lin et al. (2014). Specifically, consistent with Lin et al., the median age was used as a point of reference for categorizing younger and older CEOs. Also, consistent with Lin et al., CEO tenure was categorized based upon whether a CEO's tenure is within the top 20% of the population. The effectiveness of ICFR variable was categorical (dichotomous) and dependent upon whether a firm reported a SOX Section 404(b) material weakness.

The chi-square analysis produces a *p* value, which is an indicator of the probabilty that differences occurred by chance (Knapp, 2017). A significance level of 0.05 is typical (Knapp, 2017) and applied in this study. A *p* value result less than 0.05 is indicative of a statistically significant association between two variables, and accordingly, the null hypothesis would be rejected, and the alternative hypothesis accepted. If a significant chi-square results, a strength statistic should be applied (McHugh, 2013). In the case of two-by two tables, which are the result of two variables with two categories, the Yates's correction for continuity is useful for offsetting the inflated chi-square value (Pallant, 2016). The most common strength test used in the context of a significant chi-square test result is the Cramér's V test, which is used to determine the strength of association between nominal/ordinal variables (McHugh, 2013). In the case of two-by-two tables, the phi coefficient is the recommended measure for the strength association (Pallant, 2016). The Yates's correction for continuity and phi coefficient were appropriate applications in the evaluation of the hypotheses associated with Research Questions 1 and 2.

Binary logistic regression was applied to test the hypotheses for Research Question 3 as to whether a predictive relationship exists between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies. In prior research, scholars documented the application of logistic regression to analyze the relationship between CEO characteristics and measures of financial reporting quality (H. Huang et al., 2012; Lee, 2015, 2016; Lin et al., 2014). Logistic regression is similar to multiple regression in that numerous continuous and categorical predictor variables may be considered (Knapp, 2017). Logistic regression is used to analyze discrete outcomes (F. L. Huang & Moon, 2013) and is considered the best practice for analysis of dichotomous or categorical outcomes (Osborne, 2015). When the outcome variable is dichotomous or consists of two possible outcomes, binary logistic regression is employed (Gaur & Gaur, 2009). The results of logistic regression analysis are odds ratios for continuous variables and percentage change for the outcome variable (Knapp, 2017).

Five assumptions of binary logistic regression are (a) a dichotomous dependent variable, (b) independent observations, (c) absence of multicollinearity among the independent variables, (d) linearity between the independent variables and log odds, and (e) large sample size (Schreiber-Gregory & Bader, 2018). Required tests for the use of binary logistic regression are coefficient testing for significance and model testing for goodness of fit (Bewick, Cheek, & Ball, 2005). Another consideration is the effectiveness of the model for discriminating between groups (Bewick et al., 2005). Model discrimination and goodness of fit measures can be assessed using an alternative data set to support model validity (Bewick et al., 2005).

Binary logistic regression was an appropriate statistical test for the Research Question 3 hypotheses. The dependent variable was measured discretely. Specifically, the dependent variable representing the effectiveness of ICFR was a binary expression of the occurrence of a

SOX Section 404(b) material weakness. In contrast to the chi-square test, continuous variables were not split into categories for the logistic regression analysis. According to Osborne (2015), splitting continuous variables into two or more groups can compromise quality for the sake of convenience. Dichotomization, typically accomplished through a median split, may result in substantial variation within groups, which exceeds the variation between groups (Osborne, 2015).

Despite the presence of strong relationships among categories, dichotomization can significantly reduce effect size and mask curvilinearity (Osborne, 2015). CEO age and CEO tenure were measured continuously for purposes of the binary logistic regression analysis. When performing logistic regression, the determination that continuous independent variables are not highly correlated is critical (Knapp, 2018). Multicollinearity among predictor variables can bring about biased estimates and excessive standard errors (Alexopoulos, 2010). Accordingly, tests for multicollinearity were conducted on CEO age and CEO tenure variables to ensure the variables were not too highly correlated. The Wald statistic was used to test coefficient significance. Results of the logistic regression analysis were presented in tabular form.

Validity and Reliability

Validity and reliability are characteristics of good measurement (Cooper & Schindler, 2014). Validity is the degree to which a measurement tool may be used to gauge that which was intended for measurement effectively, whereas reliability is the accuracy and precision of the measurement tool (Cooper & Schindler, 2014). For this study, validity and reliability were evaluated in the context of the secondary analysis of existing data.

Scholars examined the advantages and disadvantages of secondary analysis of existing data and the implications for data measurement evaluation (Boo & Froelicher, 2013). Cheng and

Phillips (2014) noted the cost savings advantage of analyzing existing data over conducting an original study. Boo and Froelicher (2013) cited the benefits of using sizable, representative samples from existing data to test or advance new theories. Cheng and Phillips warned of limitations associated with the analysis of existing data collected by individuals or organizations other than parties conducting the current research. Specifically, researchers analyzing existing data sources may be uninformed about unique aspects of the data collection process critical for concluding dataset variables (Cheng & Phillips, 2014). Researchers have limited or no ability to independently ascertain the accuracy of secondary data sources (Magee, Lee, Giuliano, & Munro, 2006).

Doolan and Froelicher (2009) suggested that a proper connection between the research questions and secondary dataset for purposes of reducing errors and enhancing validity is vital (Doolan & Froelicher, 2009; Magee et al., 2006). Similarly, Magee et al. (2006) recommended that a conceptual match between the primary data collection and existing data be identified to support validity and reliability. Alignment between the conceptual fit, research questions, and theoretical framework to identify relevant study variables is essential for demonstrating validity, reliability, and the generalizability of study findings (Magee et al., 2006). Secondary datasets of high quality, accuracy, and precision should be selected with consideration for the proposed research population and study variables (Boo & Froelicher, 2013).

Researchers may encounter unique challenges when evaluating the measurement of secondary datasets (Doolan & Froelicher, 2009). For secondary research using existing datasets, the accumulation of the original data was not intended to serve current research purposes (Tripathy, 2013). Consequently, secondary dataset variables may not be defined, measured, categorized, or assessed in a manner suitable for current research (Boo & Froelicher, 2013).

Consideration of potential risks to secondary data validity and reliability is essential in the research planning phase (Boo & Froelicher, 2013).

Validity

According to Cheng and Phillips (2014), a thorough knowledge of the secondary dataset strengths and weaknesses supports the assessment of dataset validity. The Audit Analytics database was the source for SOX Section 404(b) material weakness data, and the EDGAR database was the source for CEO age and CEO tenure data. Audit Analytics data were acquired from U.S. Securities and Exchange Commission filings (Audit Analytics, n.d.). Data were aggregated and reviewed by expert analysts (Audit Analytics, n.d.). Qualitative disclosure issues data were assessed and classified to facilitate quantitative analysis (Audit Analytics, n.d.). The EDGAR database is an automated system for accumulating and validating required company submissions to the U.S. Securities and Exchange Commission (2010). The official company filing submissions are in plain text or HTML format (U.S. Securities and Exchange Commission, 2010). Given that the Audit Analytics and EDGAR databases were sources for effectively measuring the study variables, validity of the secondary dataset is supported.

Reliability

Reliability of the Audit Analytics and EDGAR databases is supported by the reputability of the data sources and the scholarly use of both secondary data sets in similar research. Accounting firms, law firms, insurance companies, investment managers, corporate reporting professionals, universities, and regulators rely upon data from the Audit Analytics database (Audit Analytics, n.d.). The EDGAR database is the main source for submissions to the SEC by public companies (U.S. Securities and Exchange Commission, 2010). Lee (2015, 2016) and Lin et al. (2014) used the Audit Analytics database to study the effects of CEO characteristics on

financial reporting quality. Oh et al. (2016) acquired CEO data directly from proxy statements. The data sets were evaluated to verify that the study variables were operationalized and coded in forms conducive for the planned analysis.

Ethical Considerations

Ethical considerations in the conduct of research involving secondary data analysis include the threat of harm to individuals, and in the case of secondary data not freely available, written consent for use (Tripathy, 2013). According to the *Belmont Report*, three ethical principles that apply to studies involving human subjects are respect for persons, beneficence, and justice (U.S. Department of Health and Human Services, National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). This study was conducted through secondary analysis of existing public disclosure data from Audit Analytics and U.S. Securities and Exchange Commission filings. Consent is implied for data freely available to the public (Tripathy, 2013). Given the secondary use of existing, publicly available data proposed for this study, human subjects were not involved.

Institutional Review Board (IRB) exemption is permitted for studies that meet the exemption criteria in the federal regulations related to research. In this study, identifiable private information was used in secondary research when the private information was publicly available; therefore, exemption from the requirements of the federal policy for the Protection of Human Subjects (45 CFR 46) was requested of the IRB. To review a study at the exempt level, the IRB must designate the study a minimal risk to participants. The IRB does not monitor or review exempt studies but requires implementation of well-defined procedures and a risk/benefit assessment.

Assessment of risks and benefits of the proposed research to individuals and society is an application of the beneficence ethical principle defined in the *Belmont Report* (U.S. Department of Health and Human Services, National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). A risk is the probability and magnitude of potential harm (U.S. Department of Health and Human Services, National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). In the research setting, a benefit is something of favorable health or welfare value, such as knowledge acquired from the research (U.S. Department of Health and Human Services, National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Apprehensions expressed by regulators about the secondary use of data include the potential harm to individuals posed using identifying information (Tripathy, 2013). Brakewood and Poldrack (2013) noted that researchers should consider the benefits of secondary data analysis. Specifically, Brakewood and Poldrack posited that sharing data for research involving the secondary analysis of existing data aligns with ethical promulgations defined in the *Belmont Report*. This study was planned to minimize the risk of harm and maximize research benefits with respect for the IRB ethical review process.

In the IRB ethical review process, participant privacy, data confidentiality, and data security are important considerations. Privacy, confidentiality, and security measures were employed in this study, despite the public availability of CEO and company data. Data privacy, storage, and security measures were described in the Instrumentation section of this chapter.

Summary

The research design was a correlational design for this quantitative explanatory study using inferential statistics. The population was U.S. publicly held nonfinancial firms with an

audit opinion on the effectiveness of ICFR under SOX Section 404(b) in 2017. A census was applied in this study, and the setting was U.S. publicly held nonfinancial companies required to submit annual independent auditor attestations on the effectiveness of ICFR in accordance with SOX Section 404(b). Secondary data were obtained from publicly available sources. The data collection process consisted of the identification of firms using the Audit Analytics database and the retrieval of CEO age and CEO tenure data for each firm from Schedule 14A filings maintained in the EDGAR database. The final population consisted of 2,149 firms. Null and alternative hypotheses were developed for each of the three research questions. Data analysis was performed using descriptive statistics and testing of hypotheses was conducted using inferential statistics. Validity and reliability were assessed in relation to the secondary analysis of existing data. Ethical issues were considered.

In Chapter 4, the results of the data collection process and analysis of the hypotheses are presented. The population selection process, method for identifying CEOs, and spreadsheet preparation procedures are detailed. The coding process for SOX Section 404(b) material weakness data is explained. A descriptive analysis and analysis of hypotheses are detailed.

CHAPTER 4. RESULTS

Introduction

Chapter 4 is a report of the data collection results and analysis of the hypotheses. Data collection was the starting point for the examination of the relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting (ICFR) among U.S. publicly held companies. Firm data were collected from the Audit Analytics Audit + Compliance online database, owned and operated by Ives Group, Inc. The application of database filtering criteria was the approach for the identification of 2,149 U.S. publicly held nonfinancial firms with an audit opinion on the effectiveness of ICFR under SOX Section 404(b) in 2017. After download of the firm data into a Microsoft Excel spreadsheet, CEOs were identified for firms in the data set. The basis for additional data entry was corresponding CEO age and CEO tenure data obtained from the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system used at the U.S. Securities and Exchange Commission.

IBM SPSS v. 24 software was the application used for the statistical analysis. Descriptive statistics were the source for a concise understanding and conveyance of the data set characteristics. Inferential statistics were the foundation for hypotheses testing. The significance level for the study was 0.05.

Chapter 4 is organized into four sections to enable analysis of the study findings and provide a foundation for the assessment of the hypotheses associated with the research questions. The first section is a detailed analysis and evaluation of the data collection process. A descriptive

analysis related to the CEO age, CEO tenure, and effectiveness of ICFR variables is the second section. The third section is an analysis of the hypotheses. The fourth section is a summary, evaluation, and justification of the important findings related to the data collection and data analysis efforts.

Data Collection Results

The initial step in the data collection process was the identification of firms relevant to the study. CEOs were identified for firms in the data set. Material weakness, CEO age, and CEO tenure data were determined and collected for each firm. The data were coded for analysis. A Microsoft Excel spreadsheet was used to facilitate data collection and analysis. Following, the population selection, CEO identification, and spreadsheet preparation processes are described.

Population Selection

The population for this study was U.S. publicly held nonfinancial firms with an audit opinion on the effectiveness of ICFR under SOX Section 404(b) in 2017. Financial institution firms exert substantial influence on the U.S. economy and are subject to more stringent oversight and control than nonfinancial firms (Lin et al., 2014). Consistent with prior studies (H. Huang et al., 2012; Lee, 2015; Lin et al., 2014), financial institution firms with standard industry classification (SIC) codes 6000-6999 were excluded from the population. The Audit Analytics online database owned and operated by Ives Group, Inc. and accessible through a purchased subscription to the Audit + Compliance module, was the source for firms relevant to the study. Audit Analytics is a private research company which collects SOX Section 404(b) data from the disclosures of public companies registered with the U.S. Securities and Exchange Commission (Audit Analytics, n.d.).

The internal control search feature within the Audit + Compliance module was the basis for the identification of firms relevant to the study. Filtering criteria related to company location, fiscal year, report type, and industry were the method for narrowing the internal control search results. All companies were located within the United States using fiscal year criterion as of 2017. The selection of the radio button for the auditor's internal control report was the method for limiting filtering results to firms with SOX Section 404(b) audit opinions. Omission of Division H (SIC 6000–6999) in the SIC section of the industry filter was the approach for exclusion of financial firms from the population. Firm data were limited to the data contained in the Audit Analytics online database at the time of the search in April 2019.

The population selection process was shown in Table 17. The initial population of 2,205 nonfinancial U.S. firms with SOX Section 404(b) reports from the Audit Analytics Audit + Compliance database was downloaded in Microsoft Excel spreadsheet format and further refined. Firm records with internal control reports that were subsequently restated were deleted to avoid the duplication of firms in the population. Firm records for foreign private issuers were deleted to limit the population to U.S. companies. Trusts are not administered by executives; therefore, trust firms were exclusions from the data set. The final population consisted of 2,149 firms.

CEO Identification

The sources for CEO age and CEO tenure data were 2017 public company definitive proxy statement filings, as reported in Schedule 14A, filed with the U.S. Securities and Exchange Commission (SEC), and archived in the EDGAR system. In the absence of available Schedule 14A filings, other types of publicly available information, such as Forms 10-K, were the sources for CEO age and CEO tenure data. The starting point for identifying CEO age and CEO tenure

data was a fast search by central index key in the Company Filings section of the EDGAR system for each firm listed in the final population from the Audit Analytics database. Specification of DEF14A for the filing type filtering criterion was the basis for the limitation of search results to proxy statement filings.

The CEO identified for each firm was the individual who acted in the CEO position at the time of the firm's 2017 fiscal year-end. Co-CEOs staffed 10 firms in the data set. For each instance of a firm with co-CEOs, the CEO identified for the study was the CEO with the highest executive responsibilities, as ascertained from the CEOs' officer titles noted in the proxy statement filing.

Spreadsheet Preparation

Preparation of the Excel spreadsheet was necessary for data collection and analysis. The initial process for spreadsheet preparation was the labeling of firms with a code and the removal of central index key numbers, employer identification numbers, and company addresses from the data set. A separate file was the source for linkage information. Study variables were collected and coded for analysis in the spreadsheet.

CEO age. The CEO age variable for entry into the spreadsheet was each CEO's chronological age as reported in Schedule 14A. For purposes of the chi-square test of independence, the continuous CEO age variable was categorized using median CEO age (56 years) as a reference point. CEOs over age 56 years were coded 1, and CEOs under age 56 years were coded 0.

CEO tenure. Calculation of the CEO tenure variable for each CEO was a two-step process. The first step was entry into the spreadsheet of the year in which the CEO began serving in the position of CEO as reported in Schedule 14A. The second step was the creation of an

Excel function to calculate CEO tenure as the difference between the year in which the CEO began serving in the position of CEO and the year 2017. For purposes of the chi-square test of independence, the continuous CEO tenure variable was categorized. CEOs with tenure ranking in the top 20% of the population were coded 1, and CEOs without tenure ranking in the top 20% of the population were coded 0. The import of the Excel data file into IBM SPSS v. 24 software was necessary for the statistical analysis.

Effectiveness of internal control over financial reporting. The data collection process for the effectiveness of ICFR dependent study variable was the assignment of codes 1 or 0 to indicate each firm's material weakness status. SOX Section 404(b) material weakness firms were coded 1. Firms without a SOX Section 404(b) material weakness were coded 0. The use of a dichotomous variable for SOX Section 404(b) material weakness disclosures was consistent with prior studies about internal control (H. Huang et al., 2012; Lee, 2015, 2016; Lin et al., 2014).

Descriptive Analysis

The initial process of examining the data file and investigating the characteristics of the study variables is the descriptive phase of the data analysis (Pallant, 2016). The purpose of descriptive statistical analysis is to depict data set characteristics and identify instances of breached assumptions in the statistical methods (Pallant, 2016). The study variables were CEO age, CEO tenure, and the effectiveness of ICFR. Following is a presentation and analysis of the descriptive statistics for the study variables.

CEO Age and CEO Tenure Variables

The CEO age and CEO tenure study variables were continuous variables. An appropriate initial summary of the contents of the CEO age and CEO tenure data set was the use of mean,

median, mode, standard deviation, minimum, and maximum statistics. Table 18 shows the summary descriptive statistics for the CEO age and CEO tenure variables.

Table 18. Descriptive Statistics for CEO Age and CEO Tenure (N = 2,149)

Variable (years)	*M*	*Mdn*	Mode	*SD*	Minimum	Maximum
CEO age	56.42	56	56	7.36	32	85
CEO tenure	8.08	5	2	7.59	1	55

Note. Data from U.S. Securities and Exchange Commission (2019).

The mean CEO age for the data set was 56.42 years, and the standard deviation for CEO age was 7.36, indicating low dispersion within the variable. The mean CEO tenure was 8.08 years. The standard deviation of 7.59 for CEO tenure is representative of a more pronounced variation from the mean in the CEO tenure variable than variation from the mean in the CEO age variable.

The median CEO age and median CEO tenure were 56 years and 5 years, respectively. The median is a more reliable gauge of the central value when outlier data points significantly affect the mean (Knapp, 2017). The calculation of a 5% trimmed mean statistic was the basis for determining the influence of outlier values on the mean CEO age and CEO tenure. Given the resulting trimmed means for CEO age (56.3 years) and CEO tenure (7.2 years), a strong influence of extreme values on CEO age or CEO tenure values was not evident. Normality is not a requirement for the chi-square test of independence, nor binary logistic regression used to test the hypotheses.

Mode and range statistics were considerations in further understanding the CEO age and CEO tenure variables. The mode, or most common value in the data set, was 56 years for CEO

age and 2 years for CEO tenure. The range of CEO age and CEO tenure values in the data set was 53 years and 54 years, respectively.

Skewness and kurtosis statistics were the basis for developing judgments about the distribution of CEO age and CEO tenure values. The skewness value is an indicator of the symmetry of the distribution, while the kurtosis value is a gauge of the pointedness of the distribution peak (Pallant, 2016). Zero values for skewness and kurtosis are characteristic of a perfectly normal distribution (Pallant, 2016). Table 19 indicates the skewness and kurtosis statistics for the CEO age and CEO tenure variables.

Table 19. Skewness and Kurtosis Statistics for CEO Age and CEO Tenure (N = 2,149)

	Skewness		Kurtosis	
Variable (years)	Statistic	*SE*	Statistic	*SE*
CEO age	0.35	0.05	0.76	0.11
CEO tenure	1.85	0.05	4.13	0.11

Note. Data from U.S. Securities and Exchange Commission (2019).

The skewness and kurtosis statistics for CEO age were .35 and .76, respectively, indicating that the distribution for the CEO age variable is approximately normal. Figure 3 shows a histogram for the CEO age variable. Relative to a normal distribution, Figure 3 shows a slightly long right tail and more centrally clustered observations. The skewness and kurtosis statistics for CEO tenure were 1.85 and 4.13, respectively, indicating that the distribution for the CEO tenure variable was not normal in terms of skew, nor the clustering of observations around the central point. Figure 4 reflects a histogram for the CEO tenure variable. Relative to a normal distribution, Figure 4 displays a long right tail and high distribution peak.

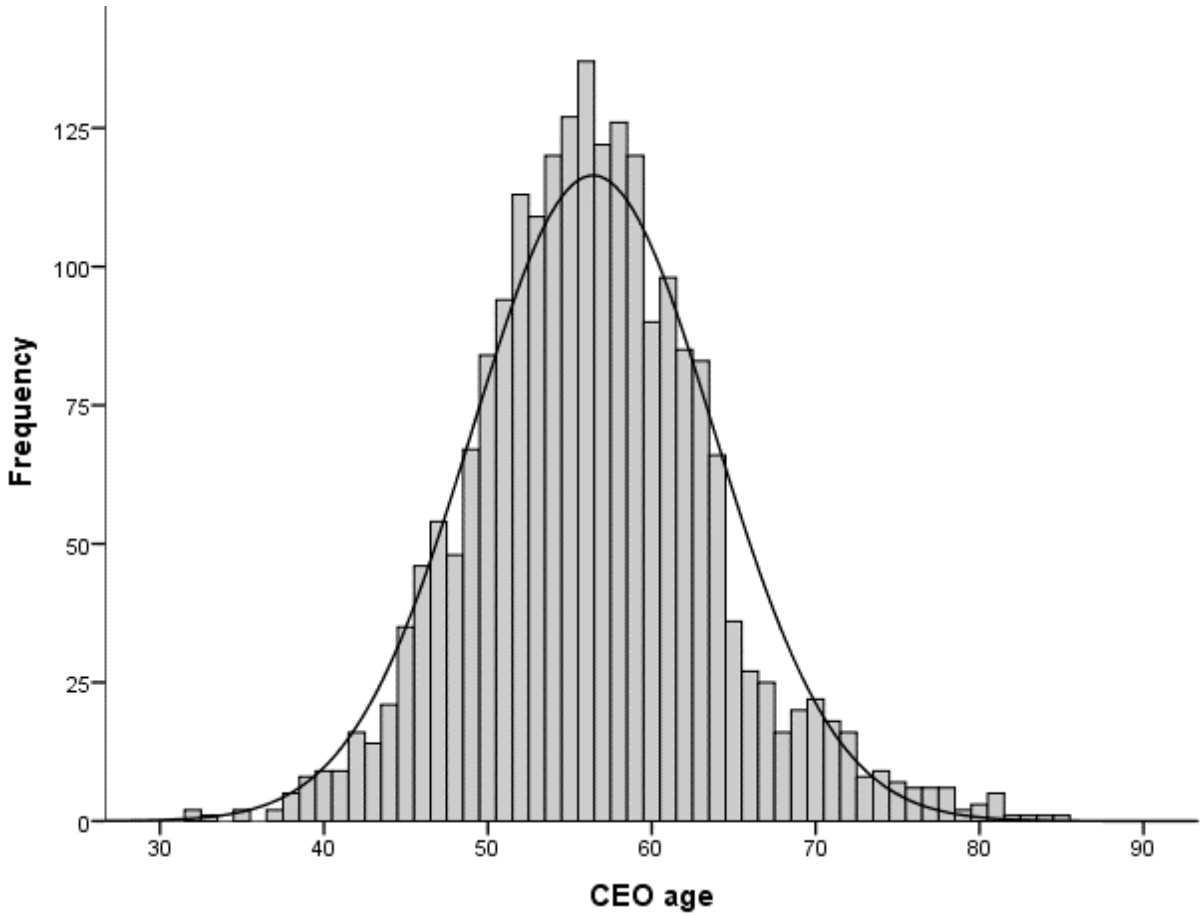

Figure 3. CEO age. Data from U.S. Securities and Exchange Commission (2019). *N* = 2,149; *M* = 56.42; *SD* = 7.36.

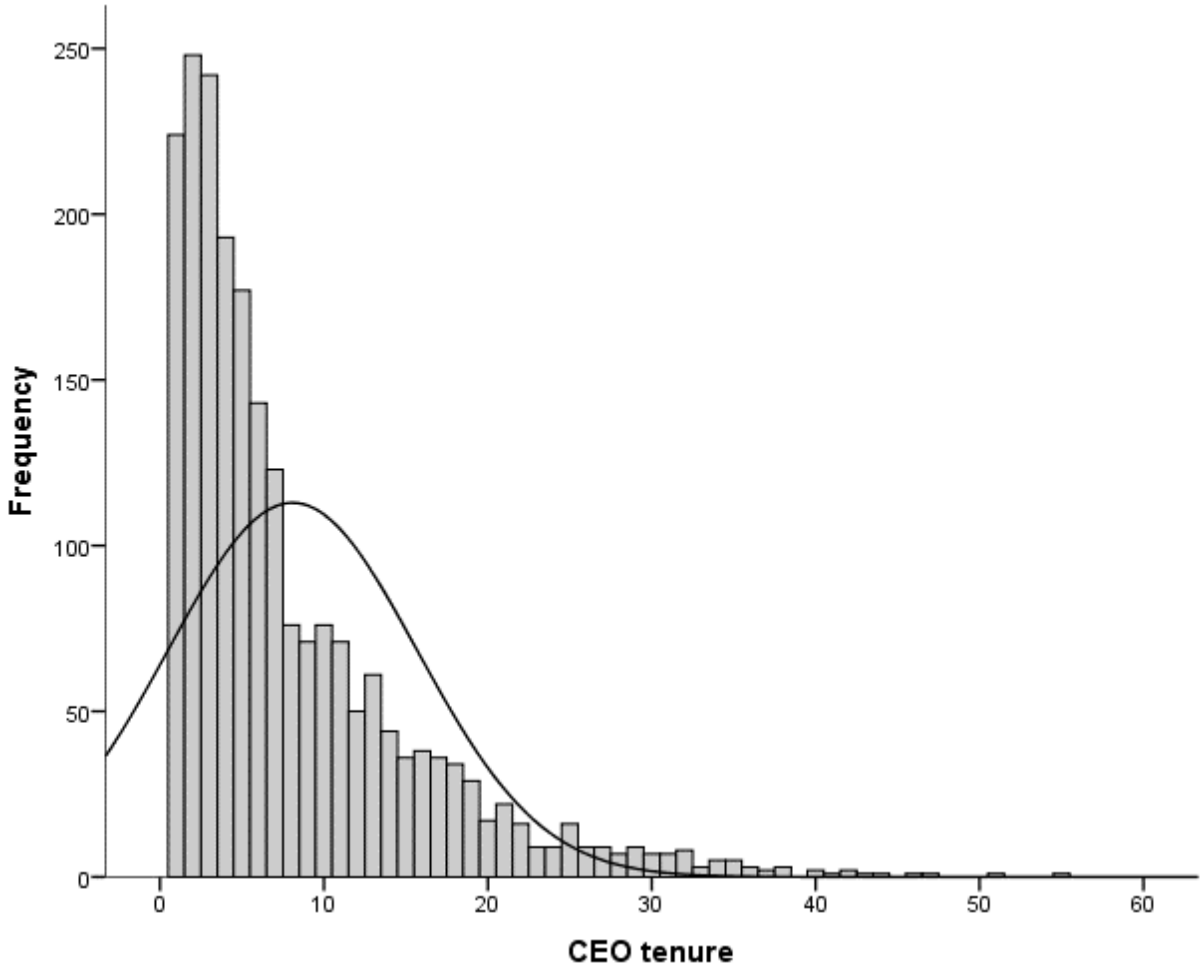

Figure 4. CEO tenure. Data from U.S. Securities and Exchange Commission (2019). *N* = 2,149; *M* = 8.08; *SD* = 7.59.

Effectiveness of Internal Control Over Financial Reporting (ICFR) Variable

The effectiveness of internal control over financial reporting (ICFR) variable was categorical. Categorical variables are described by using frequencies (Knapp, 2017). Table 20 shows the frequency and percentage statistics for the effectiveness of ICFR variable. Of the 2,149 firms in the data set, 125 (5.8%) reported material weaknesses in the firm auditor's internal control reports, whereas 2,024 (94.2%) did not.

Table 20. Frequencies of Effectiveness of Internal Control Over Financial Reporting (N = 2,149)

Effectiveness of internal control over financial reporting	*f*	%
No material weakness	2,024	94.2
Material weakness	125	5.8
Total	2,149	100.0

Note. Data from Ives Group (2019).

Analysis of Hypotheses

Given the research questions identified in Chapter 1, this study was an investigation of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies. The null and alternative hypotheses for each research question were opposing statements about the relationship between study variables. The hypotheses were tested, analyzed, and evaluated.

Hypotheses 1

Hypotheses 1:

H1₀: There is no statistically significant relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies.

H1ₐ: There is a statistically significant relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies.

The hypotheses required a statistical test that measured the relationship between CEO age and the effectiveness of ICFR among U.S. publicly held companies. A cross-tabulation analysis was a way of describing the relationship between CEO age and the effectiveness of ICFR among

U.S. publicly held companies. A chi-square test of independence was the basis for determining the statistical significance of the relationship between the variables. Six assumptions of the chi-square test are (a) cellular data expressed as frequencies, (b) mutually exclusive variable categories, (c) single-cell data for each subject, (d) group independence, (e) categorical variables, and (f) random sample size large enough that the expected frequencies are not less than 1, and at least 80% is greater than 5 (McHugh, 2013).

The first five assumptions were met as a result of the study design and selected measurements. The effectiveness of ICFR variable was gauged dichotomously. Firms with a SOX Section 404(b) material weakness were coded 1, and firms without a SOX Section 404(b) material weakness were coded 0. The CEO age variable was categorized for purposes of the chi-square test of independence. There is no relationship between the observations in the variable categories or between the categories. The sample size assumption was statistically tested. Pallant (2016) suggested that an additional assumption be applied related to sample size for the chi-square test of independence in the context of two-by-two tables. Pallant advised that a minimum expected frequency of 10 be used in the case of two-by-two tables. The assumption pertaining to sample size was evaluated based on the minimum expected frequency reported in the footnote of the chi-square tests table output produced by the statistical software.

Consistent with Lin et al. (2014), median CEO age (56 years) was the reference point for categorizing the CEO age variable in the conduct of the cross-tabulation analysis and chi-square test of independence. The approach for creating separation between younger and older CEOs, was the trichotomization of the CEO age variable and removal of the middle category from the population. The three CEO age categories were (a) CEOs under age 56 years, (b) CEOs aged 56 years, and (c) CEOs over age 56 years. After removal of 137 firm records for CEOs aged 56

years, the remaining population was 2,012 U.S. publicly held nonfinancial firms with a SOX Section 404(b) audit opinion in 2017. Table 21 shows the results of the cross-tabulation analysis. The percentage of the total material weakness firms staffed by younger CEOs and older CEOs was 46.3% and 53.7%, respectively.

Table 21. Cross-Tabulation of Effectiveness of Internal Control Over Financial Reporting Versus CEO Age (N = 2,012)

	Effectiveness of internal control over financial reporting			
	No material weakness		Material weakness	
CEO age (years)	*f*	%	*f*	%
Median < 56	930	49.2	56	46.3
Median > 56	961	50.8	65	53.7

Note. Data for CEO age from U.S. Securities and Exchange Commission (2019), for the effectiveness of internal control over financial reporting from Ives Group (2019). Pearson's $\chi^2(1) = .38$, $p = .54$. Yates's continuity correction $\chi^2(1) = 0.28$, $p = .60$.

The chi-square test of independence was the basis for determining the relationship between the dependent variable, the effectiveness of ICFR, and the independent variable, CEO age using the results from a population of 2,012 U.S. publicly held nonfinancial firms with a SOX Section 404(b) audit opinion in 2017. The chi-square test of independence indicated no significant association between CEO age and the effectiveness of ICFR, $\chi^2(1) = .38$, $p = .54$. In cases of two variables with only two categories, the Yate's correction for continuity is a useful offset for the inflated chi-square value, and the phi coefficient is the recommended measure of effect size (Pallant, 2016). The Yates's continuity correction indicated no significant relationship between CEO age and the effectiveness of ICFR, $\chi^2(1) = .28$, $p = .60$. The chi-square tests for CEO age are presented in Table 22. Given that zero cells had an expected count less than 5 and

that the minimum expected count was 59.3, the assumption about sample size held. The results did not support the rejection of the null hypothesis ($H1_0$), which indicated no statistically significant relationship between CEO age and the effectiveness of ICFR among U.S. publicly held companies. Figure 5 shows material weaknesses in the effectiveness of ICFR by CEO age category.

Table 22. Chi-Square Tests: CEO Age (N = 2,012)

Statistic	Value	p
Pearson chi-square	.38[a]	.54[b]
Continuity correction[c]	.28	.60[b]
Likelihood ratio	.38	.54[b]
Linear-by-linear association	.38	.54[b]

Note. df = 1. ϕ = .01. Data for CEO age from U.S. Securities and Exchange Commission (2019), for the effectiveness of internal control over financial reporting from Ives Group (2019).

[a]Zero cells have expected count less than 5. The minimum expected count is 59.3. [b]Not significant [c]Computed only for a 2 x 2 table.

p > .05 (not significant).

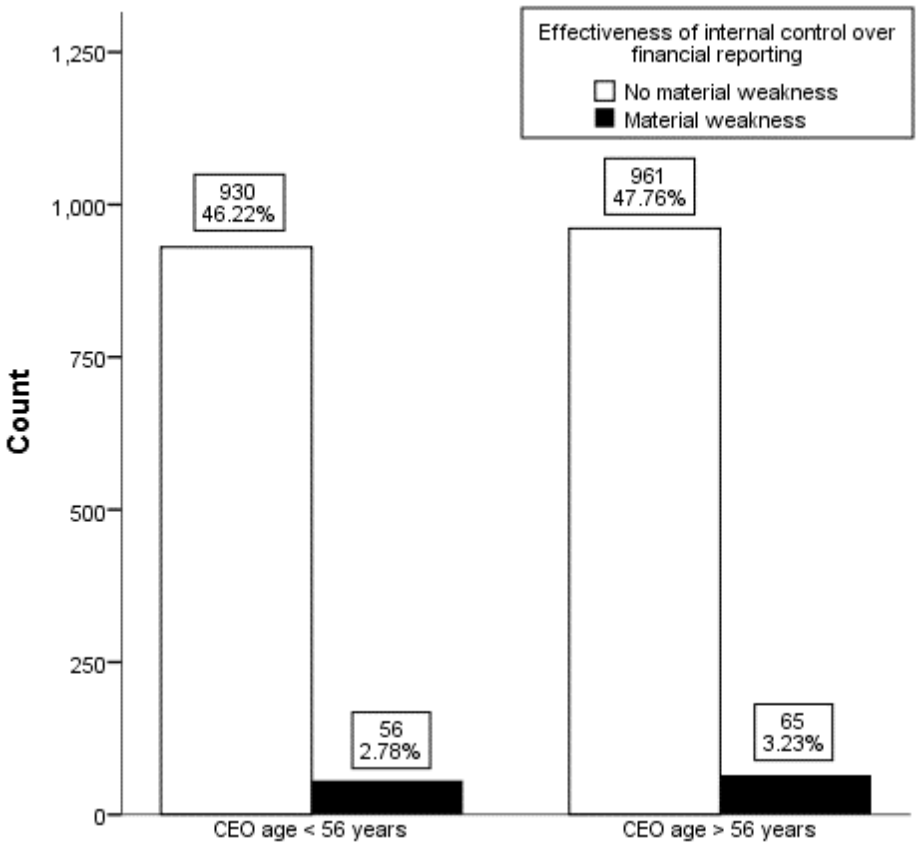

Figure 5. Material weaknesses in the effectiveness of internal control over financial reporting based on CEO age variable recoded in comparison to median CEO age. Median CEO age (56 years) was used as a reference point to classify younger and older CEOs. Data for CEO age from U.S. Securities and Exchange Commission (2019), for the effectiveness of ICFR from Ives Group (2019). N = 2,012.

Hypotheses 2

Hypotheses 2:

$H2_0$: There is no statistically significant relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies.

$H2_A$: There is a statistically significant relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies.

The hypotheses required a statistical test that measured the relationship between CEO tenure and the effectiveness of ICFR among U.S. publicly held companies. A cross-tabulation analysis was a way of describing the relationship between CEO tenure and the effectiveness of ICFR among U.S. publicly held companies. A chi-square test of independence was the basis for determining the statistical significance of the relationship between the variables.

The first five assumptions for the chi-square test of independence were met as a result of the study design and selected measurements. The effectiveness of ICFR variable was gauged dichotomously. The CEO tenure variable was categorized for purposes of the chi-square test of independence. There is no relationship between the observations in the variable categories or between the categories. The sample size assumption was statistically tested. The assumption pertaining to sample size was evaluated with consideration for the minimum expected frequency of 10 suggested by Pallant (2016) for two-by-two tables based on the minimum expected frequency reported in the footnote of the chi-square tests table output produced by the statistical software.

Consistent with Lin et al. (2014), CEO tenure ranking in the top 20% of the population was the reference point for categorizing the CEO tenure variable in the conduct of the cross-tabulation analysis and chi-square test of independence. CEOs with tenure of 13 or more years ranked in the top 20% of the population. Accordingly, the two CEO tenure categories for short- and long-tenured CEOs were (a) CEO tenure less than 13 years and (b) CEO tenure 13 years or more. Table 23 shows the results of the cross-tabulation analysis. The percentage of the total material weakness firms staffed by short- and long-tenured CEOs was 81.6% and 18.4%, respectively.

Table 23. Cross-Tabulation of Effectiveness of Internal Control Over Financial Reporting Versus CEO Tenure (*N*=2,149)

	Effectiveness of internal control over financial reporting			
	No material weakness		Material weakness	
CEO tenure (years)	*f*	%	*f*	%
Tenure < 13	1,592	78.7	102	81.6
Tenure 13 or more	432	21.3	23	18.4

Note. Data for CEO tenure from U.S. Securities and Exchange Commission (2019), for the effectiveness of internal control over financial reporting from Ives Group (2019). Pearson's $\chi^2(1) = .61$, $p = .43$. Yates's continuity correction $\chi^2(1) = .45$, $p = .50$.

The chi-square test of independence was the basis for determining the relationship between the dependent variable, the effectiveness of ICFR, and the independent variable, CEO tenure using the results from a population of 2,149 nonfinancial U.S. firms with a SOX Section 404(b) audit opinion in 2017. The chi-square test of independence indicated no significant association between CEO tenure and the effectiveness of internal control over financial reporting, $\chi^2(1) = .61$, $p = .43$. The Yates's continuity correction also indicated no significant relationship between CEO tenure and the effectiveness of ICFR, $\chi^2(1) = .45$, $p = .50$. The chi-square tests for CEO tenure are presented in Table 24. Given that zero cells had an expected count less than 5 and that the minimum expected count was 26.47, the assumption about sample size held. The results did not support the rejection of the null hypothesis ($H2_0$), which indicated no statistically significant relationship between CEO tenure and the effectiveness of ICFR among U.S. publicly held companies. Figure 6 shows material weaknesses in the effectiveness of ICFR by CEO tenure category.

Table 24. Chi-Square Tests: CEO Tenure (N = 2,149)

Statistic	Value	p
Pearson chi-square	.61[a]	.43[b]
Continuity correction[c]	.45	.50[b]
Likelihood ratio	.63	.43[b]
Linear-by-linear association	.61	.43[b]

Note. Data for CEO tenure from U.S. Securities and Exchange Commission (2019), for the effectiveness of internal control over financial reporting from Ives Group (2019). df = 1. ϕ = −.02.

[a]Zero cells have expected count less than 5. The minimum expected count is 26.47. [b]Not significant [c]Computed only for a 2 x 2 table.

p > .05 (not significant).

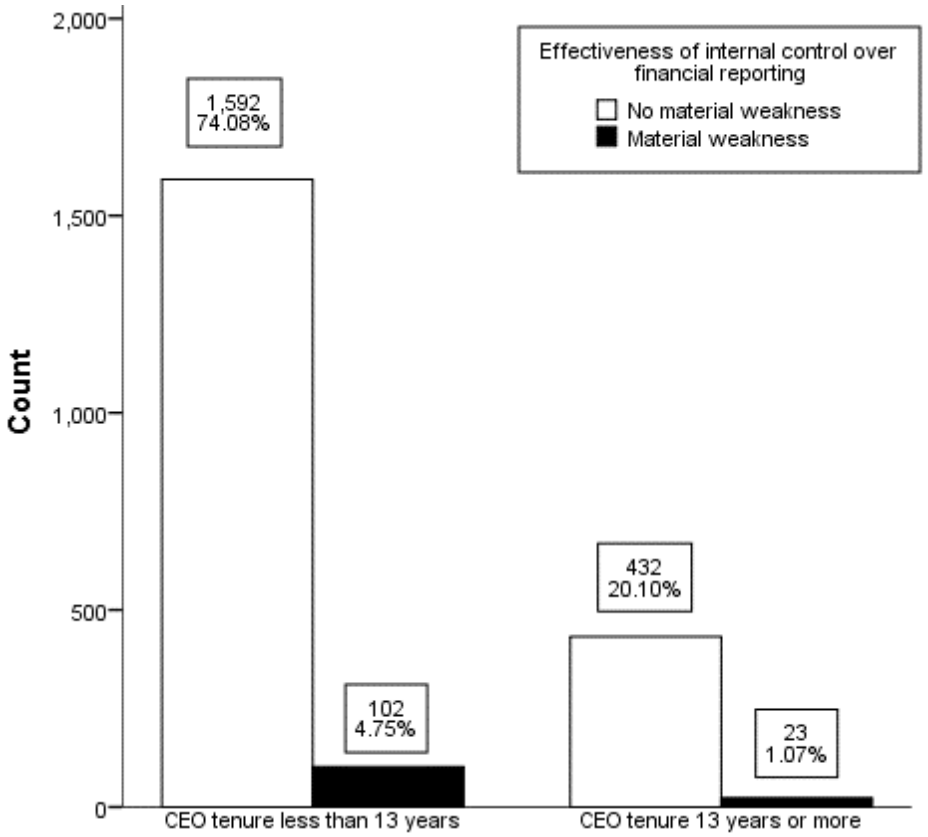

Figure 6. Material weaknesses in the effectiveness of internal control over financial reporting based on CEO tenure recoded compared to top 20% CEO tenure time. CEO tenure ranking in the top 20% of the population (13 years or more) was used as a reference point to classify short- and long-tenured CEOs. Data for CEO tenure from U.S. Securities and Exchange Commission (2019), for the effectiveness of internal control over financial reporting from Ives Group (2019). N = 2,149.

Hypotheses 3

Hypotheses 3:

$H3_0$: CEO age and CEO tenure are not significant predictors of the effectiveness of internal control over financial reporting among U.S. publicly held companies.

$H3_A$: CEO age and CEO tenure are significant predictors of the effectiveness of internal control over financial reporting among U.S. publicly held companies.

The hypotheses required a statistical test that predicted a discrete outcome based on continuous variables. Binary logistic regression was the basis for determining the influence of CEO age and CEO tenure on the likelihood that U.S. publicly held companies would report SOX Section 404(b) material weaknesses in ICFR. Five assumptions of binary logistic regression are (a) a dichotomous dependent variable, (b) independent observations, (c) absence of multicollinearity among the independent variables, (d) linearity between the independent variables and log odds, and (e) large sample size (Schreiber-Gregory & Bader, 2018).

The first two assumptions of a dichotomous dependent variable and independent observations were met as a result of the study design and selected measurements. The effectiveness of ICFR variable was gauged dichotomously. Firms with a SOX Section 404(b) material weakness were coded 1, and firms without a SOX Section 404(b) material weakness were coded 0. There was no relationship between the observations in the dependent variable categories or between the categories. The latter three assumptions relate to the nature of the data and were statistically tested.

A check for potential high intercorrelations among the independent variables was the starting point for the statistical testing of assumptions. Collinearity diagnostics in IBM SPSS v. 24 software were the method for appraising multicollinearity among the CEO age and CEO

tenure variables. Tolerance and variance inflation factor values were reference points for assessing potential multicollinearity. A Tolerance value less than .10 or a variance inflation factor value higher than 10 indicate potential multicollinearity (Pallant, 2016). The tolerance and variance inflation factor values for the independent variables were .832 and 1.203, respectively, indicating that the assumption of no multicollinearity among the predictor variables held.

Linearity of the continuous independent variables with respect to the logit of the dependent variable was assessed via the Box-Tidwell procedure (Box & Tidwell, 1962). A Bonferroni correction was applied using all five terms in the model resulting in statistical significance being accepted when $p < .01$ (Tabachnick & Fidell, 2014). As shown in Table 25, the *p* values for the interaction terms exceeded .01. Based on this assessment, all continuous variables were found to be linearly related to the logit of the dependent variable.

Table 25. Assumption of Linearity: Box-Tidwell Test (*N* = 2,149)

Interaction term	Wald	*p*
CEO age in years * ln CEO age	3.648	.056[a]
CEO tenure in years * ln CEO tenure	1.095	.295[a]

Note. The dependent variable is material weaknesses in the effectiveness of internal control over financial reporting, coded 0 = no material weakness and 1 = material weakness. A Bonferroni correction was applied using all five terms in the model resulting in statistical significance being accepted when $p < .01$ (Tabachnick & Fidell, 2014). Data for CEO tenure from U.S. Securities and Exchange Commission (2019), for the effectiveness of internal control over financial reporting from Ives Group (2019). *df* = 1.

[a]Not significant

$p > .01$ (not significant).

A large sample size is an assumption of binary logistic regression, and the issue of too few cases relative to the number of predictor variables is a cause for concern when drawing conclusions from the statistical results (Schreiber-Gregory & Bader, 2018). Schreiber-Gregory

and Bader (2018) suggested that for each independent variable, a standard of at least 10 cases with the least frequent outcome is required to achieve the sample size assumption. This study is characterized by two independent variables (CEO age and CEO tenure) and 2,149 valid cases. As reported in Table 20, the expected probability of a material weakness disclosure is 5.8%. The application of the standard suggested by Schreiber-Gregory and Bader resulted in a minimum sample size of 345 (10 × 2/.058); therefore, the large sample size assumption held.

The model encompassing the CEO age and CEO tenure predictors was not statistically significant, $\chi^2(2) = .63$, $p = .73$, indicating that the model was not able to differentiate between the firms which reported and did not report material weaknesses. The model as a whole explained between 0% (Cox and Snell R^2) and 0.1% (Nagelkerke R^2) of the variance in material weaknesses in the effectiveness of ICFR. The model correctly classified 94.2% of cases, which did not differ from the results of the analysis without the CEO age and CEO tenure variables used in the model. As shown in Table 26, neither independent variable made a statistically significant contribution to the model. The negative B values indicated that an increase in CEO age or CEO tenure will result in a reduced probability of material weaknesses in the effectiveness of ICFR, but this was not significant. The odds ratios for CEO age and CEO tenure were less than 1. The CEO age odds ratio indicated that for every additional year of CEO age, firms were .99 times less likely to report material weaknesses in the effectiveness of ICFR. For every additional year of CEO tenure, firms were .99 times less likely to report material weaknesses in the effectiveness of ICFR. The results did not support the rejection of the null hypothesis ($H3_0$), which indicated no statistically significant predictive relationship between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies.

Table 26. Logistic Regression Predicting Effectiveness of Internal Control Over Financial Reporting (N = 2,149)

						95% confidence interval	
Independent variable (years)	B	*SE*	Wald	*p*	OR	Lower	Upper
CEO age	−.008	.014	.305	.58[a]	.99	.97	1.02
CEO tenure	−.004	.014	.089	.77[a]	.99	.97	1.02

Note. The dependent variable is material weaknesses in the effectiveness of internal control over financial reporting, coded 0 = no material weakness and 1 = material weakness. Data for CEO age and CEO tenure from U.S. Securities and Exchange Commission (2019), for the effectiveness of internal control over financial reporting from Ives Group (2019). df = 2.

[a]Not significant.

$p > .05$ (not significant).

Summary

Given three research questions and three sets of hypotheses, the study was an investigation of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR. The Audit Analytics database and the EDGAR system were the data sources for the secondary analysis of existing data. The software used to conduct the statistical analyses was IBM SPSS v. 24. A descriptive analysis was the basis for an initial examination of the data file and evidence that statistical assumptions were not breached. The chi-square test of independence and binary logistic regression were the statistical techniques for hypotheses testing. The chi-square test of independence indicated no significant association between CEO age and the effectiveness of ICFR, nor CEO tenure and the effectiveness of ICFR. The model generated through binary logistic regression encompassing CEO age and CEO tenure predictors was not statistically significant. The study results are further discussed in Chapter 5.

CHAPTER 5. CONCLUSIONS

Introduction

The purpose of this study was to examine the relationship between CEO age, CEO tenure, and the effectiveness of internal control over financial reporting (ICFR) among U.S. publicly held companies. Scholars have established some evidence that upper echelon characteristics relate to internal control quality and may be useful factors for auditors' assessment of the control environment (Hanmei Chen et al., 2018; Lin et al., 2014). The study of upper echelons theory tenets in the context of financial reporting decisions is in its infancy (Plöckinger et al., 2016). Through an investigation of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR using data from 2,149 U.S. publicly held nonfinancial companies with a SOX Section 404(b) audit opinion in 2017, the study was a contribution to the body of knowledge. The design for the quantitative study was correlational, and descriptive statistics were the basis for understanding the data set. The chi-square test of independence and binary logistic regression were the approaches for hypotheses testing. To facilitate an evaluation of the research and its implications as well as the formulation of conclusions, Chapter 5 is organized into five sections: (a) Evaluation of Research Questions, (b) Fulfillment of Research Purpose, (c) Contribution to Business Problem, (d) Recommendations for Future Research, and (e) Conclusions.

Evaluation of Research Questions

Because the answer to the research questions is an explanation of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR, a quantitative methodology and correlational research design were appropriate for the study. The study population was 2,149 U.S. publicly held nonfinancial firms with an audit opinion on the effectiveness of ICFR under SOX Section 404(b) in 2017. The statistical analysis was a secondary analysis of existing publicly available data using IBM SPSS v. 24 software. Descriptive statistics were the basis for understanding the data set. Inferential statistics were the basis for testing six hypotheses associated with the three research questions. The chi-square test of independence was the statistical test of the hypotheses associated with Research Questions 1 and 2. Binary logistic regression was the statistical approach for testing the hypotheses associated with Research Question 3. Chapter 4 was a presentation of the results. In general, the results do not support a statistically significant relationship between CEO age, CEO tenure, and the effectiveness of ICFR. A detailed evaluation of each research question follows.

Research Question 1

Research Question 1 was, What is the relationship between CEO age and the effectiveness of ICFR among U.S. publicly held companies?

An examination of the chi-square test results shown in Table 22 was the basis for answering Research Question 1. The *p* value was the indicator for whether to reject or fail to reject the null hypothesis ($H1_0$). The significance level was 0.05. The study results reported in Chapter 4 do not support a statistically significant relationship between CEO age and the effectiveness of ICFR among U.S. publicly held companies.

Scholars who studied CEO age and measures of financial reporting quality demonstrated mixed findings. The findings of this study were similar to the findings of Besar et al. (2017) in which a statistically significant relationship between CEO age and financial restatements was not supported. Besar et al. conducted a correlation analysis and evidenced a negative relationship between CEO age and financial restatements; however, the relationship was not significant. Besar et al. also performed a logistic regression analysis, which did not support a statistically significant relationship between CEO age and financial restatements. The population (150 Malaysian firms) and measure of financial reporting quality (financial restatements) examined by Besar et al. differed from this study.

The findings of this study were contradictory to the findings of Lin et al. (2014) and Hanmei Chen et al. (2018) that suggested a significant relationship between CEO age and the effectiveness of ICFR. Lin et al. (2014) found that younger CEOs were significantly associated with SOX Section 404(b) material weaknesses in ICFR. Lin et al. used median CEO age as the reference point for classifying older and younger CEOs. Consistent with Lin et al., median CEO age was the reference point for categorizing the CEO age variable. Lin et al. showed that 5.0% of younger CEOs staffed material weakness firms whereas 2.5% of older CEOs staffed material weakness firms. In contrast, findings of this study indicated that the percentage of younger CEOs and older CEOs who staffed material weakness firms was 5.7% and 6.3%, respectively. Hanmei Chen et al. showed that older CEOs were negatively associated with the persistence of internal control deficiencies.

Explanations for differences between this study findings and the findings of Lin et al. (2014) and Hanmei Chen et al. (2018) may be the dissimilarity in the measurement of material weaknesses as well as the contrast in the financial reporting periods examined. Hanmei Chen et

al. measured internal control deficiencies at the ratio level rather than at the nominal level used in this study. The studies by Lin et al. and Hanmei Chen et al. included fiscal years before and after the Public Company Accounting Oversight Board (PCAOB) superseded AS 2 with AS 5 (later reorganized as 2201), effective for fiscal years ending on or after November 15, 2007 (PCAOB, 2007). In accordance with AS 5, auditors are required to report directly on the effectiveness of ICFR rather than the fairness of management's SOX Section 404(a) reports (PCAOB, 2017a). With the implementation of AS 5, the PCAOB reduced required audit procedures (U.S. Securities and Exchange Commission, 2007). This study included only firms with a SOX Section 404(b) audit opinion in fiscal year 2017; therefore, changes in audit procedures pursuant to AS 5 may be an explanatory factor for differences between the findings of this study and prior studies.

The study was a contribution to the body of knowledge about the relationship between CEO age and the effectiveness of ICFR. This study does not support a statistically significant relationship between CEO age and the effectiveness of ICFR. The results are consistent the findings of Besar et al. (2017), which indicated no support for a statistically significant relationship between CEO age and financial restatements. The results are contradictory to the findings of Lin et al. (2014) and Hanmei Chen et al. (2018), which indicated a negative association between CEO age and the incidence and persistence of SOX Section 404(b) material weaknesses, respectively. Few scholars investigated the relationship between CEO age and the effectiveness of ICFR. Given the disparity in results among this study and previous studies, a generalization about the relationship between CEO age and the effectiveness of ICFR is not evident.

Research Question 2

Research Question 2 was, What is the relationship between CEO tenure and the effectiveness of ICFR among U.S. publicly held companies?

An examination of the chi-square test results shown in Table 24 was the basis for answering Research Question 2. The *p* value was the indicator for whether to reject or fail to reject the null hypothesis ($H2_0$). The significance level was 0.05. The study results reported in Chapter 4 do not support a statistically significant relationship between CEO tenure and the effectiveness of ICFR among U.S. publicly held companies.

Scholars who studied CEO tenure and measures of financial reporting quality demonstrated mixed findings. The findings of this study were similar to the findings of Besar et al. (2017) in which logistic regression analysis did not support a statistically significant relationship between CEO tenure and financial restatements in Malaysian public firms. Besar et al. also performed a correlation analysis, which indicated a statistically significant negative relationship between CEO tenure and financial restatements.

Findings in this study are contradictory to the findings of Lin et al. (2014) and Ali and Zhang (2015) about the relationship between CEO tenure and measures of financial reporting quality. Lin et al. evidenced a statistically significant association between long-tenured CEOs and SOX Section 404(b) material weaknesses in ICFR. Lin et al. defined *long tenure* as tenure ranking in the top 20% of the data set. Consistent with Lin et al., CEO tenure ranking in the top 20% was the reference point for dichotomization of the CEO tenure variable. Lin et al. indicated that the percentage of CEOs with long tenure and without long tenure who staffed material weakness firms was 4.9% and 3.5%, respectively. In this study, the percentage of CEOs with long tenure and without long tenure who staffed material weakness firms was 5.1% and 6.0%,

respectively. Though a larger percentage of CEOs without long tenure were associated with material weaknesses in ICFR than CEOs with long tenure, the results were not statistically significant. Ali and Zhang suggested a nuanced relationship between CEO tenure and earnings management. Specifically, Ali and Zhang posited that CEOs are more likely to manage earnings in early tenure years and the final tenure year.

An explanation for the disparity in results between this study and the studies by Lin et al. (2014) and Ali and Zhang (2015) could be differences in the populations, financial reporting periods studied, chosen measures of financial reporting quality as well as changing CEO motivations over the course of tenure time. Lin et al. examined fiscal years before and after the implementation of AS 5 in 2007 whereas this study was an examination of the 2017 fiscal year. Changes in audit procedures pursuant to AS 5 may be an explanatory factor for differences between the findings of Lin et al. and this study findings. Whereas the measure of the effectiveness of ICFR in this study was SOX Section 404(b) material weaknesses, Ali and Zhang and Besar et al. (2017) gauged financial reporting quality using indicators of earnings management and financial statement restatements, respectively. As suggested by Ali and Zhang, plausible idiosyncrasies in studies about the relationship between CEO tenure and financial reporting quality are fluctuating incentives over CEOs' tenure time and the career horizon problem.

This study added value to the body of knowledge about the relationship between CEO tenure and the effectiveness of ICFR. Scholars demonstrated mixed findings in the literature about the relationship between CEO tenure and financial reporting quality. This study does not support a statistically significant relationship between CEO tenure and the effectiveness of ICFR.

Given the disparity in results among this study and previous studies, a generalization about the relationship between CEO tenure and the effectiveness of ICFR is not evident.

Research Question 3

Research Question 3 was, What is the predictive relationship between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies?

An examination of the logistic regression results shown in Table 25 was the basis for answering Research Question 3. The *p* value was the indicator for whether to reject or fail to reject the null hypothesis ($H3_0$). The significance level was 0.05. The study results reported in Chapter 4 do not support that CEO age and CEO tenure are statistically significant predictors of the effectiveness of ICFR among U.S. publicly held companies.

Scholars developed statistical models to assess the predictive relationship between CEO characteristics, such as CEO age and CEO tenure, and measures of financial reporting quality. Findings in this study are consistent with the findings of Besar et al. (2017), in which the results of logistic regression did not support a statistically significant relationship between CEO age, CEO tenure, and financial restatements. Besar et al. suggested that CEO education and CEO functional track are better predictors of financial restatements than CEO age. Despite consistency between the findings of Besar et al. and this study findings, Besar et al. examined public Malaysian firms, which are structured differently and subject to different laws than publicly held U.S. companies examined in this study. Besar et al. measured financial reporting quality using financial restatements, which differed from the material weaknesses in ICFR measure used in this study.

Findings in this study are contradictory to the findings of Lin et al. (2014) and Hanmei Chen et al. (2018). Lin et al. posited a significant inverse relationship between CEO age and

material weaknesses in ICFR and a positive association between CEO tenure and material weaknesses in ICFR. Hanmei Chen et al. developed a Poisson regression model of future internal control deficiencies and found that older CEOs were associated with reduced material weaknesses in the future compared to younger CEOs. The addition of CEO tenure to the model did not alter the findings (Hanmei Chen et al., 2018). In the presence of a powerful chief financial officer, older CEOs better diminished the continuance of internal control deficiencies than younger CEOs (Hanmei Chen et al., 2018). An explanation for disparities between this study and the studies by Lin et al. and Hanmei Chen et al. could be the negative influence of AS 5 on audit procedures. Lin et al. and Hanmei Chen et al. studied fiscal years before and after the implementation of AS 5. The financial reporting period for this study was year 2017, which is in the post-AS 5 era.

This study was a valuable addition to the body of knowledge about the predictive relationship between CEO age, CEO tenure, and the effectiveness of ICFR. Scholars demonstrated mixed findings in the literature. This study does not support a statistically significant predictive relationship between CEO age, CEO tenure and the effectiveness of ICFR. The results are consistent with the findings of Besar et al. (2017), which indicated no support for a statistically significant relationship between CEO age, CEO tenure, and financial restatements. Whereas the studies by Lin et al. and Hanmei Chen et al. indicated that older CEOs are less frequently associated with material weaknesses in ICFR, results of this study do not support this. Results of this study do not support the findings by Lin et al. that CEOs with long tenure are associated with material weaknesses in ICFR. Given the disparity in results among this study and previous studies, a generalization about the predictive relationship between CEO age, CEO

tenure and the effectiveness of ICFR is not evident. Table 27 shows a summary of the null hypotheses findings.

Table 27. Summary of Null Hypotheses Findings

Hypothesis	Findings
$H1_0$: There is no statistically significant relationship between CEO age and the effectiveness of internal control over financial reporting among U.S. publicly held companies.	Failure to reject null hypothesis
$H2_0$: There is no statistically significant relationship between CEO tenure and the effectiveness of internal control over financial reporting among U.S. publicly held companies.	Failure to reject null hypothesis
$H3_0$: CEO age and CEO tenure are not significant predictors of the effectiveness of internal control over financial reporting among U.S. publicly held companies.	Failure to reject null hypothesis

Note: The null hypothesis and finding for each research question were summarized. A statistically significant relationship between CEO age and the effectiveness of internal control over financial reporting is not supported. A statistically significant relationship between CEO tenure and the effectiveness of internal control over financial reporting is not supported. This study does not support a statistically significant predictive relationship between CEO age, CEO tenure, and the effectiveness of ICFR.

Fulfillment of Research Purpose

The purpose of this quantitative, nonexperimental study was to examine the relationship between CEO age, CEO tenure, and the effectiveness of ICFR among U.S. publicly held companies. The premise for the purpose of the study was the research gap discussed in the Chapter 2 literature review. Scholars evidenced a connection between organizational outcomes and the upper echelon characteristics of CEO age (Andreou et al., 2017; Oh et al., 2016; Wang et al., 2016) and CEO tenure (Hambrick & Fukutomi, 1991; McClelland et al., 2010; Peng, 2017). The application of upper echelons theory tenets in the context of financial reporting is a novel area of research (Hiebl, 2014; Lin et al., 2014; Plöckinger et al., 2016). As described in the literature review, an agreement about the influence of CEO age and CEO tenure on the

effectiveness of ICFR was not apparent. Figure 2 depicts the research gap for the study. A quantitative methodology and correlational design were appropriate for the study purpose. Chapter 3 was a presentation of the research design and methodology.

Per the results of the chi-square tests of independence detailed in Chapter 4, a statistically significant relationship between CEO age or CEO tenure and the effectiveness of ICFR among U.S. publicly held companies is not supported. According to the results of binary logistic regression detailed in Chapter 4, CEO age and CEO tenure are not significant predictors of the effectiveness of ICFR among U.S. publicly held companies. Rejection of the null hypotheses associated with the three research questions was not supported.

The contribution to knowledge about the relationship between CEO age and CEO tenure characteristics and the effectiveness of ICFR was evidence of fulfillment of the purpose of the study. Study results did not support upper echelons predictions. The research is beneficial to scholars and practitioners. The study of upper echelons theory in the context of accounting decisions is an emerging area of research (Hiebl, 2014; Plöckinger et al., 2016). Through the study of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR, the study was a contribution to understanding the connection between upper echelon characteristics and financial reporting decisions. Given that a census was employed to study the population, the research may be a benchmark for future studies.

The research will benefit practitioners interested in financial reporting outcomes, including regulators, policymakers, and financial statement users. Study results do not support that CEO age and CEO tenure are significantly related to financial reporting outcomes. Given the responsibility of top executives for setting the tone related to internal control procedures, the research is relevant for corporate governance decisions. The study results do not support that

CEO age and CEO tenure are significantly related to material weaknesses in ICFR. Audit professionals could find the research pertinent to their assessments of the control environment. The study results do not support that auditors should incorporate CEO age and CEO tenure characteristics in the assessment of the control environment.

Contribution to Business Problem

The specific business problem was the lack of a consensus about how CEO age and CEO tenure relate to the effectiveness of ICFR may expose audit firms to increased audit risk as well as risks related to PCAOB intervention, litigation, and reduced firm reputation. Chapter 2 was a review of the literature, and the findings were mixed with regard to the relationship between executive characteristics such as CEO age and CEO tenure and the effectiveness of ICFR. Some scholars suggested that executive demographics are proxies for accounting decisions and worthy considerations in auditors' assessments of the control environment (Hanmei Chen et al., 2018; Lin et al., 2014; Sun et al., 2017).

Given the research results documented in Chapter 4, a statistically significant relationship between CEO age, CEO tenure, and the effectiveness of ICFR is not supported. The chi-square tests of independence indicated no significant association between either CEO age and the effectiveness of ICFR or CEO tenure and the effectiveness of ICFR. The binary logistic regression model encompassing the CEO age and CEO tenure predictors was not statistically significant. The results do not support the use of CEO age and CEO tenure characteristics as proxies for management financial reporting decisions in auditors' assessments of the control environment.

Three themes in the literature are contextualization for the contribution of this study findings to the business problem. First, CEO demographic characteristics may not represent the

complexities of executives' financial reporting decisions. Second, the effect of the implementation of AS 5 on audit procedures is a potential explanation for differences in the findings of the current and prior similar studies. Third, the level of managerial discretion modifier identified by Hambrick and Finkelstein (1987) may influence the connection between CEO characteristics and executives' financial reporting decisions. Following is a discussion of the themes.

Upper echelons theorists posited that demographic proxies are useful substitutes for complex personality and behavioral characteristics, which influence management decisions (Hambrick & Mason, 1984). Findings of this study do not support that CEO age and CEO tenure characteristics are proxies for executives' accounting decisions. Some scholars suggested that more insight about management accounting decisions could be gained from personality-based factors (Plöckinger et al., 2016), such as traits of narcissism (Jia et al., 2014; Olsen et al., 2014) and other dark triad traits (Epstein & Ramamoorti, 2016; Majors, 2016). Specifically, scholars found an association between dark triad psychological characteristics and aggressive financial reporting (Jia et al., 2014; Majors, 2016), earnings management (Buchholz et al., 2019; Olsen et al., 2014), ineffective internal control systems, and financial restatements (Jia et al., 2014). Epstein and Ramamoorti (2016) recommended that external auditors consider executives' personality features in their assessments of audit risk. Vladu (2019) suggested the use of a CEO profile composite score aggregated from CEO demographic characteristics, reputation, expertise, and dark triad traits as a warning for potential earnings management and fraud. CEO age and CEO tenure demographic traits may not effectively capture the complex psychological and behavioral influences on executive financial reporting decisions. As Plöckinger et al. (2016)

advocated, gauging and implementing executives' personality and behavioral propensities in relation to financial reporting decisions is an avenue for future research.

The effect of the implementation of AS 5 on audit procedures is a potential explanation for differences in the findings of the current and prior similar studies. The findings of this study did not support a statistically significant relationship between CEO age, CEO tenure, and the effectiveness of ICFR. Lin et al. (2014) and Hanmei Chen et al. (2018) evidenced that older CEOs maintain better internal controls than younger CEOs. Lin et al. also showed that CEO tenure is inversely related to material weaknesses in ICFR.

Consistent with Lin et al. (2014) and Hanmei Chen et al. (2018), this study was an examination of U.S. publicly held companies with a SOX Section 404(b) audit opinion. The financial reporting periods differed among the studies in relation to the implementation of AS 5. Lin et al. selected a financial reporting period of 2006–2009, and Hanmei Chen et al. selected a financial reporting period of 2003–2013. The financial reporting period for this study was 2017. Whereas Lin et al. and Hanmei Chen et al. examined financial reporting periods before and after the implementation of AS 5, the financial reporting period investigated in this study was in the post-AS 5 era. The PCAOB superseded AS 2 with AS 5, effective November 15, 2007 (PCAOB, 2007). With the implementation of AS 5, the PCAOB reduced the prescriptiveness of audit procedures, eliminated some audit procedures, and increased requirements for auditor judgments (U.S. Securities and Exchange Commission, 2007). Since the implementation of AS 5, the PCAOB noted audit deficiencies related to ICFR as well as deficiencies in auditors' assessments and responses to the risk of material misstatement (PCAOB, 2017b; PCAOB, 2019). Differences in audit procedures and auditor judgments since the implementation of AS 5 may have affected

the detection of material weaknesses and accounted for the disparity in the findings among the studies.

The results of this study do not indicate that CEO age and CEO tenure characteristics are proxies for executive financial reporting decisions. Taken together with the mixed findings in the literature, this study supports that upper echelons theory tenets are less apparent in the area of financial reporting than other business contexts subject to less oversight and monitoring. Accounting standards, U.S. Securities and Exchange Commission oversight, and PCAOB monitoring represent limitations to executives' financial reporting decisions. Hambrick and Finkelstein (1987) posited that upper echelon traits are better predictors of managerial decisions when managers have a high degree of discretion; however, based on a review of the literature, Plöckinger et al. (2016) noted that executives exert influence systemically or opportunistically in their accounting style and earnings management behaviors, respectively. Consistent with the suggestions of Plöckinger et al., the findings of this study support that the accounting profession will benefit from future upper echelons research as well as the study of potential modifiers of the connection between executive characteristics and financial reporting decisions.

Recommendations for Future Research

Few scholars examined upper echelons theory in the context of financial accounting (Hiebl, 2014; Lin et al., 2014; Plöckinger et al., 2016). Five directions for future researchers to build upon the findings of this study are (a) investigation of alternative upper echelon traits in relation to financial reporting, (b) examination of firm years in the post-AS 5 financial reporting period, (c) evaluation of the potential moderating effects of managerial discretion on financial reporting decisions, (d) consideration of other parties who influence CEOs and the control environment, and (e) examination of upper echelon traits in relation to financial reporting by

non-U.S. firms. The recommendations for future research are similar to additional studies (Lin et al., 2014; Plöckinger et al., 2016; Vladu, 2019). Following is a description of the recommended future research directions.

Alternative Upper Echelon Traits in Relation to Financial Reporting

The upper echelon traits examined in this study were CEO age and CEO tenure. Future researchers may demonstrate contrasting results when examining alternative upper echelon characteristics, such as gender, education, and experience in relation to financial reporting. Results of this study do not support a relationship between CEO age, CEO tenure, and the effectiveness of ICFR. CEO age and CEO tenure demographic characteristics examined in this study may not capture the complexities associated with executive financial reporting decisions. The assessment of CEOs' dispositions is challenging; however, composite scoring with consideration for CEO psychological features has been suggested to indicate the propensity for unethical CEO behavior (Vladu, 2019). Though CEOs' personality and behavioral features were not directly investigated in this study, future researchers should examine CEO behavioral and psychological characteristics in the context of ICFR.

Firm Years in the Post-AS 5 Financial Reporting Period

The financial reporting period examined in this study was fiscal year 2017. Study data were for the post-AS 5 period. Few scholars studied the relationship between executive characteristics and internal control quality since the implementation of AS 5. Because the PCAOB reduced required audit procedures with the implementation of AS 5 (U.S. Securities and Exchange Commission, 2007), and few scholars studied the relationship between executive characteristics and internal control quality since the implementation of AS 5, research in the post-AS 5 period is a recommended direction for future researchers.

Potential Moderating Effects of Managerial Discretion on Financial Reporting Decisions

Hambrick and Finkelstein (1987) posited that managerial discretion moderates the connection between executive traits and managerial decisions. Public company executives make financial reporting decisions in a setting marked by regulation and oversight. Based on a review of the literature, Plöckinger et al. (2016) noted that few scholars examined the influence of moderators such as managerial discretion on financial reporting decisions and suggested the area of study as an avenue for future research. The moderating effects of managerial discretion on the relationship between CEO age, CEO tenure, and the effectiveness of ICFR is an avenue for future research.

Other Parties who Influence CEOs and the Control Environment

CEOs were the executives examined in this study. Other parties affect the actions of CEOs and the control environment. Chief financial officers may exert a strong influence on CEOs' actions (Hanmei Chen et al., 2018). Future researchers should study the relationship between the upper echelon traits of chief financial officers and the effectiveness of ICFR. Plöckinger et al. (2016) suggested that the power balance among top management team members is a relevant consideration for examining the relationship between executive characteristics and financial reporting choices. The study of a potential connection between top management team characteristics and internal control quality is a recommendation for future research.

Upper Echelon Traits in Relation to Financial Reporting by Non-U.S. Firms

CEOs predicate their accounting choices on cultural and country-specific factors (Besar et al., 2017). Given the dearth of upper echelons studies in accounting contexts outside of the United States, a potential benefit to the accounting profession is the extension of upper echelons research to diverse global regions with different regulations and cultures (Plöckinger et al.,

2016). Future researchers should add to the body of knowledge by studying the relationship between the characteristics of non-U.S. firm executives and ICFR.

Conclusions

Auditors exercise significant judgment in the assessment of ICFR, including the control environment (PCAOB, 2017a). Audit judgment deficiencies negatively affect audit quality (Committee of Sponsoring Organizations of the Treadway Commission, 1992, 2013) and pose risks to audit firms (Knechel & Salterio, 2016; Löhlein, 2016; Udeh & Epps, 2013). CEOs are responsible for setting the tone for the control environment (SOX, 2012). As described in the literature review, scholars demonstrated a connection between executive characteristics and financial reporting outcomes; however, there was not a consensus about how CEO age and CEO tenure characteristics relate to the effectiveness of ICFR. The study design was effective for addressing the research gap.

A quantitative methodology and correlational design were the foundation for the examination of the relationship between CEO age, CEO tenure, and the effectiveness of ICFR. The organizing framework was upper echelons theory. In contrast to neoclassical theory and agency theory, upper echelons theory is a perspective in which individual executives' characteristics proxy for management decisions and affect organizational outcomes (Hambrick & Mason, 1984). Of interest was the relationship between CEO age and CEO tenure management characteristics and accounting choices about the effectiveness of ICFR, as gauged by the incidence of SOX Section 404(b) material weaknesses. Secondary data were the basis for generating descriptive and inferential. The results of this study do not support a statistically significant relationship between CEO age, CEO tenure, and the effectiveness of ICFR. This study was a fulfillment of the research purpose and a contribution to addressing the gap in

research about how the top management characteristics of CEO age and CEO tenure relate to the effectiveness of ICFR. Study results did not support upper echelons predictions.

An implication of the study findings for business practice is that the use of CEO age and CEO tenure characteristics as proxies for management financial reporting decisions in auditors' assessments of the control environment is not supported. An explanation for the findings was that CEO age and CEO tenure demographic traits may not capture the complexities of executives' financial reporting decisions. The effect of the implementation of AS 5 on audit procedures is another potential explanation for differences in the findings of the current and prior similar studies. Finally, the level of managerial discretion in the context of financial reporting is limited because of accounting standards, U.S. Securities and Exchange Commission oversight, and PCAOB monitoring. Managerial discretion is a moderator of the connection between executive characteristics and strategic decisions (Hambrick & Finkelstein, 1987); therefore, upper echelons predictions may be less evident in financial reporting contexts than other business contexts subject to less regulation and oversight.

Few researchers have investigated the influence of CEO age and CEO tenure on financial reporting quality (Hiebl, 2014; Lin et al., 2014; Plöckinger et al., 2016). The study of upper echelons theory in the setting of financial reporting is emerging. Five recommendations for future research were (a) investigation of alternative upper echelon traits in relation to financial reporting, (b) examination of firm years in the post-AS 5 financial reporting period, (c) evaluation of the potential moderating effects of managerial discretion on financial reporting decisions, (d) consideration of other parties who influence CEOs and the control environment, and (e) examination of upper echelon traits in relation to financial reporting by non-U.S. firms.

The relationship between top management characteristics, accounting choices, and financial reporting outcomes remains an interesting and compelling area for future research.

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