

Do sources of occupational community impact corporate internal control? The case of CFOs in the high-tech industry

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in the high-tech
industry

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Junli Yu

*China Institute for Urban Governance, School of International and Public Affairs,
Shanghai Jiao Tong University, Shanghai, China*

Shelagh M.R. Campbell

Faculty of Business Administration, University of Regina, Regina, Canada

Jing Li

Lixin Accounting Research Institute,

Shanghai Lixin University of Accounting and Finance, Shanghai, China, and

Zhou Zhang

Faculty of Business Administration, University of Regina, Regina, Canada

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Abstract

Purpose – The Chief Financial Officer (CFO), despite being a critical organization member responsible for ensuring quality of financial reporting, audit and compliance, is under-researched. Grouped as a member of top management teams (TMS) in studies, factors influencing decision making in this group rely on static measures of characteristics without regard for dynamic and longitudinal influences of career trajectories and industry occupational group memberships. The relationship between the high-tech industry as a site of notable reported internal control (IC) weakness and influences on CFOs requires closer examination. The paper aims to discuss these issues.

Design/methodology/approach – The study draws together the upper echelons theory and occupational communities (OCs) to explore the impact of shared values and behavioral norms from different sources on executive decision making. Internal and external sources of OC are proposed and their influence on activities with respect to corporate IC is tested. The sample of 1,573 firm/year observations includes high-tech firms listed on major US exchanges was developed using data from five distinct databases. Executives' biographic information was manually collected.

Findings – Results indicate that senior financial executives belong not only to their firm and its culture but also to OCs that extend beyond the firm. Membership in professional credential granting occupational groups has less impact on effective IC than experience in the high-tech industry. In combination, multiple OCs show evidence of compound and counteracting effects on IC. The OC that arises in the high-tech industry makes a measurable positive difference in the quality of IC in sample firms, in contrast with the OC among credentialed accounting and financial professionals.

Research limitations/implications – This quantitative study of OC reveals the differential impact of different sources of OC and contributes to the literature on TMS a new framework for examining decision making. OC is typically studied through qualitative methods and, thus, potential exists to further explore the specific nature and dynamics of the OCs identified in this study.

Practical implications – The study highlights the role of broad affiliations and networks among senior financial executives which may have bearing on their ability to effectively manage IC. The role of these networks may also partially explain instances of CFO failure and thus dismissal. Knowledge of the role of OC may help boards of directors in the selection and promotion of senior financial officers of the firm.

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Originality/value – The paper offers a different perspective on professional accounting expertise in one specific industry where incidence of IC weakness is high relative to other industries. Study results expand recent research on TMS to include sociological impacts of cohort groups. Despite generally weaker IC in the high-tech sector, this study demonstrates the value of exploring group membership within the industry as an important predictor of behavior. The result is a new perspective to CFO decision making which illustrates the relevance of OCs among upper echelons. The implications of findings for CFO recruitment and promotion are borne out in recent instances of senior financial executive failure in the sector.

Keywords Decision making, Internal controls, Chief Financial Officers

Paper type Research paper

Introduction

In the aftermath of financial scandal and economic recession, research into the factors that influence the quality of firms' financial reporting has taken a number of different perspectives. Dominant among these approaches are explorations of the qualities of the firm, aspects of information asymmetry and individual characteristics of senior executives (Habib, 2012). Research, specifically addressing senior executives, takes either an individual trait approach or a social identity approach (Zhang *et al.*, 2014). Recent work on aspects of senior executives' background as influencers of strategic change indicate that past experience, career path and group affiliation are important factors influencing executive behavior (Weng and Lin, 2014). This study follows the evolution of the literature from individual characteristic toward a meso-level of analysis (Fine and Hallett, 2014) including group affiliation, to examine how specific affiliations known as occupational communities (OC) affect corporate decisions. Barley and Kunda (2001) call for renewed attention to work and occupations. The recent launch of a new journal dedicated to the study of professions and organizations (Brock *et al.*, 2014) further underscores a renewed interest in the characteristics of highly specialized workers and the environments they inhabit. The study responds to Matthews' (2017) critique of traditional sociological views of the accounting profession, and Carter *et al.* (2015) call to more closely examine the role of experts in times of crisis.

This study is of relevance at this time as there is also a need to examine theoretical frameworks that have served us well in the past but which may no longer provide the robustness necessary to cope with changes to the institutional and regulatory frameworks now emerging. Recent studies of professions and professional organizations focus on the nature of belonging to the profession, measures of success and the changing nature of the professions (Spence and Carter, 2014). The focus of professions and professionals is their constructed identity (Abbott, 1988; Larson, 1977), the construction of the expertise (Brint, 1994; Savage, 1996) and the organization context for practice (Muzio *et al.*, 2011) in relation to the emergence or sustainability of the profession itself as an institutional form. In contrast to the institutional view of professions (Suddaby *et al.*, 2007), the study described here places corporate senior executives and their work at its core (Van Maanen and Barley, 1984; Weststar, 2015). We broaden the discussion of the organization setting of very specialized work beyond the technical expertise of the workers in question to examine the norming influences of a specific socializing force, an OC, whose emphasis is more on behavioral norms and socialization to standards than it is on control over specific bodies of knowledge and their technical application. Marschall (2012) completed a 50-year review of OC research, illustrating the versatility of this theoretical framework as a tool to understand the dynamics of a number of emergent and evolving forms of work, inviting further study of the implications of OC for a range of organizational issues. Our study is also relevant to the stream of literature that highlights the importance of human capital in accounting which has been sidelined in conventional accounting studies. For instance, Thompson (1999, p. 394) argue "Knowledge, expertise, ability, skill, respect and standing in the community: all contribute to the successful operation of a productive enterprise." He also suggests that the value of human capital is reflected in the sense that "When an enterprise hires a member of

an established profession, they are buying into a network of expertise and collegiality that transcends the intrinsic value to the entity of the individual employee” (p. 402). In addition, our study echoes the importance of engaging and generalizing the findings of qualitative accounting research to different groups of social actors (Parker and Northcott, 2016).

Management characteristics have long been of interest to researchers as a way to explain and predict executive decision making and related firm outcomes. One of the most prominent theories evident in management research is the upper echelons theory, first proposed by Hambrick and Mason (1984) and subsequently elaborated by Hambrick (2007a), to reflect over 20 years of application of the theory. Plockinger *et al.* (2016) review the body of research into the impact of executives on corporate financial reporting and conclude that upper echelons theory is supported by evidence that executive characteristics have an impact on a range of accounting and finance-related firm outcomes. They identify a range of research streams to further explore the application of this theory to the realm of corporate financial management and reporting; however, we note that in the attempt to advance understanding of the mechanisms at play, the authors suggest that researchers probe more deeply the impact and interaction of individual characteristics. This study, on the other hand, takes a broadening approach to the application of the upper echelons theory by including group relationships in addition to individual characteristics in order to more fully understand their implications for executive decision making. As Plockinger *et al.* (2016) suggest, a closer examination of the Chief Financial Officer (CFO) as a key member of top management teams (TMT) is warranted, given their influence on corporate reporting. While these authors suggest that CFOs do not wield unfettered discretion over reporting, it is also important to consider that the CFO has responsibility for design of financial systems as well as reporting and is thus a more complex figure that suggested in the literature to date. Our approach in this study is rooted in our empirical observation of internal control (IC) weakness in the high-tech industry, which stands out as an anomaly. In keeping with Birkinshaw *et al.*'s (2014) challenge to management researchers to broaden their research efforts, with the aim of deepening and enriching theory rather than reinforcing a “narrow orthodoxy,” we challenge the dominance of professions and organizational professions in particular to consider OCs in the CFO ranks as having an important role supporting financial accounting outcomes for firms. Drawing streams of theory together to inform our analysis of empirical evidence, we are mindful of two calls in the literature: Suddaby's note of “a growing tendency amongst management scholars to be increasingly fetishistic about theory, often at the expense of phenomena” (Birkinshaw *et al.*, 2014, p. 42) and Jeacle's (2012) suggestion of the importance of cross-disciplinary research “The editors of *AAAJ* are acutely aware of such a tension and the importance of provocatively pushing the boundaries of their discipline [...] challenging the status quo, employing innovative methodologies, experimenting with the novel and taking risks” (p. 581).

In this study, we examine the impact of CFOs' OC on the quality of IC. The Committee of Sponsoring Organizations of the Treadway Commission in the USA has broadly defined IC as “a process, effected by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting, and compliance.” Doyle *et al.* (2007) suggest that prior to the enactment of Sarbanes-Oxley Act of 2002 (SOX), public listed firms faced a less stringent IC disclosure requirement and were only needed to report deficiencies upon a change in auditor. During the post-SOX period, regulators greatly increased financial reporting requirements and tightened anti-fraud provisions. As a result, management and external auditors are required to publicly disclose assessments of IC material weakness under SOX Sections 302 and 404, giving us a direct observable result of an otherwise difficult to measure process. This very specific measure of IC is clearly distinguished from the more general management control in the broader literature.

We also note that little to date has been written about CFOs especially at a time when they are increasingly at the heart of key business decisions. CFO's primary occupational responsibility is to ensure the sound design and implementation of corporate financial policies, such as financing, capital allocation and risk management, as well as managing financial reporting process (Jiang *et al.*, 2010). After SOX, the regulators impose tighter requirement for CEO and CFO, who are viewed as top two most powerful executives in a corporate setting, to maintain high quality of financial information and are required to personally certify the financial reports. More specifically, literature has suggested that CFO plays a leading role in IC process and holds more fiduciary duties for their role during the post-SOX period (Hoitash *et al.*, 2012). Studies also show that consistent with the demand hypothesis, after SOX CFOs with more financial expertise are hired to ensure better corporate governance demanded by investors and regulators (Sun *et al.*, 2015). CFOs are a particularly interesting member of TMTs because their disciplinary field is more regulated than general strategic decision making (Plockinger *et al.*, 2016). Therefore, the influence of social groups that relate specifically to norms and values tied to these regulations is a valid factor to consider in analysis of CFO decision making.

The CFO is a heretofore loosely defined group – by title alone; we propose that an OC exists among CFOs, as has been suggested by others (Schein, 1996; Campbell *et al.*, 2016). We hypothesize that OC exerts influence on members' behavior with respect to one of their core responsibilities – the quality of IC over financial reporting. The CFO is a particular example of executive decision maker with links in two separate directions. Some CFOs are members of traditional professions of accounting or finance, with the attendant qualification/certification processes. These individuals are of interest because their practice has moved beyond the site of professional practice firms toward employment in organizations with other purposes; thus, they represent the competing logics Hodgson *et al.* (2015) describe. Geiger and North (2006) show that hiring new CFOs from outside significantly increases financial reporting quality, and such result does not significantly vary between whether the new CFO is from the firm's external audit firm or any other Certified Professional Accountant (CPA) firms. Suddaby *et al.* (2009) note the shift in priorities as accountants move up through the employment ranks, whereby senior managers view technical expertise as less desirable for success at senior levels of an organization; a commercial ethic predominates among this cohort.

However, the literature on OC indicates that additional forces may be relevant to the organization experience of these individuals. Their shared scope and boundaries of work, status, and external pressures to comply with stringent regulation forge an OC that spans organizations (Salaman, 1971b; Weststar, 2015). Members of professions who also form OCs unique to their work and organization position exhibit behavior contrary to what is expected of them as professionals, as the case of lawyers who pursue collective bargaining indicates (Campbell, 2014). Suddaby *et al.* (2009) clearly state "The assumption that [credentialed] professionals homogeneously share attitudes and values about the appropriateness of institutional structures is incorrect [...] attitudes vary as a function of conditions of work" (p. 424). The authors further argue that accountants with experience in the Big 4 show the least support for rigorous enforcement of independence. Our study extends this notion to examine Big 4 experience along with an accounting or financial management credential and their impact on IC. Taken one step further, we explore how the peculiarities of one specific industry, high-tech, might present further insight into the workings and workers in the financial executive suite.

The Audit Analytics database indicates that the high-tech industry has a substantially higher incidence of reported weaknesses in IC (5 percent) than other industries (about 2 percent). We can speculate as to why this might be the case. Some of the conditions facing the industry, including speed of product development, invisibility of borders in a digital age, globalization, risk of imitation, crowd sourcing of applications in a knowledge-intensive environment can mean that business needs change at the speed of thought (Marschall, 2012).

Such speed might lead to mistakes and inadequate oversight, for example. The high-tech industry has been noted for fostering a culture that emphasizes individual contribution at the expense of socially responsible behavior (Herriford, 2002). We examine the executive directly responsible for financial integrity, the CFO, and extend the literature to include this important decision maker while at the same time enriching the domain with an industry-specific focus. Since the CFO is responsible for both the design and the implementation and monitoring of financial policies and processes in a firm, a deeper understanding of the dynamics that impact their decision making is timely. Our conclusions have implications for a range of strategic and operational decision-making choices in organizations.

Our paper unfolds as follows: we briefly review the findings of upper echelons theory and financial reporting, and then proceed to discuss OCs and their application to TMTs and CFOs in particular, in light of their accountability for corporate financial reporting. We then present an empirical study of the combined upper echelons and OC framework in the high-tech industry, and discuss our findings. The paper concludes with insights to build theory and suggestions for further research.

Theoretical framework

Upper echelons theory

The upper echelons theory (Hambrick and Mason, 1984) is summarized by Hiebl (2014) in a recent review of management and accounting control research as: managerial characteristics, measured using demographic data as a proxy for managers' cognitive base and values, partially predict strategic choices which translate into organization outcomes. This relationship is moderated by managerial discretion and executive job demands (Hambrick, 2007a). Prominent among characteristics examined are the following: age, functional track, education, career experience, socio-economic roots (Hambrick and Mason, 1984). Key relationships have been identified among these variables and strategic choices made by TMT such as product innovation, acquisitions, capital intensity, administrative complexity, financial leverage, which, in turn, impact firm outcomes in the social, financial and market realms (Hiebl, 2014). Furthermore, the external environment and organizational context are antecedents to both TMT characteristics and outcomes. Thus, we have a robust theory that has stood the test of time. With the passage of the Sarbanes-Oxley Act (SOX) in 2002, there has been an upsurge in research applying the upper echelons theory to corporate financial reporting (Plockinger *et al.*, 2016). Reviews of research using upper echelons theory continue to call for investigation of additional characteristics and moderator variables to clarify the impact of managerial influence on financial reporting. One variable mentioned in the literature, intra-team power (Finkelstein, 1992) has received limited attention (Plockinger *et al.*, 2016), and this paper proposes that group dynamics are an overlooked variable in predicting decision making, but rather than a team focus, a cohort approach will yield meaningful results. While Hambrick and Mason (1984) originally identified a cohort as "a group of individuals that have some relevant date in common" (p. 202), it is a limiting perspective that does not take into consideration the dynamic nature of social forces that influence behavior in organizations. Our contention in this paper is that an approach that considers fixed, and often historically rooted, characteristics of the TMT is limited, and that upper echelons theory can be a more valuable predictor of firm outcomes, specifically related to financial reporting, when viewed through the lens of dynamic social groups, specifically an OC. This approach reflects the fact that individual decision makers derive cognitive capacities and values through membership in their TMT, their organizations and the broader operational context, but they also may be members of an occupational group that further contributes specific capacities and values that guide behavior (Van Maanen and Barley, 1984).

Although CFOs work in a highly regulated field, the literature reveals that there is still considerable scope for strategic decision making and the upper echelons theory is a recent

major theme in the study of the quality of financial disclosure. Though the measures of IC are tightly bound up in notions of audit and related credentialing, and expertise in the accounting occupation, Hambrick and Mason (1984) note "Career experiences other than functional track can also be expected to have significant effect on the types of actions taken by a manager [...]" (p. 199).

Occupational community

Rather than a set of static characteristics, an occupation is a system wherein the parties influence and are in turn influenced by standards and norms of the group within a context of regulation and within specific industry settings (Abbott, 1988). Hambrick (2007a) does call for more work on the notion of behavioral integration of the TMT, and recent work looks at the cohort of CEO/CFO (Campbell *et al.*, 2016) but not at the cohort of CFOs alone. OCs are groups of individuals that coalesce around the work itself and attendant characteristics of the work environment, its regulation, boundaries and which give rise to specific shared values and norms across its membership. Though often precursors to a fully developed profession, OCs continue without the trappings of professions and also emerge within existing professions. These communities span individual organizations, geographical regions, and professions and identify sets of shared interests; quite often an OC will result in the mobilization of members to address specific concerns (Campbell and Haiven, 2012). OCs are found on a continuum from lesser to greater sophistication and complexity, and in its fullest form, an OC may evolve into a profession. Van Maanen and Barley (1984) claim that a profession is simply one form of an OC.

The study of OC traces its roots to Salaman (1971a, b) and Van Maanen and Barley (1984). The latter identify four key aspects of OCs: first, boundaries that define insiders and outsiders, recognition of a specific measure of specialized knowledge, often esoteric, and risk or danger in the execution of work tasks (Trice and Beyer, 1993); second, social identity, which is derived from the role, defines the members' presentation to others and may include absorption in work tasks (Weststar, 2015); third, a reference group where members of the OC take each other as their key reference for work and social endeavors: members compare themselves to others in their OC and refer to the group for maintenance of standards. In the case of accounting professionals, for example, the OC is reinforced through regulatory oversight such as SOX; and, fourth, social relations whereby hobbies (Salaman, 1971b) and general socializing (Lee-Ross, 2008) are constrained or influenced by the hours of work. For senior executives, this can take the form of not only long hours, but also significant social activity necessary to maintain personal and corporate status in the business community. Schein (1996) cites the absence of social factors in organizational research. We take our cue from this gap and propose that a specific form of social group, an OC, has a marked influence on decision making among TMT members. Previous research indicates that OCs do exist among TMT members (Campbell *et al.*, 2016). This paper examines the impact of role-specific OCs while controlling for a single industry. Literature on the professions clearly indicates that formation and acceptance into a profession, marked by the granting of a credential, entails much more than the acquisition of knowledge; it involves socialization to the values and norms of the profession, its ordered hierarchy of expertise, and to a large extent, the application of professional discretion (Campbell, 2014). An OC, as a forerunner to many professions, is also an instrument for aligning interests of its members in pursuit of the specific goals vital to the continued well-being of those members. In the case of crown prosecutors (Campbell, 2014), these goals reflected the need for greater autonomy. For architects, the OC provides a much needed network that reinforces the professional power of their occupation; railway workers developed social supports and parallel communities when their working hours effectively removed them from mainstream society (Salaman, 1971a, b). Pub workers draw upon an OC

as a source of identity work (Riley *et al.*, 1998), and video game developers frame their conception of working time and compensation through their OC (Weststar, 2015).

Lee-Ross (2008) also found that the power of OC extends beyond the workplace, particularly when work is completed in the face of danger, or when work places unusual demands on its members. Often members of OCs will seek support beyond the workplace through extended social networks (Gerstl, 1961). Senior executives who form an OC (Campbell *et al.*, 2016; Schein, 1996), and CFOs in particular, face similar challenges no matter what their organization and industry. In the contemporary globalized economy with increasing emphasis on stakeholder management and accountability, CFOs, like CEOs, are part of a “worldwide occupational community” (Schein, 1996) in the sense that they have common problems that are unique to their roles. The OC reaches beyond the single organization and encompasses all members of the occupation. Such OCs express a shared set of values, above and beyond the codes of ethics that apply to all members of specific professions. Campbell *et al.* (2016) demonstrated the presence of OC among senior executives; however, we might reasonably expect a difference between CEOs and CFOs by the virtue of the differences in the problems they face, possibly their technical training, their relative positions in a corporate hierarchy, and their responsibility for specific organization outcomes. Hiebl (2014) showed that the upper echelons theory, in particular, applies to a different extent among CEOs compared to CFOs.

Professions are traditionally defined through standards of practice aimed to protect the public interest (Abbott, 1988), coupled with rigor in admission standards aimed at protection of an economic monopoly (Freidson, 1986; Krause, 1996; Larson, 1977). Professions set norms for their members, in addition to achieving various social and economic goals. Professions regulate the body of knowledge and admission to the practice and have played an increasing role in influencing organizational forms of practice. The accounting and financial professions thus refer to a body of knowledge and a set of technical expertise and obligations, often enforced through adherence to a code of ethics. As an organizing influence, professions are external to the organization workplace, with a rationale and membership that is a distinct from, even if it overlaps, membership in employing organizations.

Suddaby *et al.* (2007) draw out attention to the weakness of theory that does not adequately explain the shift of professional work toward large organizations. Furthermore, Suddaby *et al.*'s (2009) survey of chartered accountants reveals that higher level executives in the profession exhibit a greater managerial logic, viewing their professional designation in instrumental terms and may consequently adopt selective professional norms (p. 422). This finding takes on even greater importance when considered in light of Carter *et al.*'s (2015) review and agenda for research into the professions, which identifies the weakening of professional projects and undermining of both the legitimacy of the accounting profession (and professional expertise more broadly) and historical role of dominant players like the Big 4. Finally, Matthews (2017) critiques the foundations concepts of sociology of the professions as applied to accountancy, refuting the application of social closure, monopoly and restriction of qualifications. We are thus presented with a theoretical gap when considering the influences of technical expertise compared with other organizational factors on corporate IC.

The CFO is often considered a role rather than a profession due to the diversity of incumbent characteristics, a point made in upper echelons theory research. The study of CFOs presents an opportunity to examine a specific corporate role, and the possibility that it is an emergent corporate profession, according to Muzio *et al.*'s (2011) and Hodgson *et al.*'s (2015) discussion of same, and embraces members of a collegial profession as well, resulting in an interaction of different group norms to influence decision making. Not all CFOs are accounting professionals. Some are finance professionals and some are not affiliated with any financial profession at all. OCs differ from professions in a number of ways. Although members of an OC do command a specific body of knowledge, unlike the study of

professions, the focus of OC is not upon the expertise alone, but rather OC pays particular attention to the work and workers as a point of reference (Weststar, 2015), particularly decision making and responses to specific organization and industry pressures.

We contend that CFOs form an occupational group with distinct boundaries, values and points of reference whose members form a social and business elite. Members' expertise may be diverse in terms of preliminary qualifications, but the knowledge of how to execute the role and how to balance the divided loyalties between firm and public interest in financial integrity is rooted firmly in the role itself and informed by accounting standards and statutory requirements. Does membership in an OC present competing loyalties for CFOs? Do they succumb to the pressures of the organization over the norms and values of the profession as Mintzberg (1989) suggests, or can this view of competing loyalties actually result in better decision making in terms of IC?

We hypothesize that group potential evolves from sustained experience in a single industry effectively creating an OC that is role- and industry-specific. If the strength of professional norms was sufficient, and all members complied, then we suppose that auditors would find the same outcomes across industries and economies, with the only variance being organization-specific. This is not the case.

In response to lapses in quality control and to counter the perceived absolute power of the traditional liberal professions, we have seen the public interest increasingly addressed through statutory reform (Abel, 2003) and through tougher regulation such as SOX Section 404, which ensure that controls, reporting and the responsibility for these controls are clearly outlined and enforced. The rituals and standards of practice for preserving internal accounting and financial integrity have come under greater scrutiny in recent years, not least of all in the application of SOX requirements to publicly traded firms. The pressure to comply and the pressure of increased scrutiny create the stresses that reinforced an OC. Where then do successful CFOs draw their support in order to meet these work demands? What social structures make for more effective IC? In this study, we examine how financial executives respond to the demands of IC and which sources of OC assist them in achieving the audit standards associated with effective IC.

OC derived from different sources may influence the behavior of its members in different ways; there may be different strengths of attachment to different OCs as well as competing norms and standards. Taking into consideration the different interests that underpin different OCs, we extend our analysis to determine whether there is an interaction effect of multiple sources of OC. Furthermore, the interests of different OCs may influence behavior of financial executives that results in a material impact on organizations. We specifically posit that where an executive's interests are aligned to the financial profession and standards of control and reporting, we will see fewer instances of reported IC weaknesses. The implication is that decision makers in these organizations exercise their responsibilities with regard to IC more in keeping with the public interest of shareholder and external stakeholder protection. Conversely, when the senior financial executive's interests are aligned with the interests of the firm and the industry, the unique aspects of high-tech that Marschall (2012) notes will influence the quality of IC.

Chief Financial Officers

This study examines the CFO as a key decision maker in organizations for a number of reasons. The CFO role is rising in importance in the wake of recent global financial crisis and is also emerging as an area of research focus, partly as a result of changes in regulation that followed the highly publicized cases of fraud in the early 2000s. Increasingly, CFOs assume a strategic role in their organizations (Favaro, 2001). The primary occupational responsibility of a CFO is to ensure the sound design and implementation of corporate financial policies, such as financing, investments and risk management, as well as

managing financial reporting process (Jiang *et al.*, 2010). After SOX, regulators imposed tighter requirement for CEO and CFO to maintain high quality of financial information and are required to personally certify the financial reports. "According to Deloitte & Touche's internet-based CFO Center (2008), 'accounting, control, risk management and asset preservation are the province of the CFO. The CFO must ensure company compliance with financial reporting and control requirements'" (Li *et al.*, 2010). In particular, the integrity of financial systems is the key responsibility of the CFO. This integrity is expressed as IC and is specified in professional practice norms and governed by legislation, notably the SOX regulations. Not only is the CFO accountable for the transparency and appropriate disclosure of financial transactions, but this executive also holds the legal responsibility of disclosing IC weaknesses of the firm.

Hoitash *et al.* (2012) argue that CFOs have a direct role in ensuring IC compliance and that they are being held more responsible for their fiduciary duties in this post-SOX period. They test the relation between CFO compensation and the IC weakness and show that the disclosure of IC weakness directly leads to a decrease in CFO compensation; the decline in compensation is more pronounced in firms with stronger corporate governance structure. Jha *et al.* (2010) find that long-term contingent executive compensation, such as unvested options and unrestricted equity holdings, significantly reduce the probability of IC weakness. In particular, they show that compared to CEOs, CFOs' compensation packages are more sensitive to IC quality. With the relationship between the CFO and IC weakness now established in the literature, we are poised to deepen our understanding of the factors that contribute to such weakness.

There are two principal focal points for influence on CFO actions regarding IC. The first is external pressure from regulatory requirements; the second is internal pressure from the CEO. Feng *et al.* (2011) compare firms in which CFOs manipulate material accounting items vs those that do not. Their evidence shows that the activity of CFO's accounting manipulation is not driven by their compensation incentive. Instead, their activities are explained by the pressure from CEOs despite the risk to CFOs of significant legal costs. The influence of the direct report is clear, but what of the influence of peer groups?

The preponderance of studies in the upper echelons theory research look within organizations to the characteristics and composition of senior management groups (Hambrick, 2007a; Hambrick *et al.*, 2015, Plockinger *et al.*, 2016), using individual characteristics to predict the behavior of both individuals and groups (Carpenter *et al.*, 2004). Furthermore, the impact of these behaviors is linked to firm performance. Hiebl's (2014) finding of more consistent results in the application of upper echelons theory to CFOs than to CEOs further encourages us to explore the context for CFO decision making more fully. However, Carpenter *et al.*'s study challenges the use of demographic information about senior organization leaders as a proxy for leaders' characteristics. Elements such as tenure and education alone are insufficient to fully explain the impact of individual executive characteristics on decision making. Where Brochet and Welch (2011) examine the effect of expertise on agency conflict, and Ge *et al.* (2011) also look at expertise's impact on decision making, we are exploring the impact of membership in groups with explicit behavioral norming objectives on decision making. Ge *et al.*, use the CPA credential as a measure of expertise. We look to professional designation as one indicator, along with work experience in the top accounting firms, as a manifestation of a particular group, an OC, which supports specific social forces that in turn influence decision making.

The high-tech industry

Marschall (2012) describes the high-tech industry as a fertile ground for OC. The unique aspects of the market, opportunities, funding structure, extreme work pressures, lengthened hours, and specialized and rapidly evolving skill sets in high demand, but restricted-access

occupations all contribute to the rise of OC within this industry. In particular, the author describes a culture that arises from project-based work in organizations that do not follow classical bureaucratic structures and procedures. The industry is noted for the ease and frequency of movement of members between firms (Delbecq and Weiss, 2000), a feature that helps to reinforce the values and behavioral norms of the OC.

While Marschall's (2012) study focuses on the OC in one firm, he also notes the fluidity with which OCs rise and fall with the fortunes of specific firms (p. 111) and how OC extends beyond single firms. OC members extend these firm-specific communities beyond firms to include a network of former colleagues within the broader industry. Institutional isomorphism (DiMaggio and Powell, 1983) suggests that firms in the high-tech industry will mimic each other in structure and practice in order to legitimize themselves and to achieve success. The movement of individuals bound in a tight OC across firms further supports the dissemination of values and behavior norms throughout the industry. Marschall (2012) details the behavioral implications of the OC in high-tech and reveals how norms arise in this OC to influence members of the community to behave in characteristic ways, a finding supported by Weststar's (2015) work in the video game sector of the industry.

A recent study of publicly traded firms that replaced CEOs revealed that, although it is common to look outside the firm for "new blood," this strategy is less effective than promoting from within (Steingraber *et al.*, 2011). Firms that are doing well typically continue to employ their CEO and, when her tenure ends, replace her with an internal candidate.

External recruitment is more common when the firm performance is low-to-mid range or is poor- to mid-performing (Coyne and Coyne, 2007). In contrast to this finding, external CEOs tend not to last long, and also tend not to be as successful in making sustained strategic change (Zhang and Rajagopalan, 2010). CFOs tend to be replaced from outside the firm to an even greater extent than CEOs; Mian (2001) found 50 percent of CFO replacements came from external sources. There is some indication that CFOs are replaced in order to improve financial reporting, and by extension management quality (Li *et al.*, 2010). The trend in the high-tech sector for rapid movement of executives, coupled with the evidence of CFO turnover for quality reporting reasons, leads us to ask whether there is a distinction between internal and external OCs in terms of influence on the likelihood of IC weakness. Our analysis includes the effect of the high-tech OC to determine whether industry-specific considerations can have an effect on the disclosure of IC weakness.

Theoretical synthesis

Effective leadership in any community must be attuned to its culture. If leadership arises from the ranks, these individuals are both a product and producers of behavioral norms. Leadership, specifically executive leadership, is closely aligned with the interests of ownership and investors and holds corresponding strategic influence on the financial well-being of the firm. As networked, strategic influencers, senior financial executives are influenced by the behavior norms in an industry as well as their host firm.

The upper echelons theory, as used to explain executive behavior, relies on static individual characteristics to predict behavior and on identifiable groups that behave in a consistent fashion. In this context, the CPA will behave in a certain way because the characteristics of being a CPA affect behavior, and all CPAs could be expected to behave similarly in given set of circumstances. This expectation is reinforced by the examination process and codes of ethics associated with certification in the profession. OC takes membership in groups, such as CPA associations, as an integral aspect of this theoretical approach, yet with several key distinctions. OC examines the groups that form as an outcome of work itself. These groups are not static, but change as membership, internal dynamics and the external environment change. Membership in various formal and informal groups rooted in work experiences, whether these are formative experiences

linked to qualification and certification, or experiential-based groups that form through shared workplace trials, results in a common set of values that derive meaning from the work context. These values, in turn, are what influence behavior, rather than simply membership or designation on their own. In this way, several individuals might hold a CPA designation and be members of a professional association but without sharing the same process of socialization in the face of specific work circumstances, these disparate individuals would not necessarily be expected to behave in a consistent fashion. The emergence of an OC among those who share work pressures can include a variety of individuals with unique traits and characteristics whose behavior is a function of the shared values and the unifying perspective of the OC rather than the accumulation of individual characteristics.

It is also possible that CFOs may affiliate across industries and regulatory regions quite independently of membership in a professional body. This affiliation also forms an OC, one which comprises CFOs facing similar work stresses and within similar social networking milieus. As noted above, OCs can span organizations. Finally, countering the sharing of standards and mutual support is the proprietary and highly confidential nature of the information CFOs manage and release. The desire to protect the private information of a firm may cause CFOs to affiliate and draw their values from within the organization, a tendency that may be increased with length of tenure and internal promotion (Campbell *et al.*, 2016). Gunz and Gunz (2007) describe the shift in identity from professional to organization member that can occur when lawyers move from outside advisors to in-house counsel. A closer affiliation with organization goals can have a negative impact on the quality of executive decision making.

Testable hypotheses. When OC has an external focus, affiliation with standard setting groups such as the professional regulatory body may improve the quality of CFO decision making on IC. This approach is based on the notion of a powerful set of norms derived from the credentialing process. Professional designation and employment at a Big 4 firm provide a community in which regulatory standards are reinforced. The apprenticeship periods, and thus the opportunity for behavioral norming is greater within a professional program leading to a designation than it is for individuals employed in a range of general positions and who progress through time to a specialized role. This is borne out in earlier studies where CFOs are hired externally to improve IC quality. However, in keeping with recent studies (Suddaby *et al.*, 2009; Hodgson *et al.*, 2015; Currie and Spyridonidis, 2016), the power of an internal OC may overcome the benefits just described that derive from an external OC.

We thus conclude from the preceding discussion that the accountability of CFOs for the quality of financial reporting, though shared with the CEO, is distinct because the CFO has functional responsibility for management control systems and the design of accounting practices that produce the content for financial reports. The decisions CFOs make regarding financial reporting, and specifically to reveal weakness in IC, are influenced by their individual capacities as reflected in demographic data and also by the values and norms that they embody as members of financial and accounting OCs.

We therefore hypothesize:

- H1.* The extent to which CFOs are members of an external OC is negatively related to the quality of ICs.

We now turn to contrast the effect that exposure to other industries may have, namely generalizing the CFO's perspective on matters of IC and thus weakening IC quality in terms of the specific needs of the industry, with internal sources of OC. When OC derives from internal sources, affiliation with group values based on industry and firm interests will improve the quality of CFO decision making on IC. Campbell *et al.* (2016) found that internal OC among executives does contribute to stronger IC; we expect that this finding will be influenced by an industry effect in the high-tech sector. Past work experience in the high-tech industry and

promotion from within the high-tech firm will reinforce the interests of effective IC and counteract any maverick behaviors of the industry. We thus expect the following hypothesis:

H2. The extent to which CFOs are members of an internal OC is positively related to the quality of ICs.

As our sources of OC are not mutually exclusive, we further hypothesize that there will be an interaction effect from multiple sources of OC. We hypothesize that the OC of those with professional designations provides a foundation of technical expertise but membership in the high-tech industry as a financial executive overrides this effect. We expect that the industry effect noted above will carry through and may counteract the effects of the other sources of OC. These other sources of OC include earlier career experience in a Big 4 firm and a designation achieved at the outset of a long career in the high-tech industry. The interests of the immediate firm and industry will dominate the interests of the profession and affect integrity in reporting. We thus expect the following hypothesis:

H3. The interactive effect of internal and external OC is positively related to the quality of ICs.

Finally, we are assuming that individual integrity and training are consistent across the sample; we also assume the high-tech industry does not provide any specific training in financial matters such that the skills base across participants is also consistent, and determined largely by formal education and professional designations.

Data and empirical methodology

OC has traditionally been studied using qualitative methods; interview, ethnographies and content analysis of secondary data dominate the literature. There is some quantitative research that addresses aspects of OC even though not labeled specifically as OC studies, for example, on socializing and the formation of social networks (Tews *et al.*, 2014). More recently, Campbell *et al.* (2016) develop a measure of OC using a quantitative approach, which we extend in this study while focusing on a specific industry and a single occupation. This study furthers the contribution of Campbell *et al.* by extending their measures and addressing distinct sources of OC. There is value in our study as it adds a new perspective to traditional quantitative studies of CFO decision making and also broadens the reach of OC research to a broader range of organization implications.

Marschall (2012) discusses the importance of diachronic approach for capturing the richness and diversity of occupational changes over time. In response to this challenge, we have collected longitudinal data spanning six years and we follow the progress of individual executives through their careers across and within organizations.

Data and sample

The sample of our study includes high-tech firms listed on NYSE, AMEX and NASDAQ exchanges during the period between 2006 and 2011. Our sample begins with 2006 because although the mandatory SOX 404 disclosure was effective in November 2004, our CFO data from the Execucomp database are available only from 2006 onwards. Following prior studies (see e.g. Fama and French, 1997), we identify high-tech firms based on their SIC industry code. We collect firm-year data from five data sources: Audit Analytics, Execucomp, Compustat, CRSP and Boardex. We draw the disclosure of corporate IC information from the Audit Analytics database and then merge this information with the Compustat database to obtain each company's financial information. The data are then merged with the CRSP database to obtain stock price performance. Finally, we merge the data set with the Execucomp database to obtain CFO names. We use their names to hand

collect each CFO's detailed biographic information in the Boardex database and manually code their information into our OC measures. Our final data set for the empirical analysis includes 338 firms for 1,573 firm/year observations.

Occupation community (OC) measures

We move beyond a single measure of OC in order to capture more of the nuances of the theoretical model as expressed in earlier literature. An individual who is a member of an OC completes their work in the organizational and occupational contexts simultaneously. They have an ongoing commitment to their occupation, often in the form of continuing education and other requirements for continual recertification. The allocation of effort to maintain a professional designation enhances a person's technical competence, but also draws them into a world (Abbott, 1988) of specific values and reputation management; a world that has the potential to be at odds with the goals of the employing organization. This tension draws attention to competing values systems and may contribute to more balanced, rigorous decision making. We thus examine multiple sources of OC where individuals may develop a shared set of values that influence their behavior. For any CFO, these OC measures are not mutually exclusive.

The first OC measure is labeled as OCE as it captures the sources of external OC. Following Sun *et al.* (2015), OCE equals 0 if the CFO has no professional designation including CPA, CA, CMA, CFA and has no prior working experience in the Big 4 accounting firms; OCE equals 1 if the CFO possesses a professional designation but no prior working experience in Big 4; and OCE equals 2 if the CFO has both a professional designation and Big 4 working experience.

The second OC measure is labeled as OCI as it reflects the sources of internal OC. OCI equals 0 if the CFO is not promoted internally and is recruited from other non-high-tech industries; equals 1 if the CFO is not promoted internally but is recruited from high-tech industry; and equals 2 if the CFO is promoted internally. The coding of OCE and OCI from 0 to 2 reflects a gradual increase in the extent of external and internal OC impact.

Internal control (IC) measure

We use the IC disclosures under SOX Section 404 as our measurement for the quality of corporate internal control over financial reporting. There are several rationales for why this measurement fits the scope of our study. First, to advise investors of the information risks within the firm, the Section 404 disclosure is mandatory under SOX for all public firms in the USA and requires corporate senior executives and external auditors to certify and attest their assessment of internal control effectiveness in corporate annual filings (Schneider *et al.*, 2009). A CEO or CFO who fails to comply with Section 404 requirements could potentially be subject to an SEC enforcement action with serious liability consequences. Second, there are two general outcomes under Section 404 disclosure – effective IC or weak IC. Prior literature has documented that weak internal controls lead to negative economic consequences such as higher auditing costs (Hammersley *et al.*, 2012), lower credit ratings (Elbannan, 2009) and higher cost of capital (Crabtree and Maher, 2012; Dhaliwal *et al.*, 2011). Since the CFO is primarily responsible for the organization's internal control systems, several studies have shown that CFOs are directly penalized via reduced compensation or even layoff if their firm reports weak internal controls. In sum, the above reasons suggest that internal control is important for a company and CFOs to treat the matter very seriously. Therefore, our IC outcome is a simple but a powerful measurement of CFO's key decisions.

Empirical methodology

We examine how external and internal OCs impact the quality of internal control, after controlling for common determinants of IC. The dependent variable is labeled ICQ (quality

of internal control) and is a continuous variable. ICQ takes the inverse value of the number of material internal control weaknesses reported in the Audit Analytics database. ICQ can take a value of zero, which represents firms with effective internal control, or can take a negative value, which represents lower quality of internal control. Therefore, the more negative value of ICQ, the more internal control problems the CFO needs to address. Our key testing variables are OCE, OCI and their interactive term OCE×OCI. Following prior studies of internal control (Cheng *et al.*, 2013; Doyle *et al.*, 2007), we control for common determinants of IC, such as firm size, firm age, profitability and restructure status in our regressions. We also control for several biographic factors of the CFO. These variables are CFO's gender and age, and number of years the CFO has been with the firm. For brevity, in Table AI, we report a summary of data sources and variable definitions.

Our baseline regression model is estimated as follows:

$$ICQ_{i,t} = \alpha + \beta_1 OCI_{i,t} + \beta_2 OCE_{i,t} + \beta_3 (OCI \times OCE)_{i,t} + f(SIZE, ROA, FIRMAGE, RESTR)_{i,t} + f(CFOAGE, CFOGENDER, CFOJOIN)_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where *i* and *t* represent the *i*th firm and *t*th year, respectively. We winsorize all variables at the 1 and 99 percent tails to reduce the potential impact of outliers on the regression[1]. The regressions are estimated with robust standard errors accounting for firm clusters.

Results

We report descriptive statistics for all variables in Table I. The mean values for OCE and OCI are 0.69 and 1.24, respectively. This evidence suggests that most CFOs in this industry tend to have weaker external OC and stronger internal OC. The average CFO age is 50 years, and they have been with their organizations about 5 years; in addition, 91 percent of them are males. Panel B of Table I further reports the distribution of our sample by calendar year and shows that our sample is evenly distributed across the years.

We report the impact of internal and external OCs on ICQ in Tables II and III. Table II focuses on the individual impact of OCE and OCI, whereas Table III examines the interactive effect of the two factors. In column 1 of Table II, we find that the coefficient on

Variable	<i>n</i>	Mean	SD	Lower quartile	Median	Upper quartile
<i>Panel A: summary statistics</i>						
ICQ	1,573	-0.13	1.02	0	0	0
OCE	1,573	0.69	0.87	0	0	2
OCI	1,573	1.24	0.79	1	1	2
SIZE	1,573	20.58	1.54	19.44	20.47	21.45
ROA	1,573	0.04	0.13	0.02	0.06	0.10
FIRMAGE	1,573	3.33	0.29	3.26	3.30	3.30
RESTR	1,573	0.63	0.48	0	1	1
CFOAGE	1,573	50.02	6.54	45	50	54
CFOGENDER	1,573	0.91	0.29	1	1	1
CFOJOIN	1,573	4.76	4.14	2	4	6
<i>Panel B: distribution by years</i>						
Year	2006	2007	2008	2009	2010	2011
Freq.	173	268	280	280	287	285
Percent	11.00	17.04	17.80	17.80	18.25	18.11

Notes: This table reports the univariate evidence for our dependent and explanatory variables. Lower and upper quartiles represent the 25th and 75th percentile values. Detail variable definitions and data sources are summarized in Table AI

Table I.
Descriptive statistics

Variables	Predicted sign	Dependent variable: ICQ					
		(1)	(2)	(3)	(4)	(5)	(6)
OCE	-	-0.039* (0.091)		-0.040* (0.090)	0.074** (0.012)	-0.043* (0.078)	-0.043* (0.076)
OCI	+		0.078*** (0.008)	0.079*** (0.008)	0.007 (0.346)		0.074** (0.012)
SIZE	+				0.307* (0.064)	0.005 (0.399)	0.003 (0.433)
ROA	+				-0.029 (0.758)	0.311* (0.064)	0.306* (0.067)
FIRMIAGE	+/-				-0.117** (0.017)	-0.029 (0.758)	-0.026 (0.778)
RESTR	-				-0.007* (0.072)	-0.111** (0.023)	-0.112** (0.022)
CFOAGE	+/-				0.066 (0.458)	-0.008** (0.041)	-0.008** (0.047)
CFOGENDER	+/-				0.008 (0.213)	0.043 (0.631)	0.059 (0.507)
CFOJOIN	+/-				0.063 (0.892)	0.010 (0.111)	0.008 (0.198)
Constant		-0.211** (0.015)	-0.089 (0.263)	-0.185** (0.037)	Yes	0.297 (0.532)	0.210 (0.659)
Year dummy		Yes	Yes	Yes	Yes	Yes	Yes
<i>n</i>		1,573	1,573	1,573	1,573	1,573	1,573
<i>R</i> ²		0.006	0.004	0.007	0.015	0.013	0.016
<i>F</i>		1.630*	0.095	1.660*	1.810**	1.570*	1.830**

Notes: **, *, ***, Significant at 10, 5 and 1 percent levels, respectively, with one (two) tailed test

Table II.
Testing of *H1* and
H2: the individual
impact of CFO's
internal and external
occupational
community on the
quality of
internal control

Table III.
Testing of *H3*: the joint impact of CFO's internal and external occupational community on the quality of internal control

Variables	Predicted sign	Dependent variable: ICQ	
		(1)	(2)
OCE	-	-0.169*** (0.001)	-0.176*** (0.000)
OCI	+	0.009 (0.412)	0.003 (0.468)
OCE × OCI	+	0.106*** (0.003)	0.109*** (0.002)
SIZE	+		0.006 (0.369)
ROA	+		0.315* (0.061)
FIRMAGE	+/-		-0.034 (0.716)
RESTR	-		-0.114** (0.020)
CFOAGE	+/-		-0.008** (0.046)
CFOGENDER	+/-		0.070 (0.428)
CFOJOIN	+/-		0.008 (0.246)
Constant		-0.108 (0.244)	0.246 (0.605)
Year dummy		Yes	Yes
<i>n</i>		1,573	1,573
<i>R</i> ²		0.012	0.022
<i>F</i>		2.460***	2.280***

Notes: *, **, ***Significant at 10, 5 and 1 percent levels, respectively, with one (two) tailed test

OCE is negative (-0.039) and significant at the 10 percent level. This finding is consistent with our prediction of *H1* that CFOs with higher degree of OCE will disclose more internal control weakness. In column 2, we show that the coefficient on OCI is positive (0.078) and significant at the 1 percent level without inclusion of control variables, supporting our *H2* that the higher the level of internal OC, the better quality of internal controls as reflected in smaller number of ICW. In column 3, we include both OCE and OCI in the regression and find the result remains robust. Furthermore, we repeat the analysis by including the internal control weakness (ICW) control variables and show that the coefficients on OCE and OCI remain quantitatively similar to of the results without control variables.

Next, we examine the interactive relationship between OCI and OCE in Table III. We find that coefficient on OCE×OCI is positive (0.106) and significant at the 1 percent level. The coefficient on OCE remains negative and its statistical significance is stronger than that in Table II. In contrast, the coefficient on OCI is no longer significant at any conventional level. The interpretation of the evidence in Table III needs to focus on both OCE and OCE×OCI as both are statistically significant. First, when OCI takes the value of 0 (CFO was hired externally without high-tech industry experience), the negative coefficient on OCE suggests that CFOs with a higher degree of external OC will report more ICWs of the firm. Second, the positive coefficient on OCE×OCI suggests that if we control for a given level of OCE, firms with CFOs with higher extent of internal OCs will report fewer ICWs. This result thus suggests a strong substitution effect between external and internal OCs – in short, our findings show a pattern of better IC quality among those with lower external OCs and higher internal OCs.

Finally, we perform two robustness checks on our main findings. First, we separate our sample into old and young high-tech firms based on the median firm age in our sample. Doyle *et al.* (2007) argue that younger firms and firms rapidly changing operations are more likely to incur more serious ICW issues. CFOs in new high-tech firms where change is rapid and growth is accelerating may experience the social forces present in OCs to a greater extent than those in more stable operating environments, reflecting the crisis aspect of OC. There may also be role conflict, ownership conflict and strategic direction conflict that surpasses that found in established firms, and, as a result, the CFO may be more prone to errors in judgment affecting IC. New high-tech firms will likely have limited human capital and financial resources upon which to draw for IC support and effective

decision making and such firms may also value different characteristics in the leadership team that deemphasize IC. Thus, it is possible that the OCE, OCI and their interactive effect could be different between old and young high-tech firms due to their different growth stages. Our results in Table IV show that the results observed above are more pronounced in the young firms. Finally, we repeat the analysis under a propensity score matching (PSM) subsample and report the regression results in Table V. The PSM allows us to construct a one-to-one matched sample for firms with and without ICW problems. Such design effectively reduces the impact of firms without ICW problems on our findings, as this sample accounts for the majority of firm-year observations in our original sample. We show the results remain robust[2].

Variables	Predicted sign	Dependent variable: ICQ			
		Old	Old	Young	Young
		(1)	(2)	(3)	(4)
OCE	-	0.001 (0.480)	-0.041* (0.100)	-0.072* (0.098)	-0.286*** (0.003)
OCI	+	-0.014 (0.277)	-0.089** (0.017)	0.147*** (0.008)	0.030 (0.347)
OCE × OCI	+		0.064** (0.016)		0.176*** (0.006)
SIZE	+	0.010 (0.279)	0.014 (0.162)	0.006 (0.432)	0.007 (0.423)
ROA	+	0.326** (0.020)	0.353*** (0.014)	0.326 (0.188)	0.307 (0.201)
FIRMAGE	+/-	-0.157** (0.039)	-0.174*** (0.023)	-0.103 (0.718)	-0.157 (0.581)
RESTR	-	-0.080* (0.028)	-0.085** (0.022)	-0.126 (0.115)	-0.118 (0.132)
CFOAGE	+/-	-0.005 (0.102)	-0.004 (0.205)	-0.010 (0.220)	-0.013* (0.096)
CFOGENDER	+/-	0.167*** (0.005)	0.173*** (0.004)	-0.129 (0.512)	-0.114 (0.559)
CFOJOIN	+/-	0.009** (0.042)	0.008* (0.056)	0.004 (0.802)	0.003 (0.857)
Constant		0.277 (0.405)	0.258 (0.437)	0.622 (0.621)	1.059 (0.403)
Year dummy		Yes	Yes	Yes	Yes
<i>n</i>		789	789	784	784
<i>R</i> ²		0.052	0.057	0.020	0.028
<i>F</i>		3.010***	3.130***	1.100	1.460

Table IV.
Robustness checks:
regressions by old
and young firms

Variables	Predicted sign	Dependent variable: ICQ		
		(1)	(2)	(3)
OCE	-		-0.546** (0.049)	-1.447*** (0.005)
OCI	+	1.019*** (0.003)		0.268 (0.284)
OCI × OCE	+			0.858** (0.015)
SIZE	+	-0.195 (0.175)	-0.287* (0.094)	-0.205 (0.167)
ROA	+	-0.825 (0.310)	0.175 (0.460)	-0.506 (0.382)
FIRMAGE	+/-	0.306 (0.721)	0.607 (0.489)	0.376 (0.657)
RESTR	-	-0.261 (0.356)	0.071 (0.461)	0.012 (0.493)
CFOAGE	+/-	-0.000 (0.998)	-0.017 (0.690)	-0.017 (0.687)
CFOGENDER	+/-	-0.534 (0.453)	-0.862 (0.234)	-0.538 (0.444)
CFOJOIN	+/-	0.044 (0.591)	0.131 (0.131)	0.033 (0.703)
Constant		1.726 (0.714)	4.810 (0.330)	3.502 (0.464)
Year dummy		Yes	Yes	Yes
<i>n</i>		142	142	142
<i>R</i> ²		0.113	0.077	0.158
<i>F</i>		1.26	0.82	1.58*

Table V.
Robustness check:
PSM matched sample

Notes: *, **, *** Significant at 10, 5 and 1 percent levels, respectively, with one (two) tailed test

Discussion

At a first glance, the lower level of external OC and the higher level of internal OC in our sample indicate a possible explanation for the generally higher levels of internal control weaknesses in the high-tech sector; there is possibly an industry effect at work. However, upon closer examination, this supposition does not hold. The detailed analysis of results demonstrates that membership in an external OC is associated with higher levels of internal control weakness while internal sources of OC have a positive impact on the quality of internal control. These results appear to contradict the general trend in the high-tech industry toward reporting higher levels of internal control weakness overall, where a possible explanation for weakness might lie in some characteristic of the industry itself. This study reveals that despite an overall industry trend to have higher levels of ICW, a social force related to membership in the OC of CFOs in high tech has a positive effect on the quality of financial controls, a finding that is in keeping with the findings in Campbell *et al.* (2016).

Rice and Weber (2012) indicate that a change in auditors and management leads to a higher probability of reported IC problems. The rationale is to attribute the problems to the previous auditor and managers' weak management. This may explain in part the findings in this study. The audit process commonly followed in publically traded companies spans months, and allows firms some limited opportunity to address weaknesses identified by auditors prior to the reporting date. This audit process, the results of which form the basis for the Audits Analytics data used here, may unfold in one of these ways: very few weaknesses are uncovered in firms where CFOs have a higher OCI; minor weaknesses are uncovered and suitably addressed prior to the reporting deadline for CFOs with a higher OCI; or weaknesses uncovered cannot be addressed prior to the reporting deadline for CFOs with lower OCI. Again, our study results challenge a supposition. While it might be assumed initially that CFOs with an accounting designation and/or experience in the audit industry would be better positioned to avoid weaknesses altogether, or else to remedy weaknesses uncovered in the audit process, the reverse is indicated. The interaction results are a compelling finding in support of the power of the OC that nests within this specific industry to support effective internal control.

It was not our intent in this paper to engage in a detailed review and discussion of the literature of the accounting profession itself, particularly as our focus was the organization role and credentials are but one factor in our theoretical framework. Rather, we draw upon the foundational discussions of professionalization more generally, and touch on recent developments in the changing nature of the accounting profession to position this stream of research in conjunction with the upper echelons theory, and thus highlight the possibility of competing loyalties and logics between profession, industry and firm. Hodgson *et al.* (2015) discuss the duality present in new corporate professions such as human resource management and project management as occupations that "manipulate collegial and corporate logics" (p. 745) with particular focus on the professional association and its efforts to establish legitimacy. Running through much of the discourse of professions is the notion of the work content itself with, on the one hand, protection of intangible knowledge and on the other hand social and economic monopolies of practice; less attention is paid to the role professionals occupy within organization hierarchies. Muzio *et al.*'s (2011) research on professional service firms offering legal services is one example of work that addresses the dynamics of organizational life in the context of a profession; however, law is a collegial profession, and thus the primary reason for these workers to be gathered into an organization structure. One stream of research examining management occupations reveals distinct logics and forms of work organization (Ackroyd, 1996; Ackroyd and Muzio, 2007) leading to a wave of professionalization in some management professions, yet leaving others with less than complete closure (Hodgson *et al.*, 2015). Currie and Spyridonidis (2016) also examine competing logics; in a health care setting, they explore how individuals exert agency to balance professional and policy logics for organizational gain.

One of the bases of professionalization is social closure (Weber, 1947) and this is beyond the reach of management more generally (Reed and Anthony, 1992), and, likely, the CFO ranks as well for reasons of permeable boundaries. Without the structural formality of a professional association, which, in turn, negotiates relationships with key stakeholders (Hodgson *et al.*, 2015) members of this occupational group are inclined to form an OC as a point of reference for their role and their work. Our paper looks at the privileged role of CFO within the organization as a space for work and workers which is not in itself protected, defined and represented by any professionalizing group, but which welcomes incumbents who may be members of a profession and who bring the trappings of that profession with them. We are interested in the tension that exists between the source of these CFOs' knowledge and legitimacy, as represented by either credential or industry affiliation, and how those distinct sources of OC influence decision making. The CFO is not a collegial profession, nor is it an organizational profession, like supply chain management or human resource management (Hodgson *et al.*, 2015). The accounting profession faces the negative impact of a number of forces which undermine its legitimacy: state powers reclaiming control in the aftermath of scandals, shift toward commercialism and change in the power dynamic of major firms with increasing globalization. Spence and Carter (2014) summarize the emergence of competing professional and commercial logics in accounting, emergent forms of organization structure and the changing expression of successful professional characteristics; thus, "extant literature documents the professions as being in a state of flux" (p. 948). Given that accounting and accountants are mutable constructs and that the institutional power to bind members to a specific set of norms and practices has been shown to be in decline, this paper presents a new framework for consideration: OC emerges as an effective explanatory device.

The high-tech sector is subject to cycles of rapid growth and dramatic decline, as demonstrated in the early 2000s collapse, commonly known as the "dot-com bubble." In addition to the economic distinctions of the sector, high-tech also displays a language and culture of its own, conditions that support an OC within the industry (Marschall, 2012). Beyond simply being more knowledgeable about the industry, those with higher internal OC possess a network of support and a portfolio of habits and rituals that enable them to more effectively execute the demands of the CFO role in this industry context.

Marschall (2012) describes nodes in networked communities. These nodes are sites where members draw meaning and community, and can be virtual in many instances. Nodes can also be affected by internal organization structures, stresses in the environment, leadership practices, novel speech situations, among other influences (Marschall, 2012; see also Castells, 2000). The high-tech sector serves as such a node for the OC of CFOs. Not only can an occupation and profession shift in conception and construction overtime (Abbott, 1988), but OC also develops new nodes; in this study, a node is identified in the high-tech sector.

The inclusion of the social phenomenon of OC is important not only for the impact on internal control we have demonstrated in this study, but also for the theoretical contribution it represents to upper echelons theory in terms of the static compared to the dynamic. Demographic characteristics are often fixed and of limited changeability. Total tenure and variety of industry experience often change with time through a CFO's career; however, social membership is a constantly evolving force as members continually define and refine what it means to be a member of the group (Berger and Luckmann, 1966), giving us a richer understanding of decision making over internal control. OCs add to individual characteristics a set of values and norms that influence behavior (Weststar, 2015) that support the CFO in difficult decisions and the burden of accountability for financial reporting.

This paper makes several important contributions to the literature. We build on earlier work on OC with a quantitative measure of different sources of OC and we extend the field by taking a focus on a new group of workers: CFOs. This study furthermore is globally inclusive of all firms that are captured in our source databases when much of the research into OC work

is geographically limited to single sites or regions. Finally, an occupational lens helps us to understand more broadly the compliance environment and industry evolution.

The results indicate that CFOs holding accounting designations represent greater disclosure of material weaknesses than those who come from within the industry, but not the financial professions specifically. From the standpoint of professional expertise, this finding may appear counterintuitive; however, as we have indicated earlier in this paper, there is no unitary vision of what it means to be an accountant and how accounting is practiced by professionals; the logics most appropriate for a CFO appear to be attached to the insider knowledge of the high-tech industry and perhaps a flexibility borne in an environment of rapid change and response which equips these individuals to respond to potential internal control weaknesses more effectively than their counterparts from the accounting and finance professions.

The target of this paper's theoretical contribution lies at the intersection of domain and method theory (Lukka and Vinnari, 2016) as follows: while we seek to explain the difference in observable phenomena related to financial controls and compliance with regulatory reporting requirements, we also expand the explanatory framework. This paper expands an upper echelons view of management decision making by taking into consideration industry experience over time and career trajectory in addition to the characteristics of the individual CFO at a set point in time. Furthermore, our findings indicate that this view may offer more powerful explanation of internal control weakness than credentials and Big 4.

This paper draws attention to the higher than average incidence of internal control weakness reported in the high-tech industry. We use this evidence and probe the backgrounds of CFOs to uncover the impact of OCs. The paper challenges the assumptions of what makes a good CFO from the perspective of professions, credentials and expert knowledge built in major public accounting firms. We have woven different theoretical traditions together to support our analysis, yet the value of the contribution lies in opening up a new perspective on TMT, one that expands upper echelons theory to consider OCs, and their sources, based on the study of specific phenomena present in executive decision making. As such, we are mindful of Hambrick's (2007b) discussion of the role of theory in advancing understanding of management more generally and the concurrent need to explore empirical phenomena.

Limitations and opportunities for further research

We have attempted to address several common weaknesses in quantitative studies in this paper. Common method bias and single time period weaknesses have been addressed in our use of multiple databases and a diachronic approach to the data, as Marschall (2012) calls for. Readers will recall that OCI measures exposure to the industry and the firm. A challenge to this analysis might be that the "2" value assigned to internal promotion reflects the power of a corporate culture unique to a given firm and not the OC related to the industry. Campbell *et al.* (2016) found that an internal OC exists among senior executives of a single firm, however Marschall's discussion of the uniqueness of the high-tech industry is compelling for the purposes of this analysis and we conclude there is an OC, one which bears further examination.

In addition, the social relations aspect of OC is difficult to study through secondary data. The collection of data on social interactions might best be addressed through exploratory qualitative methods such as interviews and observation. A qualitative approach would enable exploration of a different set of research questions, ones that revolve around the notion of how the OC establishes norms and what these norms entail.

Recent contributions to the broader literature on knowledge management professionals discuss relational resources (Fu, 2015), the need for cross national comparisons (Lindberg and Rantatalo, 2015) and collective cognition (Islam, 2015); aspects of the field that can be considered in further work on OCs.

Further research into power brokers within OCs (Tasselli, 2015) may reveal additional insights as to how internal control is protected and improved over time. Research exists on

the extent of links between board members and executives (Carpenter and Westphal, 2001); however, data on business network activities and sector and professional leadership roles would round out the understanding of how OCs among CFOs operate.

This study has examined one group of workers from the perspective of their attachment to organizations; we measured OC in terms of firm, industry and audit experience. Additional insights might be possible by considering the OC of itinerant executives, “guns for hire,” and their impact on organization life.

Conclusions

We set out in this study to deepen our understanding of factors that impact corporate internal control. Building on upper echelons theory, we introduced an additional element, at the meso-level of analysis, to explain the behavior of senior decision makers in organizations. In particular, the current study moves beyond individual, organization and hierarchical sources of, and explanations for, weak internal control (Sinclair, 1993) and examines the role of a specific internal network, OC, as a source for strengthening IC. Reporting an internal control weakness is evidence that such weaknesses exist. This paper demonstrates that upper echelons theory can be enhanced beyond the contribution of individual characteristics such as tenure, committee experience and education, through the consideration of OC as a means to explain CFO decision making in matters of internal control quality. This highlights the importance of considering not only firm and individual characteristics, but also the membership in other groups with the power to set norms and values. The paper also explores in depth the characteristics of CFOs in relation to the quality of internal control and draws attention to this particular and under-studied member of TMT.

In our empirical study, we identified certification as either a public accountant or a financial specialist as a single variable. Future research would helpfully refine this distinction by exploring the specific impact of one or another designation. Furthermore, a typology might be developed with further research into the strength of OCs by industry and by profession (as measured by designation). We have not undertaken an in-depth examination of the socialization mechanisms of the accounting profession itself, nor how that profession has evolved over time in terms of the public perception and the management of expert knowledge. Our focus has been on the power of the occupation grouping; further research might examine the specific mechanisms and a large body of literature exists in the sociology of occupations addressing accountants (e.g. Spence and Carter, 2014). One of the limitations of the study design is its cross-section of CFOs and their decision making. Monitoring a group over time would enable consideration of other changes to the context of the accounting and finance professions. This study has further demonstrated the utility of occupation-specific variables in the application of upper echelons theory, and shows that the CFO is a distinct grouping beyond title, that influences decision making behavior.

With the rise in prominence of all things digital and the increasingly important role of technology in economic, social and political realms of life, this paper contributes insight into an industry not previously examined for its quality of internal control. The behavior of industry members in the high-tech OC suggests that social conditions are working to support stronger internal control, a finding that is consistent with other studies. Individual actors' decision making, viewed as a function of group norms, results in fewer IC weaknesses in the sample described here. When faced with the rational and administrative demands of IC compliance, notably through SOX regulations, CFOs appear to balance the firm/profession/regulatory tensions through recourse to OC rooted in their organization and industry roles. The supposition that OC internal to the high-tech industry acts as an industry effect to weaken internal control, based on the tendency of the industry more generally to report higher than average levels of IC weaknesses, is not supported by this study. Instead, we identify the high-tech industry as a node offering support to members in a network in fulfilling their

professional responsibilities. In addition to the forgoing theoretical contributions, at a practitioner level our findings may have implications for recruitment and career management of financial officers wherein attention to credentials is balanced with industry experience and networks, governance responsibilities of boards and the development of firm succession plans.

Notes

1. Malina *et al.* (2011) suggest that removing the outliers in the sample data may alleviate the concern of distorting the results from a statistical perspective. However, they point out such exercise may eliminate some interesting “outliers,” which leave fruitful areas for qualitative research to fulfill.
2. Since our sample period covers the 2008 global financial crisis, we also check whether there is any observable change in the results around crisis. We repeat all regression analyses for pre- and post-crisis sub-period (results are not reported for brevity). We find that the key coefficients (OCE, OCI and their interactive term) become larger and more significant after crisis (2009–2011) relative to the period of 2006–2008. Exploring the impact of pre- and post-crisis is beyond the scope of this study and we leave it for future research.

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Further reading

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Variable name	Variable definitions	Data source
<i>Dependent variable</i>		
Number of ICQ	Inverse of the number of material internal control weaknesses	Audit Analytics
<i>Key testing variables</i>		
OCE	= 0 if CFO has no professional designation(s) and has no Big 4 accounting company experience; = 1 if CFO has professional designation(s) but no Big 4 experience; = 2 if CFO has professional designation(s) and Big 4 experience	Execucomp and Boardex
OCI	= 0 if CFO is recruited from outside and from non-high-tech industries; = 1 if CFO is recruited from outside and from high-tech industry; = 2 if CFO is promoted internally	Execucomp and Boardex
<i>Control variables</i>		
SIZE	Natural logarithm of total assets	Compustat
ROA	Net income divided by total assets	Compustat
RESTR	An indicator variable equal to one if the company was involved in a restructuring during the current or previous two years and zero otherwise	Compustat
FIRMAGE	Natural logarithm of the number of years the firm has CRSP data	CRSP
CFOAGE	CFO age	Execucomp
CFOGENDER	An indicator variable equal to one if CFO was male and zero otherwise	Execucomp
CFOJOIN	Number of years since the CFO joined the firm	Execucomp

Table AI.
Variable definitions**Corresponding author**Shelagh M.R. Campbell can be contacted at: shelagh.campbell@uregina.ca

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