Auditors' Internal Control Over Financial Reporting Decisions: Analysis, Synthesis, and Research Directions

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SUMMARY: We synthesize the literature on auditors' evaluation of, and reporting on, internal control over financial reporting (ICOFR), as required by the Sarbanes-Oxley Act. The purpose of the synthesis is (1) to provide information on how and how well auditors perform the task, which serves as feedback to the Public Company Accounting Oversight Board on implementation issues and problems related to auditors' application of the professional standards on ICOFR; and (2) to identify gaps in the current literature and fruitful areas of future research. Consistent with Auditing Standard No. 5, we delineate five phases of the ICOFR audit: (i) planning; (ii) scoping; (iii) testing; (iv) evaluation; and (v) reporting. We structure our synthesis using a framework that classifies the determinants of performance in each phase into five broad areas: (a) the auditor's attributes, (b) the client's attributes, (c) the interaction between the auditor and the client, (d) task attributes, and (e) environmental attributes. Key contributions include providing an ICOFR tasks taxonomy, proposing a model of the determinants of performance for each task, evaluating auditors' performance of the tasks in our taxonomy, highlighting findings and gaps of importance to regulators, and providing a road map for future research.

Keywords: Auditor judgment and decision making; internal controls; Sarbanes-Oxley Act; literature synthesis.

INTRODUCTION

Section 404(b) of the Sarbanes-Oxley Act (SOX or the Act) requires that auditors attest to the effectiveness of their public clients' internal control over financial reporting (ICOFR) (U.S. House of Representatives 2002). Several studies have examined auditors' post-SOX ICOFR evaluations. The purpose of this research is to analyze and synthesize the literature related to auditors' evaluation of, and reporting on, ICOFR.[1]

The synthesis is motivated by three factors. First, the Public Company Accounting Oversight Board (PCAOB or the Board) requested a synthesis to obtain feedback on implementation issues related to the application of the ICOFR standards. For this paper, the Board was particularly interested in research on auditors' use of entity level controls, their evaluation of compensating controls, and multi-location scoping decisions.

Second, several post-Sox studies have focused on understanding and improving auditors' ICOFR decisions necessitating a synthesis of this literature. The Board's raison d'etre for issuing Auditing Standard No. 5 was to allow auditors to exercise more judgment and enhance efficiency (PCAOB 2007).[2] Further, auditors' ICOFR evaluation affects capital market participants (Asare and Wright 2011; Rose et al. 2010). It is, therefore, important to understand how auditors make these numerous judgments. Third, by taking stock of the extant literature on auditors' ICOFR

[1] Schneider et al. (2009) provide a general review of the literature on ICOFR, which includes a survey of archival research on the characteristics of companies reporting ICOFR deficiencies and the effect of adverse ICOFR reports on market participants. Our emphasis, in contra distinction, to Schneider et al. (2009), is to synthesize current research on auditor's ICOFR judgments and decisions. Thus, while Schneider et al. discuss research related to external auditors (see table 10 of their paper), their primary focus was not auditor decision making. As such, our organizing framework, presented in the next section, and the corpus of the work we review are markedly different from theirs.

[2] The emphasis on auditor judgment in AS 5 is evidenced by the drastically reduced usage of the word "must." The directive "must" was included a total of 28 times in AS 5, as compared to 90 times in AS 2. Concerns about AS 2 included a perceived low reporting threshold for issuing a material weakness report (more than remote), too many required procedures, and high cost of implementation. Cox (2007) discusses the main differences between the two standards.

evaluation, we also provide a roadmap for future research. Thus, the synthesis provides a holistic evaluation of auditors' performance on ICOFR tasks and is of interest to regulators, practitioners, capital market participants, and academics.

While research on ICOFR predates the passage of SOX, we focus primarily on post-SOX research because auditors' ICOFR evaluations under SOX are legislatively mandated and result in publicly observable audit reports. In contrast, their pre-SOX internal control evaluations were neither legislatively mandated nor resulted in public reports. In consequence, audit decisions under the two regimes may not be comparable.[3]

We present the framework for organizing our synthesis in the next section. Briefly, the framework suggests that there are five phases of the ICOFR audit: (i) planning; (ii) scoping; (iii) testing; (iv) evaluation; and (v) reporting. It also suggests that auditors' performance on the tasks within each phase are affected by (a) the auditor's attributes, (b) the client's attributes, (c) the interaction between the auditor and the client, (d) task attributes, and (e) environmental attributes. Following the framework, we evaluate auditors' performance on the specific tasks within each phase of the ICOFR audit. We end our analysis of each phase with a brief summary of the findings, under-studied performance determinants, and suggestions for future research. We end with concluding remarks.

FRAMEWORK

Auditing Standard No. 5 prescribes a top-down, risk-based, judgment-oriented approach and requires auditors to issue an adverse report when the client's ICOFR has a material weakness as of the balance sheet date (PCAOB 2007). Consistent with Auditing Standard No. 5, we delineate five phases of the ICOFR audit: (i) planning (assessing areas susceptible to material

[3] See Trotman and Wood (1991) for a meta-analysis of pre-SOX studies on internal controls.

misstatements); (ii) scoping (identifying key controls); (iii) testing (assessing operating effectiveness); (iv) evaluation (assessing deficiencies in control); and (v) reporting.

The PCAOB is obviously interested in enhancing the quality of auditors' ICOFR evaluations and has a regime of inspections to identify and publicize the most common or noteworthy deficiencies and observations (PCAOB 2009). Nevertheless, some stakeholders have raised questions about auditors' efficacy at performing ICOFR audits (e.g., Rice and Weber (2012)). Accordingly, post-SOX ICOFR research studies, which focus on auditors' decisions, have sought to understand and ultimately improve the quality of ICOFR decisions.

Reflecting ICOFR multi-phases and the emphasis on quality, we propose an organizing framework that emphasizes the determinants of quality in each stage of the ICOFR decision. As shown in Figure 1, ICOFR evaluation is a five-stage process that starts with planning and ends with an ICOFR report. Following Nelson and Tan (2005) and Bonner (2008), we posit that determinants of performance on the tasks in each phase can be classified into five broad areas: (a) the auditor's attributes (broadly defined to include cognition, incentives, and personality); (b) the client's attributes (broadly defined to include management and engagement characteristics); (c) the interaction between the auditor and the client; (d) task attributes (broadly defined to include the format and structure of the task); and (e) environmental attributes (broadly defined to include regulation, the litigation environment, professional concerns, and authoritative guidance).

Insert Figure 1 About Here

Several distinctive features of the framework require elaboration. First, it shows that several judgments and decisions are made in each phase of the ICOFR evaluation process. For instance, auditors make risk assessments, materiality decisions, and judgments about how much to rely on the work of others during planning. Second, the framework highlights that judgments and decisions made in each phase can affect subsequent phases. For instance, inadequate risk assessments affect scoping decisions. At the same time, outcomes from subsequent phases can be used to revise earlier judgments. To illustrate, sample results in the testing phase may suggest that the planning risk assessments were unreasonable. Third, the framework highlights the importance of the interaction between auditors and their clients as well as regulatory actions (e.g., PCAOB inspections) on ICOFR performance.[4]

PLANNING

The essence of planning the ICOFR audit is to identify high risk areas, which if not properly controlled by the client, can lead to a material misstatement of the financial statements (PCAOB 2007). The financial statements often reflect various events, transactions, and processes consummated at multiple locations across different systems. How should, or how does, an auditor determine the areas that are most susceptible to material misstatements? As indicated in Figure 1, AS 5 requires the auditor to make risk assessments, evaluate the extent to which she will use the work of others, and assess materiality in the planning phase (PCAOB 2007). We discuss the determinants of performance in each of these tasks.

[4] While not explicitly shown in the framework, auditing is a social activity and requires interactions among the audit team as well as with consultants, risk management personnel, peer reviewers, regulators and even law enforcement personnel such as attorneys and judges. These interactions are implicitly incorporated in the framework.

Risk Assessments

Risk assessment underlies the entire ICOFR audit process, including the determination of significant accounts and disclosures and relevant assertions, the selection of controls to test, and the determination of the evidence necessary for a given control (PCAOB 2007). Improper risk assessments can compromise the efficacy of the ICOFR audit.

Effect of Auditor Attributes

Auditor attributes that can potentially affect risk assessments include knowledge, confidence, and propensity to consult experts. Brazel and Agoglia (2007) examine the effect of auditors' accounting information system (AIS) knowledge on their ability to identify the risk present when they receive deficient system recommendations from computer assurance specialists (CAS), varying in competence. They find that auditors with high AIS knowledge assess the system as more risky than those with lower AIS knowledge. They also find that auditors' system risk assessment was affected by the competence of the CAS.

Hunton et al. (2004) examine the extent to which auditors and CAS recognize elevated risks associated with an ERP system compared to a legacy system, in the presence of a control weakness over access privileges.[5] They also examine the propensity of auditors to consult with CAS when assessing these systems in the planning phase. Compared to the CAS, auditors are less effective at recognizing the higher network, database, and application security risks associated with the ERP system.[6] Further, auditors do not indicate a greater need to consult with CAS when auditing ERP versus a legacy system and are highly confident in the ability of the

[5] A control weakness over access privileges presents significant risks in an ERP setting as a breach of security provides unauthorized access to the enterprise-wide database (Hunton et al. 2004).

[6] However, both auditor types assessed significantly higher business interruption, process interdependency and overall control risks with the ERP as compared to the legacy system.

financial audit team to assess risk in both computing environments. This provides evidence that auditors may be overconfident in their ability to assess ERP system risks.

Kopp and O'Donnell (2005) examine the effect on ICOFR performance of organizing information about ICOFR around business process instead of control objectives during the training of students enrolled in their first undergraduate accounting course. They find that novices who were trained to evaluate ICOFR using business-process-focused materials develop stronger category knowledge and identify more control issues in a post-training ICOFR evaluation task. This suggests that a process focus may be a more effective mental model for assessing risk.

Effect of Client Attributes

Professional standards emphasize the importance of management integrity in assessing ICOFR risk. Analysis of archival data of selected audits by a Big 4 accounting firm shows that auditor's evaluation of management integrity influences their risk assessments (Kizirian et al. 2005). Further, management integrity is associated with the discovery of current period misstatements, controlling for overall audit effort and prior-year errors.[7] Hernandez and Groot (2007) find that audit partners consider management's integrity, honesty, and ethics to be the most important indicators of fraud potential.

Effect of Auditor and Client Interactions

Using semi-structured interviews with auditors, Cohen et al. (2010) examine the interaction between auditors and client's governance players (audit committee, the board of directors, and internal auditors) and how such interaction affects the audit process, including risk assessments. Auditors in this study noted that the use of corporate governance in the various

[7] The authors find that prior-year error better explains risk and planning assessments than management integrity.

phases of the audit has changed over the last five years, with more frequent meetings with governance players. Auditors also noted that the audit committee plays an important role in providing an oversight function over ICOFR. Presumably, this perceived enhancement of the corporate governance structure results in a lower control risk assessment (Cohen et al. 2010).

One effect of auditor client interactions is that auditors become privy to management's ICOFR assessments, ahead of their risk assessments. This raises the possibility that auditors are susceptible to the 'curse of knowledge,' a cognitive bias in which knowing management's assessments makes auditors more likely to accept them or gravitate towards them (Camerer et al. 1989). In an experimental setting, Earley et al. (2008) find that management's ICOFR assessments influence auditors' ICOFR assessments, and that the effect is largest when control deficiencies are initially assessed less severely by management. In a second experiment, Earley et al. (2008) provide evidence that 'curse of knowledge' effects are reduced when auditors physically document the financial statement impact of management assessed deficiencies.

Effect of Task Attributes

Bedard et al. (2005) examine the sensitivity of auditors' risk assessments to variations in IT security and information quality. They find that 'bad news' related to IT security control activities and control environment characteristics do not raise IT security risk assessments, but 'good news' lowers those assessments. However, they find a stronger direct linkage between risk factors and risk assessment for information quality. This implies that judgment-based risk assessments are not necessarily similar across the components of ICOFR.

Hammersley et al. (2011) find that auditors who receive information about a material weakness in the transaction cycle they are auditing assess higher fraud risk and indicate a higher need to consult with a risk management partner compared to auditors in the other experimental

conditions (no information on material weakness or information on material weakness in another cycle). Further, auditors who receive information about a material weakness in the cycle they are auditing produce audit programs that are no more effective, and are less efficient, than those produced by auditors in the other experimental conditions. Hammersley et al. (2008) conclude that auditors attend to the material weakness information when assessing risk and making audit planning decisions, but they do not appear to know how to use such information effectively.

Morrill et al. (2012) find that auditors who generated risks before identifying controls identify significantly more (and more important) ICOFR deficiencies than participants who performed the tasks in the reverse order. On this basis, we conclude that a risks-first approach appears to be more effective. However, they also find that the risks-first auditors identify significantly fewer controls, indicating a potential compromise in the quality of scoping.

Effect of Environmental Attributes

We found no empirical research on the effect of environmental attributes on the quality of ICOFR risk assessments. Similarly, the Board has not provided a conceptual risk model that focuses on ICOFR evaluations (Akresh 2010). ICOFR audit risk is the risk that an auditor will issue an unqualified ICOFR report on an ICOFR that has at least one unremediated material weakness. As such, ICOFR audit risk differs from audit risk and cannot be evaluated by the audit risk model.[8] Akresh (2010) and Kinney et al. (2010) have proposed related conceptual models for the ICOFR audit. Akresh's model decomposes ICOFR risk into design risk and operating risk. Kinney et al. (2010) propose that ICOFR audit risk is a function of inherent risk and the risk that the auditor's ICOFR and financial audit procedures fail to detect (a) material weakness in

[8] A material weakness can exist regardless of whether it has resulted in a material misstatement (PCAOB 2007 ¶3). As such, the ICOFR audit is a test of a process, not a test of an output (Akresh 2010; Kinney et al. 2010; Asare and Wright 2011).

the design or implementation of controls; (b) material weakness due to ineffective operation of well-designed controls; and (c) financial statement misstatement (whether or not material) that exists due to a material weakness.[9]

Using the Work of Others

Figure 1 shows using the work of others as an important planning task. Auditors should evaluate the extent to which they will use the work of "others" to reduce the work that they might otherwise perform (PCAOB 2007, ¶16).[10] This requirement represents an important change from AS 2 and eliminates the AS 2 requirement that the auditor's own work must serve as principal evidence for the auditor's opinion (PCAOB 2004, ¶108). Archival research shows companies that have high quality internal audit departments have fewer material weaknesses (Lin et al. 2011). Research studies have focused primarily on the effect of client's attributes on the quality of auditors' reliance decisions.

Effect of Client Attributes

The client attributes studied include internal audit outsourcing, internal auditors' involvement in the development of the systems, whether the client involves external consultants in the ICOFR evaluation, and the client's credibility. Munro and Stewart (2010) examine the impact of internal audit outsourcing (in-house versus outsourced) and involvement in system consulting (low involvement versus high involvement) on auditors' reliance on the work of the internal auditors. In an experimental setting, they find that external auditors are less likely to rely

[9] Inherent risk is the common element between ARM and the ICOFR audit risk models. Consequently, Kinney et al. (2010) suggest that cost of the audit procedures for ICOFR will be incremental even for processes tested on the traditional audit and logically for processes not tested under the traditional audit.

[10] "Others," in this context refer to internal auditors, company personnel, and third parties working under the direction of management or the audit committee that provides evidence about the effectiveness of internal control over financial reporting. In an integrated audit of internal control over financial reporting and the financial statements, the auditor also may use this work to obtain evidence supporting the auditor's assessment of control risk for purposes of the audit of the financial statements. See Gramling et al. (2004) for a review of the literature on auditors' pre-Sox internal audit reliance decisions.

on the work of internal auditors who have been involved in system consulting. However, whether the function is outsourced or provided in-house does not affect the auditor's reliance decision.

On the other hand, Glover et al. (2008b) find that auditors rely more on the work performed by outsourced internal auditors than by in-house internal auditors but only when inherent risk is high. They also find that auditors rely more on the work performed by internal auditors for objective tasks than subjective tasks when inherent risk is high but not when inherent risk is low. Gramling and Vandervelde (2006) find that auditors assess internal auditor objectivity to be higher when the provider is another accounting firm.

Blaskovich and Mintchik (2011) find that when a low credibility client engages an ICOFR consultant, auditors assess a higher reliance on ICOFR and budget fewer audit hours, relative to a no consultant situation. However, for highly credible clients, auditors do not change their reliance on ICOFR and actually budget more audit hours when the consultant is involved than when no consultant is used. The results suggest that auditors view the involvement of ICOFR consultant as a compensating factor but for only low credibility clients.

Blaskovich and Mintchik (2007) survey external auditors of two of the Big Four firms to examine their reactions to clients who engage consultants to assist in ICOFR assessments. They find that auditors consider management's engagement of an ICOFR consultant as a positive signal that reflects legitimate managerial interests in assessing ICOFR rather than a managerial intent to hide problems. They also report that auditors believe such involvement is more likely when there are control deficiencies or when management is concerned about potential internal control weaknesses.

Bedard and Graham (2011) find that management is less likely to under-assess the severity of identified control deficiencies if it engages large public accounting firms as ICOFR

consultants or has independent internal compliance functions. Auditors in the Cohen et al. (2010) field study indicate that the role of the internal audit function has changed over the past five years and that the nature and extent of reliance on internal audit work has increased considerably.

Materiality

As shown in Figure 1, auditors must assess materiality in the planning phase. The auditor needs to concern herself with only ICOFR whose absence or weakness present a reasonable possibility of material misstatement to the financial statements and related disclosures. According to AS 5, the auditor should use the same materiality considerations for both the audit of the financial statements and ICOFR (PCAOB 2007, ¶20). There is virtually no research that examines the relationship between materiality and auditors' ICOFR judgments.[11] The exception is a pre-SOX study that shows auditor's planning materiality values increase with the quality of the client's control environment (Blokdijk et al. 2003). While this study sheds insights, its generalizability is limited since it was conducted in the pre-Sox era.

Summary and Future Research

Several themes emerge that provide feedback to the PCAOB and represent avenues for future research. First is the absence of a generally agreed upon ICOFR audit risk model. The models proposed by Akresh (2010) and Kinney et al (2010) are an important start; however, they do not map out the process by which risk assessments are translated into audit effort and do not sufficiently address the interdependence between design and operating risk. The PCAOB and future research should consider developing an ICOFR risk model.

Second, auditors are not fully aware of the risks in complex ERP systems, may be overconfident in their ability to assess risks in this setting, and are reluctant to seek consultation

[11] For a review of the literature on materiality in financial statement audits, see Messier et al. (2005).

from CAS. Auditors with higher AIS knowledge are more effective at recognizing elevated risks in an ERP system. These findings suggest the importance of aligning auditors' skill sets to their task assignments. A fruitful avenue for future research is to investigate the factors that lead to overconfidence and willingness to consult with CAS as well as examining alternative mechanisms and incentives that encourage consultation.

Third, preliminary evidence suggests that a process organization of knowledge is more effective than an "objectives" organization. But why should a process organization be superior to an "objectives" organization? Are the findings from novices' cognition generalizable to experienced auditors? What is the effect and relevance of knowledge organization in complex ERP systems?

With respect to client attributes, auditors' assessment of management integrity is associated with risk assessments and discovery of misstatements. However, auditors may be unduly influenced by management penance. Future research should examine the information sources available to auditors, the determinants of management integrity, and how an assessment of low management integrity affects ICOFR reporting? What factors, similar to penance, work to reduce auditors' skepticism when assessing management integrity? While the existence of a material weakness appears to be associated with the assessment of higher fraud risk, auditors continue to have difficulties linking these heightened assessments to an audit program, raising questions as to whether fraud experts should be embedded on every audit engagement.

While the PCAOB has emphasized that auditors can perform an efficient, integrated audit by leveraging the work of others, auditors must be cautious because client-provided documentation and assessments have the propensity to bias auditor assessments. The evidence to date on the effect and nature of the bias is mixed, suggesting the need for additional research.

Extant research suggests that as internal auditors provide more in-house financial system consulting, auditors consider them less objective. Important research questions are raised as a client outsources the internal audit function. For instance, while this arguably enhances objectivity, is it at the cost of a loss of the availability and intimate familiarity with the client's process? There are no studies on materiality assessments for the ICOFR audit. Our framework suggests five broad attributes that can potentially affect materiality assessment and can be the focus of future research

Finally, the PCAOB inspections provide anecdotal evidence that auditors sometimes fail to (i) identify certain components of an account or certain locations in a multi-location environment that presents different risks of material misstatement of the financial statements than other components of the same account or other locations, respectively, and (ii) consider the effects of control deficiencies identified during the audit on the risk assessment (PCAOB 2009). We found no research that addresses these potential concerns, making them timely issues for further research.

SCOPING

In the scoping phase, auditors are required to use a top-down approach to select the controls to test (PCAOB 2007, ¶21). A top-down approach requires that the auditor understand the overall risks to ICOFR, focus on entity-level controls (ELCs) and work down to significant accounts and their relevant assertions (PCAOB 2007, ¶21). As shown in Figure 1, auditors, therefore, select a portfolio of the client's ELCs, account-specific controls, and location controls (in the case of multi-location audits).

Entity Level Controls

ELC's operate over multiple accounts, vary in nature and precision, and include controls that can have a direct or indirect effect on the likelihood that a material misstatement is prevented or detected (PCAOB 2007, ¶ 23). PCAOB inspections reveal significant variance in the effectiveness of the auditors' efforts to identify and test ELC's, and to use the results of those tests to tailor the audit (PCAOB 2009). Extant research has primarily focused on the effect of client (management integrity factors and quality of governance players and systems) on the scoping of ELC. One study provides indirect evidence on the effect of standards (environmental attribute) on scoping decisions.

Effect of Client Attributes

Wolfe and Mauldin (2011) examine the impact of two control environment ELCs (management competence and trustworthiness) on auditors' evaluation of the control environment. They find that a trustworthiness deficit results in more severe evaluation of the control environment, presumably leading to less scoping of ELCs. However, an integrity-challenged management who offer penance to auditors (promise to be more diligent), can regain the trust of auditors, resulting in a willingness to rely on the controls in the next accounting period.

Pizzini et al. (2011) find that two ELC factors (the quality of the internal audit function (IAF) and audit committee effectiveness) are inversely related to audit delays. Presumably, the scoping and testing of the high quality ELCs enhance the timeliness of the audit. Masli et al. (2010) find that companies that invested in internal control monitoring technology had lower audit fee increases and a reduction in the incidence of material weaknesses. Similarly, Morris

(2011) finds that companies who invest in ERP systems are less likely to have both ELC and account-specific deficiencies.

Effect of Environmental Attributes

Doogar et al. (2010) examine the effect of AS 5 on scoping. Specifically, they examine the alignment of audit fees and client fraud risk under AS 2 and AS 5. If auditors apply AS 5's risk-based, top-down, judgment-oriented approach, then AS 5 should result in be a better alignment of risk and effort, hence fees, compared to AS 2. Doogar et al. (2010) find that during the AS 5 period, higher-fraud-risk clients pay higher fees than lower-fraud-risk clients. In contrast, AS 2 fees do not exhibit systematic association with client fraud risk. They also find average fees under AS 5 to be lower than AS 2 audit fees. These findings are consistent with improved scoping under AS 5.

Location Controls

Multi-location scoping requires auditors to determine the number of locations and the specific controls to test at each location (PCAOB 2010, ¶11) .[12] The primary concern is whether auditors fail to (i) identify locations that present heightened risks of material misstatement, and (ii) evaluate the relevant qualitative and quantitative factors (PCAOB 2009). The few multi-location ICOFR studies have focused on either client or environmental attributes.

Effect of Client Attributes

Auditing Standard 9 lists several client attributes that are relevant to assessing the risk of material misstatement associated with a particular location, hence scoping (PCAOB 2010, ¶12).

[12] The challenge for the auditor is often the lack of concentration of risk or dollar amounts that the auditor can use to achieve a low risk of material misstatement by performing audit procedures at just a few locations. If neither value nor risk is concentrated in a few units, and the units are independent, then many of the units would need to be examined to arrive at an assessment that there is a low risk of material misstatement. In such instances, the auditor faces the problem of selecting a sample of locations that best tests the financial statement assertions.

Based on an interview with experienced auditors and a review of firm manuals, Allen et al. (1998) identify eight client attributes that affect scoping: degree of centralization; diversity of locations; special reporting requirements; effectiveness of internal controls; effectiveness of internal audit; number of locations; proximity of locations and transferability of assets; and distribution of dollar values between locations.[13] These identified factors include qualitative and quantitative considerations. However, there is no quantitative model proposed or a discussion of possible relative weightings of these risks in identifying the locations to audit or the intensity of auditing required at each location. A recent interview with auditors corroborates the findings of Allen et al. (1998) (Hegazy and Nahass 2011). In addition, Hegazy and Nahass (2011) discuss how auditors might weight some of the factors to achieve an overall "low risk" of material misstatement by applying the general audit risk model to the multi-location issue.

Effect of Environmental Attributes

Research on environmental attributes has focused on developing a conceptual model to guide multi-location scoping (Stern 1992). Pre-Sox research generally applied classical statistical techniques to allocating materiality (or risk) across the significant locations and accounts to achieve the desired risk of material misstatement (Dutta and Graham 1998; Elliott and Rogers 1972; Glover et al. 2008a). More recent professional literature specifies a two stage risk approach consisting of: Selection Risk (the risk that of not selecting a risky location) and Detection Risk (the risk that that audit procedures will fail to detect error conditions at selected locations) (AICPA 2008). Graham et al. (2011) provide additional guidance on applying this two-stage risk evaluation.

[13] In addition, they identify seven factors that affect multi-location testing decisions: results of prior audits; relative profitability of segments; extent of centralized controls; availability of information about units at a central location; uniformity of internal control structure; electronic data processing operations; and extent of intercompany transactions.

Summary and Future Research

There are relatively few research papers on scoping, in spite of its importance to the efficiency of the ICOFR process. The limited research to date has focused on the effects of the client and environmental attributes. Regarding client attributes, the evidence suggest that management trustworthiness and investment in monitoring controls affect scoping. Regarding environmental attributes, evidence suggests that prescription-oriented AS 2 induced inefficiencies, some of which have been eliminated by the risk-based scoping prescribed by AS 5.

There are several opportunities for research on scoping. We find no studies on auditor, auditor-audit interaction, and task attributes. Future research can examine how auditors' cognition and incentives affect their ability and willingness to use ELCs as substitutes for account specific controls and to determine locations to visit. Are auditors' cognitively wired to scope some types of ELCs but not others, accounting for the tendency to scope only ELCs associated with the control environment and the period-end financial reporting process (PCAOB 2009)? What interactions between the auditor and client explain the tendency for auditors to evaluate only the ELCs scoped by the client? With respect to task attributes, can the scoping decision be structured differently (e.g., by decomposition) to facilitate the scoping of more effective ELCs (see e.g., Wilks and Zimbelman (2004); Agoglia et al. (2003))?

The PCAOB posed two specific and related ELC questions to the ICOFR synthesis team: (1) What are effective ELCs; and (2) how do auditors use ELCs in scoping tests of account-

specific internal controls? A search of academic literature reveals that these issues are not addressed directly or comprehensively in the literature, suggesting an opportunity for research.[14]

With respect to multi-location scoping, although there have been intermittent efforts to develop a model to guide the process, there is currently no generally accepted model. Thus, research can focus on model development as well as how materiality and risk relate to the multi-location audit environment.[15] The PCAOB asked our team to identify any research examining how auditors determine which client locations to perform ICOFR procedures and whether substantive testing should be performed at the locations at which the auditor conducted testing for ICOFR purposes. Our synthesis also reveals the absence of cognitive accounts of the multi-location scoping decision. With respect to task attributes, research could examine the role of ELC assessments in determining the nature and extent of multi-location testing. For example, are there specific ELCs that guide auditors' decisions about the locations to select and the key controls to test at various locations? In addition, future research could address whether auditor selection of locations for testing is influenced by factors unrelated to a risk-based approach to location selection. For example, how does the distance of the location from the principal audit location, the profitability level of the location[16] (holding constant the materiality), or the need to use other firm offices for testing affect multi-location scoping?

[14] Previous research has identified barriers to conducting research that addresses issues of regulatory importance (e.g., Allen et al. (2006)). In particular, accounting firms appear to have an unjustified belief that experimental data can expose them to legal liability. However, experimental data seldom will meet the test for relevancy required for evidence admissibility under the Federal Rules of Evidence.

[15] PCAOB Auditing Standard No. 9, *Audit Planning* (PCAOB 2010), lists seven factors for consideration in determining the locations to visit and the extent of procedures to perform at those locations, and references Appendix B (*Special Topics*) of AS No.5, which also discusses multi-location issues in an audit of internal controls. The PCAOB guidance provides no specific discussion of how to weigh the various factors or how to combine the risks. Additional considerations are identified in the academic research cited.

[16] Based on anecdotal evidence, Allen et al. (1998) indicate this is a factor, however there is no empirical evidence supporting this conclusion to-date.

TESTING

As shown in Figure 1, ICOFR testing entails determining the nature, timing, and extent of the audit procedures. Further, AS 5 permits auditors to use a benchmarking strategy for fully automated application controls in subsequent years' audits. (PCAOB 2007, Appendix B ¶B28).[17] Post-Sox ICOFR research on testing has focused on the effect of auditor (experience and competence), client (ICOFR quality), and task attributes (documentation, outcome feedback).

Effect of Auditor Attributes

Janvrin et al. (2009) find that Big 4 auditors are more likely to use computer assisted audit techniques (CAAT) than non-Big 4 auditors. Brazel and Agoglia (2007) find that auditors' AIS knowledge affect their testing decisions.[18] Bierstaker and Thibodeau (2006) find that audit experience enhances the auditors' ability to identify internal control weaknesses when internal control questionnaires are used. This result complements the Bryant et al. (2009) finding that cognitive style feedback (auditor attribute) improves novice auditors' ability to complete internal control tasks. Specifically, as auditors gain experience they receive more outcome feedback from their superiors and from the results of the tests that they perform, and this feedback improves their performance on ICOFR testing tasks.

Effect of Client Attributes

Janvrin et al. (2009) find that CAS are used approximately 45% of the time on audits where control risk is assessed below maximum. They also find a higher propensity for auditors to

[17] Specifically, if the client's controls over program changes and access to programs are effective and the auditor ascertains the application control has not changed from the last time it was tested, the auditor can conclude the automated control is effective without repeating the prior year's testing.

[18] Scope encompassed staffing as well as the nature, extent, and timing of audit procedures. The authors measure nature and staffing as the total number of procedures planned and the number of procedures assigned to a more senior-level auditor than a staff assistant. The timing and extent were computed as the total number of testing hours budgeted at fiscal year-end (versus interim) and the total number of budgeted hours.

use CAAT when a controls-reliance strategy is adopted.[19] Similarly, analytical modeling shows that ICOFR testing is a valuable tool for the auditor when control strength is informative about the likelihood of fraud (Patterson and Smith 2007).

Archival research also provides indirect evidence of the effect of the client's attributes on testing. For instance, Hoitash et al. (2008) find a strong association between audit fees and ICOFR problems disclosed in the first year of the implementation of Section 404. Further, audit pricing for companies with ICOFR problems varies by problem severity, and companies disclosing ICOFR problems under Section 302 continue to pay higher fees the following year, even if no problems are disclosed under Section 404. Similarly, Ettredge et al. (2006) find that the presence, type and severity of ICOFR material weakness are associated with longer delays in regulatory filings. These results are consistent with the theory that auditors do more testing when the client has ICOFR problems and pass on these costs to the clients. That is, ICOFR problems are priced.

Effect of Task Attributes

Bierstaker and Thibodeau (2006) find that auditors who complete ICOFR questionnaires identify more internal control weaknesses than auditors who make narrative documentation.[20] Bryant et al. (2009) find that outcome feedback improves novice auditors' ability to complete ICOFR tasks. Specifically, auditors' ICOFR performance increases as they obtain more outcome feedback from their superiors and from the results of testing.

[19] A reliance strategy refers to an audit approach where the auditor plans to rely on the entity's controls to gather audit evidence, in order to reduce the nature, timing, and extent of substantive audit procedures. When a reliance strategy is followed, the auditor should obtain a more detailed understanding of internal controls to develop a preliminary or "planned" assessment of control risk.

[20] This is an interesting finding because a Pre-SOX study found that auditors have decreased their use of internal control questionnaires and flowcharts in favor of narratives (Bierstaker and Wright 2004).

Summary and Future Research

Testing the operating effectiveness of ICOFR plays an important role in identifying ICOFR deficiencies and material weaknesses (Hammersley et al. 2008; Patterson and Smith 2007). Research to date has examined the effect of auditor attributes (experience and competence), client attributes (ICOFR quality), and task attributes (type of documentation and outcome feedback) on testing. On the other hand, there is no research that examines the effect of auditor-client interaction and environmental attributes on testing.

With respect to environmental attributes, future research could examine how SOX and the anticipation of the PCOAB's inspection program affect testing and documentation. In particular, what testing changes are implemented in response to PCAOB negative findings? PCAOB inspections found that some auditors identified ELCs that appeared to be designed to operate with a high degree of precision, but failed to obtain sufficient audit evidence of their operating effectiveness (PCAOB 2009). This raises the question of how auditors design testing plans to test ELCs that are not easily tested by attribute sampling methods (e.g., management philosophy and operating style).

Our synthesis indicates that little is known about the type of procedures auditors perform when testing ICOFR. Future research could examine whether some types of tests are more effective than others in helping auditors to identify design and operating deficiencies. Field research could examine the nature and type of association between specific client attributes (e.g. auditor-client tenure, industry, planned budget, etc.) and the nature, extent, and timing of audit procedures performed to test the client's ICOFR. Do auditors manage audit effectiveness and efficiency appropriately by selecting more rigorous tests of account-specific controls (such as re-

performance) when ELCs are assessed as weaker, and opt for less rigorous tests when ELCs are assessed as stronger?

Anecdotal evidence suggests that auditors fail to evaluate the implications that ICOFR deficiencies have for performing substantive testing and vice versa (PCAOB 2005, p. 8) . To our knowledge there has been no research on how auditors incorporate the results of substantive testing and ICOFR evidence from prior years (benchmarking) when testing their client's ICOFR. What attributes enhance or detract from effective integration?

The effects of auditors' incentives (e.g. client loss risk or litigation risk) and pressures (e.g., deadlines) can potentially affect testing strategies. For instance, is there a difference in how auditors resolve internal control testing exceptions based on the stage of the audit (see e.g., Bennett (2012)). The extent of roll-forward procedures depends on several factors including the results of preliminary testing, the length of the roll-forward period, and the possibility that significant changes to controls have occurred during the roll-forward period. Little is known about roll-forward testing practices and their effectiveness.

EVALUATION

As shown in Figure 1, the evaluation of deficiencies involves three key tasks. First, the auditor evaluates the severity of each identified control deficiency to determine whether the deficiency, individually or in combination, represents a material weakness (PCAOB 2007, ¶62). Second, the auditor evaluates the mitigating effects of identified compensating controls (PCAOB 2007, ¶68). Third, the auditor determines whether the deficiency, or combination of deficiencies, might prevent prudent officials in the conduct of their own affairs from concluding that they have reasonable assurance transactions are recorded as necessary to permit the preparation of financial statements in conformity with generally accepted accounting principles (i.e., the "Prudent Official

Test") (PCAOB 2007, ¶70). In addition, the auditor should determine the effect of the deficiency on the nature, timing, and extent of substantive procedures (PCAOB 2007, B6). We discuss performance determinants of the first two tasks and the consideration of the effects of control deficiencies on substantive testing. We found no research on the Prudent Official Test but discuss some potential research ideas.

Severity Assessment

According to AS 5, the severity of a deficiency depends on (1) "whether there is a reasonable possibility the company's controls will fail to prevent or detect a misstatement of an account balance or disclosure;"[21] and (2) "the magnitude of the potential misstatement resulting from the deficiency or deficiencies" (PCAOB 2007, ¶63).

Effect of Auditor Attributes

Kaplan et al. (2008) report that less experienced auditors are more likely to be persuaded by a favorable control assessment made by management. This suggests that auditors gain persuasion knowledge with experience that makes their severity assessments more resistant to management's persuasion attempts. Bedard and Graham (2011) report that auditors assess deficiencies more severely than management, although they do not provide evidence on which auditor attribute drives this result.

Effect of Client Attributes

Bedard and Graham (2011) report that management is less likely to identify pervasive control issues and often underestimates the severity of identified control deficiencies. However, internal auditors might curtail management's propensity to underestimate the severity of

[21] There is a reasonable possibility of an event when the likelihood of the event is either "reasonably possible" or "probable," as defined in Financial Accounting Standards Board Statement No. 5, *Accounting for Contingencies* ("FAS 5").

deficiencies (Stefaniak et al. 2012). According to paragraph 64 of AS 5, “the severity of a deficiency does not depend on whether a misstatement actually has occurred but rather on whether there is a reasonable possibility that the company's controls will fail to prevent or detect a misstatement” (PCAOB 2007). PCAOB inspectors report instances where “auditors inappropriately based their conclusions about the severity of control deficiencies solely on the materiality of the identified errors in the financial statements” (PCAOB 2009). Three studies have examined the effect of client’s misstatements on auditors’ severity assessments.

Based on interviews with audit partners, Kinney et al. (2008) report that auditors find identification of ICOFR design problems to be a difficult task when no misstatements have been detected. Analysis of proprietary data shows that auditors judge greater severity when a misstatement has occurred, which appears consistent with the findings from PCAOB inspections (Bedard and Graham 2011). Kinney and Shepardson (2011) show that reported material weaknesses in annual reports are often associated with misstatements. Focusing upon small U.S. public companies, they show that, even without public reports on ICOFR, analysis of the cause of known accounting misstatements yields substantial insights about material weakness in ICOFR. Their results suggest that for small firms, management internal control reports and traditional financial audits may be a cost effective alternative to external auditor attestation on ICOFR. However, Bedard and Graham (2011) show that only a small percentage of all deficiencies and material weaknesses would be identified if misstatements were the only indicator of control deficiencies.

Asare et al. (2011) find that auditors judge account specific and ELC deficiencies more severely (i.e., higher likelihood of leading to material misstatements) when immaterial misstatements have been detected and corrected than when no misstatements are present. They

also show that differences in auditors' likelihood and magnitude assessments lead to different deficiency classifications (i.e., material weakness versus significant deficiency). Asare et al. (2011) suggest that auditors have difficulties imagining how a misstatement could occur when a deficiency has not led to any misstatements. Thus, auditors might underestimate the severity of a control deficiency that is yet to lead to a misstatement, which is a problem when the occurrence of misstatements lags the control deficiency.

Bedard and Graham (2011) also examine the effect of several client attributes on auditors' evaluation of deficiencies. They report that higher severity assessments are associated with greater knowledge and independence in the client's assessment, ICOFR design ineffectiveness, certain types of entity level deficiencies (e.g., control environment), and certain types of account specific deficiencies (e.g., revenue and tax). They conclude that auditors judge greater severity when a misstatement has already occurred. In the absence of a misstatement, severity is contingent on client and deficiency characteristics.

Effect of Auditor and Client Interactions

Because management is often the "first-mover" and tends to underestimate the severity of deficiencies, it raises the important question of whether and how management's persuasion tactics affect auditors (Wolfe et al. 2009). Is professional skepticism enough to withstand management persuasion tactics? An archival study and two experimental studies have addressed this issue. Bedard and Graham (2011) find that management under-assesses the severity of identified deficiencies. However, they also report that auditors frequently override management's severity classifications, suggesting that auditors, under some conditions, resist management assessments.

Wolfe et al. (2009) evaluate two types of persuasion tactics: concessions that admit a

control deficiency occurred and denials that argue against the presence of a control deficiency. For IT control deviations, Wolfe et al. (2009) find that auditors assess the significance of a deficiency lower and the perceived adequacy of management's explanation higher for concessions than for denials. For manual control deviations they find no differences between concessions and denials. Thus, the results provide evidence of a systematic bias in auditor judgment because the technology element present in an IT control deviation reduces perceived management blame for the deviation, even though the technology element is irrelevant to assessing the significance of a deficiency.

Effect of Task Attributes

Wolfe and Mauldin (2011) examine the effect of the root cause of a control deviation on auditors' evaluation of the severity of the deficiency. They characterize a management-driven control deviation as either a promise or a competence violation. In a promise violation, management promises the auditor he will perform the control procedure but fails to do so. In a competence violation, management's failure to apply the control procedure is due to a misunderstanding of how the control works. In an experimental setting, Wolfe and Mauldin (2011) find that auditors assess the control deficiency resulting from a promise violation about twice as severe as that from a competence violation, unless the manager offers to perform a non-substantive penance (agreeing to re-perform the control on all open transactions). A manager's offer of penance increases auditor trust in next period's controls and client-prepared documents, regardless of violation type. These findings begin to explain auditor under-and-over reliance on ELCs, such as management integrity, observed in the PCAOB audit inspections.

Compensating Controls

The need to evaluate compensating controls arises when auditors identify design or operating deficiencies in ICOFR that could represent a material weakness. To have a mitigating effect, the compensating control should operate at a level of precision that would prevent or detect a misstatement that could be material (PCAOB 2007, ¶68; SEC 2007 footnote 49). Accordingly, a properly designed and operating compensating control can enable the auditor to classify what would otherwise be considered a material weakness as a less severe significant deficiency (Gramling et al. 2010). The only study that has examined compensating controls evaluated the effect of auditor (knowledge) and client (inherent risk) attributes.

The Effect of Auditor and Client Interactions

Gramling et al. (2010) argue that information about a client's inherent risk and an auditor's knowledge of the presence of a material weakness, which is unrelated to the compensating control, can increase the required precision and testing of compensating controls. In effect, they suggest client risk and auditor knowledge can have a halo effect, which could dampen the effect of compensating controls. In an experiment, Gramling et al. (2010) find that the existence of an unrelated material weakness resulted in audit partners requiring more precision in the design and testing of compensating controls to deem it as sufficiently mitigating the control risk. However, knowledge of the overall inherent risk did not influence partners' judgments about the compensating control.

The Impact of Substantive Testing

The auditor should determine the effect of any identified on the nature, timing, and extent of substantive procedures to be performed to reduce audit risk in the audit of the financial statements to an appropriately low level (PCAOB 2007). Two studies have examined the effect

of task attributes (controls over estimates and fraud controls) on auditors' effectiveness at linking control deficiencies to substantive testing.

The Effect of Task Attributes

Wolfe and Diaz (2009) find that partners and managers under-adjust substantive tests for design deficiencies and seniors have difficulty determining the appropriate risk and substantive tests to adjust. Hammersley et al. (2011) find that auditors do not adjust substantive plans effectively to address known fraud-related material weakness. Similarly, Mauldin and Wolfe (2012) find that auditors have difficulty determining substantive tests to address estimates-related control deficiencies.

Summary and Future Research

Extant research provides systematic evidence that auditors' severity assessments are unduly influenced by the absence of a misstatement. Future research should consider mechanisms that can help auditors "imagine what could go wrong where nothing wrong has happened" (Asare et al. 2011). Examples of such mechanisms include restructuring the task (e.g., documentation, decomposition of the task, or requirements to list what could go wrong). Research also shows management's ability to persuade auditors with their severity assessment is contingent on the task properties and auditor attributes, although there is no unifying theory of how to curb the harmful effect of overreliance. Future research could develop and test a framework of how auditors cope with management persuasions in ICOFR evaluations. Such a framework should identify task, auditor, and environment attributes that can hinder or enhance auditors' ability to cope with persuasion.

The PCAOB specifically sought research on auditors' evaluation of the impact of compensating controls on determining whether a control deficiency of combination of

deficiencies is a material weakness. Future research should examine the conditions under which compensating controls are used and abused. For instance, under what conditions do auditors identify, test, and accept compensating controls that are not sufficiently precise, or do not operate effectively, to mitigate the risks associated with identified deficiencies?

Anecdotal evidence from PCAOB inspections also provides several avenues for future research. For instance, why do some auditors fail to consider relevant risk factors when evaluating the severity of identified control deficiencies (PCAOB 2009)? How effective are auditors in considering and evaluating control deficiencies identified through using the work of others (see PCAOB 2009)?

We did not identify any research that examines how auditors aggregate deficiencies occurring at different locations, in different processes, or in different components of the COSO framework. This appears to be an important and complex task to be addressed in future research. There is limited evidence on how auditors assess the likelihood and magnitude of potential misstatements from identified control deficiencies. The standard provides several examples of factors that affect both the likelihood and magnitude of misstatements.[22] Thus, future research should explore how these factors affect the two thresholds as well as how auditors assess the thresholds (see e.g., Asare and Wright (2012)). Prior research concludes labels can systematically affect judgments in ways not explained by economic analysis (Koonce et al.

[22] Risk factors that affect whether there is a reasonable possibility that a deficiency, or a combination of deficiencies, will result in a misstatement of an account balance or disclosure include, but are not limited to, the following: the nature of the financial statement accounts, disclosures, and assertions involved; the susceptibility of the related assets or liabilities to loss or fraud; the subjectivity, complexity, or extent of judgment required to determine the amount involved; the interaction or relationship of the control with other controls, including whether they are interdependent or redundant; the interaction of multiple deficiencies; and the possible future consequences of the deficiency. Factors that affect the magnitude of the misstatement that might result from a deficiency, or deficiencies, include, but are not limited to, the following: the financial statement amounts or total value of transactions exposed to the deficiency and the volume of activity in the account balance or class of transactions exposed to the deficiency that has occurred in the current period or that is expected in future periods.

2005). There are several labels that are used in the integrated audit. AS 5 warns that such labels should not affect the evaluation of deficiencies. Descriptively, however, how does the labeling of a control (e.g., entity-level, preventive, detective, etc.) influence the evaluation of a related control deficiency? Asare et al. (2011) find the type of control deficiency does not affect the evaluation of the severity of a deficiency. However, their study did not focus on labeling. Moreover, Asare et al. (2011) studied an account-specific control and a precise ELC, leaving open the possibility that their findings do not generalize to imprecise ELCs (such as control environment).

There is no research on whether and how the Prudent Official Test is applied in practice. Possible research issues include who is the prudent official (a regulator, another auditor, or management) as well as whether the consideration of the prudent official is effective in curbing overreliance on management's severity assessment.

In performing an integrated audit, auditors should determine the effect of any control deficiencies on the nature, extent, and timing of substantive testing. Extant research shows that auditors have difficulties integrating results from the ICOFR audit and the financial statement audit. Research that explores the source of this difficulty will be useful to determining interventions that can lead to effective integration.

REPORTING

As shown in Figure 1, the auditor must issue an unqualified report (i.e. there is no material weakness in the ICOFR), adverse report (i.e., at least one material weakness exist in the ICOFR), or a disclaimer (a restriction on the scope of the engagement) on the client's ICOFR (PCAOB 2007, ¶90). This decision is likely made by the partner and is affected by the cumulative work in the various phases as well as partner-specific attributes.

Effect of Client Attributes

Research to date has employed archival data to draw inferences about client attributes associated with different types of reports. These studies provide indirect evidence that auditors consider these attributes. The common themes from these archival studies are that smaller companies as well as companies with higher business risk[23] are more likely to have a material weakness in their ICOFR (Ashbaugh-Skaife et al. 2007; Doyle et al. 2007; Stanton et al. 2005; Ogneva et al. 2007).[24]

Compared to companies with entity-level material weaknesses, companies with account-specific weaknesses are larger, financially healthier, more diverse in business operations, and have higher growth (Doyle et al. 2007). Doyle et al. (2007) conclude that complex operating environments promote account-specific control deficiencies, whereas a lack of staffing and expertise promote entity-level material weaknesses.

Corporate governance also appears to influence the incidence of material weaknesses. Audit committee financial expertise reduces the likelihood of a material weakness in the ICOFR (Hoitash et al. 2009; Krishnan and Visvanathan 2007; Zhang et al. 2007). Similarly, the presence of former audit partners on the audit committee reduces the likelihood of material weaknesses (Naiker and Sharma 2009), and a more qualified chief financial officer reduces the likelihood of material weaknesses (Li et al. 2010). Financial expertise effects are negated, however, when the chief executive officer (CEO) is involved in corporate board selection (Carcello et al. 2011).

[23] Higher business risk is characterized by more and dispersed business segments, high revenue growth, operating losses, high inventory levels, restatements, foreign transactions, and restructurings.

[24] Ashbaugh-Skaife et al. (2007) include deficiencies other than material weaknesses, but their results are similar to others who only study material weaknesses.

Carcello et al. (2011) conclude that CEO board selection involvement diminishes or eliminates the benefits of independent and financial expert audit committees.

Summary and Future Research

While reporting research has focused on client attributes, there is limited research on how auditor, auditor-client interactions, and environmental attributes affect auditors' ICOFR reporting decisions. Thus, future research could consider auditor, client, task, and environmental attributes that have the potential to create bias in the reporting process. Further, while archival research provides indirect evidence of factors considered by auditors in the reporting decisions, they do not provide sufficient insights into auditors' decision process. Thus, experimental studies are needed to complement the archival findings.

CONCLUSION

At the request of the PCAOB, considering the importance of taking stock of the bourgeoning literature on auditors ICOFR decisions, and to provide a roadmap for future research, we have synthesized research on the auditor's assessment of ICOFR. Our synthesis contributes to the accounting literature in five ways. First, we provide an ICOFR task taxonomy. This provides a platform to classify current and future studies. Second, we provide a model of the determinants of performance in each phase of the taxonomy. Third, we highlight findings related to the PCAOB's stated interest in the auditor's testing of entity level controls, multi-location scoping, and the effect of compensating controls on the evaluation of identified control deficiencies. Fourth, we provide several anecdotal problems from PCAOB inspections to highlight areas of research that are likely to affect regulations. Fifth, we provide a comprehensive synthesis of the literature on audit decision-making as required by the Sarbanes-Oxley Act of 2002. Our findings, therefore, provide insights for standard setters, practitioners, and academics.

An important theme that is immediately discernible from our synthesis is the paucity of research on the issues that are of importance to the PCAOB. The issues of data and participants' accessibility appear to be the bottleneck and have been previously highlighted (Allen et al. 2006). Another theme that is important is the absence of conceptual models for the ICOFR task, which may account for some the difficulties auditors have in scoping and testing. Additional guidance is also needed on the assessment of risk and materiality for multi-location audits. By providing practitioners with theoretical frameworks for ICOFR risk assessment and multi-location scoping, the PCAOB can proactively address some of the concerns noted in their inspection reports.

Consistent with the regulation's intent, external auditor attestation appears to strengthen a company's ICOFR environment. Further, there is evidence that auditors have adjusted their methodology to apply the top-down risk-based approach emphasized in AS 5, with an attendant decrease in cost to companies.

Research suggests that auditors have difficulties assessing risk in complex accounting systems and might be overconfident in their risk assessments. Behavioral research has also shown that the right form of documentation can improve auditor judgment, though too much reliance on company-prepared documentation reduces the auditor's ability to identify weaknesses in a company's ICOFR. Despite the profession's increased usage of narrative documentation, experimental results suggest auditors are better able to identify missing controls through the use of flowcharts and internal control questionnaires. These findings suggest practitioners can improve the quality of their audits by choosing the appropriate form of documentation. Also of interest to practitioners, several archival studies have identified

characteristics of companies more likely to report material weaknesses. These studies highlight the importance of strong corporate governance structures.

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Figure 1: A Framework for Analyzing Auditors' Internal Control Over Financial Reporting Decisions