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journal homepage: [www.elsevier.com/locate/jae](http://www.elsevier.com/locate/jae)A review of archival auditing research<sup>☆</sup>Mark DeFond<sup>a,\*</sup>, Jieying Zhang<sup>b</sup><sup>a</sup> University of Southern California, USA<sup>b</sup> University of Texas, Dallas, USA

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## ABSTRACT

We define higher audit quality as greater assurance of high financial reporting quality. Researchers use many proxies for audit quality, with little guidance on choosing among them. We provide a framework for systematically evaluating their unique strengths and weaknesses. Because it is inextricably intertwined with financial reporting quality, audit quality also depends on firms' innate characteristics and financial reporting systems. Our review of the models commonly used to disentangle these constructs suggests the need for better conceptual guidance. Finally, we urge more research on the role of auditor and client competency in driving audit quality.

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## 1. Introduction

Auditing is valued for its ability to provide independent assurance of the credibility of accounting information, which improves resource allocation and contracting efficiency. The growing complexity of business transactions and accounting standards increases auditing's potential to add value. In recent years, changes of unprecedented magnitude have fundamentally altered the audit market landscape for both auditors and their clients. For the first time in history the public accounting profession in the US is under direct government regulation. The result is a sea change in the supply and demand dynamics of the audit markets, and a surge in research that seeks to better understand the drivers of audit quality. The purpose of our review is to summarize and critique the recent auditing research, and to provide direction for future research.

The archival auditing research empirically addresses auditing-related questions, predominantly using economics-based methods of inquiry and analysis. We limit our review to this literature because it is a burgeoning line of research and because we are constrained by our expertise. We do not systematically review the auditing research that draws its inferences from experiments, surveys, or theory. Our goal is to identify the fundamental questions being addressed, what we have learned, inherent problems with the literature, and what needs to be learned going forward. Our target audience is accounting researchers and Ph.D. students

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with a general interest in understanding the auditing literature, and auditing researchers interested in an economics-based review of the archival literature. Consequently, we limit the scope of our review primarily to studies published in the major general interest accounting journals. We also restrict our review primarily to studies that are published from 1996 through mid 2013 in order to focus on recent developments in the literature.<sup>1</sup>

We organize our review around an economics-based framework that examines the supply and demand forces that shape the audit market. A dominant feature of the literature we review is its primary focus on audit quality. As a result, we structure our discussion around the following four questions: (1) What is audit quality? (2) What drives client demand for audit quality? (3) What drives auditor supply of audit quality? and (4) What are the regulators' concerns about audit quality? We characterize the demand for audit quality as a function of client incentives and competencies, and the supply of audit quality as a function of auditor incentives and competencies. We separately examine regulators' concerns because of the profound nature of the recent regulatory changes in the US audit markets and the large volume of research motivated by these changes.<sup>2</sup> Table 1 provides an outline of our review.<sup>3</sup>

Our first set of observations comes from considering the question “What is audit quality?” We observe that most of the commonly used definitions of audit quality portray auditing as a binary process, whereby auditors either succeed or fail in detecting GAAP violations. In contrast, we argue that auditors' responsibilities extend well beyond the simple detection of “black and white” GAAP violations, to providing assurance of financial reporting quality. This responsibility arises from professional auditing standards that require auditors to consider “the quality, not just the acceptability” of the client's financial reporting (SAS 90). It is further reflected in the audit opinion, which provides assurance that the “financial statements are fairly presented in accordance with GAAP,” since fair presentation requires faithful representation of the firm's underlying economics (FASB, 1980, SFAC No. 2). The auditor's broad charge to consider financial reporting quality is also consistent with court rulings that hold auditors liable for misleading financial statements even when those statements strictly comply with GAAP. Collectively, these arguments suggest that audit quality is a continuous construct that assures financial reporting quality, with high quality auditing providing greater assurance of high quality financial reporting.

Audit quality improves financial reporting quality by increasing the credibility of the financial reports. Thus, audit quality is a component of financial reporting quality. While difficult to define, financial reporting quality is also determined by the firm's financial reporting system, which maps its underlying economics into the financial reports; and the firm's innate characteristics, which determine its underlying economics. Together, the firm's financial reporting system and innate characteristics affect the quality of the pre-audited financial statements, which constrain the achievable level of financial reporting quality. Accordingly, we define higher audit quality as “greater assurance that the financial statements faithfully reflect the firm's underlying economics, conditioned on its financial reporting system and innate characteristics.”

We also observe that while the literature uses a large number of proxies to measure audit quality, there is no consensus on which measures are best, and little guidance on how to evaluate them. To address this issue, we draw on the perspective we gain from our review to provide a framework for choosing among and interpreting the commonly used proxies. We first note that the proxies fall into two inherently different groups; outputs of the audit process, such as auditors' going-concern (GC) opinions, and inputs to the audit process, such as auditor size. We further classify the output-based measures into four categories – material misstatements, auditor communication, financial reporting quality, and perceptions; and the input-based measures into two categories – auditor characteristics and auditor–client contracting features (such as audit fees). We then identify several dimensions that characterize each category's unique strengths and weaknesses. One dimension is how directly the auditor influences the proxies in each category. Material misstatements, for example, are directly under the auditor's influence, while perception-based measures, such as the cost of capital, are a longer walk. Another dimension is whether the proxies capture relatively more egregious audit failures, such as material misstatements, or relatively less egregious earnings management, such as measured by high discretionary accruals (DAC). Yet another dimension is whether the proxies capture actual or perceived audit quality, where proxies such as earnings response coefficients (ERCs) capture perceived quality, and measures such as restatements capture actual quality. Finally, we evaluate the proxies based on measurement issues, such as whether measurement error is particularly problematic.

Based on our evaluation of these dimensions, we conclude that no single category paints a complete picture of audit quality. We therefore recommend that when possible, researchers use multiple proxies from different categories to take advantage of their strengths and attenuate their weaknesses.<sup>4</sup> However, because the proxies in each category reflect different dimensions of audit quality, we do not necessarily expect agreement across categories. For example, while a given threat to audit quality may lead to within-GAAP earnings management, as proxied by benchmark beating, it may not rise to

<sup>1</sup> We focus our review on the major studies that exemplify trends in the literature, and do not necessarily include every study published during this time period.

<sup>2</sup> While the literature focuses primarily on audit quality, it also examines the audit process and audit efficiency. Most of these studies, however, still have implications for audit quality. For reviews of the audit quality research from a different perspective than ours, see Francis (2004, 2011) and Knechel et al. (2013).

<sup>3</sup> We thank Donovan et al. (2014) for pointing out the inter-relatedness of our demand and supply factors. We classify papers based on demand and supply factors because it is a useful technique for grounding our review in a structured economic framework, and do not mean to oversimplify the complex interactive nature of audit markets.

<sup>4</sup> We emphasize, however, that we do not recommend triangulating across all proxies, because it is neither practical nor desirable. Rather, we suggest comparing measures across the broad categories, which are few in number.

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the level of an egregious audit failure, as proxied by a restatement. Thus, we urge researchers to articulate the inferences that can and cannot be drawn from the proxies they employ, which is currently missing from much of the literature.

Because it is inextricably intertwined with financial reporting quality, audit quality also depends on firms' innate characteristics and financial reporting systems. Therefore, it is critically important for empirical models of audit quality to disentangle these constructs. The existing models have evolved empirically in the absence of strong theoretical guidance, and are unlikely to fully control for firms' innate characteristics and financial reporting systems. This suggests that the treatment effects identified in some of the existing models may be attributable to these underlying constructs. Going forward, future research would benefit from more theoretical guidance on disentangling the complex relation between audit quality and financial reporting quality.

Our second set of observations is based on our review of the literature that examines the client's demand for audit quality. We begin by examining studies that address a fundamental question that precedes virtually all other research in this review: does auditing add value? This literature finds for example, that clients who voluntarily choose to be audited reduce their cost of capital, consistent with auditing reducing information risk.<sup>5</sup> Also, GC opinions and auditor changes inform stock prices. However, given the strong priors, it is not surprising that financial statement audits add value, and thus it is unlikely

<sup>5</sup> Donovan et al. (2014) conclude that analysts are uninterested in audit quality variation, based on evidence from a search of the term "audit" in conference calls and analyst reports. We believe their analysis is too limited to draw such a strong conclusion, and that it omits compelling evidence to the contrary. For example, the Institute of Certified Financial Analysts (ICFA), representing over 10,000 professionals, has filed comment letters that strongly support the PCAOB's proposal to increase disclosure by auditors (<http://pcaobus.org/Rules/Rulemaking/Docket034/143.pdf>). Further, an ICFA survey of its members finds that "72 percent of respondents said the auditor's report is important to their analysis and use of financial reports in the investment decision making process" and "72 percent would like to see information on circumstances or relationships that might bear on the auditor's independence" ([http://www.cfainstitute.org/Survey/independent\\_auditors\\_report\\_survey\\_results.pdf](http://www.cfainstitute.org/Survey/independent_auditors_report_survey_results.pdf)). Collectively, we believe this evidence is consistent with analysts having an interest in audit quality variation.

that future research will make significant new discoveries without venturing into new territory. Going forward, assurance services are rapidly expanding beyond traditional financial statement audits, as evidenced by the recent growth in voluntary “sustainability” audits. This raises many unanswered questions, such as whether assurance of non-financial information adds value, whether auditors’ incentives and competencies transfer to non-financial settings, and what audit quality means in these settings. Also, a recently proposed US auditing standard requires auditors to discuss “critical audit matters” and disclose information on auditor tenure and independence, and international standard setters are considering similar innovations. Expanding beyond the current boilerplate audit opinion will doubtlessly open up new avenues for further research.

We next examine studies exploring the client’s demand for audit quality. Theory suggests that agency costs drive this demand, and while measuring agency costs is challenging, researchers identify innovative settings to test this theory. While this literature generally finds support, it is relatively small. We posit that the demand for audit quality is also a function of client competency, which refers to the client’s ability to achieve its desired level of audit quality. Motivated by the significant demand-side changes imposed by SOX, research on client competency is one of the fastest growing areas we review. This research finds strong evidence that independent and expert audit committees choose higher quality audit inputs, such as hiring industry specialist auditors; and achieve higher quality audit outcomes, such as fewer restatements and lower DAC. However, the literature that narrowly focuses on SOX-related competencies is fairly saturated. To make further progress, researchers need to explore what audit committees actually do. For example, we know nothing about how committees affect pre-audited financial statement quality, or how they interact with external auditors. We also know little about other client competencies. For example, research on the internal audit function (IAF) is still in its infancy. Interesting questions include whether IAF substitutes or complements the external audit function, and whether outsourcing IAF impairs or improves audit quality. Given the increased interest in demand-side factors, and the limited evidence, we call for more research on how clients’ competencies help fulfill their demand for audit quality.

Our third set of observations is based on our review of the literature that investigates the auditor’s supply of audit quality. Theory suggests that the supply of audit quality is a function of the auditor’s independence and competency, where independence arises from reputation and litigation incentives, and competency refers to the ability to deliver high audit quality. This research finds that damaged reputation from extreme audit failures reduces client market value and the auditor’s ability to retain clients. However, this research is based exclusively on rare events and does not link reputation to actual audit quality. In addition, the US evidence is confounded by litigation risk. Thus, despite strong priors, it is unsettled whether reputation concerns improve audit quality, especially in the US. The research on auditor litigation finds strong evidence that auditors engage in a variety of strategies to mitigate litigation risk, such as charging higher fees, increasing GC opinions, reducing DAC, shedding riskier clients, and lobbying for litigation relief. We observe, however, that clear evidence on whether these strategies translate into improved audit quality is elusive. For example, while a large array of risk factors are priced in audit fees, most studies are unable to distinguish whether higher fees are due to more audit effort (consistent with higher audit quality), or simply a risk premium (which is a deadweight loss). Similarly, while increased GCs and reduced DAC are consistent with higher audit quality, they are also consistent with excessively conservative auditors seeking to avoid litigation, which impairs audit quality. Thus, given the strong theoretical prediction that reputation and litigation risk improves audit quality, we are surprised that the evidence is not more conclusive. Going forward, a potentially fruitful area is to more firmly establish whether reputation and litigation risk actually translates into higher audit quality.

Auditor size, as captured by Big N membership, is often argued to capture stronger auditor incentives, because reputation costs increase with size, and because larger auditors’ “deep pockets” make them a target for litigation. Big N research is one of the most thoroughly researched areas in the literature, and provides a mountain of evidence that Big N auditors deliver higher quality as captured by a long list of proxies that span multiple categories of audit quality. Thus, the Big N literature is fairly mature. Going forward, however, more evidence is required to resolve the unsettled question of whether Big N quality differentiation is actually driven by self-selection. We also encourage future researchers to focus less on *whether* Big N improves audit quality, and more on *why*. In particular, in addition to stronger incentives, Big N auditors also have greater competency in delivering high audit quality, due to advantages such as their ability to attract higher quality inputs. Current research, however, does little to disentangle the effects of incentives from the effects of competency. We therefore encourage more research that investigates the effects of Big N competencies on audit quality.

While more limited than the research on auditor incentives, research on auditor competencies finds that they improve audit quality, particularly industry specialization and Big N office size. However, auditor competency encompasses many other dimensions, which are currently under-researched. Going forward, we encourage more research on these other dimensions, such as the traits of individual auditors, audit firm ownership structure, audit quality control systems, and compensation schemes. We also believe it is valuable to study what auditors actually do by examining features of the audit process, such as professional skepticism. While field studies, surveys, and experiments have comparative advantages in audit process research, we encourage archival researchers to use creative settings and research designs to open up the “black box.” Overall, we call for more research on the role of auditors’ competencies in driving audit quality.

Our fourth set of observations comes from our review of the research that explores regulators’ concerns about audit quality, an area that has mushroomed in recent years and represents the single largest area we review. Most of this literature is motivated by the passage of SOX.<sup>6</sup> Studies that examine the overall effects of SOX find ambiguous results. This is probably

<sup>6</sup> Similar legislation, such as IFIAR and CLERP9, motivated international auditing research.

not surprising given the number of levers SOX pulls, and the difficulty in predicting how each lever may affect audit quality. Studies examining individual SOX provisions, however, are more definitive but also more nuanced. These studies find that regulatory intervention may improve audit quality, but only in limited settings, and that in some settings it may impair quality. For example, audit committee provisions increase audit quality, and adverse Section 404 audit opinions trigger subsequent improvements in monitoring. However, banning non-audit services (NAS) does not seem to affect audit quality, and tax-related NAS actually improves it. In addition, studies examining potential threats to auditor independence find little evidence that they impair audit quality. For example, long auditor-tenure and larger clients actually improve audit quality, contrary to regulators' long-held concerns. We observe that threats to audit quality typically present a tradeoff between auditor independence and competency. For example, while long tenure breeds familiarity that threatens auditor independence, it also increases client-specific knowledge. Thus, finding that these threats do not impair audit quality, and even improve it in some cases, is consistent with auditor competencies playing an important role in explaining audit quality.

We conclude that it is premature to draw definitive conclusions from the SOX literature. Much of this research is conducted during a relatively turbulent period when SOX is newly implemented, while the effects of SOX may be realized slowly over time. It is also difficult to evaluate the net benefits of regulatory change, because it is difficult to gauge the related costs. Therefore, the social welfare implications are unclear. In addition, regulatory intervention, such as PCAOB inspections, exacerbates the auditor's exposure to litigation and reputation risk by providing additional opportunities for auditor litigation and increasing reputation losses. Thus, a major challenge is disentangling regulatory intervention from litigation and reputation risk.

Going forward, significant changes in the auditing environment highlight the importance of research aimed at better understanding the effects of regulatory intervention.<sup>7</sup> Prior to SOX, regulatory intervention was infrequent and incremental, and typically resulted in new rules that focused on increasing the auditor's supply of audit quality. Post-SOX, the PCAOB's routine inspections make regulatory intervention frequent and direct, and SOX includes changes designed to increase not only the auditor's supply of audit quality but also the client's demand for audit quality. This shift represents a fundamental change in the risk dynamics of US audit markets and suggests regulatory intervention is likely to play a large role in shaping audit quality in the future. One barrier to understanding the effects of regulation is the lack of research on the regulatory process. A fundamental unanswered question is whether the benefits of regulation outweigh its costs. If it does, the next question is which regulatory regime is best. For example, an alternative to the current US model is following an "IRS" model whereby regulators actually perform the audit (PCAOB, 2007). However, while such a model may strengthen independence, it may also weaken competency. Another alternative is an insurance model, whereby auditing firms explicitly reimburse investor losses. The costs and benefits of these models are currently unexplored.<sup>8</sup>

Our review makes several contributions. First, we define higher audit quality as greater assurance of high financial reporting quality. This definition reflects the continuous nature of audit quality, encompasses the auditor's broad responsibilities, and explicitly acknowledges audit quality as a component of financial reporting quality. While these features are implicitly assumed in many audit quality proxies, they are missing from existing definitions, creating a mismatch between the theoretical construct of audit quality and its empirical proxies. Second, we provide a framework for systematically choosing among the commonly used audit quality proxies, and for evaluating what we learn from their results. Existing research often lacks motivation for its proxy choices, and provides little discussion of the advantages and disadvantages of the chosen proxies. We also review the commonly used audit quality models and conclude that future research would benefit from more conceptual guidance in disentangling the complex relation between audit quality and financial reporting quality. Third, we observe that the literature traditionally focuses primarily on the auditor's supply of audit quality, with comparatively less attention to client demand-side factors. While SOX has shifted this focus to some degree, we encourage future researchers to continue expanding our knowledge of demand-side factors. Fourth, we note that prior research generally focuses on the incentives that drive audit quality, with less attention to competencies. Studies on client audit committee expertise and auditor industry specialization are the exception, and we urge future researchers to explore additional factors related to competency. Finally, we observe a dramatically heightened risk of regulatory intervention targeting both incentives and competencies of auditors to supply and clients to demand audit quality. Thus, future research that seeks to better understand the regulatory process is critical for understanding its effect on audit quality.

The remainder of this review is organized as follows: [Section 2](#) discusses the question "what is audit quality?" and [Section 3](#) reviews the research that addresses "what drives client demand for audit quality?" [Section 4](#) examines the literature that investigates "what drives auditor supply of audit quality?" and [Section 5](#) reviews the literature that examines "what are the regulators' concerns about audit quality?" We summarize and conclude in [Section 6](#).

<sup>7</sup> Donovan et al. (2014) suggest steering away from research motivated by regulation. The presence of regulation, however, is a defining feature of audit markets around the world, and the trend is toward more rather than less regulation (e.g., the elimination of self-regulation in the US and the establishment of the PCAOB). Since we do not foresee a realistic scenario whereby the audits of public companies are likely to be unregulated, we believe research on better understanding regulated audit markets is worthwhile.

<sup>8</sup> Donovan et al. (2014) call for research on whether regulated audit quality exceeds the level demanded by investors and clients. We agree and believe that studying the optimal level of regulation is inherently interesting. Their call, however, also begs the question of whether audit quality falls short of the amount demanded by investors and clients. Our credibility as researchers depends upon our taking an impartial approach in asking both questions. In this vein, we emphasize that our review is agnostic on the question of whether regulation in audit markets is optimal.

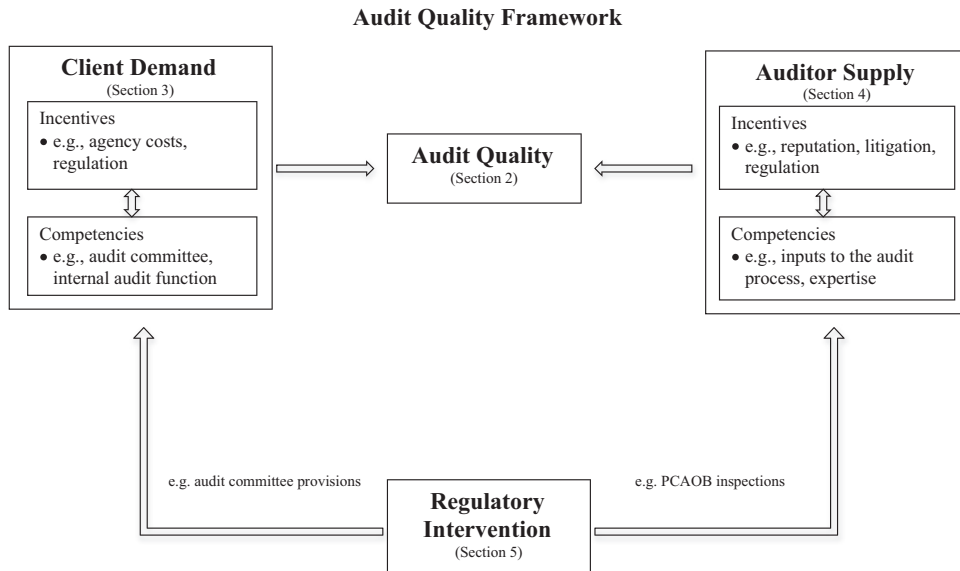


Fig. 1. Audit quality framework.

## 2. What is audit quality?

Audit quality, in one context or another, is the focus of the majority of the auditing research published over the past fifteen years. Its conceptual nature and relation to financial reporting quality, however, are not well understood. In addition, while the literature uses a large number of proxies to measure audit quality, there is no consensus on which measures are best, and little systematic direction on the desirability or comparability of one proxy versus another. Thus, we begin our review with a discussion of the conceptual nature and definition of audit quality, followed by a discussion of the relation between audit quality and financial reporting quality. We then present a framework for understanding and evaluating the audit quality proxies commonly used in the literature. Our goal is to better understand the nature of audit quality and its relation to financial reporting quality, and to provide guidance in choosing among the audit quality proxies and interpreting their results.

We view auditor-provided assurance services as an economic good (Simunic, 1980), and argue that audit quality is determined by both client demand and auditor supply, which depends upon the incentives and competencies of the client and auditor. The demand for audit quality arises from client incentives, as determined by factors such as agency costs and regulation; and the client competency in meeting this demand, as reflected in factors such as the audit committee and the internal audit function. The supply of audit quality is affected by auditor incentives for independence, as determined by factors such as reputation, litigation and regulatory concerns; and auditor competency in supplying audit quality, as reflected in factors such as expertise and engagement-level inputs to the audit process. Thus, variation across clients' and auditors' incentives and competencies lead to variation in audit quality. Importantly, regulatory intervention plays a critical role in shaping both the incentives and competencies that drive client demand and auditor supply of audit quality, and most of the research we review is motivated by regulatory concerns. Thus, we separately consider the effects of regulatory intervention on the demand and supply factors that affect audit quality. Fig. 1 summarizes our framework for viewing audit quality as a function of client demand and auditor supply, both of which are affected by regulatory intervention.

### 2.1. Defining audit quality

Most studies define audit quality as some variation of “the market-assessed joint probability that a given auditor will both detect a breach in the client's accounting system, and report the breach” (e.g., DeAngelo, 1981). While this definition motivates a large body of research, it portrays auditing as a binary process, with the auditor's role reduced to the simple detection and reporting of “black and white” GAAP violations. While there is no doubt that auditors are charged with assuring that the financial statements are free of material misstatements, we believe that this characterization understates the benefits of high audit quality, which extend well beyond the simple detection and reporting of GAAP violations to assuring financial reporting quality. In particular, we expect high quality auditors to consider not only whether the client's accounting choices are in technical compliance with GAAP, but also how faithfully the financial statements reflect the firm's underlying economics.<sup>9</sup>

<sup>9</sup> Several regulators also address audit quality issues. In particular, the International Auditing and Assurance Standards Board (2013) proposed a framework for audit quality, focusing primarily on the audit process; and the Department of the Treasury's Advisory Committee on the Auditing Profession asked the PCAOB to develop key indicators of audit quality (US Treasury, 2008), which the PCAOB plans to do (PCAOB, 2013b).

The notion that the auditor's responsibility extends to assuring financial reporting quality is consistent with generally accepted auditing standards, which require auditors to evaluate financial reporting quality. For example, Statement on Auditing Standards 90 requires auditors to judge "the *quality*, not just the *acceptability*, of the company's accounting principles as applied in its financial reporting" (*emphasis added*) (Statement on Auditing Standards 90).<sup>10</sup> Similarly, Auditing Standard No. 14 requires auditors to "evaluate the *qualitative* aspects of the company's accounting practices, including *potential bias* in management's judgments" (*emphasis added*) (PCAOB, 2010).<sup>11</sup> These standards indicate that auditors are responsible for assuring a level of financial reporting quality that exceeds mechanical compliance with accounting standards.

The auditor's role in assuring financial reporting quality is also consistent with the audit opinion, which provides reasonable assurance that the "financial statements are fairly presented in accordance with GAAP." This indicates that auditors are concerned with how GAAP is applied, which consists of more than the rote application of rules. In particular, applying GAAP requires professional judgment in making a myriad of estimates, the objective of which is to faithfully reflect relevant information about the firm's underlying economic activities.<sup>12</sup> This is promulgated in SFAC No. 8, which specifies relevance and faithful representation as the two fundamental qualitative characteristics of useful financial information (FASB, 2010).

Litigation risk also provides incentives for auditors to be concerned with financial reporting quality. Consistent with auditing and accounting standards, courts hold that auditors must consider substance over form. This is indicated in a US Supreme Court ruling that holds auditors legally liable for misleading financial statements even when those statements are in strict compliance with GAAP (Ball, 2009).<sup>13</sup> This suggests that auditors are legally responsible for how well the financial statements reflect the firm's underlying economics, not just the mechanical application of GAAP.<sup>14</sup>

The above arguments suggest that higher audit quality provides greater assurance of high financial reporting quality. This implies that audit quality is a continuous construct, which at first blush, appears inconsistent with the binary nature of the audit opinion. The audit opinion, however, is not meant to indicate the level of audit quality. Rather, it communicates the auditor's assurance that the financial statements comply with GAAP. Audit quality refers to the quality of the auditor's opinion (i.e., assurance), not the opinion itself. The quality of the auditor's opinion can vary, with high quality auditors providing greater assurance that the financial statements faithfully reflect the firm's underlying economics.

While high audit quality provides greater assurance of high financial reporting quality, financial reporting quality is also a function of the firm's financial reporting system and its innate characteristics. The financial reporting system, including internal controls, maps the firm's underlying economics into the financial reports. The firm's innate characteristics are characterized by its underlying economics, which are determined by its returns generation process (Dechow et al., 2010). Together, the firm's financial reporting system and innate characteristics affect how faithfully its financial reports reflect its underlying economics, thereby constraining the achievable level of financial reporting quality. For example, *ceteris paribus*, financial reporting quality is expected to be lower for firms with difficult to measure innate characteristics, such as assets that consist primarily of investment opportunities, than for firms with assets that consist primarily of tangible assets, regardless of the level of audit quality. Thus, for purposes of this review, we adopt a definition of audit quality that reflects auditing's close association with financial reporting quality, and that considers the constraints imposed by the firm's financial reporting system and innate characteristics. Specifically, we define higher audit quality as "greater assurance that the financial statements faithfully reflect the firm's underlying economics, conditioned on its financial reporting system and innate characteristics."<sup>15</sup>

## 2.2. The relation between audit quality and financial reporting quality

This section makes several observations about the relation between audit quality and financial reporting quality. One is that audit quality is a component of financial reporting quality, because high audit quality increases the credibility of the financial reports. This increased credibility arises through greater assurance that the financial statements faithfully reflect the firm's underlying economics. Audit quality, however, is not the only component of financial reporting quality. Financial reporting quality is also affected by the quality of the pre-audited financial statements, which are an input to the audit process. The quality of the pre-audited statements is further determined by the firm's financial reporting system, which

<sup>10</sup> This requirement is further expanded by Auditing Standard (AS) No. 16, which increases auditors' responsibilities to evaluate manager's subjective judgments regarding critical accounting policies and practices (PCAOB, 2012a).

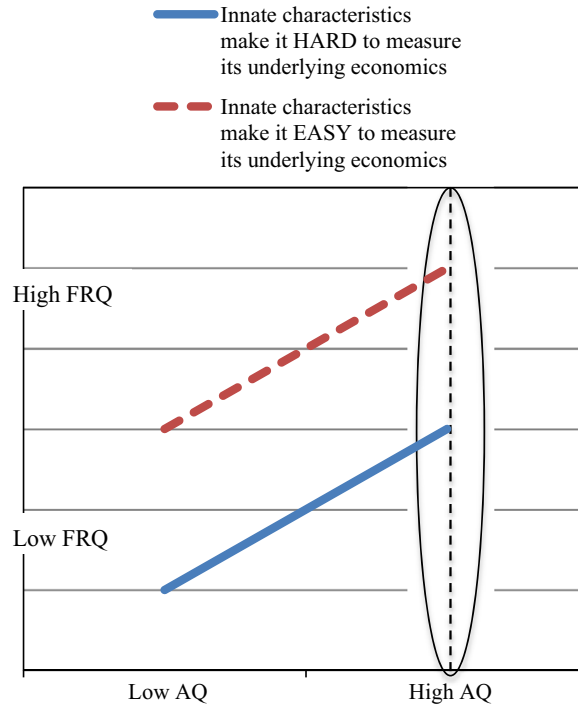
<sup>11</sup> For example, AS 14 requires auditors to qualitatively assess whether quantitatively immaterial accounting errors would result in avoiding debt covenant violations, increasing management bonuses, turning losses into gains, meeting earnings expectations, or favorably affecting earnings trends.

<sup>12</sup> Consistent with auditing improving financial reporting quality, Lennox et al. (2013) find that audit adjustments are associated with more earnings smoothness and persistence, and higher accrual quality.

<sup>13</sup> U.S. v. Simon (425 F.2d 796, 1969), United States Court of Appeals Second Circuit; Argued April 18, 1969; Decided Nov. 12, 1969, Certiorari Denied March 30, 1970.

<sup>14</sup> The UK audit opinion requires auditors to attest that the financial statements present a "True and Fair View," which requires auditors to depart from GAAP when necessary (Livne and McNichols, 2009).

<sup>15</sup> Our definition of financial reporting quality is consistent with the definition of earnings quality in Dechow et al. (2010). However, to emphasize the auditor's assurance responsibilities, we use the phrase "faithfully reflect the firm's underlying economics" instead of "providing more information about the features of a firm's financial performance."



**Fig. 2.** The effect of audit quality on financial reporting quality, conditioned on the firm's innate characteristics. This graph illustrates how the client firm's innate characteristics ( $I$ ) affect the relation between audit quality (AQ) and financial reporting quality (FRQ). We consider two firms, one with innate characteristics that make it hard ( $I_{\text{Hard}}$ ), and another easy ( $I_{\text{Easy}}$ ), to map its underlying economics into the financial statements. To focus on the effects of the innate characteristics, we assume that their financial reporting systems are the same, and to simplify the analysis we assume the relation is linear. The graph shows that high AQ assures a higher level of FRQ for  $I_{\text{Easy}}$  than for  $I_{\text{Hard}}$ , because the achievable level of FRQ is higher for  $I_{\text{Easy}}$  than for  $I_{\text{Hard}}$ . Thus, the firm's innate characteristics constrain the assured level of financial reporting quality that results from high audit quality. Specifically, high AQ can only assure a level of FRQ that is achievable given the firm's innate characteristics, which constrains its financial reporting quality.

maps its underlying economics into the financial reports; and the firm's innate characteristics, which determine its underlying economics (Dechow et al., 2010). Thus, financial reporting quality (FRQ) is a function of audit quality (AQ), the quality of the firm's financial reporting system ( $R$ ) and its innate characteristics ( $I$ ). These relations can be described in notation form as

$$FRQ = f(AQ, R, I) \quad (1)$$

$$\frac{\partial FRQ}{\partial AQ} > 0 \quad (2)$$

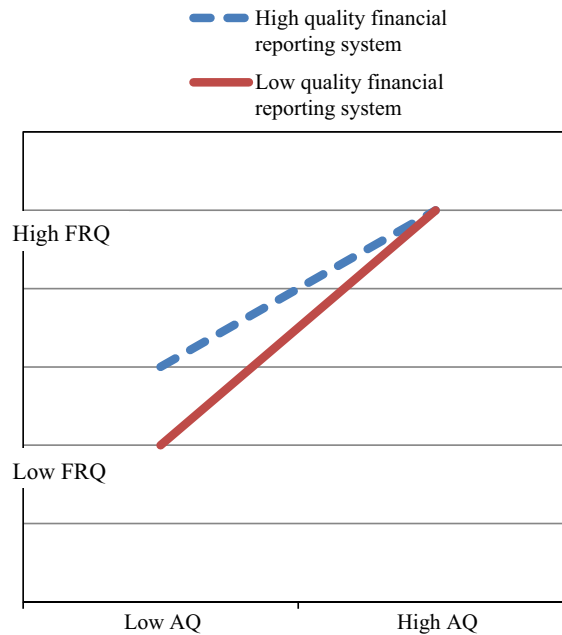
We also observe that the firm's innate characteristics affect the relation between AQ and FRQ. Specifically, high AQ can only assure a level of FRQ that is achievable given the firm's innate characteristics, which constrain its financial reporting quality. For example, consider two firms, one with innate characteristics that make it hard ( $I_{\text{Hard}}$ ), and the other easy ( $I_{\text{Easy}}$ ), to map its underlying economics into its financial statements. We graphically compare these two firms in Fig. 2. To focus on the effects of the innate characteristics, we assume their financial reporting systems are identical. Fig. 2 shows that high AQ assures a higher level of FRQ for  $I_{\text{Easy}}$  than for  $I_{\text{Hard}}$ , because the achievable level of FRQ is higher for  $I_{\text{Easy}}$  than for  $I_{\text{Hard}}$ .<sup>16</sup> Thus, the firm's innate characteristics constrain the assured level of financial reporting quality that results from high audit quality. This can be described in notation form as

$$(FRQ|I_{\text{Easy}}, AQ_{\text{High}}) > (FRQ|I_{\text{Hard}}, AQ_{\text{High}}) \quad (3)$$

We further observe that the quality of the firm's financial reporting system also affects the relation between AQ and FRQ. This is because auditors may require adjustments to the pre-audited financial statements before they are willing to assure their credibility. *Ceteris paribus*, auditors require fewer adjustments for clients with high quality financial reporting systems, because they have higher quality pre-audited financial statements. For example, consider two firms. One has a very high quality financial reporting system ( $R_{\text{High}}$ ), such that a high quality auditor requires no adjustments to the pre-audited financial statements. This firm may be viewed as having "perfect" internal controls over financial reporting, which produce

<sup>16</sup> We portray the lines in Fig. 2 as linear as a simplifying assumption in order to emphasize our key points.





**Fig. 3.** The effect of audit quality on financial reporting quality, conditioned on the quality of the firm's financial reporting system. This graph illustrates how the quality of the firm's financial reporting system ( $R$ ) affects the relation between audit quality (AQ) and financial reporting quality (FRQ). It considers two firms, one with a very high quality financial reporting system ( $R_{\text{High}}$ ), such that the audit results in no adjustments to the pre-audited financial statement. The other firm has a low quality financial reporting system ( $R_{\text{Low}}$ ), such that a high quality audit results in significant adjustments to the pre-audited financial statements. To focus on the effects of the financial reporting system, we assume that their innate characteristics are the same. The graph shows that the improvement in FRQ for  $R_{\text{High}}$  derives solely from the greater assurance provided by high AQ. In contrast, the improvement in FRQ for  $R_{\text{Low}}$  derives from both greater audit assurance, and the adjustments that result from the audit. Thus, (1) high audit quality results in larger improvements to FRQ for firms with relatively lower quality financial reporting systems, and (2) the assured level of FRQ provided by high AQ is not constrained by the quality of the financial reporting system.

pre-audited financial statements that cannot be improved upon. The other firm has a low quality financial reporting system ( $R_{\text{Low}}$ ), such that a high quality auditor requires large adjustments to the pre-audited financial statements. We graphically compare these firms in Fig. 3. To focus on the effects of the financial reporting system, we assume that their innate characteristics are identical. In Fig. 3, the improvement in financial reporting quality for  $R_{\text{High}}$  derives solely from the greater assurance provided by high audit quality. In contrast, the improvement in financial reporting quality for  $R_{\text{Low}}$  derives from both greater audit assurance, and the audit adjustments required by a high quality auditor. Therefore, we observe from Fig. 3 that high audit quality results in a larger improvement in financial reporting quality for firms with relatively lower quality financial reporting systems. More formally, the effect of the firm's financial reporting system ( $R$ ) on the relation between AQ and FRQ can be described in notation form as

$$\left( \frac{\partial \text{FRQ}}{\partial \text{AQ}} \Big|_{R_{\text{High}}} \right) < \left( \frac{\partial \text{FRQ}}{\partial \text{AQ}} \Big|_{R_{\text{Low}}} \right) \quad (4)$$

We also observe that audit quality is not independent of the other components of financial reporting quality. In particular, managers are likely to choose the quality of the financial reporting system in anticipation of the audit quality they expect the auditor to deliver. Thus, the quality of the pre-audited financial statements is endogenous to the quality of the independent audit. In addition, auditors are expected to explicitly consider the quality of the firm's financial reporting system and its innate characteristics in selecting clients, and in the audit planning process. This is reflected in the audit risk model, where the auditor's choice of effort is expressed as a function of the client's inherent and control risk, which is equivalent to the firm's innate characteristics and the quality of its financial reporting system. However, while managers and auditors base their decisions on expected quality, we observe that unexpected random errors also affect the audit quality actually delivered. Thus *ex post* events may occur that lead to undiscovered errors or frauds.

### 2.3. Measuring audit quality

In this section we evaluate the commonly used audit quality proxies, focusing on how well they map into the theoretical construct of audit quality, and what we can learn from their unique strengths and weaknesses. Audit quality is difficult to measure because the amount of assurance auditors provide is unobservable. One way to infer audit quality is to consider outputs of the audit process, such as GC opinions or financial reporting quality. Output-based proxies are appealing because they attempt to measure the level of audit quality actually delivered. This is why studies examining the effects of supply-side

factors almost exclusively use output-based proxies.<sup>17</sup> An alternative way to infer audit quality is to consider audit inputs, such as auditor size and audit fees. Input-based proxies are appealing because clients must choose audit quality based on observable inputs. This is why studies examining the effects of demand-side factors almost exclusively use input based proxies. Due to the inherent differences in output and input proxies, we discuss them separately.

### 2.3.1. Output-based audit quality measures

In this section we evaluate the output-based audit quality measures commonly used in the literature. An important feature of these measures is that they are constrained by the firm's financial reporting system and innate characteristics. For example, firms with innate characteristics that are easier to map into their financial reports are less likely to issue restatements. Similarly, firms with better financial reporting systems have higher pre-audited financial reporting quality, and thus are less likely to issue restatements.<sup>18</sup> Therefore, it is important for researchers to disentangle the effect of audit quality from the effects of the firm's innate characteristics and the strength of its financial reporting system.

We begin this section by describing each measure and the types of studies that use it. We then evaluate the measures along several dimensions that determine how well each proxy captures audit quality. The principal dimensions we discuss are directness, egregiousness, actual-versus-perceived, and several measurement-related dimensions. We define directness as the extent to which the auditor influences, controls or is responsible for the output. Thus, this dimension only applies to output measures. For example, the auditor has sole influence, control, and full responsibility for the type of opinion. We define egregiousness as the severity of the misconduct implied by the measure. For example, auditor-related AAERs capture relatively egregious misconduct. The actual-versus-perceived dimension describes whether the proxy attempts to measure actual audit quality, such as restatements, or perceived audit quality, such as stock price reactions. Finally, we discuss a variety of measurement-related dimensions, including discreteness, consensus on the measurement, and measurement error. We discuss the output proxies in descending order of their directness, as summarized in Table 2.

**2.3.1.1. Material misstatements.** The two misstatement measures most commonly used in the literature are restatements and Accounting and Auditing Enforcement Releases (AAERs). Accounting restatements correct misstatements in previously issued financial statements. Restatements are used in a variety of research settings, including tests of whether audit quality is associated with non-audit service fees (NAS), audit committee characteristics, and auditor industry specialization.<sup>19</sup> AAERs are enforcement actions concerning civil lawsuits brought by the SEC in a federal court or administrative proceeding. AAERs are used relatively infrequently, probably because they are rare (e.g., [Lennox and Pittman, 2010b](#)). Most studies also restrict their analysis to AAERs that target the auditor or capture fraudulent accounting.<sup>20</sup>

Restatements and AAERs are very direct and egregious measures of audit quality because they indicate that the auditor erroneously issued an unqualified opinion on materially misstated financial statements. These proxies attempt to measure actual audit quality using an output of the audit process. In addition, they are typically measured as discrete variables, with relatively high consensus on their measurement, and thus have relatively low measure error. A major advantage of restatements and AAERs is that they are usually strong evidence of poor audit quality. A subset of restatements and AAERs identify the presence of management fraud, which is an advantage because many users and regulators believe that fraud prevention is the auditor's first priority.<sup>21</sup>

There are also several disadvantages of these measures. One major limitation is that the absence of a restatement or AAER cannot be interpreted as high audit quality. This is because low quality audits may prevent egregious failures, which are captured by restatements and AAERs, but fail to prevent less egregious within-GAAP earnings management. In addition, material misstatements allowed by low-quality audits may simply go undetected. Another limitation of restatements and AAERs is that they are relatively rare events, which limits their statistical power and makes them impractical when sample sizes are relatively small. Lastly, it is important to acknowledge that auditors only provide "reasonable assurance" that the financials are free of material errors, and even high quality audits may not catch highly elaborate well-concealed fraud. As a result, it is important to control for the firm's innate risks that are beyond auditor's control.

**2.3.1.2. Auditor communication.** The audit opinion is currently the auditor's only direct communication with shareholders about the audit process and its outcome.<sup>22</sup> GC modified audit opinions communicate the auditor's evaluation of whether there is substantial doubt about the client's ability to continue as a going concern.<sup>23</sup> Managers have incentives to pressure auditors to issue clean opinions because GCs impose costs on the client. Succumbing to this pressure impairs auditor

<sup>17</sup> Output-based proxies, however, are constrained by firms' innate characteristics and confounded by the reporting system. Thus, it is important to control for client innate characteristics and internal controls over financial reporting in isolating the effects of audit quality.

<sup>18</sup> Figs. 2 and 3 illustrate these points.

<sup>19</sup> E.g., [Kinney Jr. et al. \(2004\)](#), [Archambeault et al. \(2008\)](#), [Chin and Chi \(2009\)](#).

<sup>20</sup> Researchers also often exclude immaterial restatements, and [Hennes et al. \(2008\)](#) show that it is important to distinguish errors from irregularities in restatement.

<sup>21</sup> Auditing standards require auditors to formally assess fraud risk, and to gain *reasonable* assurance that fraud does not result in material misstatements (SAS 99). However, *absolute* assurance is prohibitively costly.

<sup>22</sup> GCs are the only modified opinions accepted in public company filings with the SEC, although US auditing standards allow "qualified" opinions (for scope limitations), or "adverse/disclaimer" opinions (for deviations from GAAP or the absence of evidence to form an opinion) for private firms.

<sup>23</sup> Modified Audit Opinions are typically used as an alternative to GCs in foreign jurisdictions, since audit reporting requirements differ from those in the US. (e.g., [Chan and Wu, 2011](#)).

**Table 2**  
Audit quality proxy comparative dimensions.

Proxy Category	Commonly used proxies	Directness	Egregiousness	Actual vs. Perceived	Measurement Issues			Unique Strengths & Weaknesses	
					Discrete vs. Continuous	Consensus on Measurement	Measurement Error	Strengths	Weaknesses
<i>OUTPUT MEASURES</i>									
Material misstatements	Restatements, AAERs	Relatively more direct	Relatively more egregious	Actual	Discrete	High	Low	<ul style="list-style-type: none"> <li>Relatively strong evidence of poor audit quality</li> </ul>	<ul style="list-style-type: none"> <li>Does not capture subtle quality variation</li> <li>Cannot infer high quality from lack of misstatements</li> <li>Rare and low power</li> </ul>
Auditor communication	GC opinions	Relatively more direct	Relatively more egregious	Actual	Discrete	High	Medium	<ul style="list-style-type: none"> <li>Uniquely captures auditor independence</li> <li>Relatively strong evidence of poor audit quality</li> </ul>	<ul style="list-style-type: none"> <li>Does not capture subtle quality variation</li> <li>Only applies to distressed firms, limits generalizability</li> </ul>
Financial reporting quality	DAC, Meet/beat, Accrual quality, Conservatism	Relatively less direct	Relatively less egregious	Actual	Primarily continuous	Low	High	<ul style="list-style-type: none"> <li>Tightly linked to continuous nature of audit quality</li> <li>Suggests within-GAAP manipulation</li> <li>May signal more egregious undetected misstatements</li> <li>Captures quality variation for a large number of firms</li> </ul>	<ul style="list-style-type: none"> <li>Subject to large measurement error and potential bias</li> <li>Limited consensus on measurement</li> </ul>
Perception-based	Market reaction, Cost of capital, Change in market share, PCAOB inspections	Depends on proxy	Degree of egregiousness can be inferred	Perceived	Primarily continuous	Depends on proxy	Can be high (e.g., COC)	<ul style="list-style-type: none"> <li>Captures perceptions of users such as investors and audit committees</li> <li>Captures subtle quality variation</li> <li>Measurable for a large number of firms</li> <li>Equity measures reflect net benefits and costs of audit quality</li> </ul>	<ul style="list-style-type: none"> <li>Limited consensus on measurement for some (e.g., cost of capital)</li> <li>Cost of capital is very indirect</li> </ul>
<i>INPUT MEASURES</i>									
Auditor characteristics	Big N, Industry specialization	N/A	N/A	Actual	Discrete	High	Can be high (e.g.,	<ul style="list-style-type: none"> <li>Strong prior beliefs that measures capture incentives and/or</li> </ul>	<ul style="list-style-type: none"> <li>Does not capture subtle quality variation</li> </ul>

Table 2 (continued)

Proxy Category	Commonly used proxies	Directness	Egregiousness	Actual vs. Perceived	Measurement Issues			Unique Strengths & Weaknesses	
					Discrete vs. Continuous	Consensus on Measurement	Measurement Error	Strengths	Weaknesses
<b>OUTPUT MEASURES</b>									
Auditor–client contracting features	Audit fees, Change in fees	N/A	N/A	Actual	Continuous	High	Medium	specializa- tion) competencies • Large body of research supports this prior • Captures quality variation for a large number of firms • Well-developed fee models	• Lack of consensus in measuring specialization • Subject to alternative explanations

independence, thus reducing audit quality.<sup>24</sup> GC opinions are used to capture audit quality in a variety of settings, particularly in tests of perceived threats to audit quality, such as those potentially posed by NAS, client size, and auditor tenure. GCs are also used in tests of whether audit quality is associated with litigation risk, and Big N office size.<sup>25</sup>

GCs are very direct measures of audit quality because the audit opinion is the auditor's responsibility and directly under his or her influence and control. Failure to report a GC when one is warranted means the auditor issued the wrong audit opinion, which is an egregious audit failure and evidence of poor audit quality.<sup>26</sup> GC proxies attempt to measure actual audit quality based on an output of the audit process. Because the audit opinion is the auditor's direct communication with financial statement users it is a highly salient output of the audit process.<sup>27</sup> Finally, GCs are discrete measures, with relatively high consensus on their measurement, and relatively low measurement error.

GCs have several advantages in measuring audit quality. First, failing to appropriately issue a GC is a clear indication of low audit quality (holding measurement issues aside).<sup>28</sup> Second, the GC opinion formulation process is a setting that allows direct insights on auditor independence. This is an advantage because auditor independence is a necessary condition for auditing to have value (Watts and Zimmerman, 1981).

GC opinions also have several limitations. One is that, like restatements and AAERs, the egregious nature of GCs means that they are not useful in capturing more subtle compromises in audit quality. GCs are also relatively rare and exclusively issued to financially distressed clients. This reduces statistical power in tests using large samples of healthy firms. While researchers often restrict their analysis to distressed firms to increase power, it reduces generalizability. Another limitation is that GCs reflect a fairly narrow aspect of the auditor's role, and do not fully capture the broad value of auditing. Finally, while the literature interprets more GCs as greater auditor independence, more GCs may also indicate excessive auditor conservatism, which arguably reduces audit quality. Auditors have incentives to issue more GCs than are appropriate because they reduce the auditor's liability in court (Kaplan and Williams, 2013).<sup>29</sup> The risk of erroneously interpreting excessive auditor conservatism as increased audit quality is a problem that affects all output-based audit quality proxies, including restatements and DAC. However, clients have incentives to resist excessive auditor conservatism by dismissing overly conservative auditors (DeFond and Subramanyam, 1998).

*2.3.1.3. Financial reporting quality characteristics.* Its close link with audit quality makes financial reporting quality an intuitively appealing proxy. While financial reporting quality is conceptually broad, auditing researchers primarily use earnings quality measures that are designed to detect opportunistic earnings management. This is motivated by the assumption that high quality auditing constrains opportunistic earnings management. The most frequently used measures are based on the Jones (1991) discretionary accruals (DAC) model (e.g. Becker et al., 1998; Francis et al., 1999). Studies also use meet or beat earnings targets, the Dechow and Dichev (2002) accruals quality measure, and Basu (1997) timely loss recognition (TLR).<sup>30</sup>

Financial reporting quality proxies are less direct than restatements or GCs, because the auditor's influence on reporting quality is likely to be relatively more limited. Measures such as DAC do not directly identify GAAP violations, and thus are relatively less egregious when compared to restatements and AAERs. Like restatements and GCs, the financial reporting quality proxies are also attempt to measure actual outputs of the audit process (i.e., the audited financial statements). Finally, most financial reporting quality measures are continuous, but with little consensus on their measurement and high levels of measurement error.

Financial reporting quality measures have several advantages that make them especially attractive candidates for capturing audit quality. One is that audit quality is a component of financial reporting quality. Theoretical motivation for these measures comes at least partially from the observation that financial statements are a joint product of both the manager and the auditor (Magee and Tseng, 1990; Dye, 1991; Antle and Nalebuff, 1991). Thus, financial reporting quality measures are conceptually well suited for measuring audit quality, where higher audit quality is defined as greater assurance that the financial statements faithfully reflect the firm's underlying economics conditioned on the its financial reporting system and innate characteristics.

Another advantage of the financial reporting quality measures is that they are expected to detect "within GAAP" earnings manipulation, for example to meet earnings targets. As noted by former SEC Chairman Arthur C. Levitt, while this kind of

<sup>24</sup> Consistent with this, GCs lead to a greater incidence of auditor switching, which provides an incentive for auditors to report fewer GCs in order to retain clients (Krishnan, 1994).

<sup>25</sup> For examples of threat studies see DeFond et al. (2002), Reynolds and Francis (2001), Carey and Simnett (2006). For examples of litigation and office size, see Lennox and Li (2012) and Francis and Yu (2009).

<sup>26</sup> Arguably, however, failing to warn investors of going concern problems is not as egregious as allowing a material misstatement (which also involves issuance of the wrong audit opinion).

<sup>27</sup> Additional auditor communication comes from the auditor's opinion on internal controls over financial reporting.

<sup>28</sup> It is not trivial to determine whether a GC is appropriate. Researchers often control for measures of financial distress, which themselves are subject to manipulation. Earnings overstatements may lead auditors to conclude that a GC is inappropriate when it is. A small minority of studies, however, examine the frequency of Type II errors (e.g., Robinson, 2008).

<sup>29</sup> Early studies find mixed evidence that GCs reduce auditors' litigation exposure (Carcello and Palmrose, 1994; Lys and Watts, 1994). However, these studies do not control for endogeneity.

<sup>30</sup> Less frequently used measures include specific accruals such as claim loss reserves in the insurance industry (Petroni and Beasley, 1996; Gaver and Paterson, 2007) or loan loss provisions in financial institutions (Kanagaretnam et al., 2010), audit-adjustments (Kinney Jr. and Martin, 1994), and management and analyst forecast accuracy (Behn et al., 2008; Ball et al., 2012).

earnings management impairs financial reporting quality by misleading investors, it does not rise to the level of a material misstatement (Levitt, 1998). Thus, within-GAAP manipulation is likely to represent the “qualitative aspects of management’s accounting choices” that reflect “potential bias in management’s judgments” that auditing standards require auditors to evaluate (PCAOB, 2010). In addition, while proxies such as DAC do not directly capture egregious misstatements, DAC is associated with AAERs (Dechow et al., 1996), and thus captures the increased likelihood of more extreme misstatements. Yet another advantage is that their continuous nature captures variations in audit quality even in studies that are restricted to relatively small samples, and within the subset of clients who do not have egregiously poor audit quality. This contrasts with restatements and GCs, whose infrequent occurrence requires large samples, and whose discrete nature masks any variation in audit quality among clients without restatements and GCs.

An especially salient disadvantage of the financial reporting quality measures is that they tend to have high measurement error and even bias.<sup>31</sup> This is particularly true for DAC and accounting conservatism.<sup>32</sup> For example, average absolute DAC can range from 4% to 10% of total assets, depending on the estimation model and sample (Gul et al., 2009; Reichelt and Wang, 2010), which seems too large to be plausibly explained by earnings management alone. Therefore, it is important for future research using these measures to exercise caution. There is also often little consensus on how these proxies should be measured. For example, DAC can be measured using an absolute value, a signed value, the Jones model, the modified Jones model, and/or performance matching.<sup>33</sup> Finally, financial reporting quality is determined by many factors and audit quality is just one component. Thus, it is important to control for the other factors that explain financial reporting quality.

*2.3.1.4. Perception-based measures.* These measures include investors’ perceptions, such as earnings response coefficients (ERCs), the stock market reaction to audit-related events, and the cost of capital. ERCs are often used to assess questions such as whether perceived threats impair audit quality, and whether Big N auditors provide higher quality. Stock market reaction tests are used in assessing events such as auditor changes and the issuance of GCs. The cost of debt and equity are used to address questions such as whether Big N auditors provide higher quality and whether perceived threats impair audit quality.<sup>34</sup> Researchers also infer audit quality from changes in auditors’ client market share, which can be viewed as audit committees’ perceptions. For example, client market share changes can result from audit committees dismissing the auditor.<sup>35</sup> These measures are typically used to test whether an event, such as an audit failure, impairs the auditor’s ability to attract and retain clients, and to charge an audit fee premium. Although fewer in number, studies also examine shareholder’s perceptions as reflected in proxy votes, and insurers’ perceptions as reflected in auditor insurance premia.<sup>36</sup>

The perception-based measures are relatively indirect compared to the other output-based measures. This is particularly true for measures of investor’s perceptions, because the auditor’s influence over firm value is comparatively small relative to the multitude of other firm-level and economy-wide factors. This suggests that it is critical for researchers to control for these potentially omitted correlated variables. Egregiousness can be inferred from tests that use perception-based measures. For example, a relatively larger stock market reaction or larger loss of client market share is consistent with a more egregious audit failure. In terms of measurement, most perception-based proxies are continuous, with wide variation in the consensus on their measurement and the degree of measurement error. For example, short-window market reaction measures have strong consensus and low measurement error, while cost-of-capital measures have relatively less consensus and high measurement error.

Perception-based measures have several unique advantages over other output-based measures. One is that they capture audit quality more comprehensively than actual output measures. For example, measures such as restatements capture material earnings misstatements. This contrasts with measures such as firm value, or change in client market share, which conceptually capture additional dimensions of audit quality, such as disclosure quality, an element of the financial statements that help investors interpret reported earnings. Another advantage is that they are continuous, and thus capture both egregious failures as well as more subtle variations in audit quality. In addition, investor related perception-based measures, *ceteris paribus*, capture the net benefits or costs associated with audit quality. This means that the effects of a particular audit market innovation may reduce firm value even if it improves audit quality as reflected in financial reporting quality. Finally, changes in client market share can be viewed as uniquely capturing the audit committee’s perception of audit quality.

<sup>31</sup> While measurement error biases against erroneously finding significant associations, this is problematic because it is common in this literature to draw conclusions on insignificant associations. For example, several studies interpret the absence of an association between NAS and DAC as evidence that NAS does not pose a threat to audit quality.

<sup>32</sup> Kothari et al. (2005), Dietrich et al. (2007), Patatoukas and Thomas (2011), Ball et al. (2013).

<sup>33</sup> Lennox et al. (2014) provide a detailed discussion on the tradeoffs between signed and absolute DAC.

<sup>34</sup> For examples of perceived threat and Big N studies, see Francis and Ke (2006) and Teoh and Wong (1993). For market reaction, see Griffin and Lont (2010) and Menon and Williams (2010). For cost of capital, see Pittman and Fortin (2004), Mansi et al. (2004).

<sup>35</sup> We also include PCAOB inspection reports as another perception-based measure because they effectively reflect the PCAOB’s perception of audit quality. However, PCAOB inspections differ from the other perception-based measures because they are based on inspectors’ factual assessments of the auditor’s actual procedures. Thus, they may also be viewed as direct assessments of the quality of the inputs to the audit process.

<sup>36</sup> For examples of client retention, see Weber et al. (2008). For examples of proxy votes, see Raghunandan (2003). For examples of insurance premia, see Casterella et al. (2009, 2010), Choi et al. (2008).

The biggest disadvantage of these measures is that they are relatively indirect, because financial reporting quality usually only has a second order effect on firm value (Zimmerman, 2013). There is also a large variation across these proxies in terms of how directly they capture audit quality. For example, measures such as cost of capital are much less direct than the market reaction measures, which focus very narrowly on individual audit-related events. There is also relatively less consensus on how to measure the cost of capital relative to the other market-based measures, and more error in measuring it. Thus, tests using the cost of capital measures are likely to have less power than those employing the other market-based measures.

### 2.3.2. Input-based audit quality measures

Input-based measures evaluate audit quality using observable inputs to the audit process. However, because inputs may not directly translate into outputs, they are relatively noisy audit quality measures. In this section we discuss the two categories of input-based proxies commonly used in the literature: auditor-specific characteristics such as auditor size (captured by Big N membership) and industry specialization, and auditor–client contracting features such as audit fees.<sup>37</sup> We begin by describing each measure and the types of studies that tend to use it. We then evaluate the unique strengths and weaknesses of each measure, including issues related to measurement. Because input-based proxies do not capture auditor misconduct and are all based on actual observed characteristics, they do not vary on the dimensions of directness, egregiousness, or actual-versus-perceived quality.

**2.3.2.1. Auditor characteristics.** Auditor size, usually measured as Big N membership, is used to proxy for audit quality because large auditors are expected to have stronger incentives and greater competencies to provide high audit quality (DeAngelo, 1981). Auditor industry specialization, usually measured by client industry concentration, is used to proxy for audit quality because specialist auditors are expected to have greater competency and stronger reputation incentives to provide high audit quality. The literature typically uses these measures as dependent variables to examine factors that drive client demand for audit quality (e.g., Wang et al., 2008). However, there is also a large literature that uses these measures as independent variables to examine whether auditor characteristics affect the supply of audit quality (e.g., Lennox and Pittman, 2010b).

A distinguishing feature of these measures is that they are not engagement-specific. In particular, Big N and industry specialization are fixed characteristics of the auditor, at least over a reasonable horizon. This contrasts with the other audit quality proxies, such as GC opinions, which auditors can adjust in response to changes in their incentives. A consequence of this difference is that auditors are unable to use Big N membership, or industry specialization as choice variables in determining the level of audit quality they supply. While an auditor cannot realistically improve audit quality by becoming a Big N or industry specialist over a short horizon, clients on the other hand can improve audit quality by choosing a Big N or industry specialist auditor. Thus, these measures are most useful in studies that examine the client's demand for audit quality.

A major strength of the Big N proxy is its relatively high construct validity. Specifically, Big N is associated with almost all of the other audit quality proxies. A strength of industry specialization is that it provides a measure of quality variation within Big N auditors. This is a benefit because this finer partitioning allows researchers to address questions that pertain to within Big N quality differences. A major limitation of these proxies is that they are typically measured dichotomously, which implicitly assumes a homogeneous level of audit quality within each group (Clarkson and Simunic, 1994).<sup>38</sup> As a consequence, and similar to restatements, AAERs, and GC opinions, Big N and industry specialization fail to capture relatively subtle variations in audit quality. Auditor industry specialization also suffers from a lack of consensus on its measurement (Neal and Riley, 2004), suggesting that specialization captures audit quality with relatively large measurement error.

**2.3.2.2. Auditor–client contracting features.** Information on audit quality may also be inferred from auditor–client contracting features, such as audit fees. Audit fees are used to proxy for audit quality because they are expected to measure the auditor's effort level, which is an input to the audit process that is intuitively related to audit quality.<sup>39</sup> A distinguishing feature of audit fees is that they are the outcome of both supply and demand factors. Auditors cannot unilaterally charge higher fees for additional effort unless there is a corresponding increase in client demand for the additional effort. As a result, audit fees are used in both demand and supply studies. For example, in demand studies, audit fees are often used to test whether audit committee competencies are associated with audit quality. In supply studies, audit fees are most commonly used to test whether audit quality is associated with litigation risk, and whether Big N or industry specialist auditors are associated with audit quality.<sup>40</sup>

<sup>37</sup> While less frequent, other input-based measures are also used, including NAS and employment of former audit employees (e.g., Abbott et al., 2003a; Lennox and Park, 2007). However, it is unclear whether these measures actually capture lower audit quality (see Section 5).

<sup>38</sup> On the other hand, if the relation between auditor size and audit quality is not linear, then it is possible that a dichotomized measure reduces measurement error.

<sup>39</sup> While audit hours are potentially another input-measure of quality (e.g., Deis and Giroux, 1992), data availability is a major limitation. We discuss studies that use audit hours to capture audit effort (and hence quality) in Section 4.

<sup>40</sup> For examples of demand studies, see Engel et al. (2010). For examples of supply studies, see Seetharaman et al. (2002), and Chaney et al. (2004).

Audit fees have several advantages in measuring audit quality. One is that they are continuous and thus capture subtle variations in quality. Another is that the literature has developed relatively sophisticated fee models with *R*-squares often exceeding 70%, which to some extent alleviates concerns about correlated omitted variables.<sup>41</sup> Audit fees also have drawbacks that limit the interpretability of their results. One is that in addition to capturing audit effort, fees also capture risk premia and improved audit efficiency (discussed in Section 4). This is a critical limitation because it means that an increase in audit fees cannot be unambiguously interpreted as an increase in audit quality. A further limitation is that fees capture the joint outcome of both supply and demand factors. Thus, researchers must take particular care in interpreting the results from fee studies.

### 2.3.3. Commonly used audit quality models

Because it is inextricably intertwined with financial reporting quality, audit quality also depends on firms' innate characteristics and financial reporting systems. Therefore, it is critically important for models that empirically test audit quality to disentangle these constructs. In this section we illustrate how some of the commonly used audit quality models control for firms' innate characteristics and financial reporting systems. Table 3 reports four models commonly used in tests of the following audit quality proxies: GCs, DAC, audit fees, and Big N. The top row of Table 3 lists the control variables that are typically used in these models and the second row reports some of the studies that use these models. We emphasize, however, that these control variables are provided for illustrative purposes only. Most studies include additional control variables, because each treatment variable has its own set of potentially omitted correlated variables. While the control variables in Table 3 may provide a starting point, they are by no means comprehensive.

The models in Table 3 are typically structured as follows:

$$AQ = \alpha + \beta \times (\text{Treatment variable}) + \sum_{i=1}^n \gamma_i \times (\text{Control variable}_i) + \varepsilon$$

For example, several studies examine whether NAS impairs audit quality, where audit quality is proxied by the auditor's propensity to issue a GC. These studies typically use a logit model that regresses a GC indicator variable (*AQ*) on a dummy variable that captures whether the auditor provides NAS (Treatment variable), and several control variables. Finding a significantly negative coefficient on NAS is interpreted as evidence of reduced audit quality. Table 3 reports the control variables commonly used in the GC models. These control variables originate with research that attempts to explain the auditor's decision to issue a GC opinion (e.g., Mutchler et al., 1997). They capture factors that threaten the client's ability to continue as a going concern, such as high bankruptcy risk and poor ROA, and factors that mitigate this threat, such as expected future financing. When GC is used to proxy for audit quality, these variables control for potentially omitted variables that are correlated with NAS.

It is notable that many of the control variables in Table 3, such as size and leverage, are also likely to be correlated with firms' innate characteristics and financial reporting systems. However, fundamental constructs such as innate characteristics and financial reporting systems are challenging to identify and measure. The existing models have evolved empirically in the absence of strong theoretical guidance, and are unlikely to fully control for these fundamental constructs. This suggests that some of the identified treatment effects from the existing models may be attributable to firms' innate characteristics and financial reporting systems. Consistent with a high risk of omitted correlated variables, some of the audit quality models have relatively low *R*-squares. For example, based on the studies cited in Table 3 that use US data, DAC models have *R*-squares in the range of 8–percent.<sup>42</sup> Going forward, future research would benefit from more conceptual guidance in disentangling the complex relation between audit quality and financial reporting quality.

### 2.3.4. Which audit quality measures are best?

Several important observations can be drawn from our examination of the commonly used audit quality proxies. One is that while all of the measures have their strengths, they also suffer from important weaknesses. In fact, some of the proxies with the greatest strengths also suffer from the worst weaknesses. For example, while restatements and AAERs rank high in terms of directly capturing audit quality, and have little measurement error, they are rare, which limits their usefulness to large-sample studies. This contrasts with DAC, which is farther from the auditor's influence, and suffers from serious measurement issues, but can be measured for a wide variety of firms and settings. Nevertheless, output-based measures are constrained by firms' financial reporting systems and innate characteristics, thus it is important to control for these effects in isolating audit quality. Our review of the models commonly used to disentangle these constructs suggests the need for better conceptual guidance.

Another observation is that many of the proxy categories have complementary strengths. This suggests that there are benefits from comparing measures across categories, rather than within categories. For example, while restatements and GCs are particularly well suited for detecting egregious misreporting, DAC is intended to detect within-GAAP manipulations.

<sup>41</sup> While correlated omitted variables are always a concern with models that attempt to explain audit quality, it is a relatively larger concern when we know little about the factors that explain a particular measure.

<sup>42</sup> We note, however, that this is less of a concern in audit fee models, which have *R*-squares in the range of 71–87 percent.



**Table 3**  
Commonly Used Audit Quality Models.

	GCs	DACs	Big N	Audit fee
Model-specific variables	<ul style="list-style-type: none"> <li>● Size</li> <li>● Leverage</li> <li>● Loss</li> <li>● ROA</li> <li>● Probability of bankruptcy</li> <li>● Change in leverage</li> <li>● Stock returns</li> <li>● Subsequent security issuance</li> <li>● Report lag</li> <li>● Operating cash flow</li> <li>● Investments</li> <li>● Age</li> <li>● Lagged GC</li> <li>● Industry dummy</li> </ul>	<ul style="list-style-type: none"> <li>● Size</li> <li>● Leverage</li> <li>● Loss</li> <li>● Sales growth</li> <li>● Operating cash flow</li> <li>● Big N</li> <li>● Market-to-book</li> <li>● Total accruals</li> <li>● Equity/debt issuance</li> <li>● Industry/year dummy</li> </ul>	<ul style="list-style-type: none"> <li>● Size</li> <li>● Leverage</li> <li>● Loss</li> <li>● ROA</li> <li>● Current ratio</li> <li>● Asset turnover</li> <li>● Growth</li> <li>● Capital intensity</li> <li>● Equity/debt issuance</li> <li>● Industry/year dummy</li> </ul>	<ul style="list-style-type: none"> <li>● Size</li> <li>● Leverage</li> <li>● Loss</li> <li>● ROA</li> <li>● Current assets/total assets</li> <li>● Quick ratio</li> <li>● Foreign sales</li> <li>● Number of segments</li> <li>● December year end</li> <li>● GC opinion</li> <li>● Industry/year dummy</li> </ul>
Sources	Mutchler et al. (1997), Louwers (1998), Carcello and Neal (2000), Reynolds and Francis (2001), Craswell et al. (2002), DeFond et al. (2002), Lennox (2005), Carey and Simnett (2006), Francis and Yu (2009), Hope and Langli (2010), Lennox and Li (2012)	Becker et al. (1998), Klein (2002), Ashbaugh et al. (2003), Myers et al. (2003), Butler et al. (2004), Menon and Williams (2004), Gul et al. (2009), Prawitt et al. (2009), Krishnan et al. (2011), Michas (2011), Lennox and Li (2012),	Francis et al. (1999), Kim et al. (2003), Chaney et al. (2004), Khurana and Rama (2004), Mansi et al. (2004), Lennox (2005), Choi and Wong (2007), Fortin and Pittman (2007), Guedhami et al. (2009), Chang et al. (2009), Gul et al. (2010), Chen et al. (2011)	Gul and Tsui (1998), Seetharaman et al. (2002), Chaney et al. (2004), Francis et al. (2005), Choi et al. (2009), Doogar et al. (2010), Gul and Goodwin (2010), Numan and Wilekens (2012), Dao et al. (2012), Fung et al. (2012)

Thus, comparing measures at opposite ends of the “egregiousness” spectrum provides evidence on whether a particular variable of interest has a large or a small effect on audit quality. Analogously, when actual quality measures suffer from measurement problems or causality is in question, market-based measures such as the stock price reaction have the potential to provide evidence that does not suffer from these problems. In contrast, within-category comparisons, such as between DAC and meeting or beating benchmarks, do not confer the same benefits. In addition, within-category proxies are more likely to have correlated biases as compared with proxies across categories.<sup>43</sup>

The overriding objective in choosing audit quality proxies is to use measures that are most appropriate for the research setting. In evaluating appropriateness, one broad consideration is whether the study examines the demand or supply of audit quality. Output-based measures are usually best suited for tests that examine the supply of audit quality, while input-based measures are usually best suited for tests that examine the demand for audit quality. However, based on our evaluation, it is obvious that no single proxy is capable of painting a complete picture of audit quality. Thus, for supply studies, we recommend choosing measures across the four output measure categories when it is feasible. Comparing across categories provides a more comprehensive understanding of the effect on audit quality than comparing within a given category. We recognize that it is neither practical nor desirable to use all possible measures in a single study. However, this is not likely to be a major constraint to our recommendation as there are only four output categories. We also note that this is a practical strategy as evidenced by several studies that effectively adopt this approach (e.g. Lennox and Li, 2012; Dao et al., 2012). Finally, we urge researchers to evaluate and carefully articulate the inferences that can and cannot be inferred from the proxies based on their unique strengths and weaknesses. Currently, the literature often lacks such discussion.

### 3. What drives client demand for audit quality?

In this section we review and critique the research that investigates the client demand for audit quality. We divide this section into two parts. The first part discusses the research on a fundamental question that precedes virtually all of the subsequent research in this review: does auditing add value? If financial statement users do not value auditing, then questions of audit quality, which is the focus of most archival auditing research, become irrelevant. The second part of this section discusses research on the factors that drive clients to demand audit quality, where we view the demand for

<sup>43</sup> For example, if both DAC and the propensity to meet or beat earnings targets are biased, and the biases are correlated, using both measures may reinforce an incorrect inference.

audit quality as a function of the client's incentives to demand audit quality, as well as their competency in meeting this demand.

### 3.1. The demand for auditing – does auditing add value?

The value of auditing arises from its ability to assure that the financial statements faithfully reflect the client's underlying economics. These assurances reduce information risk, which ultimately improves resource allocation efficiency, including contracting efficiency. While auditing is mandated for public clients, an interesting question is whether auditing adds value in the absence of regulation. Empirically documenting the value of auditing, thus, is an arduous task. We divide the research on the value of auditing into two groups. The first contrasts the value of audited versus unaudited financial information. The second investigates the value of the information communicated by auditors, which includes their opinions on the financial statements and internal controls, and the information provided by auditor changes disclosed in 8-Ks.

#### 3.1.1. Evidence from audited versus unaudited financial information

The most direct evidence on whether auditing has value comes from comparing the value of audited versus unaudited financial reports. A major challenge in this research, however, is that unaudited publicly available financial information is rare. As a result, this research tends to examine unique settings where the financial reports of privately-held firms are publicly available, often outside of the US. This literature finds that voluntary audits reduce the cost of debt, improve credit ratings, and have signaling value that is lost when auditing is mandatory; and that voluntary quarterly reviews reduce the number of audit adjustments.<sup>44</sup> However, the choice to stay private is endogenous. This research is also restricted to using the cost of debt to capture the value of auditing, because data on the cost of equity is unavailable for private companies.

A small subset of this literature also finds that mandatory audits of management forecasts increase their accuracy, mandated 10-Q reviews improve ERCs, mandated public school audits improve resource allocation efficiency, and that mandated public housing authority audits reduce overstatements.<sup>45</sup> Thus, they consistently find that auditing adds value. However, the number of studies is relatively small, and the settings usually lack generalizability. In addition, the regulation that mandates these audits and reviews is endogenous.

#### 3.1.2. Evidence from auditor communication

##### 3.1.2.1. Evidence from going-concern audit opinions.

The audit opinion is a direct communication from the auditor to financial statement users, and thus presents a natural setting for testing whether auditing adds value. GC opinions are the only modified audit opinions accepted in public company filings with the SEC.<sup>46</sup> Thus, research investigating the value of audit opinions in the US examines GC opinions. GCs communicate the auditor's "substantial doubt about the entity's ability to continue as a going concern for a reasonable period of time, not to exceed one year beyond the date of the financial statements being audited" (AU 341, PCAOB, 2012b).<sup>47</sup>

Auditing standards do not define when companies cease to be going concerns, this commonly occurs when companies enter bankruptcy. Thus, a large body of research explores whether GCs are useful in predicting bankruptcy. This literature is primarily motivated by regulators' concerns that clients often fail shortly after receiving a clean opinion, suggesting that auditors do not provide adequate "early warning" of impending financial failure (e.g., U.S. House of Representatives 1985, 1990). These concerns are based on the suspicion that auditors succumb to management pressure to issue overly optimistic opinions. Consistent with these concerns, the literature finds that auditors routinely make Type II errors (i.e., issuance of a clean opinion in the year prior to bankruptcy) about 50% of the time (Hopwood et al., 1989; Raghunandan and Rama, 1995).

Another concern is that auditors respond to this litigation risk by being too quick to issue GC opinions. Consistent with this concern, the literature also finds that auditors make Type I errors (i.e., issuance of a GC opinion in the absence of bankruptcy within the subsequent year) about 90% of the time (Geiger et al., 2005). Higher Type I errors may reflect auditors' perception that litigation risk is more costly than losing a client. However, Type I and Type II errors can also result from unforeseeable events subsequent to the audit opinion date, such as a rapid decline (or recovery) in financial health (Blacconiere and DeFond, 1997). Empirical models that explain GCs find that they communicate auditors' private information about the client's financial health, and consider evidence that is both "contrary" to continuation as a going concern (such as debt default), as well as evidence that "mitigates" failure (such as financing sources).<sup>48,49</sup>

Market reactions to first-time GCs provide direct evidence of whether GCs are valued. While early studies find mixed evidence, recent studies find that GCs result in a negative market reaction (which attenuates the market reaction to

<sup>44</sup> Blackwell et al. (1998), Kim et al. (2011), Minnis (2011), Lennox and Pittman (2011), Ettredge et al. (2000).

<sup>45</sup> McConomy (1998), Clarkson (2000), Manry et al. (2003), Saito and McIntosh (2010), Grein and Tate (2011).

<sup>46</sup> As noted previously, GCs are the only modified opinions accepted in public company filings with the SEC. DeFond and Lennox (2011) find that 17% of SEC registrants report GC opinions.

<sup>47</sup> The FASB's proposed standard on Going Concerns (FASB, 2008) defines the time horizon as "at least, but not limited to, twelve months from the end of the reporting period."

<sup>48</sup> Mutchler (1985), Dopuch et al. (1986, 1987), Menon and Schwartz (1987), Carcello et al. (1995), Mutchler et al. (1997).

<sup>49</sup> Recent evidence also suggests that management opportunism may impair audit quality, as evidenced by fewer GCs following insider selling (Chen et al., 2013).

bankruptcies), reduce ERCs, focus valuation on the balance-sheet, and increase the likelihood of IPO delisting.<sup>50</sup> In addition, auditing standards that strengthen the auditor's responsibility for identifying GCs improves their informativeness.<sup>51</sup> Evidence that GCs have value is consistent with auditors possessing value relevant private information that is not communicated elsewhere. There is, however, mixed evidence on whether the market under-reacts to GCs, possibly due to research design differences.<sup>52</sup> Overall, while the exact timing of the reaction may be in dispute, the research strongly suggests that market participants value the information communicated in GC opinions.<sup>53</sup>

*3.1.2.2. Evidence from internal control opinions.* Internal controls over financial reporting are designed to provide “reasonable assurance about the reliability of a company's financial reporting and its process for preparing and fairly presenting financial statements in accordance with GAAP” (PCAOB, 2004). Section 404 requires management to issue a report on the effectiveness of the internal controls, and auditors to issue a separate report of their independent assessment. If the auditor discovers a “material weakness” in internal controls (ICMWs), they must issue an adverse opinion.<sup>54,55</sup> In this section we review studies on whether the market reacts to the Section 404 opinion. We defer our review on the real effects of ICMW disclosures to Section 5.1.2.2, where we discuss SOX's provisions.

An adverse 404 opinion is potentially informative because ICMWs present “more than a remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected” (PCAOB, 2004). However, ICMW disclosures do not mean that the identified weakness resulted in a misstatement. Rather, it means that an internal control weakness is identified that *could have* resulted in a misstatement. This provides tension to the studies that investigate the effects of ICMWs. While sparse, the evidence suggests that the market does not react to Section 404 ICMW opinions. While ICMW 404 opinions increase the cost of debt, the evidence is mixed on whether they increase the cost of equity.<sup>56</sup> Overall, the small number of studies that examine investor perceptions of ICMW 404 opinions makes it difficult to draw definitive conclusions.

Prior to phasing in Section 404, Section 302 required an unaudited attestation by management on the effectiveness of internal controls over financial reporting. Section 303 became effective in 2002, and required audited attestation for Accelerated Filers in 2004. In 2010, as a result of the Dodd Frank Act, the SEC announced that non-Accelerated filers are not required to include audited attestation under Section 404 but still must provide management's attestation. In contrast to Section 404, there is consistent evidence that the market reacts negatively to unaudited Section 302 disclosures.<sup>57</sup>

*3.1.2.3. Evidence from auditor changes.* The market reacts negatively to auditor resignations, consistent with resignations communicating information about high litigation risk. By comparison, the reaction to auditor dismissals depends on the reason, with a negative reaction to dismissals with auditor-client disagreements, problems with internal controls, or dismissals without auditor comment letters; and a positive reaction to service or fee related dismissals. There is also evidence that ERCs decline after disagreement or fee-related auditor changes, but increase following service-related changes; and that CEO and CFO turnover increase following auditor resignations.<sup>58</sup> Overall, these studies are consistent with auditor changes conveying useful information to audit market participants about financial reporting quality and management integrity.

### 3.1.3. Critique and future research on the value of auditing

This literature provides compelling evidence that market participants value auditing, with several limitations. One is generalizability. For example, studies that compare audited with unaudited information are based primarily on voluntary audits by private firms, which are likely to face different agency costs. Studies on auditor changes and GCs examine relatively infrequent events, and GCs are limited to distressed firms and capture a relatively narrow aspect of auditing. While the negative market reaction to GCs and their ability to predict bankruptcy suggest that they provide new information, this

<sup>50</sup> Firth (1978), Elliott (1982), Dodd et al. (1984), Melumad and Ziv (1997), Frost (1997), Menon and Williams (2010), Chen and Church (1996), Chen et al. (2000), Ghicas et al. (2008), Blay et al. (2011), Subramanyam and Wild (1996), Willenborg and McKeown (2001).

<sup>51</sup> Holder-Webb and Wilkins (2000), Carcello et al. (2009), Gassen and Skaife (2009).

<sup>52</sup> Taffler, Lu, and Kausar (2004), Kausar et al. (2009), Ogneva, Subramanyam, and Raghunandan (2007).

<sup>53</sup> For a review of the GC literature, see Carson et al. (2013).

<sup>54</sup> Auditors also must identify “significant deficiencies,” which are less severe than “material weaknesses” and do not result in an adverse opinion. Significant deficiencies are privately communicated to the audit committee and do not appear in the audit opinion.

<sup>55</sup> For brevity, we combine the terms Internal Control Deficiencies (ICDs), disclosed under SOX Section 302, and Internal Control Material Weaknesses (ICMWs), disclosed under Section 404, and refer to both simply as ICMWs. While this distinction is important in testing the difference between managers' voluntary and mandated reporting, both reveal internal control problems that are the focus of our summary.

<sup>56</sup> Beneish et al. (2008), Dhaliwal et al. (2011), Kim et al. (2011), Ogneva and Subramanyam (2007), Ashbaugh-Skaife et al. (2009).

<sup>57</sup> Beneish et al. (2008), Hammersley et al. (2008), Kinney Jr. and Shepardson (2011), Hermanson and Ye (2009), Munsif et al. (2013), Bedard and Graham (2011).

<sup>58</sup> For overall reaction, see Krishnan and Krishnan (1997), Bockus and Gigler (1998), Shu (2000), Wells and Loudder (1997), DeFond et al. (1997), Griffin and Lont (2010). For positive or negative reaction, see Smith and Nichols (1982), Whisenant et al. (2003b), Krishnan (2002), Sankaraguruswamy and Whisenant (2004). For ERCs and turnover, see Hackenback and Hogan (2002) and Menon and Williams (2008).

evidence is also consistent with a “self-fulfilling prophecy”, because GCs can cause bankruptcy by triggering covenant violations and increasing financing cost.<sup>59</sup>

Going forward, newly proposed auditing standards by the PCAOB may open up a fruitful new avenue to study the value of auditing. These standards require broadening the scope of the auditor’s report to include discussion of “critical audit matters” (PCAOB, 2013a). “Critical audit matters” are defined as issues that involved the most difficult, subjective or complex auditor judgments, posed the most difficulty to the auditor in obtaining sufficient evidence, or posed the most difficulty to the auditor in forming the opinion. In addition, the auditor must report information about their independence, tenure with the client, and the auditor’s responsibilities for other information filed with the SEC that contains audited financials. This new report will be a dramatic departure from the terse boilerplate language that characterizes the current auditor’s report.

In addition, the scope and complexity of the business environment and economic transactions has greatly increased in recent years, increasing the demand for information. As a result, assurance services beyond the traditional financial statement audits are growing rapidly. Over 50% of the Fortune 500 voluntarily issue audited “sustainability” reports that address environmental concerns, and all of the Big N auditors provide sustainability auditing services.<sup>60</sup> This trend coincides with recent SEC requirements that require registrants to consider the effects of climate change in their financial reports (SEC, 2010).<sup>61</sup> This expansion in the scope of corporate reporting suggests that auditing may have value beyond just the traditional financial statements. However, this also raises many questions, such as whether the new assurance services really add value, what audit quality means in a non-accounting setting, and whether expertise at financial statement assurance translates to non-accounting settings.

### 3.2. What drives client demand for audit quality?

We view the demand for audit quality as a function of the client’s incentives to demand audit quality, and their competency in meeting this demand. Thus, we separately discuss studies that address client incentives and those that address client competencies. Theory suggests that client demand for audit quality arises from the incentives to reduce agency costs faced by the firm (Jensen and Meckling, 1976). In addition, regulation places a floor on the demand for audit quality among public companies, and regulatory intervention can change both client incentives to demand high audit quality and their competencies for achieving this demand. We note, however, that client incentives are not independent of client competencies. In particular, greater incentives to demand high audit quality also provide greater incentives for clients to develop competencies to fulfill their demand.

#### 3.2.1. Client incentives to demand high audit quality

Moral hazard problems arise from the information asymmetry between managers and outside stakeholders, most notably shareholders and creditors. This in turn provides managers with incentives to issue financial statements that allow stakeholders to monitor their actions (Jensen and Meckling, 1976; Watts, 1977; Watts and Zimmerman, 1983). Costly verifiability of the financials in turn gives rise to management’s demand for independent third party assurance that the financial statements are fairly presented. Higher agency conflicts increase the demand for greater third party assurance, and hence higher audit quality. Since agency conflicts are the primary source of the client’s incentives to demand high audit quality, it is natural to examine the link between audit quality and agency conflicts.<sup>62</sup>

Major research design challenges in this literature include identifying settings in which there is variation in agency costs, and developing valid agency cost proxies. Research addresses these challenges in several ways. Some studies directly measure agency costs using managerial ownership or leverage. Some studies exploit unique international settings that provide advantages such as data availability for private companies, a wide variation in management and foreign ownership, and natural experiments such as “privatization,” which shifts ownership from the state to private citizens. Other studies examine auditor change settings in the US, in which companies switch between Big N and non-Big N auditors, or Andersen’s clients are forced to choose a new auditor.

Most studies in this literature capture the demand for high audit quality by the client’s choice of auditor characteristics, such as Big N or industry specialization. Although the evidence is relatively limited, most of the research in this area finds support for the hypothesis that agency costs explain the choice of audit quality. Specifically, higher audit quality is demanded by U.S. firms that experience increases in leverage and decreases in managerial ownership, ex-Andersen clients with high leverage and low managerial ownership, UK firms with low executive shareholdings and high debt ratios, UK unlisted firms with either low or high managerial ownership, Chinese non-State-Owned-Enterprises, Canadian companies with large differences between cash flow rights and control rights, French companies with less family control and more diversified ownership, and international firms that undergo shifts from state to private ownership. While most studies

<sup>59</sup> Louwers et al. (1999), Chen et al. (2012), Hansen and Watts (1997).

<sup>60</sup> O’Dwyer (2011), Power (1997, 2003), Simnett et al., (2009), Moser and Martin (2012), Dhaliwal et al. (2012).

<sup>61</sup> Similarly, the FTC recently required Google and Facebook to have “privacy audits,” and dozens of technology companies, including Twitter, to have “security audits.” These audits are essentially a form of e-commerce assurance (Jamal et al. 2003; Gendron and Barrett, 2004).

<sup>62</sup> While the literature focuses on agency cost explanations, Francis et al. (2011) show that private firms in countries with weak institutions demand higher audit quality to enhance investor protection.

support the link between agency costs and audit quality, not all do. In particular, ex-Andersen clients with high leverage and low managerial ownership were no more likely to switch to a Big N successor auditor than other ex-Andersen clients.<sup>63</sup>

Several studies also explore factors that may exacerbate the agency problem. Intuitively, riskier and more complex firms face larger agency problems and hence are likely to demand higher audit quality. This intuition is consistent with a small number of studies that identify a variety of inherent risk factors that influence the demand for audit quality. These studies find that firms with riskier IPOs and larger total accruals demand Big N auditors, and that firms with high R&D intensity and more investment opportunities demand specialist auditors.<sup>64</sup> We also note that because these factors increase client complexity, the demand for Big N and specialist auditors in these settings may not be due to the auditors' incentives, but instead due to their competency in auditing complex accounting issues.

### 3.2.2. Client competencies to fulfill their audit quality demands

We define client competencies as the clients' abilities to meet their incentive driven demand for audit quality. These abilities consist of mechanisms that facilitate meeting their demand for audit quality, and are typically integral parts of the corporate governance system. Thus, one line of the literature on client competencies studies the effects of corporate governance strength on the demand for audit quality. These studies find consistent evidence that strong corporate governance is associated with the choice of audit inputs that are associated with higher audit quality, where strong governance is captured primarily by board characteristics. For example, firms with stronger governance are more likely to appoint industry specialist auditors, switch to Big N auditors, choose more independent audit committees, and pay higher fees.<sup>65</sup>

Another line of research on client competencies studies the specific governance mechanisms that help clients achieve their desired level of audit quality: audit committee characteristics, internal control reporting, and the internal audit function. The audit committee studies generally find that independent audit committees and audit committees with financial experts demand higher audit quality, and studies on internal control reporting generally find that material internal control weaknesses are associated with poor accounting quality. However, because most of the research on audit committee characteristics and internal control reporting is triggered by SOX, we defer our detailed discussion of these studies to Section 5.1. In this section we limit our discussion to the effects of the internal audit function on satisfying the client's demand for high audit quality.

The internal audit function (IAF) was first established at the beginning of the 20th century and has evolved from being the "eyes and ears" of management to the "audit of management" (Bailey et al., 2012). While IAF has broad responsibilities that include operational functions, their primary focus is on the reliability of financial reporting and internal controls. IAFs are often under the direct oversight of the audit committee and as such play a potentially critical role in achieving the client's desired level of audit quality. Gramling et al. (2004) note that while SOX does not specifically address the IAF, the expanded internal control responsibilities of the audit committee, external auditors, and management, suggest an increasing role for IAF. In addition, Auditing Standard No. 5 (AS5) specifically permits external auditors to directly rely on the work of IAFs, and a recent practitioner study finds that clients are expanding the corporate governance role of IAF, and that external auditors are placing greater reliance on the IAF (Protiviti, 2013).

Outside of experimental studies, the research on IAF is limited, falling into two groups.<sup>66</sup> One group examines the link between IAF and financial reporting quality, and finds that a stronger IAF is associated with fewer material weaknesses under SOX 404, and less earnings management. The other group examines the link to external audit efficiency, and finds that a stronger IAF is associated with lower fees and shorter audit lags, consistent with the IAF improving external audit efficiency.<sup>67</sup>

In addition, IAF also has implications for the supply of audit quality. As with external audit quality, internal audit quality is also likely to be a function of independence and competency, although, internal auditors are inherently less independent than external auditors. Consistent with independence being an important factor affecting internal audit quality, external auditors charge higher fees to clients who use IAF as a training ground for future executives (Messier et al., 2011). The notion is that external auditors perceive such IAF personnel to be less objective, but not less competent, than IAF personnel who are not being trained as future executives. In addition, Desai et al. (2010) model the extent of external audit work to be carried out by the internal auditor as a function of the strength of the IAF function.

### 3.2.3. Critique and future research on the demand for audit quality

In spite of considerable research design challenges, the literature generally concludes that agency cost incentives increase the demand for audit quality, and that client competencies, such as audit committee characteristics, improves audit quality. However, the evidence on agency costs incentives for US companies is limited, and the studies on client competencies

<sup>63</sup> For support, see Francis and Wilson (1988); DeFond (1992); Blouin et al. (2007); Firth (1997); Lennox (2005b); Wang et al. (2008); Khalil et al. (2008); Francis et al. (2009); Guedhami et al. (2009). For no support, see Barton (2005).

<sup>64</sup> Copley and Douthett (2002); Francis et al. (1999); Godfrey and Hamilton (2005); Cahan et al. (2008).

<sup>65</sup> Beasley and Petroni (2001); Cassell et al. (2012); Beasley and Salterio (2001); Klein (2002b); Engel et al. (2010).

<sup>66</sup> In contrast to the archival studies, there is a large body of experimental work on the IAF. See Bame-Aldred, Brandon, Messier Jr., Rittenberg and Stefaniak (2013) for a review of that literature.

<sup>67</sup> For reporting quality, see Lin et al. (2011); Prawitt et al. (2009). For efficiency, see Felix et al. (2001); Abbott et al. (2012).

arising from strong IAF are in their infancy. An inherent limitation of the agency cost literature is that it necessarily relies on input measures of audit quality, such as Big N, specialization, and fees. Input measures are appropriate in this literature because the tests are designed to capture the client's choice of audit quality, which is restricted to observable inputs. While unavoidable, this reliance on input measures precludes the ability to compare their results to output measures with complementary strengths and weaknesses. In addition, discrete input measures such as Big N are unable to capture subtle differences in the demand for audit quality.

Another limitation inherent to this literature is endogeneity. While this applies to much of the archival auditing literature, endogeneity is particularly acute in the demand literature, because both the audit quality and agency cost proxies are choice variables. Consequently, most papers in this area acknowledge endogeneity and take steps to address it. The most common approach is to use two-stage least squares regressions, although a major challenge is identifying exogenous instruments (e.g., Guedhami et al., 2009). Another approach is to use difference in differences designs in auditor switch settings, although it limits generalizability to firms that switch auditors (e.g., Wang et al., 2008).

Going forward, a variety of evolving developments call for a deeper understanding of the factors that drive the demand for auditing and audit quality. One development is that SOX attempts to increase client demand for audit quality by, for example, beefing up internal controls and strengthening audit committees. This raises awareness of the role client demand factors potentially play in shaping audit quality. One path to better understand client demand factors is to expand the scope of the agency cost factors examined. In particular, research primarily examines agency cost proxies such as leverage and management ownership, which capture the conflicting preferences of managers and stakeholders. This ignores another critical input to the agency cost problem, the information asymmetry between these stakeholders.

Another path for better understanding the factors that drive client demand for audit quality is further research on client competencies related to IAF. Examining IAF is potentially fruitful because it potentially has a large effect on financial reporting quality. While there is limited evidence that IAF improves financial reporting quality, it is unclear whether this is because IAF improves internal controls, or because it facilitates the external audit. In addition, a unique feature of IAF is that some clients perform this function in house and others outsource it, often to a public accounting firm. This naturally raises the question of whether outsourcing provides higher internal audit quality than in-house IAF. This comparison reflects the classic tradeoff between independence and competency, where in-house IAF possesses more firm-specific knowledge but is less independent than outsourced IAF. Finally, there are also no generally agreed upon proxies for the quality of the IAF.<sup>68</sup>

#### 4. What drives auditor supply of audit quality?

In this section we review and critique the research that investigates the factors that drive auditors to supply audit quality. The supply of audit quality is a function of both the auditor's incentives for independence and their competency (Watts and Zimmerman, 1981). Auditor independence arises from market-based incentives that include reputation and litigation concerns (Dye, 1993), and auditor competency refers to the auditor's ability to deliver high audit quality, as reflected in factors such as inputs to the audit process, and expertise. In addition, in the case of public companies, regulation essentially sets a minimum floor on the supply of audit quality for public companies. Further, regulatory intervention can change auditors' incentives to supply high audit quality and their competencies for delivering this supply. For example, banning NAS intends to improve independence, and CPA licensure intends to improve competency.

The literature primarily focuses on the auditors' incentives for independence, particularly those arising from litigation risk. Thus, we first discuss studies that directly examine the effects of litigation and reputation risk on audit quality. We then discuss a large subset of the literature that indirectly captures auditor incentives using auditor characteristics such as Big N membership. Finally, we discuss the limited but growing literature on auditor competency, as captured by auditor industry specialization, office size, and features of the audit process. We defer our discussion of the literature on regulatory intervention to Section 5, which separately examines the effects of non-market-based incentives on audit quality.

##### 4.1. Auditor incentives to supply high audit quality

"Engagement risk" is used in the professional literature to describe the auditor's exposure to "loss or injury from litigation, adverse publicity, or other events arising in connection with the audited financial statements" (SAS 106). Engagement risk arises from three sources: litigation risk, reputation risk, and regulation risk (Knechel et al., 2007). Litigation risk exposes auditors to financial penalties, while reputation risk impairs the ability to attract and retain clients.<sup>69</sup> Regulation risk is the threat of regulatory intervention, which subjects auditors to sanctions that include fines and criminal penalties. These risks, however, are not independent. For example, litigation and regulatory sanctions are likely to damage the auditor's reputation.

<sup>68</sup> The literature has considered input measures such as internal audit hours, influence by the audit committee vs. management, and output measures such as third-party ratings on best practices.

<sup>69</sup> Litigation risk can be further refined as originating from "client business risk" (the auditor's risk of association with risky clients) or "auditor business risk" (the auditor's risk of being sued even if they comply with auditing standards). For expediency, we refer to the more general term "litigation risk" in most of our discussion.

#### 4.1.1. Reputation risk

We observe that reputation risk differs in two ways from litigation risk. One is that reputation costs impair an asset, reputational capital, while litigation costs create a liability. Thus, reputation has an upside in the sense that auditors can build reputation, whereas litigation risk has only a downside. Another difference is that unlike reputation risk, litigation risk is subject to direct intervention from changes in the legal environment, such as the shift in legal regime that resulted from the Private Securities Litigation Reform Act (PSLRA).

While it is intuitive that reputation risk provides an incentive for high quality audits, direct evidence that reputation incentives affect audit quality is rare. Several studies look for reputational effects by testing whether the Enron failure imposes costs on other Andersen clients. While several studies find a negative market reaction for Andersen clients following Enron, particularly for large NAS purchasers, there is also evidence that the negative reaction is confounded by oil price changes.<sup>70</sup> Another alternative explanation is that the market expected the litigation damages imposed by the Enron failure to exhaust Andersen's ability to "insure" their remaining clients.

To avoid litigation as a confounding explanation, two studies examine extreme audit failures in low litigation jurisdictions outside the US. Following a major audit failure in Germany, a KPMG affiliate lost clients, and its clients experienced share price declines (Weber et al., 2008). Similarly, following a major audit failure in Japan, a PwC affiliate lost clients (Skinner and Srinivasan, 2012). These studies provide evidence that auditor reputation provides incentives for high quality auditing independently of litigation risk.

In summary, the evidence is consistent with reputation risk providing an incentive for auditors to deliver high quality audits. However, the US evidence is limited and much of the evidence is inextricably confounded by high litigation risk. While foreign settings provide stronger evidence, it is difficult to generalize their results to the US. Moreover, these studies, in both US and foreign settings, rely on rare cases of extreme reputation loss. As such, while they are informative about whether damaged reputation is associated with perceived lower audit quality, they are silent about whether improved reputation motivates auditors to provide higher quality. Thus, primarily due to the difficulty in ruling out the confounding effects of litigation, it is unsettled whether reputation concerns play an important role in motivating auditors to provide high quality audits in the US.

#### 4.1.2. Litigation risk

Litigation damage claims against auditors can be large enough to threaten the viability of even the largest audit firm, and thus are expected to have significant incentive effects. As a result, we expect auditors to engage in strategies that counter litigation threats. The literature investigates the following strategies: (1) reduce risk by increasing audit quality through additional effort (e.g., Simunic, 1980); (2) bear risk by charging a risk premium (e.g., Bell, Doogar, and Solomon, 2008); (3) avoid risk through client retention and acceptance (e.g., Johnstone and Bedard, 2004); and/or (4) attenuate risk through lobbying for reduced legal liability (Geiger and Raghunandan, 2001). Thus, we organize our discussion around these strategies. We combine the first two categories, which both involve fees. This divides the literature into three broad groups: the effects of litigation on (1) audit effort and fees, (2) client acceptance and retention decisions, and (3) lobby activities. While our review focuses on the archival literature, a large proportion of the auditor litigation research over the past fifteen years is theoretical. Because this literature is prevalent, and because theory ideally informs empirical research, we discuss the relevant theoretical literature in the Appendix.

##### 4.1.2.1. Reducing litigation risk through increased effort and/or fees

**4.1.2.1.1. Fee studies.** Auditors can reduce the risk of material misstatement by increasing effort, which increases audit quality and audit fees.<sup>71</sup> Alternatively, auditors can pass this risk on to the client by charging a fee premium. Strategies that include higher fees, however, require the client's willingness to pay those fees. In addition, effort can never completely eliminate litigation risk, because auditors can be sued even when they fully comply with auditing standards (SAS 47, footnote 1).<sup>72</sup> This suggests that even when auditors reduce risk through additional effort they may still charge a premium to manage the "residual" risk. Taken together, this predicts that higher litigation risk is associated with higher fees, which reflects effort, a risk premium, or both (Simunic and Stein, 1996).<sup>73</sup>

Early studies identify several risk factors associated with higher fees, including client losses, modified opinions, public ownership, and for IPOs, bankruptcy and litigation disclosures.<sup>74</sup> However, the associations in these early studies are often weak and inconsistent, probably because much of the fee data are obtained from surveys and other proprietary sources. Recent fee studies identify additional priced risk factors, including several engagement characteristics. These studies find that auditors price high DAC, lack of conservatism, internal control deficiencies, high short interest, political connections,

<sup>70</sup> Chaney and Philipich (2002), Cahan et al. (2009), Cahan et al. (2011), Krishnamurthy et al. (2006), Nelson et al. (2008).

<sup>71</sup> Morgan and Stocken (1998), however, theorize that audit fees do not completely reflect litigation risk.

<sup>72</sup> Consistent with this, complaints against Big N auditors are three times the number of audit failures, as measured by AU 561 failure identified in Peer Review reports (Sullivan, 1992).

<sup>73</sup> Interestingly, Behn et al. (1999) show that client satisfaction is positively associated with audit fees.

<sup>74</sup> Simunic (1980), Simon and Francis (1988), Francis and Simon (1987), Palmrose (1986), Beatty (1993). See Simunic and Stein (1996) for a review of the early literature that links fees to litigation risk.

high free cash flows, poor credit ratings, and unethical business practices such as bribery.<sup>75</sup> Studies also compare fees across countries with different litigation regimes. They find higher fees for clients listed or cross-listed in high litigation risk countries, and in countries that adopt IFRS, although this may be due to increased procedures required by IFRS rather than increased risk.<sup>76</sup>

Most studies, however, do not address whether higher fees are due to increased effort or risk premia. This distinction is critical because additional effort increases quality, consistent with [Caramanis and Lennox \(2008\)](#), who find that increased audit hours reduce earnings management. In contrast, risk premia simply shift the expected litigation cost to the client. One way to disentangle effort from risk premia is to examine actual audit hours, which capture effort, and billing rates, which reflect (at least in part) the risk premia.<sup>77</sup> While several studies find that risk-related fees reflect additional audit effort, others find they reflect both effort and risk premia, particular in the early years of an engagement, perhaps due to the increased risk of audit failure.<sup>78</sup>

A series of studies draw unique insights from examining fees and restatements. An early study finds that restatements are associated with higher fees ([Kinney Jr. et al., 2004](#)), perhaps because restatement firms are also riskier. After controlling for the higher risk, later research finds that restatements are actually less likely for clients with higher fees ([Blankley et al., 2012](#); [Lobo and Zhao, forthcoming](#)). This suggests that fees capture effort, consistent with higher fees being associated with a reduced likelihood of waived material misstatements ([Keune and Johnstone, 2012](#)). However, this literature does not inform the question of whether fees also reflect litigation risk premia.

**4.1.2.1.2. Non-fee studies.** Non-fee studies are few in number. One subset examines shifts in litigation risk and finds that lower litigation risk reduces audit quality. Specifically, passage of the PSLRA reduces audit quality in the US, shifting from unlimited to limited auditor liability reduces audit quality in China (but not in the UK), and post-IPO clients demand lower audit quality than high risk pre-IPO clients. Another subset examines the effects of misstatement risk, as reflected in accruals. These studies find mixed evidence on whether higher accruals or DAC affect GCs, and if so whether it is due to litigation risk or poor financial health.<sup>79</sup> Recently, however, [Kaplan and Williams \(2013\)](#) use a simultaneous equations model and find that auditors issue more GCs to high litigation risk clients, are sued less after issuing GCs, and suffer smaller financial losses from being sued. In addition, auditors constrain DAC for inherently risky clients ([Cahan and Zhang, 2006](#)).

**4.1.2.2. Avoiding litigation risk through client acceptance and retention decisions.** If additional effort and/or increased fees are insufficient to reduce risk to a tolerable level, auditors can avoid risk by dropping risky clients.<sup>80</sup> It is unclear, however, whether high quality auditors prefer less risky clients. On one hand, “deep pockets” and higher reputation give high quality auditors incentives to avoid risky clients. On the other hand, their high quality allows them greater capability to mitigate client risk. Consistent with theory, however, and using data from a variety of sources, this research finds consistent evidence that auditors are more likely to resign from, and less likely to accept, riskier clients.<sup>81</sup>

**4.1.2.3. Attenuating litigation risk through lobbying activities.** While less researched, auditors may also attenuate litigation risk by lobbying. A large lobbying effort by US auditors resulted in passage of the PSLRA in 1995, which reduced auditor liability. This is *prima facie* evidence that auditors lobby for litigation relief. Consistent with PSLRA reducing litigation risk, after its passage, auditors issue fewer GC opinions ([Geiger and Raghunandan, 2001](#)), and Big N clients report higher DAC ([Lee and Mande, 2003](#)). These findings are consistent with auditors benefiting from litigation relief.

**4.1.2.4. Determinants of auditor litigation risk.** While most research studies the effects of litigation risk on audit quality, some identifies determinants of litigation risk. One set of determinants is auditor characteristics. These studies find that litigation risk is higher for auditors who are larger, have shorter tenure, share profits nationally (as opposed to locally), but not higher for industry specialists. Another set of determinants is client characteristics. These studies find that litigation risk is higher for clients that are larger, financially distressed, less conservative, and with higher growth, higher return volatility, riskier accounts, GCs, income-increasing accruals, fictitious transactions. A third set of determinants is engagement characteristics, including understanding client business risk, working paper review procedures, and sampling size choices.<sup>82</sup> [Shu \(2000\)](#)

<sup>75</sup> [Abbott et al. \(2006\)](#), [Gul et al. \(2003\)](#), [DeFond et al. \(2012\)](#), [Hogan and Wilkins \(2008\)](#), [Cassell et al. \(2011\)](#), [Gul \(2006\)](#), [Gul and Tsui \(1998\)](#), [Gul and Goodwin \(2010\)](#), [Lyon and Maher \(2005\)](#).

<sup>76</sup> [Seetharaman et al. \(2002\)](#), [Choi et al. \(2008 and 2009\)](#), [Magnan \(2008\)](#), [Kim et al. \(2012\)](#), [De George et al. \(2013\)](#).

<sup>77</sup> Audit effort can also be inferred from audit reporting lags ([Knechel and Payne, 2001](#)).

<sup>78</sup> For the relation between fees and risk premia, see [Simunic and Stein \(1996\)](#), [Bell et al. \(2001\)](#), [Schelleman and Knechel \(2010\)](#), [Johnstone and Bedard \(2003\)](#), [Bell, Doogar, and Solomon \(2008\)](#). For increased risk of audit failure in early years, see [Erickson et al. \(2000\)](#), [Myers et al. \(2003\)](#).

<sup>79</sup> For shifts in litigation risk, see [Geiger and Raghunandan \(2001\)](#), [Lee and Mande \(2003\)](#), [Firth et al. \(2012\)](#), [Lennox and Li \(2012\)](#), [Venkataraman et al. \(2008\)](#). For misstatement risk, see [Krishnan et al. \(2011\)](#), [Bradshaw et al. \(2001\)](#), [Francis and Krishnan \(1999\)](#), [Bartov et al. \(2001\)](#), [Butler et al. \(2004\)](#).

<sup>80</sup> Client acceptance rates may also be a U-shaped function of the strictness of the legal regime, with lower rates in moderate liability regimes, than in strong or weak regimes ([Laux and Newman, 2010](#)).

<sup>81</sup> [Bockus and Giger \(1998\)](#), [Krishnan and Krishnan \(1997\)](#), [Shu \(2000\)](#), [Raghunandan and Rama \(1999\)](#), [Johnstone and Bedard \(2003\)](#), [Choi et al. \(2004\)](#), [Johnstone and Bedard \(2004\)](#), [Hackenbrack and Hogan \(2005\)](#).

<sup>82</sup> For auditor characteristics, see [Casterella et al. \(2010\)](#), [Stice \(1991\)](#), [Casterella et al. \(2010\)](#), [Hay et al. \(2007\)](#). For client characteristics, see [Stice \(1991\)](#), [Carcello and Palmrose \(1994\)](#), [Lys and Watts \(1994\)](#), [Shu \(2000\)](#), [Bonner et al. \(1998\)](#), [Heninger \(2001\)](#), [DeFond et al. \(2013\)](#). For engagement characteristics, see [Erickson et al. \(2000\)](#), [Gibbins and Trotman \(2002\)](#), and [Elder and Allen \(2003\)](#), [Yim \(2009\)](#).



introduces a composite metric, which has been widely adopted as a measure of firm litigation risk. We note, however, that these models have developed in a relatively piece-meal fashion and are relatively descriptive in nature.

#### 4.1.3. Auditor incentives captured by auditor size

For over three decades, a large body of research has focused on whether large auditors provide relatively higher audit quality, where large auditors are typically captured by Big N membership. This literature asks whether there is cross-sectional variation in audit quality, referred to as “audit quality differentiation.” Big N auditors are posited to provide higher audit quality because they are expected to be more independent. This is because their larger client base subjects them to greater reputation risk and less pressure to succumb to an individual client, and because their “deep pockets” subject them to higher litigation risk. Because this literature generally theorizes that Big N auditors provide higher audit quality from stronger incentives, these studies are joint tests of (1) whether Big N captures stronger incentives, and (2) whether stronger incentives are associated with higher audit quality. Big N auditors, however, also have higher competency in providing audit quality.

We first examine studies that support the notion that Big N auditors provide higher audit quality, which constitutes the majority of this literature. We group these studies based on the nature of the audit quality proxies they employ. We then discuss the evidence from a few studies that challenge this research. Finally, we critique this literature.

##### 4.1.3.1. Evidence that size is associated with audit quality differentiation

**4.1.3.1.1. Evidence from material misstatements.** Big N auditors are less likely than non-Big N auditors to trigger litigations and AAERs.<sup>83</sup> Importantly, the association with AAERs is also found shortly prior to 2002, a time during which the Big N auditors were severely criticized for providing low quality audits. Several studies that model restatements include a Big N control variable and find only weak evidence that Big N auditors are associated with fewer restatements, except among the largest quartile of auditor offices.<sup>84</sup>

**4.1.3.1.2. Evidence from auditor communication.** Using Chinese data, [Chan and Wu \(2011\)](#) find that audit firm mergers increase audit quality as measured by Modified Audit Opinions (the counterpart of GCs in China). This supports the notion that larger auditors provide higher audit quality due to the increased incentives provided by larger quasi-rents. We observe, however, that such mergers are also likely to increase the competency of merged audit firm to provide higher audit quality, making it difficult to disentangle the incentive effects from the competency effects.

**4.1.3.1.3. Evidence from financial reporting quality.** This research finds that compared to non-Big N auditors, Big N auditors are associated with smaller DAC, even after controlling for management’s simultaneous choice of both accruals and auditor type.<sup>85</sup> Further, this association is relatively stronger in China during periods in which managers have strong incentives to manage earnings, and in countries with strong investor protection rights.<sup>86</sup> However, [Zang \(2012\)](#) finds that while Big N auditors constrain accrual-based earnings management, they do not constrain earnings management from real activities.

In addition to constraining accruals management, research also finds that Big N auditors are associated with a variety of other measures that suggest improved reporting quality. For example, clients of Big N auditors have a stronger association between DAC and future profitability, greater accounting conservatism in strong enforcement countries, faster 8-K filings, more frequent, timely, and informative management forecasts, smaller absolute management earnings forecast errors among Canadian IPOs, higher financial reporting comparability, and more timely disclosure of auditor changes.<sup>87</sup>

**4.1.3.1.4. Evidence from perceptions of audit quality.** Since Big N auditors are associated with improved financial reporting quality, a natural extension is to examine whether the market perceives Big N audited financial information to be more valuable. Early research finds that ERCs are larger for Big N auditors compared to non-Big N auditors ([Teoh and Wong, 1993](#)). Notably, this finding is robust to a matched pairs design and in settings where clients switched between Big N and non-Big N auditors. More recently, this finding is corroborated by a large number of studies. For example, when compared to non-Big N clients, Big N clients tend to have a stronger association between share prices and DACs, higher analyst forecast accuracy, higher acquisition prices for M&A targets, smaller price discounts among minority shareholders, lower stock price synchronicity in China, lower cost of equity, lower cost of debt, higher propensity to raise outside capital in weak legal environments, and a higher propensity to issue equity over debt.<sup>88</sup>

A large subset of the market-based studies examines evidence from auditor changes. One branch of this research examines switches between Big N and non-Big N auditors. If these switches represent a change in audit quality, market participants will react positively to unanticipated “upgrades” and negatively to unanticipated “downgrades.” While early studies find little reaction to auditor changes, studies using more recent data find a negative reaction to downgrades and a positive reaction to upgrades, which is attenuated shortly after the implementation of SOX 404 and the PCAOB audit firm

<sup>83</sup> [Palmrose \(1988\)](#), [Farber \(2005\)](#), [Lennox and Pittman \(2010b\)](#).

<sup>84</sup> [DeFond and Jiambalvo \(1991\)](#), [Archambeault et al. \(2008\)](#), [DeFond et al. \(2012\)](#), [Francis et al. \(2014\)](#).

<sup>85</sup> [Becker et al. \(1998\)](#), [Francis et al. \(1999\)](#), [Kim, Chung, and Firth \(2003\)](#).

<sup>86</sup> [Chen, Chen, Lobo, and Wang \(2011\)](#), [Francis and Wang \(2008\)](#).

<sup>87</sup> [Krishnan \(2003\)](#), [Francis and Wang \(2008\)](#), [Schwartz and Soo \(1996b\)](#), [Ball et al. \(2012\)](#), [Clarkson \(2000\)](#), [Francis et al. \(2013\)](#), [Schwartz and Soo \(1996a\)](#).

<sup>88</sup> [Krishnan \(2003\)](#), [Behn et al. \(2008\)](#), [DeFranco et al. \(2011\)](#), [Fan and Wong \(2005\)](#), [Gul et al. \(2010\)](#), [Khurana and Raman \(2004\)](#), [Pittman and Fortin \(2004\)](#), [Mansi et al. \(2004\)](#), [Choi and Wong \(2007\)](#), [Chang et al. \(2009\)](#).

inspections.<sup>89</sup> This is consistent with the difference in audit quality between Big N and non-Big N auditors narrowing after SOX, as suggested by the large exodus of small low quality auditors following the passage of SOX (DeFond and Lennox, 2011).

Another branch of the auditor change literature examines IPOs, since companies often change auditors before going public. These studies find that IPOs with Big N auditors exhibit lower underpricing, even after controlling for self-section bias.<sup>90</sup> Willenborg (1999) extends this literature by examining the pricing of small development stage IPOs, where the risk of failure is high but the financial information provided is minimal. Consistent with Dye (1993), this paper finds evidence that large audit firms play both an insurance role (by providing recourse to investors) and an information role (by helping assess firm value). A problem with the “insurance hypothesis,” however, is that even the largest auditing firms do not have the capital to “insure” large public companies. This is evidenced by the large losses suffered by shareholders following failures such as Enron and WorldCom. Using KPMG’s tax shelter clients, Brown et al. (forthcoming) isolate the insurance role of auditing by documenting negative (positive) market reactions to events that increase the likelihood of criminal charges (impending settlement). In another extension, Weber and Willenborg (2003) find that GC opinions issued by Big N auditors to IPO firms are better able to predict future delisting when compared to non-Big N auditors (after controlling for auditor–client self-section bias). However, Leone et al. (2013) find that Big N audit quality declines for IPOs issued during times of stock market euphoria.

*4.1.3.1.5. Evidence from audit fees.* While Big N is often used as an input-based measure of audit quality, researchers also examine its association with another input-based measure – audit fees. Several early studies find evidence that clients pay a fee premium to Big N auditors, consistent with these auditors providing higher audit quality.<sup>91</sup> This premium can range as high as 50% over the fees paid to non-Big N auditors and is found across a variety of national jurisdictions, including the US, the UK, Australia, and Hong Kong.<sup>92</sup> Ireland and Lennox (2002) further show that the Big N fee premium is twice as large once client selection is controlled for. However, while there is clear evidence of the existence of a fee premium, it is unclear whether the fee premium represents higher audit quality, monopoly pricing, or simply a risk premium. Thus, it is important to look for further evidence that corroborates the audit quality explanation.

*4.1.3.2. Evidence that auditor size is NOT associated with audit quality differentiation.* While there is strong evidence that auditor size as captured by Big N membership provides higher audit quality, there still remains some tension on this issue. Theoretical work suggests that larger auditors can actually provide lower quality audits (Bar-Yosef and Sarath, 2005; Beyer and Sridhar, 2006), consistent with a handful of empirical studies. For example, Petroni and Beasley (1996) find no systematic difference in claim loss reserve accuracy or bias between clients of Big N and non-Big N auditors. However, because claim loss reserves are risky accounts, small auditors may exert relatively more effort in auditing them. In addition, Chaney et al. (2004) find evidence among private firms that Big N fee premia disappear once self-selection is controlled, although Lennox et al. (2012) find that the premia remain. More recently, Lawrence et al. (2011) challenges the long series of studies that find Big N auditors increase financial reporting quality. Using a propensity score matching technique, they suggest that Big N quality differentiation (as captured by DAC, cost of equity, and analysts forecast accuracy) is due to differences in client characteristics.<sup>93</sup> However, a recent working paper suggests that the results in Lawrence et al. (2011) are sensitive to research design choices inherent in propensity score matching (DeFond et al., 2014).

*4.1.3.3. Critique of the auditor size research.* The research that examines the link between Big N auditors and audit quality is exceptionally large and studies a large variety of audit quality proxies. The overwhelming majority of these studies find strong evidence that Big N auditors are associated with higher quality auditing as captured by a lower likelihood of fraud, lower DACs, higher fees, increased ERCs, improved management forecasts, timelier 8-K filings, and a lower cost of debt and equity. Taken as a whole, these studies provide evidence that triangulates across audit quality proxies that are complementary on many dimensions. Specifically, the proxies include both direct and indirect measures, egregiously large misstatements as well as “within-GAAP” manipulations, actual and perceived quality, and both input and outputs from the audit process. Thus, this research provides compelling evidence consistent with the notion that Big N auditors deliver higher quality audits when compared to smaller auditors.

Self-selection is a major challenge currently facing this literature, and a large part of the archival auditing literature as well. For example, Big N auditors may be associated with smaller DAC simply because lower DAC reflects lower audit risk, and Big N auditors choose less risky clients. We emphasize, however, that concerns about Big N membership capturing auditor–client self-selection are not new to this literature, and the literature has long recognized self-selection and endogeneity to be inherent research design challenges. For example, the evidence suggests that Big N auditors select lower

<sup>89</sup> Nichols and Smith (1983), Johnson and Lys (1990), Eichenseher et al. (1989), Knechel et al. (2007), Chang et al. (2010).

<sup>90</sup> Simunic and Stein (1987), Balvers et al. (1988), Beatty (1989), Hogan (1997).

<sup>91</sup> The Big N fee premium also exists for non-profit clients (Krishnan and Schauer, 2000; Vermeer et al., 2009).

<sup>92</sup> Palmrose, 1986; Simon and Francis (1988), Pong and Whittington (1994), Francis (1984), Francis and Stokes (1986), Craswell et al. (1995), DeFond et al. (2000).

<sup>93</sup> There is also less direct evidence that challenges Big N audit quality. Guedhami and Pittman (2006) find that legal institutions are superior to Big N auditors in reducing poor financial reporting for minority investors. Moreover, Louis (2005) looks at post-acquisition performance and finds that acquirers with non-Big 4 auditors outperform acquirers with Big 4 auditors.

risk clients (e.g., [Johnstone and Bedard, 2004](#)). Similarly, if risky clients expect greater scrutiny from Big N auditors, they are likely to select smaller auditors.

A large number of studies, particularly recent ones, attempt to address self-selection using a variety of techniques, including Heckman two-stage procedures, two-stage treatment effects models, general matching procedures, change analyses, difference-in-difference designs, and propensity score matching.<sup>94</sup> While these techniques may partially attenuate concerns about self-selection and endogeneity, they can never be completely eliminated outside of a purely experimental setting ([Cochran and Rubin, 1973](#)). [Larcker and Rusticus \(2010\)](#) address the use of instrumental variables analysis in accounting research, which is also applicable to auditing research in addressing endogeneity issues in general. [Lennox et al. \(2012\)](#) provide an excellent discussion on the use of the Heckman procedure to control for selection bias. In particular, they recommend that researchers be more careful in implementing the first stage selection models, and be more circumspect in claiming to have “controlled for selection bias”. Further, [DeFond et al. \(2014\)](#) find that Propensity Score Matching is inherently sensitive to several research design choices, and that it suffers from the “random matching” problem. They propose a new technique, Coarsened Exact Matching, which does not suffer from these problems and thus results in higher match quality. We believe that given the obvious validity threat posed by selection biases, it is important for researchers to address these biases to the extent possible, and to carefully interpret their findings in light of these threats.<sup>95</sup>

Another challenge in this literature is identifying what factors drive Big N audit quality. Specifically, while most of this literature concludes that Big N quality differentiation is driven by incentives, Big N auditors also have greater competency in providing higher audit quality. Big N auditors are expected to be more competent for a variety of reasons. For example, Big N auditors enjoy economies of scale that make it more efficient to monitor audit quality ([Watts and Zimmerman, 1981](#)).<sup>96</sup> In addition, their large size allows them to attract and retain higher quality audit inputs, particularly with respect to human resources and expertise ([Dopuch and Simunic, 1982](#)). While Big N captures both auditor incentives and competencies, most of the literature does not attempt to disentangle the two. Recently, however, researchers have begun to examine audit quality variation within Big N auditors, which holds their incentives relatively constant, thereby teasing out the effects of competency on audit quality. The auditor characteristic that is examined most extensively in this literature is auditor industry specialization. The research on auditor industry specialization is discussed in the next section, which surveys the literature on auditor competencies.

#### 4.2. Auditor competencies to deliver high audit quality

Auditor competency refers to the auditor's abilities to deliver high audit quality, which include training, skills, and expertise. We note, however, that auditor competencies are not independent of their incentives. Greater incentives to supply high audit quality also motivate auditors to develop competencies that facilitate the delivery of high quality audits. Similarly, greater competency in delivering high quality audits is expected to increase the auditor's reputation capital, thereby providing greater incentives to supply high audit quality. The archival research on auditor competencies is fairly recent, and thus relatively small compared to the auditor incentives literature.

##### 4.2.1. Evidence from auditor industry specialization

The industry expertise research extends the auditor size literature by investigating whether quality differentiation occurs at the intra-audit firm level. Auditors will choose to specialize if they perceive benefits, such as increased fees or market share from higher quality audits and/or economies of scale. Industry specialists are expected to provide higher audit quality because they have greater knowledge of industry business and accounting practices than non-specialists ([Dopuch and Simunic, 1982](#)). This suggests that specialists have greater competency in delivering high quality audits. In addition, industry specialists have higher reputational capital at stake, providing them with greater incentives to deliver high audit quality. Industry specialization can arise at different organizational levels for different reasons. Global and national-level specialization provides greater opportunities for knowledge sharing, while office-level specialization leverages client-specific knowledge and local business conditions. Partner-level specialization may capture knowledge that is difficult to transfer and provide stronger individual incentives.

A challenge in this literature is measuring specialization, which is usually captured as industry market share, based on sales, size, fees, or number of clients, using a simple proportion or Herfindahl index. Auditors are specialists if they are industry leaders or audit some arbitrary percentage of the market, usually 10–30% ([Neal and Riley, 2004](#)). Only Big N auditors are national-level specialists because they dominate most industries. In addition, many studies control for brand name by restricting their analysis to Big N auditors. Thus, industry specialization often refers to specialization among Big N auditors.

This literature takes several approaches to test whether industry specialists provide higher quality audits. One examines audit quality proxies. A large number of studies find that *national-level* specialists are associated with high audit quality

<sup>94</sup> See [Weber and Willenborg \(2003\)](#), [Kim, Chung, and Firth \(2003\)](#), [Doogar and Easley \(1998\)](#), [Wang et al. \(2008\)](#), [Blouin et al. \(2007\)](#), [Armstrong et al. \(2010\)](#), [Core \(2010\)](#), [Lawrence et al. \(2011\)](#), [Lennox and Pittman \(2010b\)](#).

<sup>95</sup> Dies and Hill (1998) present a bootstrap method to address the simultaneity of the demand and supply of audit services.

<sup>96</sup> [Banker et al. \(2003\)](#) empirically document that the production function of the public accounting industry exhibits significant scale economies during 1995–1999.

proxies, including DAC, ERCs, GCs, benchmark beating, disclosure quality, and analyst forecast accuracy, with relatively limited evidence that *City level* specialists provide higher quality.<sup>97</sup> *Partner-level* specialization data is not available in the US, but Taiwan data finds that these specialists reduce restatements (Chin and Chi, 2009).<sup>98</sup> Another approach examines the market reaction to auditor switches and finds a positive (negative) reaction for switching to a specialist (non-specialist), consistent with the perception that specialists provide higher quality (Knechel et al., 2007). Yet another approach examines fee premia. While early studies find premia only for larger clients, recent studies conclude that *national-level* industry leaders earn premia, but only when they are also *city-level* industry leaders; *global-level* industry leaders earn premia irrespective of whether they are also *national-level* specialists; and *partner-level* industry leaders earn premia, but only when they are also public firm specialists.<sup>99</sup> However, a recent study suggests that the quality these associations are explained by self-selection (Minutti-Meza, 2013). While self-selection is a legitimate concern, it is premature to draw a definite conclusion on this issue and we call for future research to further explore the effect of self-selection in the specialization literature.

Digging deeper, the degree of audit market competition impacts the specialization premia. Numan and Willekens (2012) find that the specialization premia increases with the distance between the auditor's market share and the market share of the next closest competitor, and Mayhew and Wilkins (2003) find similar results in the IPO market. This suggests that fee premia accrue to auditors with superior bargaining power. Consistently, fee premia decline when clients have strong bargaining power.<sup>100</sup> Moreover, when specialization produces economies of scale, auditors may instead grant fee discounts (DeFond et al., 2000).

Less explored is why audit firms choose to specialize. Kwon (1996) finds that as industry concentration decreases, competitors are more likely to share the same auditor, since proprietary information concerns decline. In addition, specialization is more likely in homogenous industries where economies of scale are larger, in industries with a lower incidence of litigation, and when audit partner specialists receive higher compensation.<sup>101</sup> These findings suggest that demand-side industry forces and litigation risk play a role in the choice to specialize.

In addition to specialization, geographic location also affects audit quality differentiation. Auditors provide higher audit quality to clients that are geographically closer, consistent with geographic proximity increasing knowledge of the client and thus improving the auditor's competency. In particular, auditors tend to provide higher quality audits to clients that are geographically closer as evidenced by DAC (Choi et al., 2012), consistent with the accounting and finance literature on geographic proximity (e.g., Kedia and Rajgopal, 2009).

#### 4.2.2. Evidence from auditor office size

In addition to specialization, researchers also examine whether auditor office characteristics capture auditor competencies that influence audit quality. Most commonly examined is Big N office size, as measured by client fees or assets. Large Big N offices are argued to offer higher quality because of greater in-house expertise. Although limited in number, studies find that large offices provide higher audit quality, as measured by DAC, GCs, fee premia, and restatements.<sup>102</sup> An implication of this literature is that office size, along with industry specialization, also captures within-audit firm differential audit quality provided by Big N auditors. Francis et al. (2014) examine the "contagion" effects within offices and find that offices with audit failures, as proxied by restatements, also have clients with higher DAC within the office. This suggests that certain auditor offices have systematic and persistent audit-quality problems.

#### 4.2.3. Evidence from the audit process

While limited in number, several studies identify audit process inputs that may affect auditor competency. Intuitively, audit process inputs are direct measures of competency, and as such provide salient evidence of audit quality factors. This literature finds that Dutch Big N auditors improve quality by choosing lower materiality levels and deploying audit hours using a more contextual and less procedural approach (Blokdiijk et al., 2003, 2006).<sup>103</sup> Materiality levels are also shown to affect auditors' tolerance of earnings management to meet or beat earnings forecasts (Legoria et al., 2013). Lennox et al. (2013) also find that audit adjustments, another input to the audit process, are associated with higher earnings smoothness, earnings persistence, and accrual quality. In addition, audit partners compensation schemes also affect the likelihood of GC opinions (Carcello et al., 2000).<sup>104</sup>

<sup>97</sup> Balsam et al. (2003), Reichelt and Wang (2010), Lim and Tan (2008), Payne (2008), Dunn and Mayhew (2004), Behn et al. (2008), Reichelt and Wang (2010).

<sup>98</sup> Evidence also suggests that industry specialist auditors attenuate the negative association between short auditor tenure and audit quality (Gul et al., 2009).

<sup>99</sup> For early studies, see Palmrose (1986), Pearson and Trompeter (1994), Deis and Giroux (1996), Ettredge and Greenberg (1990), O'Keefe et al. (1994), Menon and Williams (2001), Craswell et al. (1995). For more recent studies, see Ferguson et al. (2003), Francis et al. (2005), Basioudis and Francis (2007), Carson (2009), Zerni (2012), Goodwin and Wu (2014).

<sup>100</sup> Casterella et al. (2004), Huang et al. (2007), Fung et al. (2012).

<sup>101</sup> Cairney and Young (2006), Hogan and Jeter (1999), Knechel et al. (2013), Liu and Simunic (2005).

<sup>102</sup> Francis and Yu (2009), Choi et al. (2010), Michas and Yu (2013).

<sup>103</sup> In contrast, Chewning et al. (1999) find evidence that the gains from equity-for-debt swaps follow a conventional percentage of income, rule-of-thumb materiality level. See Messier et al. (2005) for a detailed review of the literature on materiality.

<sup>104</sup> Studies also investigate how the audit process improves efficiency (Dopuch et al., 2003; Knechel et al., 2009). They find audit efficiency is affected by planning (Davidson and Gist, 1996; Newman et al., 2001), analytical procedures (Hirst and Koonce, 1996), materiality levels (Mittendorf, 2010), competitive bidding (Johnstone et al., 2004), resource allocation to detect fraud (Newman et al., 1996), and partner-client familiarity (Vermeer et al., 2008).

### 4.3. Institutions and other factors

Auditors' incentives and competencies are also affected by audit environment factors such as regulatory intervention, market conditions, auditing standards, and the institutional environment. However, with the exception of regulatory intervention (discussed in Section 5), research on these other factors is relatively scarce. The limited evidence finds that auditors provide less effort for IPOs when market conditions are favorable, that the precision of accounting standards affects managers' incentives to manage earnings and auditors' incentives to undo earnings management, and that Big N audit quality is higher in countries with a more developed audit profession.<sup>105</sup>

### 4.4. Critique and future research on what drives auditor supply of audit quality

The literature on the supply of audit quality, which focuses on auditor incentives, suffers from several limitations. One is that the research on auditor reputation risk is small. While there is strong evidence from low-litigation risk foreign jurisdictions (e.g., Germany and Japan), the US evidence is limited and confounded by litigation risk. Given that reputation incentives have strong theoretical support and intuitive appeal, further research is needed on this fundamentally important market-based incentive.

An extensive literature finds strong and consistent evidence that increased litigation risk triggers a variety of auditor responses, including charging higher fees, increasing GC opinions, reducing DAC, shedding riskier clients, and lobbying for litigation relief. While the evidence from fees, GC opinions and DAC are largely consistent with litigation risk increasing audit quality, much of this research is open to alternative explanations. The audit fee studies find compelling evidence that auditors price a plethora of litigation risk factors, but most studies do not disentangle whether the increased fees are due to increased audit effort (consistent with higher audit quality), or simply risk premia (which is a deadweight loss). The non-fee studies using GCs and DAC provide more direct evidence than the fee studies, but may be capturing excessive auditor conservatism, which reduces audit quality. Auditors may respond to litigation risk with excessive conservatism because GCs protect them from litigation (Thoman, 1996; Kaplan and Williams, 2013). Thus, we call for additional research that teases out audit effort from risk premia in fee studies, and to rule out reporting conservatism as an explanation for the non-fee studies.

We also observe that the other strategies employed in response to litigation risk do not improve, and may even harm, audit quality. Specifically, while shedding riskier clients should improve audit efficiency through better auditor–client matching, it may reduce audit quality if the subsequent auditor is lower quality. In addition, lobbying activities that lead to reduced litigation risk may also reduce audit quality. These alternative mechanisms suggest that improving audit quality is just one of several ways to mitigate litigation risk, and it is unclear which one auditors will choose. In summary, given the costs imposed by litigation risk, it is not surprising that auditors engage in a variety of strategies to mitigate its effects. Given the strong theoretical predication that litigation risk improves audit quality, however, it is somewhat surprising that the link to audit quality is not more conclusive. We also observe that empirical research rarely draws on the rich theoretical literature in this area, which addresses a variety of questions regarding audit quality. Thus, we believe future research would benefit from exploiting the insights found in the theoretical literature.

The research examining Big N audit quality is one of the longest running sagas in the auditing literature. This literature amasses a mountain of data supporting the contention that Big N auditors provide higher audit quality. Recent work, however, suggests that the past research on Big N audit quality is likely driven by client self-selection, casting doubt on the vast evidence of Big N quality differentiation. We believe, however, that it is premature to dismiss the large body of literature that supports Big N quality differentiation, especially because most of this literature empirically addresses endogeneity concerns. Going forward, we recommend further research to explore the extent of the problem of self-selection and endogeneity. We observe that while there is strong evidence that Big N auditors provide higher quality than their smaller counterparts, what is less clear is why. In particular, Big N captures both auditor incentives and competency, and most of the literature does not attempt to disentangle the two. In addition, the sparse research on reputation risk, and the susceptibility of the litigation research to alternative explanations, raises doubt about the role played by incentives in explaining Big N audit quality.

Recently, researchers are looking more carefully at a variety of audit firm characteristics associated with auditor competencies. The characteristic most commonly examined is auditor industry specialization and there is convincing evidence that specialist auditors provide higher quality. A criticism of this literature is that it makes strong assumptions about the mechanisms through which specialization improves audit quality. One assumption is that industry-specific knowledge is transferrable across clients, personnel and over time, which requires sophisticated knowledge management systems. Expertise gained on a particular client does not necessarily benefit the audits of other clients in the same industry. They may not even benefit the audits of the same clients over time, particularly given audit team turnover. Another assumption is that auditors gain greater industry expertise by auditing a relatively larger proportion of clients in an industry, as compared with auditing a single large client, or a few large clients in an industry. There is also little consensus on how to empirically measure specialization, making it difficult to compare the results across studies.

<sup>105</sup> Copley and Douthett (2009), Nelson et al. (2002), Michas (2011).

We encourage research on auditor competencies and suggest that the literature explore factors beyond audit firm specialization. For example, we currently know little about basic characteristics of audit firms such as their choice of ownership structure, governance systems, audit quality control systems, compensation schemes, or audit technology.<sup>106</sup> Knowledge of these characteristics potentially provides insights into various input factors affecting auditor competency and incentives.<sup>107</sup> In addition to factors that affect the audit firm's competencies, the individual auditor's competencies are also likely to play a role in providing high quality. Two recent studies explore audit partner characteristics, such as educational background, political affiliation, prior reporting history (Gul et al., forthcoming; Knechel et al., 2013). We encourage future research to consider additional individual auditor characteristics, such as professional skepticism, personality traits, gender, the complex audit team interactions, and the socio-economic characteristics. Data to facilitate this analysis in the US may be available as a result of a current PCAOB proposal that calls for the disclosure of information on the identity of the signing auditor partner (PCAOB, 2011c).

We also note that in contrast to the large amount of evidence on size and specialization, the audit process is a black box to archival auditing researchers, primarily due to data limitations. A critical area of the audit process that has been virtually ignored in the archival literature is the auditor's assessment of fraud risk and audit procedures for detecting fraud. This is quite surprising given the high profile frauds over the past two decades and the auditor's increasing responsibilities for fraud detection.<sup>108</sup> The audit process is an area where field studies, survey methodology, and behavioral research have a comparative advantage. Having said this, creative settings and research designs may allow archival researchers to peek into the black box to investigate interesting research questions.<sup>109</sup>

## 5. What are the regulators' concerns about audit quality?

Audit market regulation is a non-market-based mechanism that intends to improve audit quality by altering auditors' and clients' market-based incentives and competencies. Regulators traditionally intervene in audit markets following high profile audit failures, when market-based incentives and competencies are perceived to have failed (DeFond and Francis, 2005). SOX, which followed a spectacular series of alleged audit failures, is a recent case in point. A fundamental question is whether regulatory intervention improves audit quality. For our discussion, we divide the regulation literature into two groups. The first examines the effects of regulatory intervention, both before and after SOX. The second investigates broad engagement-specific characteristics that regulators have traditionally perceived as threats to auditor independence, which are possible candidates on the agenda for future regulatory intervention.

### 5.1. What are the effects of regulatory intervention?

While regulatory intervention may change the equilibrium level of audit quality (as well as its price and quantity), it is unclear whether the new equilibrium is preferable. While policymakers seem to have a zero tolerance for audit failures, completely eliminating failures is prohibitively costly. In addition, while regulatory intervention may benefit some, its "one size fits all" nature may harm others. Thus, it is an empirical question whether regulatory intervention improves audit quality. In this section we review the literature on the effects of both pre-SOX and SOX regulation. We further divide SOX research into the overall effects of SOX and the effects of specific SOX provisions.

#### 5.1.1. The effects of pre-SOX regulation

Prior to the SOX, US audit markets were self-regulated, and the SEC intervened only "indirectly through encouragement, and at times reprimands, of the profession" (PCAOB, 2007). For example, harsh criticism from the SEC following the McKesson and Robbins fraud in the 1930s (the Enron of its time) led to auditing standards that required auditors to take physical inventory counts and confirm accounts receivable. Condemnation from the SEC following a spate of scandals in the 1970s led to the AICPA self-regulatory framework for oversight of the profession, which included AICPA Peer Reviews. However, direct regulatory intervention prior to SOX was rare, focusing primarily on incremental changes to supply-side factors.<sup>110</sup>

Pre-SOX, regulators' concerns motivated many studies, although actual regulatory intervention was infrequent. While some pre-SOX studies find benefits from regulation, regulation is often a double-edged sword that can also impair audit quality and/or efficiency. For example, while banning price competition in municipal audit markets attracts higher quality auditors, it also reduces audit efficiency (Hackenbrack et al., 2000). Similarly, while lifting the ban on auditors' solicitation of

<sup>106</sup> Existing evidence on these factors is limited. For example, survey evidence suggests that structured audit teams have more control over information overload but lower satisfaction with supervision (Rudolph and Welker, 1998).

<sup>107</sup> While information on audit firm factors is currently sparse in the US, the US Treasury's Advisory Committee on the Auditing Profession recently called for public disclosure of the Big N auditors' audited financial statements, which would provide information on auditor characteristics beyond size and specialization (US Treasury, 2008).

<sup>108</sup> While there is little recent archival research on the role of auditing in fraud assessment and detection, there is a large body of experimental and other work in this area. See Trompeter et al. (2013) for a review of that literature.

<sup>109</sup> Blokdiijk et al. (2003, 2006) and Feng and Li (2009) are examples of such attempts.

<sup>110</sup> We do not suggest that all pre-SOX intervention was supply side. An exception is the requirement to disclose audit fees. However, this requirement for additional disclosure differs fundamentally from SOX requirements that dictate practices such as firm's hiring decisions related to board members.

public companies improves audit quality (Chaney et al., 1997), this is actually the repeal of prior regulation, which originally reduced audit quality. In addition, while the SEC's requirement to publicly disclose audit fees improves the alignment between audit fees and client risk, this is an unintended benefit (Francis et al., 2005).<sup>111</sup>

### 5.1.2. The overall effects of SOX

The shift from self-regulation to government-regulation under SOX marks an unprecedented change in the history of regulatory intervention in US audit markets and is the focus of most auditing research over the last decade. While SOX includes other provisions, the vast majority of the reforms are attempts to improve audit quality. Thus, SOX studies are implicitly auditing studies. Empirical research investigates the overall effects of SOX by inferring its effectiveness from the stock price reaction to its passage, and by comparing audit quality metrics before and after SOX.

Studies examining the stock price reaction to SOX provide evidence on its perceived effects on audit quality. A conceptual advantage of gauging SOX's effectiveness from stock prices is that they capture the expected *net* benefits to SOX's intended beneficiaries. Overall, these studies find mixed evidence. While several studies find that SOX increases shareholder value, at least for a subset of firms, others find it decreases shareholder and bondholder value, particularly for cross-listed firms.<sup>112</sup> However, there are several challenges that make it difficult to determine which studies are most convincing (Leuz, 2007; Karolyi, 2009). One challenge is identifying appropriate benchmark firms that are unaffected by SOX. Another important challenge for event studies is the choice of event dates, which may partially explain some of the contradictory results.

Studies using more direct audit quality measures are limited. One finds that after SOX auditors are more likely to issue GC opinions prior to bankruptcy, consistent with improved auditor independence (Geiger et al., 2005). However, this could be due to excessive auditor conservatism, and the increase appears to be short-lived, reverting to pre-SOX levels after 2003 (Fargher and Zhang, 2008; Feldmann and Read, 2010). There is also evidence that SOX decreases earnings management, which is consistent with theory suggesting that SOX improves internal controls (Patterson and Smith, 2007). For example, firms put relatively more weight on bonus contracts subsequent to SOX, consistent with reduced earnings management (Carter et al., 2009). While accruals management falls following SOX, real earnings management increases, which is arguably more harmful to shareholders (Cohen et al., 2008). SOX also improves price efficiency, as indicated by smaller negative drifts following restatements (Burks, 2011), and more informative insider trading disclosures (Brochet, 2010).

A variety of studies identify SOX-related changes with ambiguous effects on audit quality. For example, several studies find a shift in client market share from Big 4 to non-Big 4 auditors.<sup>113</sup> While this appears to be a flight to lower audit quality, it may be explained by capacity constraints imposed on Big 4 auditors due to additional Section 404 audit work (Landsman et al., 2009). In addition, the flight to smaller auditors may not have reduced audit quality because non-Big 4 quality increases after SOX (DeFond and Lennox, 2011). Not surprisingly, SOX is also followed by an increase in audit fees, as well as an increase in director's pay and litigation insurance (Raghunandan and Rama, 2006; Linck et al., 2009). While increased fees may suggest improved audit quality, the additional effort to comply with SOX may or may not translate into higher quality. Notably, the aggregated increase in audit fees more than compensates for the lost NAS fees from the near ban on NAS (Ghosh and Pawlewicz, 2009). Thus, a potential consequence of the SOX-driven increase in audit fees may be increased auditor financial dependence on their clients. Interestingly, this indicates that audit fees may potentially pose the same threat to auditor independence in the post-SOX environment that NAS fees were feared to pose in the pre-SOX environment.<sup>114</sup>

### 5.1.3. SOX provisions that intervene in the demand for audit quality

Major SOX provisions include requiring financial expertise on audit committees, Section 404 audits, restricting the employment of former auditors, mandating PCAOB inspections, moving auditing standard setting to the PCAOB, and proscribing NAS.<sup>115,116</sup> A feature that distinguishes SOX from most prior regulatory intervention, is that it focuses on more than just supply-side factors. SOX intervenes in a variety of demand-side factors, including audit committee characteristics and investments in internal controls. SOX also affects both client incentives and their competencies to demand audit quality. For example, Section 404 increases client incentives to demand audit quality, while audit committee requirements increase client competencies to fulfill this demand.<sup>117</sup> Below we discuss research on the individual SOX provisions that primarily affect client demand for audit quality.

<sup>111</sup> Theory also suggests that the 150 hour rule potentially harms audit quality by raising the profits of less qualified pre-150 hour rule CPAs, who remain active longer than they otherwise would have (Lee et al., 1999).

<sup>112</sup> Jain and Rezaee (2006), Li et al. (2008), Hochberg et al. (2009), Zhang (2007), DeFond et al. (2011), Litvak (2007), Berger et al. (2011).

<sup>113</sup> Hogan and Martin (2009), Chang et al. (2010), DeFond and Lennox (2011).

<sup>114</sup> In addition, many SOX studies find unfavorable outcomes unrelated to audit quality (e.g., Engel et al., 2007; Leuz et al., 2008; Piotroski and Srinivasan 2008; Gao, 2011; Hansen et al., 2009; Gao et al., 2009; Barger et al., 2010; Kang et al., 2010).

<sup>115</sup> We do not examine studies that explore SOX provisions that may indirectly affect the demand or supply of audit quality, such as the requirement for CFO/CEO certification of the financial statements, which may increase the demand for audit quality.

<sup>116</sup> We include NAS and former audit partner employment in this section because they are part of the SOX regulations. In Section 5.2, we discuss other potential engagement specific threats to audit quality that are not included in SOX (such as client importance).

<sup>117</sup> Other SOX requirements increasing client incentives to demand audit quality include CEO/CFO certification, increased fraud penalties, and the potentially negative consequences to clients of adverse PCAOB inspection reports.

**5.1.3.1. Audit committee provisions.** A major consequence of SOX is raising public awareness of the role auditing plays in effective corporate governance. Perhaps the most visible sign of this “upgrade” in the status of the auditing profession are the SOX mandated changes to the audit committee. The audit committee mandates differ fundamentally from most other SOX provisions because they attempt to increase the demand for audit quality by improving *client* governance. This contrasts with most other SOX changes, which attempt to increase audit quality by changing *auditor* behavior, for example by reducing financial dependence on the client (i.e., reducing NAS fees).

SOX requires entirely independent directors and one financial expert on the audit committee. In addition, new NYSE and NASDAQ listing requirements adopted pursuant to SOX (but not directly from SOX) require at least three directors on the audit committee.<sup>118</sup> Notably, these three changes intend to increase client demand for audit quality by altering both client incentives and competencies. Increasing director independence attempts to increase incentives, while increasing financial expertise and size attempts to improve client competencies.<sup>119</sup>

Most studies investigate whether audit quality improves with these three requirements, with some studies also examining meeting frequency, and audit committee compensation.<sup>120</sup> While increased independence is likely to improve audit quality, the benefits may not outweigh the costs. For example, increasing independence may replace inside directors with outside directors, who have greater independence but less firm-specific expertise. In addition, it is unclear whether this provision actually improves independence, because major US stock exchanges have required (or encouraged) 100% audit committee independence since 1999. It is also not obvious that increasing committee size improves audit quality, since larger boards may be less efficient due to agency problems such as free-riding (Hermalin and Weisbach, 2003).<sup>121</sup>

Most research asks whether SOX's audit committee provisions improve audit quality and finds strong support. One group examines the committee's choice of inputs to the audit process. They find that more independent committees tend to hire industry specialists, and pay higher fees.<sup>122</sup> However, higher fees may also capture higher misstatement risk. There is also evidence that independent audit committees minimize perceived threats to audit quality by purchasing less NAS, not hiring former auditor employees, and dismissing Andersen more quickly. In addition, financial experts are associated with many of these outcomes, as are meeting frequency and committee size but to a lesser extent.<sup>123</sup> Finally, audit committees receive higher pay when the demand for audit quality is higher.<sup>124</sup>

Another group examines the committees' effects on audit outputs and also finds strong support. Early studies find that firms who voluntarily choose to have an audit committee have fewer restatements and better governance (DeFond and Jiambalvo, 1991; Pincus et al., 1989). Since SOX, this research has mushroomed, finding broad based evidence that independence and expertise are associated with fewer restatements, smaller DAC, fewer ICMWs in auditor change 8-Ks, and timelier resolution of ICMWs. Financial expertise is further associated with more conservatism, higher accruals quality, and positive price reactions to their appointment.<sup>125</sup> Independence is further associated with more GCs, fewer auditor resignations, less benchmark beating, lower cost of debt, and fewer auditor dismissals following GCs (consistent with protecting auditor from management reprisals).<sup>126</sup>

Finally, limited evidence suggests other audit committee characteristics also improve audit quality. Specifically, larger committees are associated with more frequent and accurate management forecasts and fewer ICMWs, legal expertise is associated with lower DAC, and more frequent meetings are associated with fewer auditor resignations and smaller DAC.<sup>127</sup> Moreover, audit committees compensated by stock options or chosen by a nominating committee that includes the CEO have more restatements. Restatements also increase audit committee turnover.<sup>128</sup>

<sup>118</sup> Other audit committee changes required under SOX are: the audit committee must appoint the outside auditor; management must provide the audit committee access to advisors and other experts; the audit committee must implement whistle-blowing procedures to accommodate accounting related employee complaints; and the audit committee must approve the purchase of non-audit services not prohibited by SOX.

<sup>119</sup> Audit committee independence is also associated with higher quality boards of directors (Klein, 2002b).

<sup>120</sup> Interest in meeting frequency is motivated by the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (1999), a panel organized by the SEC and the major US stock exchanges. We note, however, that more frequent meetings may also signal problems, such as those arising from restatements or SEC enforcement letters.

<sup>121</sup> Theory suggests that audit committees may improve audit quality by countering management's reporting bias (Caskey et al., 2010), and by inducing truth telling in auditors (Kornish and Levine, 2004).

<sup>122</sup> Higher quality boards are also associated with higher audit fees (Carcello et al., 2002). Further, the association between audit committees and fees varies with firm risk (Krishnan and Visvanathan, 2009).

<sup>123</sup> Consistently, a survey finds that committee independence, expertise and meeting frequency are associated with outsourcing non-routine internal audit services to external auditors (which should not create an economic bond), but not routine internal audit services (which should create a bond) (Abbott et al., 2007).

<sup>124</sup> For audit inputs, see Abbott and Parker (2000), Abbott et al. (2003b). For perceived threat, see Abbott et al. (2003a), Lennox and Park (2007), Chen and Zhou (2007). For audit committees pay, see Engel et al. (2010).

<sup>125</sup> In particular, accounting-related financial expertise explains the association with high audit quality (e.g., DeFond et al., 2005; Krishnan, 2005; Krishnan and Visvanathan, 2008; Dhaliwal et al., 2010).

<sup>126</sup> For evidence on independence and expertise, see Abbott et al. (2004), Klein (2002a), Xie et al. (2003), Bedard et al. (2004), Krishnan (2005), Goh (2009). For further evidence on expertise, see Krishnan and Visvanathan (2008), Dhaliwal et al. (2010), DeFond et al. (2005), Engel (2005). For further evidence on independence, see Carcello and Neal (2000), Lee et al. (2004), Vafeas (2005), Anderson et al. (2004), Carcello and Neal (2003).

<sup>127</sup> In contrast, survey evidence suggests that audit committees are largely ceremonial (Beasley et al., 2009; Cohen et al., 2002, and 2010).

<sup>128</sup> For evidence on large committees, see Karamanous and Vafeas (2005), Goh (2009), Krishnan et al. (2011), Abbott, Parker, and Peters (2004), Xie, Davidson, and DaDalt (2003). For evidence on committee compensation and turnover, see Archambeault et al. (2008), Carcello et al. (2011a, 2011b), Srinivasan (2005).



To summarize, independent audit committees choose high quality audit inputs and reduce perceived threats to audit quality; and committee independence and expertise are associated with many output-based audit quality proxies with complementary strengths and weaknesses (e.g., restatements, GCs, DAC, auditor size and specialization, and market reactions). These studies provide strong evidence that client demand is important in explaining audit quality.

Most audit committee studies consist of association tests, which are susceptible to endogeneity concerns. One way to address the endogeneity concern is to gain a better understanding of the factors that affect the choice of audit committee characteristics.<sup>129</sup> In addition to addressing endogeneity, a natural path for moving this well-researched literature forward is to identify new committee characteristics that affect audit quality. This would build on the current literature that examines the personal and social characteristics of board members in the governance literature. For example, a recent study finds that committee members' industry expertise and social ties affect restatements and DAC (Cohen et al., forthcoming; Hwang and Kim, 2012). Going beyond the current committee characteristics affected by SOX can provide insights into the effect of "voluntary" audit committee quality.

**5.1.3.2. Section 404 internal control audits.** This section discusses research on what is arguably the most costly and controversial SOX provision, Section 404.<sup>130</sup> Section 404 requires both management and auditors to attest to the efficacy of the client's internal controls over financial reporting. Management's 404 report also requires managers to acknowledge their responsibility for the adequacy of internal controls. Section 404 intends to improve financial reporting quality by providing incentives for clients to increase the quality of their internal controls, and increase the supply of audit quality by requiring auditors to formally evaluate and opine on the internal controls. Thus, while we include 404 under "demand" factors, it is also related to the supply of audit quality. In Section 3.1.2.2 we discuss whether the 404 opinion is informative to the market. In this section we review studies that investigate other economic consequences of 404 internal control audits.

Much of the research documents the characteristics of firms with adverse 404 opinions disclosing Internal Control Material Weaknesses (ICMWs). ICMW firms tend to be smaller and distressed, have CFOs with weaker accounting credentials, less independent audit committees, less internal control monitoring technology, and no clawback provisions. Consequently, ICMW firms pose higher audit risk, as evidenced by more earnings management, less accounting conservatism, poor accrual quality, less accurate management guidance, higher fees and more resignations.<sup>131</sup> However, the explanatory power of ICMW prediction models are low, suggesting there is much more to be learned.<sup>132</sup>

Studies on the consequences of 404 audits find that ICMWs trigger improved monitoring, as evidenced by increased audit committee and executive turnover, and reduced CFO bonuses. Perhaps as a consequence, ICMW remediation improves accrual quality and investment efficiency, and reduces fees and reporting lags. Moreover, ICMWs also provide new information that changes user behavior, reducing donor contributions to not-for-profits, reducing bondholder reliance on financials, and increasing cost of debt. However, ICMWs do not predict restatements.<sup>133</sup>

Overall, ICMW firms have poor governance and performance, and monitoring improves subsequent to the ICMW opinion. However, if ICMWs are informative, it is puzzling that the market does not react to the announcement of ICMW 404 opinions, as discussed in Section 3.1.2.2. Yet it is unclear whether the expected reaction is positive or negative. While ICMWs identify poorly performing firms, suggesting a negative reaction, they also signal subsequent improvement, suggesting a positive reaction. Thus, further evidence on the informativeness of ICMWs is needed. In addition, while finding changes in behavior following ICMWs suggests users respond, it does not imply causality. If ICMWs are correlated with poor governance, these firms would have changed even without the ICMW opinion. Finally, it is difficult to disentangle the effects of management's 404 reports from the effects of auditors' 404 reports.

**5.1.3.3. Restrictions on former auditor employees (FAEs).** Several high profile accounting scandals involved companies whose senior financial officers were employed by their auditors (e.g., Enron), raising the concern that these "revolving door" practices impair audit quality. As a result, SOX prohibits auditors from servicing clients whose financial officers or directors served on the engagement during the prior year. This one year "cooling off" period stems from concerns that FAEs' familiarity with the auditor's procedures provide opportunities to circumvent them. In addition, the audit team's familiarity with FAEs may reduce their independence (Beasley et al., 2000), and FAEs' desires to please their future employer may compromise their independence prior to joining clients. Counter arguments, however, suggest FAEs improve audit quality, because they know the clients' financial reporting systems. Requiring a cooling off period may also harm auditors' ability to hire high quality personnel, since gaining employment with clients has historically been a career benefit. In addition,

<sup>129</sup> Farber (2005) finds that audit committee quality strengthens following fraudulent activities.

<sup>130</sup> Krishnan et al. (2008) estimate that average Section 404 implementation costs per client were \$2 million, with the largest quartile of clients paying \$4.5 million, equivalent to 0.5% of sales revenues.

<sup>131</sup> For characteristics studies, see Doyle et al. (2007a), Li et al. (2010), Hoitash, et al. (2009), Masli et al. (2010), Chan et al. (2012). For consequence studies, see Chan et al. (2008), Goh and Li (2011), Doyle et al. (2007b), Feng et al. (2009), Hoitash et al. (2008), Ashbaugh-Skaife et al. (2007).

<sup>132</sup> Lu et al. (2011) find that disclosures regarding internal control weaknesses in Canadian MD&A are also associated with poor earnings quality. Theory suggests that managers with strong incentives to commit fraud prefer weak controls and that auditors exert less effort investigating fraud in the presence of weak controls (Caplan, 1999).

<sup>133</sup> For monitoring studies, see Li et al. (2010), Wang (2010), Johnstone et al. (2011), Hoitash et al. (2012). For remediation studies, see Ashbaugh-Skaife et al. (2008), Cheng et al. (2013), Hoitash et al. (2008), Hoag and Hollingsworth (2011), Munsif et al. (2012). For user behavior studies, see Petrovits et al. (2011), Costello and Wittenberg-Moerman (2011), Dhaliwal et al. (2011), Kim et al. (2011), Rice and Weber (2012).

auditors' litigation and reputation concerns may be sufficient to counter this threat. Thus, it is ultimately an empirical question whether FAEs impair audit quality. While FAEs pose threats to both client demand and auditor supply of high audit quality, we classify the FAE provision under demand-side factors because the intent of the regulatory solution is to restrict client behavior.

The number of studies on this issue is small and the results quite mixed. Some studies find that FAEs threaten audit quality. Specifically, companies with FAEs have higher DAC, fewer GCs, are less likely to miss earnings expectations, and more likely to be replaced following GCs. Other studies, however, find that FAEs either improve or have no effect on audit quality. Specifically, the market responds favorably to FAE appointments, companies with FAEs report fewer internal control weaknesses and lower DAC, FAEs on audit committees procure less NAS, and newly appointed FAE CFOs are not associated with higher DAC.<sup>134</sup>

The mixed evidence on whether FAEs threaten auditor independence is interesting for two reasons. One is that the two studies examining GCs find that FAEs reduce audit quality, while the three studies examining DAC find mixed results. This is puzzling because if FAEs compromise auditors' GC decisions, it seems they should also compromise auditors' tolerance of within-GAAP earnings management, which is less egregious. A second is that pre-SOX studies find that FAEs impair audit quality, while the single post-SOX study finds that FAEs improve audit quality. This suggests that other incentives, such as CEO/CFO certification, may be sufficient to overcome FAE threats. However, we caution that it is difficult to compare these studies due to design differences. Going forward, we believe research would benefit from examining additional audit quality proxies, and from considering other client-management characteristics, such as social connections with management.

#### 5.1.4. SOX provisions that intervene in the supply of audit quality

SOX attempts to increase the supply of audit quality by increasing both auditor incentives and competencies. For example, PCAOB inspections attempt to increase auditor competency by remediating poor auditing practices, while proscribing NAS attempts to increase auditor incentives by increasing their independence.<sup>135</sup>

**5.1.4.1. PCAOB audit firm inspections.** The most fundamental change imposed by SOX is replacing self-regulation of the audit market with government regulation. This resulted in creating the PCAOB, whose mandate is to "protect the interests of investors and further the public interest in the preparation of informative, fair, and independent audit reports." The PCAOB reports to the SEC and has broad powers to regulate the audit market, including oversight and discipline of public accounting firms.

One of the PCAOB's most controversial oversight mechanisms is mandatory audit firm inspections, which replace voluntary peer reviews conducted under the AICPA.<sup>136</sup> Comparing the AICPA peer reviews with the PCAOB inspections provides an opportunity to contrast self-regulation versus government regulation in the auditing profession. PCAOB inspectors differ from AICPA peer reviewers on two fundamental dimensions: independence and expertise. The PCAOB chooses inspectors with an emphasis on independence from the auditing profession. As such, the inspectors cannot be practicing CPAs. This contrasts with AICPA reviewers, who are practicing CPAs. This contrast presents a classic trade-off between independence and expertise, a central feature in the debate between the benefits of self-regulation versus government regulation (e.g., Stigler, 1971; Peltzman, 1976).

One motivation for establishing PCAOB inspections is widespread criticism that AICPA peer reviews are ineffective, due to their lack of independence. Despite this criticism, however, peer review reports predict audit failures and auditor–client realignment, although the most useful information in the reviews is the evaluation of auditors' quality control systems and an overall audit firm rating.<sup>137</sup> This provides evidence that audit market participants value auditor competencies, in this case the effectiveness of their audit quality control systems.

PCAOB inspections have also been criticized because inspectors lack current auditing expertise (DeFond, 2010) and are under pressure to identify problems (Farrell and Shabad, 2005). Thus, whether the inspections improve audit quality is unclear. Supporting evidence finds that the inspections improve audit quality for small auditors. Specifically, inspections identify substandard small auditors, as evidenced by restatements and DAC (Abbott et al., forthcoming); and have a remedial effect on small auditors, as evidenced by increased GCs following the inspections (Gramling et al., 2011).<sup>138</sup> Further, threat of the inspections drove nearly half of all small audit firms to exit the market, with their clients switching to higher quality auditors (DeFond and Lennox, 2011). There is little evidence, however, that PCAOB inspections improve audit quality for large auditors. In particular, unfavorable PCAOB inspections do not result in auditor–client realignment, due to their lack of information on auditors' quality control systems (Lennox and Pittman, 2010a).<sup>139</sup> We caveat, however, that the limited number of studies in this area makes it difficult to draw definitive conclusions.

<sup>134</sup> For threat studies, see Menon and Williams (2004), Lennox (2005a). For improvement and no result studies, see Geiger et al. (2008), Naiker and Sharma (2009), Naiker et al. (2013), Geiger and North (2006).

<sup>135</sup> Regulatory intervention that also increases competencies includes licensure requirements and the 150-hour rule.

<sup>136</sup> AICPA reviews still exist after SOX, but with greatly reduced scope (Lennox and Pittman, 2010a; DeFond, 2010).

<sup>137</sup> Casterella et al. (2009), Hilary and Lennox (2005), Lennox and Pittman, (2010a).

<sup>138</sup> Survey evidence suggests that smaller CPA firms perceive the initial PCAOB inspection to negatively impact their practice while medium and larger firms report more positive consequences (Daugherty and Tervo, 2010).

<sup>139</sup> However, PCAOB sanctions against Deloitte in 2007 are followed by auditor–client realignment, and a negative market reaction among Deloitte clients (Boone et al., 2013; Dee et al., 2011).

5.1.4.2. *PCAOB standard setting.* The PCAOB also replaces the Auditing Standards Board (ASB) in setting auditing standards. The contrast between the two boards also presents a classic trade-off between independence and expertise. While the majority of the PCAOB members cannot be CPAs, ASB members were primarily CPAs. The PCAOB's first substantive standards (AS2 and AS3) led to a significant increase in reporting lags by forbidding the "roll forward" of information from prior audits. This lag resulted in an increase in unaudited earnings announcements, which were subsequently revised (Bronson, Hogan, Johnson and Ramesh, 2011). Their replacement with AS5 reduced duplicate testing, and better aligned audit fees with client risk (Doogar et al., 2010). While comparing standard setting under different regimes is interesting, the evidence is too limited to draw conclusions. In addition, the effectiveness of standard setting is difficult to gauge since it involves broader consideration of the social-welfare of all stakeholders.

Going forward, we encourage researchers to consider more explicitly the various forces that shape standards and standard setting. We also encourage more research on the consequences of standard setting by examining how auditing standards might change the auditor's incentives and/or competency, and ultimately audit quality. For example, the recently adopted Auditing Standards No. 16, which emphasizes the continuous nature of audit quality, potentially strengthens auditors' incentives to improve accounting quality.

5.1.4.3. *Proscription of non-audit services.* The SEC's objections to auditor provided non-audit services date back to 1957 (POB, 2000) and academic research began shortly thereafter (Schulte, 1985). Regulators are concerned that NAS threatens auditor independence by putting auditors in management roles and by making them financially dependent on their clients. Prohibiting most NAS suggests that regulators perceive that litigation and reputation incentives are insufficient to maintain auditor independence. However, while NAS may impair independence, it may also create "knowledge spillovers" that improve auditor competency and efficiency (Simunic, 1984). If the benefits of improved competency outweigh the costs of reduced independence, banning NAS may reduce audit quality and efficiency (Beck and Wu, 2006; Lu and Sapra, 2009).<sup>140</sup>

Early research, using fees from surveys, provides mixed evidence (Simunic, 1984; Palmrose, 1986). Recent studies, using fees from publicly available data, paint a more consistent pattern: the effect of NAS on audit quality depends on whether the study examines actual or perceived audit quality. Most studies examining actual audit outputs fail to find that NAS impairs audit quality. In particular, NAS is not associated with restatements, GC opinions, DACs, meeting or beating earnings benchmarks, or conservatism.<sup>141</sup> However, a few studies suggest NAS impairs audit quality. In particular, NAS is associated with higher restatements in the UK, lower accruals quality, higher DAC, fewer GC opinions (but only in limited settings), and less concern about internal audit quality. Nonetheless, the large majority of studies employing output-based proxies find no evidence that NAS impairs audit quality.<sup>142</sup> In contrast, most studies that examine perception-based proxies conclude that NAS impairs quality. In particular, NAS is associated with lower ERCs, more negative abnormal returns among Andersen clients, higher cost of capital, and lower likelihood of auditor ratification. However, a few studies find that NAS does not impair perceived quality, as captured by bond ratings, and abnormal returns among large Andersen clients.<sup>143</sup>

A striking finding in this literature is that some NAS actually improves audit quality, consistent with knowledge spillovers. Tax-related NAS is associated with fewer restatements, less earnings management, more accurate GCs, and more accurate tax reserves; and internal audit-related NAS reduces fraud risk.<sup>144</sup> However, publicly disclosing NAS fees reduces tax-related NAS purchases, suggesting that it is perceived as a threat (Omer et al., 2006). Somewhat surprisingly, however, spillovers are not reflected in reduced audit fees, even though they reduce reporting lags (Wu, 2006; Whisenant et al., 2003a; Knechel and Sharma, 2012).

Taken together, studies using output-based proxies find that NAS does not impair auditor quality, and some NAS may even improve it; while studies using perception-based proxies find that investors penalize companies purchasing NAS.<sup>145</sup> Investors' negative perception of NAS may arise from concerns that it increases regulatory scrutiny and litigation risk, even if it does not impair quality. Consistently, companies with restatements that purchase more NAS have a greater likelihood of auditor litigation, suggesting that juries believe NAS threatens auditor independence even when the evidence suggests otherwise (Schmidt, 2012). Alternatively, perception-based proxies may be more powerful in detecting audit quality dimensions not captured by output-based proxies. For example, NAS may reduce the quality of client footnote disclosures, a dimension not captured by DAC or GCs, that should be captured by investor perceptions. A limitation of this research, however, is that firms are not required to disclose the type of NAS they purchase, with the exception of tax and systems NAS. The proxy typically used, total NAS fees, captures only the threat of financial dependence, but not the threat to independence from auditors taking on management roles. Thus, NAS studies may not adequately capture the channel through which NAS impairs audit quality.

<sup>140</sup> Surveys suggest spillovers vary across auditor technology for knowledge retention (Salterio and Denham, 1997).

<sup>141</sup> Kinney Jr. et al. (2004), Paterson and Valencia (2011), Knechel and Sharma (2012), DeFond et al. (2002), Geiger and Rama (2003), Li (2009), Callaghan et al. (2009), Ashbaugh et al. (2003), Koh et al. (2012), Lim and Tan (2008), Chung and Kallapur (2003), Larcker and Richardson (2004), Reynolds et al. (2004), Huang et al. (2007), Ruddock et al. (2006).

<sup>142</sup> Ferguson et al. (2004), Srinidhi and Gul (2007), Frankel et al. (2002), Kinney Jr. and Libby (2002), Gul et al. (2007), Ye et al. (2011), Felix et al. (2005).

<sup>143</sup> For supporting evidence, see Higgs and Skantz (2006), Francis and Ke (2006), Krishnan et al. (2005), Krishnamurthy et al. (2006), Khurana and Raman (2006), Raghunandan (2003), Raghunandan and Rama (2003), Mishra et al. (2005), Liu et al. (2009), Dao et al. (2012). For non-supporting evidence, see Brandon et al. (2004), Chaney and Philipich (2002).

<sup>144</sup> Kinney Jr. et al. (2004), Patterson and Valencia (2011), Cook et al. (2008), Robinson (2008), Gleason and Mills (2011), Prawitt et al. (2012).

<sup>145</sup> This is consistent with the observation made in Francis (2006).

## 5.2. Regulatory concerns about perceived threats to auditor independence

This section discusses studies that investigate a variety of engagement-specific characteristics that regulators perceive as threats to audit quality, but that are not included in SOX. These include studies on the audit quality implications of long auditor tenure, opinion shopping, low-balling, client importance, and market structure. These perceived threats have been the focus of regulatory scrutiny for decades and may well appear in future regulation. We organize this section based on whether the potential intervention targets the client's demand for, or the auditor's supply of, audit quality.

### 5.2.1. Perceived threats to auditor independence – client demand-side factors

**5.2.1.1. Long auditor–client tenure.** Regulators have long shown concern that long auditor–client tenure breeds familiarity that threatens auditor independence. A commonly proposed solution is to alter client demand by mandating auditor rotation (e.g., AICPA, 1978; Turner, 2002b; PCAOB, 2011a).<sup>146</sup> Critics of mandatory rotation, however, argue that it destroys client-specific knowledge gained from long auditor–client tenure, and allows “opinion shopping” under the guise of moving to a more independent auditor (PCAOB, 2011b; Beck and Wu, 2006).<sup>147</sup>

Most studies find that long tenure improves audit quality. In particular, long tenure is associated with fewer AAERs, more GCs, lower DAC and higher ERCs, and a lower cost of debt.<sup>148</sup> In addition, long tenure does not affect audit adjustments or private firms' cost of debt, mandatory rotation in Spain does not affect GCs, and voluntary auditor switches increase reporting lags.<sup>149</sup> However, some studies find that long tenure threatens audit quality. In particular, long tenure is associated with fewer GCs and more benchmark beating in Australia, higher audit fees for former Andersen clients, and lower earnings quality before SOX (but also short tenure).<sup>150</sup>

Overall, most studies find that long tenure does not impair audit quality and may even improve it. An unresolved question, however, is why short tenure lowers audit quality. One explanation is that auditors have less client-specific knowledge in early years, and hence less competence in detecting substandard reporting. Another is that auditors have stronger incentives to yield to client pressure in early years due to low-balling (Gul et al., 2009). A third explanation is reverse causality: low audit quality increases auditor turnover, thereby shortening auditor tenure. Thus, further research is needed to disentangle these explanations.

**5.2.1.2. Opinion shopping.** “Opinion shopping,” a long-held regulatory concern (e.g., US Senate, 1977), refers to clients seeking successor auditors who are willing to issue a clean audit opinion when the incumbent threatens to issue a GC. Opinion shopping can harm audit quality if either the incumbent or the successor yields to client pressure to issue a clean opinion when a GC is warranted, thereby impairing auditor independence. One way US regulators attempt to curtail opinion shopping is by requiring auditor change 8-Ks to disclose auditor–client disagreements and auditors' concerns about clients' internal controls. In addition, predecessor auditors must make their working papers available to successors, which may also curtail opinion shopping.

Early studies find that while auditor changes increase following GCs, switchers are not more likely to receive a clean opinion from the successor auditor (Chow and Rice, 1982; Smith, 1986; Krishnan, 1994), suggesting that opinion shopping does not impair auditor independence (Lu, 2006). However, opinion-shopping clients are expected to compare the probability of receiving an unfavorable opinion from the incumbent auditor with the probability of receiving a more favorable opinion from the successor auditor (Teoh, 1992). Once this “what if” scenario is explicitly considered in the UK, clients decide to switch or not based on whether it maximizes their likelihood of receiving a clean opinion (Lennox, 2000). Thus, evidence suggests that opinion shopping is successful, which reduces GCs thereby lowering audit quality. Similar results are found in China, where clients avoid unfavorable opinions by switching to local auditors, or smaller auditors in response to regulation that increases large auditors' unfavorable opinions (Chan et al., 2006; DeFond et al., 2000).

One limitation of this research is the limited number of studies. Another is that opinion shopping may not only reduce GCs, but also impair audit quality on other dimensions. Issuing a clean opinion when a GC is appropriate suggests a lack of independence, which may also be reflected in increased restatements and earnings management. In addition, regulatory prescriptions designed to curb opinion shopping may have unintended negative consequences. For example, in South Korea, Portugal, and France, regulators attempt to prevent opinion shopping through forced auditor retention, which conflicts with mandatory auditor rotation. In addition, mandatory rotation may exacerbate opinion shopping by allowing clients to find a more pliable auditor under the guise of switching to a more independent one (PCAOB, 2011b). Thus, a regulatory solution that mandates both rotation and retention may also have to intervene further by choosing the successor auditor in order to prevent opinion shopping. The cost to such an approach, of course, would be the loss of efficiency that is gained from the

<sup>146</sup> Long tenure may also be viewed as a supply-side factor because it potentially reduces auditor independence.

<sup>147</sup> SOX Section 203 mandates partner rotation, although it is unclear whether it improves audit quality, because new partners within the same firm lack incentives to identify prior misstatements. While partner rotation improves quality in China, it does not in Taiwan (Lennox et al., 2013; Chi et al., 2009).

<sup>148</sup> St. Pierre and Anderson (1984), Carcello and Nagy (2004), Louwers (1998), Geiger and Raghunandan (2002), Knechel and Vanstraelen (2007), Myers et al. (2003), Gul et al. (2007), Johnson et al. (2002), Chen et al. (2008), Ghosh and Moon (2005), Mansi et al. (2004).

<sup>149</sup> Fortin and Pittman (2007), Joe et al. (2011), Ruiz-Barbadillo et al. (2009), Schwartz and Soo (1996b).

<sup>150</sup> Carey and Simnett (2006), Davis et al. (2009), Kealey et al. (2007).

current practice of auditor–client alignment based on matching client characteristics with the auditor best suited to serve their needs (Johnson and Lys, 1990).

### 5.2.2. Perceived threats to auditor independence – auditor supply-side factors

**5.2.2.1. Low-balling.** “Low-balling” refers to the practice of discounting fees in the initial engagement year to win the client, with the intention of subsequently recouping these losses. Regulators have long argued that this practice compromises auditor independence by effectively creating a receivable from the client, which threatens independence (e.g., SEC, 1977; The Cohen Commission Report, 1978).<sup>151</sup> More recently, low-balling was criticized during the Congressional hearings leading up to the passage of SOX (SEC, 2000; Turner, 2002).

Several theories explain low-balling. DeAngelo (1981) argues that low-balling arises because switching costs allow auditors to charge “quasi-rents” on continuing engagements, while Dye (1991) argues that low-balling arises because these quasi rents cannot be fully disclosed. Kanodia and Mukherji (1994), on the other hand, argue that low-balling arises from a combination of the auditor’s private information and switching costs. Finally, another view is that low-balling results from price competition and the auction nature of audit markets (Elitzur and Falk, 1996; Chan, 1999). Predictions from these theories are mixed. DeAngelo (1981) predicts that low-balling will not impair independence because it is a sunk cost. Others, however, predict that low-balling will impair independence but only in limited circumstances, such as when there is lack of consensus on the implementation of accounting standards (Magee and Tseng, 1990), when bidders underestimate audit costs (Elitzur and Falk, 1996), or when outside information discourages auditors’ information gathering (Bagnoli et al., 2001). Still others argue that low-balling may actually improve auditor independence because it represents a “bail bond” that can only be refunded if the auditor is retained, which is contingent on the auditor performing a high quality audit (Lee and Gu, 1998).

Low-balling studies examine whether fees are lower in the initial years of the engagement. While early studies fail to find low-balling, later studies, using larger samples and public data, find low-balling, but not consistently.<sup>152</sup> Interestingly, while mandatory public disclosure of audit fees in Australia decreases low-balling, consistent with Dye (1991), low-balling persists after public fee disclosure in the U.S., consistent with DeAngelo (1981).<sup>153</sup> Why these results conflict, however, is not well understood. We also observe that this literature focuses almost exclusively on the existence of low-balling, with little attention to whether low-balling affects audit quality. This seems surprising given that regulators’ primary concern is the threat to audit quality. Finally, we also observe that fee discounts are only indirect evidence of low-balling. To directly test low-balling it is necessary to have data on audit costs.

**5.2.2.2. Client importance.** The nature of the auditor–client relationship presents a natural threat to auditor independence because auditors have incentives to retain fee-paying clients (Mautz and Sharaf, 1961; DeAngelo, 1981). The financial dependence on “important clients” prompted the Cohen Commission to conclude that complete auditor independence is a practical impossibility (AICPA, 1978). Contrary to regulators’ concerns, and consistent with theory (Zhang, 1999), litigation and reputation concerns may largely offset this threat, because large clients are more likely to attract scrutiny (Reynolds and Francis, 2001; Bonner et al., 1998; Stice, 1991). If large enough, these concerns may even drive auditors to provide higher audit quality for larger clients. Evidence from GCs supports the notion that auditors provide higher quality to larger clients, with larger clients receiving more GCs across a wide range of jurisdictions.<sup>154</sup> Evidence from accruals, however, is mixed. While some find that client importance is negatively related to DAC and loan loss provisions, some find the opposite, and some find no relation.<sup>155</sup>

In summary, comparing evidence across GCs and accrual-based audit quality proxies paints an intuitive explanation of the auditors’ response to client importance. Specifically, auditors have strong incentives to avoid egregious failures for large clients, such as failing to issue a GC when one is warranted, since the cost of failure is higher for larger clients. Large clients, however, tend to have less of an effect on the auditor’s incentives to reduce within-GAAP manipulations, as reflected in accrual-based proxies.

**5.2.2.3. Audit market structure.** The market structure literature primarily examines market concentration. Regulators are concerned that audit market concentration may threaten audit quality because the Big N’s market dominance may reduce competition, which fosters entrenchment, thereby lowering auditor incentives to provide high quality (GAO, 2003, 2008).<sup>156</sup> On the other hand, audit market concentration may also improve audit quality, because threats from client importance decline, and clients have fewer choices to shop for opinions. The evidence is mixed. Some studies find that Big N concentration improves audit quality

<sup>151</sup> The SEC prohibits auditors from auditing clients with unpaid audit fees due to this potential threat.

<sup>152</sup> Simunic (1980), Francis (1984), Palmrose (1986), Simon and Francis (1988), Ettredge and Greenberg (1990), O’Keefe, Simunic and Stein (1994), Walker and Casterella (2000), Craswell and Francis (1999), Ghosh and Lustgarten (2006), Huang et al. (2009).

<sup>153</sup> Craswell and Francis (1999), Ghosh and Lustgarten (2006), Huang et al. (2009).

<sup>154</sup> Reynolds and Francis (2001), Craswell et al. (2002), Carcello et al. (2009), Chen, Sun, and Wu (2010), Hope and Langli (2010).

<sup>155</sup> Reynolds and Francis (2001), Gaver and Paterson (2007), Choi et al. (2010), Kanagaretnam et al. (2010), Chung and Kallapur (2003).

<sup>156</sup> However, the relation between audit market concentration and competition is unclear. While concentration may increase barriers to entry, competition is not solely determined by the number of auditors. Consistent with this, while the 1989 Big 8 mergers increase the competitiveness of the merged firms, the demise of Andersen decreases competition (Sullivan, 2002; Kohlbeck et al., 2008). In addition, Big N concentration is actually accompanied by frequent entry and exit in international markets (Buijink et al., 1998).

as captured by fewer restatements and increased earnings quality; while other studies find that Big N concentration impairs audit quality as captured by increased earnings management and lower accrual quality.<sup>157</sup>

Another stream of research examines whether concentration increases audit fees, but finds little support, and that concentration even lowers fees in some settings.<sup>158</sup> Finally, some studies identify the drivers of audit market concentration, and find that concentration is explained by client size and structural shifts in audit costs (Doogar and Easley, 1998; Ferguson et al., 2013). In summary, given the limited number of studies and the mixed findings, we believe additional research is needed in this area.

### 5.3. Critique and future research on regulators' concerns about audit quality

While the studies examining the overall effects of SOX yield ambiguous result, this is not surprising given the number of levers SOX pulls, and the difficulty in predicting how they affect audit quality. Studies examining SOX's specific provisions find that regulatory intervention is associated with improved audit quality, but only in limited settings. Specifically, evidence is persuasive that audit committee and Section 404 provisions, but not banning NAS, improves audit quality. Evidence is inconclusive on FAEs and PCAOB inspections and standard setting. Studies examining perceived threats to audit quality find limited or even contrary evidence. Specifically, evidence is limited on whether low-balling or opinion shopping impairs audit quality, and suggests that long tenure and client importance actually improves audit quality. An important observation is that the audit committee research yields the most unambiguous evidence of improved audit quality. Notably, the audit committee provisions are intended to increase client demand for audit quality by improving their competencies. This contrasts with prior regulatory interventions that have historically focused on the auditor incentives to supply of audit quality.

Pre-SOX, regulatory intervention generally focused on increasing the supply of audit quality. Some intervention occurred at the engagement level, through SEC enforcement actions (AAERs). While AAERs carry severe penalties, they target only the most egregious audit failures. Intervention also occurred at the audit market level, as a result of pressure from the SEC and Congress, which often led the self-regulated standard setter to adopt new rules. While new standards "changed the rules of the game," they were infrequent and generally incremental. Post-SOX, however, the risk of regulatory intervention is stronger at both the engagement and audit market level. At the engagement level, PCAOB inspections are added to the regulatory arsenal, actively seeking out a wide range of auditor misconduct. At the audit market level, recent experience suggests that future regulatory intervention is likely to be more frequent and more severe than in the past, targeting both the auditor's supply and the client's demand for audit quality, competencies as well as incentives.

The effect of accounting and auditing standards on audit quality is also a potentially fruitful area. Standard setters are often accused of creating accounting rules without considering their auditing implications. While it is not clear whether these accusations are justified, it suggests there may be an interaction between accounting standards and audit quality. A case in point is the trend toward fair value accounting as an underlying feature of the accounting model. Historically, auditors' primary differential advantage has been their expertise in verification of historical cost information. Thus, an important question is whether auditors' expertise, and hence audit quality, is applicable to a fair value accounting model.<sup>159</sup> At present there is little or no research on the role of accounting standard setting in achieving high audit quality.

An important goal of future research is to understand the nature and extent of regulatory intervention in the new regime. On the supply side, however, a major challenge will be disentangling the effects of regulatory intervention from the effects of litigation and reputation risk due to their interrelatedness. Regulatory intervention has spillover effects that exacerbate the auditor's exposure to litigation and reputation risk. New regulations provide additional opportunities for litigation against auditors, which also increases reputation risk. In addition, the PCAOB inspections provide a new channel for discovering auditor misconduct, which may increase both legal damages and reputation losses.

Another challenge is that it is impossible to evaluate the net benefits of regulatory change. While there is evidence that some changes brought about by regulatory intervention have improved audit quality, there is also evidence that the costs of these changes are high, and it is not clear if there are net benefits. In addition, although stock market reactions summarize the perceived benefits and costs of intervention from the investors' perspective, it does not fully capture social welfare implications. It may also be premature to draw definitive conclusions concerning the effects of some of the SOX provisions. This is because many of the provisions are complex and costly, and it may take time for the audit markets to fully understand their costs and benefits. This suggests that some of the early research on SOX may benefit from being revisited. It is also difficult to establish causality in studying changes in the regulatory environment. For example, the demise of Andersen and the increased scrutiny of the auditing profession following Enron may have provided auditors with sufficient incentives to improve audit quality even in the absence of regulatory intervention. This suggests that SOX cannot be viewed simply as an exogenous quasi-experimental shock, and instead is the result of several factors, including the corporate and audit industry events that occurred around the same time (Larcker and Rusticus, 2009).

<sup>157</sup> For improvement, see Newton et al. (2013), Dunn et al. (2013), Kallapur et al. (2010). For impairment, see Boone et al. (2012), Francis et al. (2012), Bandyopadhyay and Kao (2001).

<sup>158</sup> Simunic (1980), Pearson and Trompeter (1994), Bandyopadhyay and Kao (2004), GAO (2008), Dunn et al. (2013), Carson et al. (2012), Ferguson and Stokes (2002).

<sup>159</sup> While there is little archival research on the role of auditing in fair value estimation, there is a large body of experimental work. See Bratten et al. (2013) for a review of that literature.

Finally, while US audit markets have recently shifted from self-regulation to government-regulation, these are not the only models for delivering assurance services. Prior to opting for self-regulation in 1933, Congress unsuccessfully proposed the removal of auditing from the private sector altogether, by establishing a “Corps of Government Auditors” (PCAOB, 2007). While such a model may strengthen auditor independence, it also potentially raises concerns about auditor competencies. Another alternative is an insurance model, whereby auditing firms would explicitly reimburse investor losses. However, little is known about the effects of alternatives to the current model.

## 6. Conclusions

The last 15 years have witnessed profound changes to the auditing profession and a boom in auditing research. A dominant feature of the recent research is its primary focus on audit quality. We review and critique this research using a robust economics-based framework that provides insights into the demand and supply of audit quality and the increasing role of regulatory intervention.

We first provide a comprehensive definition of audit quality, with higher audit quality providing greater assurance of high financial reporting quality. Our definition reflects audit quality’s continuous nature, encompasses the auditor’s broad responsibilities, and recognizes audit quality as a component of financial reporting quality that is bounded by the firm’s reporting system and innate characteristics. Equipped with this definition, we then provide a framework for choosing among and evaluating the commonly used audit quality proxies along four dimensions: directness, egregiousness, actual-or-perceived, and measurement issues. We observe that the most direct measures of audit quality also capture egregious audit failures but lack the power to detect more subtle variations in audit quality. While the less direct measures have the advantage of capturing the continuous nature of audit quality, they are often farther from the auditor’s influence and also more susceptible to measurement problems. We conclude that researchers should choose measures across proxy categories, and articulate the inferences that can and cannot be drawn from the proxies. Because it is inextricably intertwined with financial reporting quality, audit quality also depends on firms’ innate characteristics and financial reporting systems. We review the commonly used audit quality models and conclude that future research would benefit from more conceptual guidance in disentangling these constructs.

The literature on client demand examines both client incentives to demand high audit quality and client competencies to fulfill their demand. Agency cost incentives are an important driver of client demand for high audit quality as evidenced by the choice of Big N auditors and industry specialists. Research on client competencies, although relatively new, is a growing area that focuses on the mechanisms clients use to meet their demands for audit quality. During the period of our review, these studies identify numerous audit quality drivers that were previously virtually unrecognized in the literature, such as audit committee characteristics and the internal audit function. This research is partly motivated by the shift in regulatory regime from primarily a supply-side focus to both a supply and demand-side focus, as evidenced by recently mandated changes to client’s internal control systems and audit committees. This research strongly supports the important role played by these mechanisms in fulfilling client demand for high quality auditing. While the literature still focuses primarily on supply-side factors, we encourage further research that investigates the relatively less understood client incentives and competencies that drive the demand for audit quality.

For decades, most of the auditing literature focused almost exclusively on studying the supply of audit quality. This research is relatively mature and has made several significant contributions in advancing the literature. However, there is limited evidence on the role played by reputation incentives for auditor independence in the US, and while there is much more evidence on the role played by litigation incentives for independence, alternative explanations make these studies difficult to interpret. The Big N literature provides convincing and ample evidence that Big N auditors provide higher audit quality, although it is unclear whether this is due to stronger incentives or greater competencies. In addition, more evidence is required to resolve the unsettled question of whether Big N quality differentiation is actually driven by self-selection. Research on auditor competency, which is more recent but quite prolific, primarily studies the effects of industry specialization, auditor office size, and features of the audit process. Evidence from this research is consistent with auditor competency having a significant effect on improving audit quality. We encourage researchers to look more closely at the effects of auditor competencies on audit quality by using a richer set of audit firm, auditor office, and individual auditor characteristics to capture competency. We also encourage researchers to closely examine the critical features of the audit process, such as professional skepticism.

Regulatory intervention drives the majority of the archival auditing research in the last decade and all signs suggest it will continue to do so in the future. This research has been especially fruitful and appears to inform much of the recent auditing legislation and auditing standard setting. The recent unprecedented regulatory changes in the US audit markets suggest that regulatory intervention is likely to be increasingly important. Although it is inconclusive whether the recent interventions are effective in improving audit quality, especially the overall effect of SOX, evidence suggests that audit committee provisions increase client demand for audit quality, and that adverse Section 404 audit opinions trigger subsequent improvements in monitoring. Notably, both of these mandates focus on client demand, not auditor supply, and both emphasize client competencies in fulfilling their demand for audit quality. In contrast, there is little evidence that banning NAS adversely affects audit quality, and some evidence that certain types of NAS actually improve audit quality.

Similarly, there is little evidence that several commonly perceived threats to audit quality actually pose serious threats. Importantly, whether these perceived threats impair audit quality rests on trading off reduced auditor independence with

improved auditor competencies. The lack of evidence on these potential threats suggests that, in these settings, competencies play a larger role than independence in explaining the supply of audit quality. Thus, we encourage future research to further explore the relatively under-researched role of auditor competencies on audit quality. Finally, we observe that the new regulatory environment suggests that regulatory intervention is likely to play a prominent role in shaping audit quality and recommend additional research to better understand this relatively new risk that is likely to affect both auditors' and clients' incentives as well as their competencies.

## Appendix. Theoretical literature on auditor litigation incentives to supply audit quality

Recent theoretical research primarily investigates two features of the litigation environment: liability rules and damage awards. The liability rules typically examined are “due care” and “strict liability.” Under due care, the current liability regime in the US, auditors are only liable if they are found negligent.<sup>160</sup> Under strict liability, auditors are liable irrespective of negligence as long as damages are proven. The damage award regimes usually studied are “joint-and-several-liability” and “proportionate liability.” Joint-and-several-liability holds auditors liable for up to one-hundred percent of the damages when other defendants are unable to pay their share, even when the auditor is only partially at fault. In contrast, proportionate liability holds auditors liable only for damages in proportion to their fault. In the US, the Private Securities Litigation Reform Act of 1995 (PSLRA) replaced the joint-and-several-liability rule with a hybrid version of the proportionate liability rule, which marked an important reduction in litigation risk for US auditors (Hillegeist, 1999).

The most frequently addressed question in this literature is whether increased legal liability leads to increased audit quality. Consistent with intuition, most theory concludes that higher litigation risk improves audit quality. Studies comparing liability rules generally find that strict liability induces higher audit quality than due care (Schwartz, 1997; Radhakrishnan, 1999; Zhang and Thoman, 1999; Liu and Wang, 2006; Yu, 2011).<sup>161</sup> Studies comparing damage award rules find that proportionate liability reduces audit quality when compared to joint-and-several liability (Chan and Pae, 1998; Hillegeist, 1999; Patterson and Wright, 2003).<sup>162</sup> There is also evidence that larger penalties for audit failures (regardless of the legal regime) result in higher audit fees (Newman, Patterson, and Smith, 2005) and overinvestment in audit effort (Pae and Yoo, 2001); and that increased liability decreases audit failure (Deng et al., 2012) and reduces auditor shirking (Zhang, 2007).<sup>163</sup>

However, several studies also conclude that higher litigation risk actually lowers audit quality. For example, under joint-and-several liability, high litigation risk may reduce audit quality when litigation costs are less sensitive to audit effort (Narayanan, 1994), and may increase audit failure due to management's strategic reporting (Hillegeist, 1999). In addition, increasing litigation risk by increasing the number of parties to whom auditors are liable decreases audit quality (Chan and Wong, 2002). Finally, increased legal liability may simply drive auditors to report more conservatively (Thoman, 1996; Deng et al., 2012), which potentially reduces financial reporting quality.

Another commonly asked question in this literature is which legal liability regime is socially optimal. Perhaps not surprisingly, the answer to this much broader question is inconclusive. With respect to liability rules, one view is that strict liability is socially optimal, as long as the accompanying damage awards are appropriately set (Schwartz, 1997; Zhang and Thoman, 1999; Liu and Wang, 2006). Another view is that due care is socially optimal because strict liability results in larger damage awards and hence higher legal fees, which are deadweight losses (Radhakrishnan, 1999). With respect to damage awards, Chan and Pae (1998) contend that proportionate liability is the socially optimal damage award regime because the higher litigation costs under joint-and-several liability are greater than the benefits from increased audit effort. Other studies argue that no single legal system or amount of legal exposure is socially optimal because they all lead to negative externalities, such as under or over investment in audit technologies (Pae and Yoo, 2001), wealth transfers from auditors (Schwartz, 1997), or conflicting changes in audit quality and audit failures (Hillegeist, 1999).

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<sup>160</sup> However, the determination of negligence is not clearly specified and thus the due care regime may also be referred to as a “Vague Negligence” regime (Schwartz, 1997).

<sup>161</sup> Dye (1995) suggests that switching from unlimited to limited liability will drive poor auditors out of the market or lower their profit.

<sup>162</sup> Melumad and Thoman (1990) show that higher damage award lowers interest rates for good client firms because lenders expect to recover more from the damage award.

<sup>163</sup> Smith and Tidrick (1998) study the allocation of legal costs, and find that the UK system, which requires the losing party to pay all legal costs, induces higher audit effort even at lower audit prices under some conditions, when compared to the US system that holds all parties responsible for their own legal costs. However, it is unclear which system imposes higher expected liability on auditors.



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