

A Framework for Understanding and Researching Audit Quality

Jere R. Francis

INTRODUCTION

This paper presents a general framework for studying factors associated with engagement-level audit quality. The framework is intended to sharpen our thinking about conducting audit-quality research, and to help scholars, professional accountants, regulators, and policy makers to better understand the multiple drivers of audit quality. While the framework has a broad scope, the research implications will focus mainly on archival-based audit research.¹

Table 1 summarizes the framework, and the central point of the paper is that audit quality is affected by each of the units of analysis in Table 1.² The framework begins with two inputs to the audit process (in addition to the client's financial statements/records): (1) audit-testing procedures, and (2) engagement team personnel. The next level in the framework is the audit process whereby decisions and judgments are made by the engagement team with respect to the specific tests to be implemented, the interpretation of evidence from these tests, and the ultimate engagement-level

Jere R. Francis is a Professor at the University of Missouri–Columbia.

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¹ A supply-side perspective is taken in this essay with regard to the production of audit quality. There is also a literature on the demand for differential audit quality that draws on agency and signaling theories, and the insurance demand for audits, e.g., Beatty (1989), DeFond (1992), Francis et al. (1999), Chaney and Philipich (2002), and Cahan et al. (2008).

² A distinction has been made between research on micro-level audit processes versus the macro-level audit environment (Abdel-khalik and Solomon 1989). However such a distinction is not especially insightful because the incentives of auditors at the engagement-level and the audit processes they follow are strongly influenced by the institutions that regulate auditing, as well as by the employment contracts of auditors with accounting firms and the incentives created by these organizations. In addition, micro-level audit procedures are largely prescribed by the accounting firms in which auditors work, and these procedures are influenced by the institutions that regulate auditing, including the legal environment in a country.

TABLE 1
Units of Analysis in Audit Research

Audit Inputs

Audit tests
Engagement team personnel

Audit Processes

Implementation of audit tests by engagement team personnel

Accounting Firms

Engagement teams work in accounting firms
Accounting firms hire, train, and compensate auditors, and develop audit guidance (testing procedures)
Audit reports are issued in name of accounting firms

Audit Industry and Audit Markets

Accounting firms constitute an industry
Industry structure affects markets and economic behavior

Institutions

Institutions affect auditing and incentives for quality, e.g., State Boards of Accountancy, the AICPA, FASB, SEC, and PCAOB, as well as the broader legal system

Economic Consequences of Audit Outcomes

Audit outcomes affect clients and users of audited accounting information

decision with respect to the audit report. Auditing takes place within the context of an accounting firm. The observable outcome of the audit is an audit report that is issued in the name of the accounting firm, along with the client's audited financial statements. More fundamentally, accounting firms hire, train, and evaluate audit personnel, and prescribe the testing procedures to be used on audit engagements. Collectively, accounting firms constitute an industry, and we know from the industrial organization literature that the structure of an industry can affect markets and economic behavior. Last, auditing takes place within a larger institutional context that affects the incentives and behavior of individual auditors and accounting firms.³

Audit quality is affected at each level of analysis in Table 1. Audits are of higher quality at the *input level* when the people implementing audit tests are competent and independent, and when the testing procedures used are capable of producing reliable and relevant evidence. The quality of audit inputs flow through to the *audit process*, where audits are of higher quality when the engagement team personnel make good decisions regarding the specific tests to be implemented and appropriately evaluate the evidence from these tests in leading to the audit report. Audit quality is affected by the *accounting firm* in which the auditors work. Firms develop the testing procedures used on audit engagements, and create incentives that affect the behavior of engagement team personnel. Last, the incentives of accounting firms and individual auditors to produce high-quality audits are affected by the *institutions* that regulate auditing and punish auditors and accounting firms for misconduct and low-quality audits.

A comprehensive understanding of the drivers of audit quality requires research at all levels of the framework in Table 1. I provide examples of audit research for each unit of analysis and it will be seen that some areas are clearly under-researched, such as audit inputs, accounting firms, and

³ In the U.K., the Financial Reporting Council (2006) has articulated a framework for audit quality that identifies five drivers of quality: the culture within an audit firm; skills and personal qualities of audit staff; effectiveness of the audit process; reliability and usefulness of audit reporting; and factors outside the control of auditors such as governance, audit committees, and shareholder support of auditors.

institutions. The objective is not to provide a literature review, but rather to illustrate how research into audit quality can be done for each unit of analysis in the framework. The research that is cited is primarily published in leading North American journals, although there is a growing body of auditing research around the world as well. The paper concludes with some conjectures as to why auditing research is not having more influence on audit practice and audit regulation.⁴

WHAT IS AUDIT QUALITY?

The term *audit quality* needs to be explained before proceeding. Audit standards imply that audit quality is achieved by the issuance of the “appropriate” audit report on the client’s compliance with generally accepted accounting principles. However, audit quality is a complex concept and cannot be reduce to a simple definition (Financial Reporting Council 2006; Bonner 2008). I argue that there are gradations of audit quality across a continuum from low- to high-quality audits, and that quality is affected by each element of the framework in Table 1.⁵

Legal View of Audit Quality

Before examining the continuum view of audit quality I start with a discussion of binary audit quality. The legal view of auditing provides a simple dichotomy of either “audit failure” or “no audit failure.” An audit failure occurs if the auditor is not independent in fact, or if an independent auditor incorrectly issues a clean audit report due to the failure to collect sufficient competent evidence as required by auditing standards. In contrast a “good audit” or a non-failure is one in which the auditor complies with auditing standards and issues the correct opinion regarding the client’s financial statements at an appropriate level of audit risk.

Audit failures have economic consequences for auditors, clients, and third parties. However, the extant evidence indicates there are relatively few demonstrable audit failures. Engagement-level audit failures can be unambiguously identified when there is successful civil litigation against auditors or criminal prosecution (which is very rare) and assuming, of course, that court decisions are correct. Successful litigation is infrequent in part because auditors resolve disputes before they reach the formal stage of a lawsuit (which is generally unobservable), or auditors settle out of court before a case goes to trial. Palmrose (1988) documents that the incidence of litigation against auditors of publicly listed companies is less than 1 percent of audit engagements, and the litigation rate in which auditors are found guilty in a trial is even smaller (Palmrose 1987; Carcello and Palmrose 1994).

While successful litigation against auditors is arguably the most definitive measure of an audit failure, another plausible measure is an SEC enforcement action against an auditor (or accounting firm). However, an SEC enforcement action does not actually “prove” there is an audit failure. Typically, the offending auditor or accounting firm does not formally admit to fault but agrees to restrain from certain activities in the future that are deemed to impair audit quality and described in

⁴ A comprehensive list of audit research papers is available in the document “33 Years of Auditing Research,” which is available on the Auditing section’s website at: <http://aaahq.org/audit/research.htm>. This document lists papers published from 1977–2009 in *Accounting, Organizations and Society*; *Auditing: A Journal of Practice & Theory*; *Behavioral Research in Accounting*; *Contemporary Accounting Research*; *Journal of Accounting and Economics*; *Journal of Accounting and Public Policy*; *Journal of Accounting Research*; and *The Accounting Review*.

⁵ A widely cited definition is from DeAngelo (1981) in which audit quality is viewed as the joint probability of detecting and reporting material misstatements. While the definition is intuitive, it provides no insight to the multiple factors that affect an auditor’s capacity to detect misstatements. Another limitation is that the definition implicitly defines fraud, rather than a continuum of audit quality, since an auditor who knowingly fails to report a material misstatement has committed fraud, at least in the United States.

detail in the enforcement action. Based on the analyses in Feroz et al. (1991), Dechow et al. (1996), and Dechow et al. (2011), the number of annual actions against auditors is also quite small and far less than 1 percent of SEC registrants. SEC enforcement actions have also been used to identify instances in which the SEC accused companies of fraudulent financial reporting (not just misleading reporting), and two studies by Beasley et al. (1999) and Beasley et al. (2010) together identify 641 alleged cases of fraud spanning the 21-year period from 1987 to 2007. Of these 641 frauds, the auditor was named in the SEC enforcement action in only 163 cases. Taking corporate fraud as the most severe case of an auditor failure indicates there is an almost negligible audit failure rate, given there are well over 10,000 SEC registrants filing multiple documents annually.⁶

To sum up, the evidence from litigation and SEC actions both point to a very low audit failure rate. However, it is likely that the true rate of “low-quality” audits is higher because the SEC does not have the resources to pursue all cases. Furthermore, there are significant costs to plaintiffs in pursuing litigation against auditors, which may limit lawsuits even though the cases might have merit. As a consequence, it is quite possible there are many low-quality audits that are of no better quality than those that are known to be audit failures, and this is why it is important to think about audit quality as a continuum.

A second binary approach to audit quality is based on the relation between a going-concern audit report and client business failure. An audit failure could be deemed to occur when client business failure is not preceded by a going-concern audit report.⁷ Lennox (1999) uses the going concern/client failure framework in a different way to measure auditor reporting accuracy. Auditors report accurately if client failures are preceded by a going-concern opinion, and if clients that do not fail receive a clean opinion. Using British data, Lennox (1999) documents that Big 4 auditors issue more accurate audit reports than do the non-Big 4 accounting firms (fewer Type 1 and Type 2 errors).⁸

The reporting accuracy framework in Lennox (1999) is illustrated for U.S. firms using the Compustat population for the period 1995 through 2002.⁹ There are 62,094 firm-year Compustat observations during this time period of which 5,822 firm-year observations have going-concern reports and 785 firms failed. A Type 1 error (over-qualifying) occurs when the auditor issues a going-concern report and there is no client failure within the next 12 months: this occurred for 5,467 of the 5,822 going-concern reports, giving a Type 1 error rate of 8.92 percent ($5,467 / (62,094 - 785)$). A Type 2 error (under-qualifying) is arguably more serious because it implies the auditor erred in issuing a clean opinion. This is also the reporting error that is equated with audit risk, i.e., an incorrect clean opinion. A Type 2 error occurred for 430 of the 785 client failures, which gives an error rate of 55 percent ($430 / 785$).

The overall audit report error rate is the sum of Type 1 errors (5,467) and Type 2 errors (430), giving a total error rate of 9.5 percent ($(5,467 + 430) / 62,094$). The take away from this analysis is that auditors are conservative and routinely over-qualify, issuing about seven times as many going-concern audit reports as there are client failures ($5,822 / 785$). Of course, this could be viewed as

⁶ The PCAOB inspection program in the United States also identifies audit deficiencies by accounting firms, but a limitation of the public disclosure is that the specific audit engagements are not revealed. In addition, the overall outcome of the inspection process is not publicly reported so it is not possible to know how an accounting firm is judged to be performing (Lennox and Pittman 2010).

⁷ Strictly speaking, it is not a failure because the auditor is *not* responsible for predicting client business failure, and consistent with this is the fact that auditors are only sued approximately 50 percent of the time following a client bankruptcy (Palmrose 1987; Carcello and Palmrose 1994).

⁸ The term “Big 4” refers to the largest accounting firms, although the research cited in the essay covers a long period in which the Big 8 firms were reduced through mergers to the Big 5, and the collapse of Arthur Andersen in 2002, resulted in the current Big 4 firms: Ernst & Young, Deloitte, KPMG, and PricewaterhouseCoopers.

⁹ I thank Clive Lennox for sharing this data and analysis.

providing a timely warning of potential rather than actual client failure. However, when there is an actual client failure, the auditor usually gets it wrong and fails to issue a going-concern report in the year prior. The more serious Type 2 error rate is quite large at 55 percent; however, the actual number of Type 2 errors is very small (430) and represents only 0.7 percent of total audit engagements (430/62,094). Again this evidence suggests a very low binary audit failure rate.

Audit Quality as a Continuum

The dichotomous view of audit quality is not only important, but also has limitations. First, the demonstrated audit failure rate is very low, which raises the question of what we can learn about audit quality that is generalizable by focusing on those few engagements where there is a demonstrable failure. It also begs the question of whether audit failures can be reduced further, and whether regulations that significantly expand audit effort, such as Section 404 of the Sarbanes-Oxley Act, are likely to materially reduce audit failures. Second, audit quality is more likely a continuum that can range from very low quality (audit failures) to very high quality. By focusing on audit failures we ignore nearly all of the distribution of audit quality. In effect, the binary view of audit quality truncates the continuum of audit quality and creates two simple categories: an audit failure, which occurs for less than 1 percent of engagements, and the remainder of the distribution, which is lumped together and classified homogeneously as “non-failures.”

As already discussed, it is likely that litigation and SEC enforcement data understate the true rate of low-quality audits.¹⁰ Thus there is much to be learned about audit quality from studying variation within the 99+ percent of audits that are technically not known to be audit failures but nevertheless are likely to vary considerably in quality, including some very low-quality audits. The question then becomes how to measure variation in audit quality across the spectrum of audits that are non-failures?

There are two primary observable outcomes of the audit process: the audit report, which is directly under the auditor’s control, and the client’s audited financial statements, which are the responsibility of the client but are also affected by the audit process (Antle and Nalebuff 1991; Nelson et al. 2002; Gibbins et al. 2010). I described earlier how the going-concern audit report can be used to assess audit quality within a *binary* framework. The going-concern report can also be used as a continuum measure. Specifically, the probability of issuing a going-concern report, conditional on the client’s financial situation, is used to measure the auditor’s independence. In this research, the focus is not on the accuracy of the going-concern report but rather the likelihood of issuing such a report conditional on the financial circumstances of the client (e.g., Reynolds and Francis 2000; DeFond et al. 2002; Carey and Simnett 2006). The premise of this research is that a less independent auditor is less likely to issue a negative report, all things being equal, in order to avoid losing clients that are more likely to switch after receiving a going-concern report (Krishnan 1994).

I now discuss how the second audit output, the client’s audited financial statements, can be used to infer variations in audit quality across a *continuum*, and the underlying research design for this analysis.¹¹ Financial statements are jointly produced by clients and their auditors (Antle and Nalebuff 1991), and the seminal empirical studies linking statistical properties of client financial statements with audit characteristics are Becker et al. (1998) and Francis et al. (1999) who

¹⁰ Restatements also indicate a higher rate of low-quality audits. Annual restatement rates have been running around 10 percent of SEC registrants in the post-SOX era (Audit Analytics 2010a). This data suggest that low-quality audits may be more frequent than the low rates suggested by litigation and SEC enforcements.

¹¹ In terms of research design, there is not a lot of variation to be explained in audit report research since around 90 percent of U.S. auditor reports are standard clean opinions. In contrast, all companies have financial statements and there is potentially far greater cross-sectional variation earnings quality, which creates potentially more powerful research designs.

document that the clients of Big 4 auditors have smaller abnormal or unexpected accruals than do the clients of non-Big 4 auditors, based on the well-known model of expected accruals developed by Jones (1991) and extended by DeFond and Jiambalvo (1994).¹²

The basic research design which links earnings quality attributes to auditor characteristics is described in Equation (1):

$$\text{earnings quality} = f(\text{audit characteristics} + \text{controls for nonaudit factors}). \quad (1)$$

The design in Equation (1) tests if audit-related factors (the units of analysis in Table 1) are systematically associated with the quality of earnings on audit engagements, after controlling for other (nonaudit) factors that may affect earnings quality.¹³ It is very important to emphasize that audit characteristics are not direct measures of audit quality; rather, the design tests if there are systematic differences in audit outcomes (earnings quality) conditional on certain audit characteristics. If there are systematic differences, then there is evidence consistent with the audit characteristics affecting earnings quality from which one can then infer audit-quality differences.

In principle, the design in Equation (1) can be used for both experimental and archival research. For example, an experiment might investigate if proposed audit adjustments to earnings differ as a function of auditor characteristics, such as gender or experience (audit inputs in Table 1). However, in practice, Equation (1) has been investigated primarily in archival research and has focused mainly on the association of accounting firm attributes with clients' earnings quality. Some of the accounting firm attributes that have been examined include accounting firm size (Big 4/non-Big 4), engagement office size (Francis and Yu 2009; Choi et al. 2010), accounting firm industry expertise measured at both the national level and specific office level (Reichelt and Wang 2010), accounting firm tenure with the client (Johnson et al. 2002), the presence of accounting firm alumni in executive positions in client firms (Menon and Williams 2004; Lennox 2005), and the accounting firm's fee dependence on the client (Frankel et al. 2002). These studies find that earnings quality is higher when the auditor is larger in both overall size and engagement office size, and when the auditor has more industry expertise. On the other hand, earnings quality is lower in the initial years of engagement tenure, and when audit firm alumni hold key executive positions in client firms.¹⁴

While earnings quality is an important stream of research in financial accounting, it could be argued that earnings-quality metrics are not an appropriate measure of audit quality. The reasoning would go like this: cross-sectional variation in the statistical properties of earnings, by itself, does

¹² Abnormal accruals are believed to lower the quality of earnings when they are the result of aggressive accounting policies whose purpose is to achieve income targets. Levitt (1998) argues that this kind of "earnings management" behavior is misleading because it distorts the true performance of the firm, even if the accounting discretion that leads to abnormal accruals is technically within the bounds of generally accepted accounting policies (GAAP). In Levitt's (1998) view, it is very difficult to distinguish between financial statements that are the product of aggressive earnings management and those with outright fraud where there is intent to deceive.

¹³ There are multiple attributes of earnings quality in the research literature (Schipper and Vincent 2003), and new models continue to be developed, such as the Kahn and Watts (2009) firm-specific measure of accounting conservatism. Some of the statistical properties that have been tested in an audit context include abnormal accruals (Jones 1991), accruals estimation error (Dechow and Dichev 2002), earnings management to meet benchmarks (Burgstahler and Dichev 1997; DeGeorge et al. 1999), and accounting conservatism (Basu 1997). Another measure of earnings quality is a client restatement due to the failure to correctly implement GAAP in a prior period. A restatement indicates low-quality financial reporting in a prior fiscal year due to the incorrect application of GAAP, and studies have tested the association of auditor characteristics with a client restatement to make inferences about audit quality (e.g., Kinney et al. 2004).

¹⁴ Given that audit quality is argued to be associated with the quality of client earnings, it is important to report economic magnitudes in order to gauge the degree to which auditor characteristics materially affect reported earnings. For example, Francis and Yu (2009) report when Big 4 office size goes from the 25th percentile value to the 75th percentile value in the sample, the average effect is to reduce the client's abnormal accruals by a magnitude of 8.9 percent of operating income.

not necessarily mean the underlying financial statements are misstated for firms with more extreme values in the statistical distributions. Why are the statistical properties interesting or meaningful if companies and their auditors are not successfully sued or sanctioned by the SEC? Two recent papers provide evidence that directly link earnings-quality metrics with audit quality. Caramanis and Lennox (2008) measure audit quality by actual engagement hours and show that client earnings quality is higher when auditors exert more effort. Gunny and Zhang (2009) also document a direct link between audit quality and the quality of client earnings. They examine the Public Company Accounting Oversight Board's (PCAOB's) accounting firm inspection reports. For those accounting firms in which the PCAOB investigation discovered the auditor failed to prevent a significant departure from GAAP, Gunny and Zhang (2009) document that the magnitude of abnormal accruals is larger for all clients of the accounting firm, and that their clients are also more likely to have a subsequent restatement of earnings. In other words, the PCAOB inspection report is indicative of a systemic problem with audit quality for all of the firm's clients. This research is important because it establishes a direct casual link between a low-quality audit firm (based on PCAOB inspections) and low-quality earnings for all clients of the firm.

Other evidence also suggests that earnings-quality metrics provide insight into the underlying quality of the firm's earnings, including the possibility that GAAP has not been followed. For example, we know that companies sanctioned by the SEC typically have unusually large income-increasing accruals (Feroz et al. 1991; Dechow et al. 1996). Further, Beneish (1997) and Dechow et al. (2011) show that earnings-quality metrics have predictive ability in identifying those firms that the SEC sanctions for misreporting. In other words, when a company's earnings-quality metrics are out of line with statistical norms, there is a greater likelihood the company is violating GAAP and will be detected by the SEC. An important implication of this research is that earnings-quality metrics may be useful to auditors as a forward-looking risk diagnostic tool.

Even if aggressive accounting does not cross the line and technically lead to GAAP violations, there are still significant economic consequences to the company (and potentially to the auditor) for reporting low-quality earnings. Sloan (1996) documents that the accrual component of earnings is less persistent to next period earnings than is the operating cash flow component of earnings. In addition, Xie (2001) finds that abnormal accruals have lower persistence than expected (nondiscretionary) accruals. In other words, low-quality earnings reduce the informativeness of earnings for investors in predicting future performance. Sloan (1996) also documents that earnings of firms with extreme accruals are mispriced in the short term; however, the market eventually understands the mispricing that will lead to lower stock returns in the future for those firms that had large income-increasing abnormal accruals in prior periods. Since a large drop in stock price can trigger investor lawsuits, auditors have an additional incentive to curb aggressive earning management behavior that might increase earnings in the short term but lead to lower earnings in the future.¹⁵

¹⁵ There are also other economic consequences of low-quality earnings, beyond the possibility of litigation. This is demonstrated in Francis et al. (2004) who show that firms with low earnings quality have a higher cost of capital. Francis et al. (2004) estimate that the cost of capital increases by 261 basis points for firms in the worst decile of accrual quality compared to those in the best decile. Thus, it is clear from the earnings-quality literature that there are serious capital market consequences to reporting earnings of low quality, even if reported earnings are technically in compliance with GAAP. For this reason alone, the earnings quality-audit quality linkage cannot be dismissed on the simplistic argument that earnings quality and audit quality are both satisfactory as long as there is no direct evidence of outright GAAP violation. The research literature shows that there clearly are significant cross-sectional differences in the quality of earnings, and that these differences do have significant economic consequences.

Research Design Issues

There are three important design considerations in testing Equation (1): the assumption that earnings quality is linear in nature; a validity threat in archival research with respect to correlated omitted variables; and a validity threat from the potential for selection bias. Each of these is now discussed.

The design in Equation (1) implies that earnings-quality metrics are linear in nature. For example, a linear view of abnormal accruals assumes that earnings quality declines monotonically as the magnitude of abnormal accruals becomes larger. However, it is also possible that earnings quality erodes only when the magnitudes of abnormal accruals become extremely large. This line of reasoning implies that the earnings quality/audit quality linkage might be more usefully investigated as a nonlinear relation.¹⁶ To illustrate this point, I compute abnormal accruals using a standard cross-sectional Jones (1991) model for 20 years of Compustat data (1986–2006). I partition abnormal accruals into ten deciles from the smallest (most negative) to the largest (most positive), and test if the means in each decile are different for Big 4 and non-Big 4 clients. The results are reported in Table 2.

Big 4 clients have smaller absolute abnormal accruals (overall) by an average magnitude of 0.131 (13.1 percent of assets). While this difference is quite large, Table 2 also illustrates that Big 4/non-Big 4 differences are significant and large only in the most extreme deciles of the distribution of signed accruals. In the middle deciles (5, 6, 7), the differences are not significant, and for all of the deciles except the two most extreme deciles (1 and 10) the magnitudes of the differences are quite small, well under 1 percent of client assets. Thus, Table 2 shows that the differences are not economically large for 80 percent of the distribution, and for this reason it is misleading to make a blanket statement that implies that all non-Big 4 audits result in materially lower earnings quality (measured by abnormal accruals) relative to Big 4 firms. The analysis in Table 2 illustrates the need to carefully consider the degree to which there may be nonlinearities in the association of earnings-quality metrics with audit test variables.

Second, the analysis in Table 2 also illustrates the potential threat of correlated omitted variables, which is an issue in all archival research. It is possible that the univariate differences in Table 2 are driven by clientele differences rather than auditor effects. This means that in using the research design in Equation (1) there must be a convincing set of variables to control for innate firm fundamentals and other factors that potentially affect the earnings-quality metrics, in order to increase confidence that the audit test variable is not simply reflecting the effect of an omitted correlated variable. To illustrate, Francis and Yu (2009) include 17 control variables, in addition to industry fixed effects. However, this approach can become unwieldy and it may be useful to think about more parsimonious ways of incorporating a large set of control variables into the models such as the use of factor analysis. Additionally, since most accounting studies use panel data, we should routinely use a random or fixed effect model (as appropriate), as these are the classic econometric models used to control for firm-specific omitted variables (Greene 2007, Chap. 14). A fixed-effect model treats the firm effect as constant across time, while the random-effect model allows the firm effect to vary with time. A fixed-effect model is a special case of the more generalizable random-effect model, and a Hausman (1978) specification test indicates which one is the appropriate specification.

A third validity threat occurs from selectivity or the potential threat of self-selection bias. In the audit context, self-selection occurs because auditors are not randomly assigned to companies, so it

¹⁶ In fact nonlinear specifications are tested with the earnings benchmark tests, i.e., avoiding the reporting of small losses, declines in earnings, or earnings which miss analysts' forecasts (Burgstahler and Dichev 1997; Degeorge et al. 1999).

TABLE 2
Analysis of Abnormal Accruals for Clients of Big 4 and Non-Big 4 Accounting Firms

Panel A: Pooled Absolute Abnormal Accruals

<u>Rank</u>	<u>Non-Big 4 Clients</u>	<u>Big 4 Clients</u>	<u>Difference</u>	<u>t-stat</u>
All Firms	0.3316	0.2006	0.1310	62.52***

Panel B: Signed Abnormal Accruals by Deciles

<u>Decile Rank</u>	<u>Non-Big 4 Clients</u>	<u>Big 4 Clients</u>	<u>Difference</u>	<u>t-stat</u>
1 (small)	-0.7585	-0.6575	-0.1010	-19.81***
2	-0.2260	-0.2221	-0.0038	-3.13***
3	-0.1095	-0.1074	-0.0020	-3.89***
4	-0.0532	-0.0518	-0.0014	-4.31***
5	-0.0151	-0.0152	0.0001	0.27
6	0.0173	0.0172	0.0001	0.26
7	0.0563	0.0560	0.0003	1.08
8	0.1167	0.1151	0.0016	2.95***
9	0.2608	0.2575	0.0033	2.03**
10 (large)	0.8130	0.7579	0.0551	12.16***

** , *** Significant at $p < 0.05$ and $p < 0.01$, respectively (two-tailed).

There are a total of 74,708 (23,695) observations audited by a Big 4 (non-Big 4) accounting firms. Observations are taken from Compustat for the years 1986–2006 for firms with data available for all variables used to calculate total and abnormal accruals (cash, current assets, current liabilities, depreciation, deferred charges, deferred taxes, gross property, plant and equipment, sales, and total assets). Utilities (SIC 4400–4900) and financial firms (SIC 6000–6900) are excluded. Abnormal accruals are computed using the Jones (1991) model as extended in DeFond and Jiambalvo (1994) at the industry-year level and based on two-digit SIC codes, with a minimum of ten observations required for an industry-year. Observations with extreme values of accounting data were not excluded or winsorized, so the mean abnormal accruals may be larger than in some studies.

is possible that companies with certain innate characteristics are more likely to have earnings of a particular quality and these companies may also be more likely to select certain kinds of auditors. For example, companies selecting Big 4 auditors may be more likely to have better control systems that prevent misreporting and aggressive earnings management behavior that can lower the quality of earnings. In other words, it could be the case that companies with good controls and inherently high-quality earnings are more likely to select “good” auditors, rather than the use of a “good” auditor acting to constrain earnings management behavior.

Selectivity is a difficult issue to resolve, and the traditional two-step Heckman model is not as widely used today in the labor economics literature (where it originated) due to well-known specification problems, model fragility, and multicollinearity (Lewis 1986; Heckman 1990; Heckman and Navarro-Lozano 2004). The greatest potential threat of selection bias in the audit context is likely to be the comparison of large and small accounting firms that can have quite different clienteles at the extremes (smallest clients of the non-Big 4 versus largest clients of the Big 4). However, the empirical evidence is mixed. Clatworthy et al. (2009) find no selection bias due to auditor size in their study of audit fees, while Lawrence et al. (2011) report evidence of selection bias in their analysis of discretionary accruals and *ex ante* cost of capital. Apart from Big4/non-Big clientele differences, other audit characteristics such as a Big 4 industry specialist versus a Big 4

non-specialist seem less likely to have the kind of extreme clientele differences that could result in a self-selection threat.¹⁷

To sum up, research provides a direct link between low-quality audits and low-quality earnings of clients (Caramanis and Lennox 2008; Dechow et al. 2011; Gunny and Zhang 2009). More generally, low-quality earnings have economic consequences for firms and auditors even if such earnings are technically in compliance with GAAP, and recent research has documented a number of empirical regularities between the quality of earnings and various accounting firm characteristics. However, as with all archival research in accounting, there are research design challenges and validity threats, especially with respect to omitted correlated variables and self-selection bias.

UNITS OF ANALYSIS IN AUDIT RESEARCH

The framework in Table 1 is now examined in detail and relevant research is used to illustrate what can be learned about audit quality for each unit of analysis.

Audit Inputs

The two inputs to the audit process are the people who do audits and the audit tests that are used to gather evidence.¹⁸ Audits are of higher quality when undertaken by competent people. While we might reasonably assume that auditors are competent based on general education requirements and CPA licensing, the fact remains that we know very little about the people who conduct audits. Why is this important? We know from the social psychology literature that demographic, physiological, and cognitive characteristics can affect an individual's performance. Dillard and Ferris (1989) and Ho and Waymond (1993) review the early accounting research on this topic. Surprisingly little has been done in the past 20 years, although Nelson and Tan (2005) call for more attention to individual auditor attributes in the design of JDM research, and Hurtt (2010) develops a measure of an individual auditor's capacity for professional skepticism.

One recent development has been the analysis of partner signing information on the audit report to evaluate the effects of audit partner characteristics on audit quality. Carey and Simnett (2006) study the effects of a partner's engagement tenure and find that audit quality declines with tenure (a lower likelihood of issuing a going-concern report). Their results suggest that the auditor's objectivity might become impaired by a long-term relationship with a client, and provide some support for the argument in Bazerman et al. (1997) that it is difficult for auditors to be skeptical and objective toward their longstanding clients. In contrast, Chen et al. (2008) find no evidence of impairment using partner tenure data in Taiwan. A study by Chin and Chi (2010) also uses partner data from Taiwan and reports evidence that audits are of higher quality (based on earning quality metrics) when the engagement partner is a woman. These archival studies of partner characteristics illustrate the importance of knowing more about the people who do audits and the effect it may have on audit quality.

¹⁷ Lennox et al. (2011) provide a review of the use of selection models in accounting research and conclude that the procedure is applied in a rather mechanical way that produces unconvincing evidence. The main difficulty is developing credible instruments (variables) that are important in the first-stage prediction model, but which can be justifiably excluded in the second-stage outcome model. Larcker and Rusticus (2010) discuss similar issues in their review of instrumental variable models in accounting research. An alternative procedure that avoids the problems with the Heckman model is the use of matched pairs using the matched propensity score methodology in which treatment and control firms are matched on observable characteristics (Rosenbaum and Rubin 1983; Heckman and Navarro-Lozano 2004). However, a major limitation of this procedure is that it only controls for observable effects, while the Heckman procedure, in principle, controls for both observable and unobservable characteristics.

¹⁸ Judgment decision-making (JDM) research focuses on the auditor's judgment decisions with respect to audit planning, evaluation of evidence, and audit report formation, and is discussed in the next sub-section.

We also have an impoverished understanding of the intrinsic quality of audit evidence. An audit will only be as good as the quality of the evidence generated by audit-testing procedures (again, note that this is distinct from JDM research). Despite its foundational importance to audit quality, we know very little about audit evidence. The two things we should want to know are the reliability and relevance of evidence produced by audit-testing procedures. Reliability refers to the inherent truthfulness of the evidence. Relevance refers to how well evidence maps to the ultimate assertion being evaluated by the auditor in the audit report, namely, that the client's financial statements are prepared in accordance with GAAP. Mathematically, the probability that a financial statement assertion is true can be defined as $P(A) = p(A|q) * p(q)$, where $P(A)$ is the probability assertion A is true, $p(A|q)$ is the probably assertion A is true conditional on evidence q, and $p(q)$ is the probability that evidence q is true. In other words, $P(A)$ is the joint probability of the assertion being true conditional on evidence q (relevance), and the inherent reliability of the evidence q. Only when we know more about the reliability and relevance of evidence can we develop cost-effective audit tests and accurately assess actual audit risk, i.e., the probably of inappropriately issuing a clean audit report.¹⁹

The confirmation of accounts receivable is one of the few specific testing procedures explicitly required by audit standards in the United States. However, several studies suggest that this testing procedure does not necessarily produce reliable evidence. For example, Caster (1990) was given permission to send out "incorrect" balances in a real audit setting with both under- and over-statement of account balances. For the most part customers did not recognize the balances were misstated in the confirmations. Caster et al. (2008) undertake a broader assessment of the limitations of confirmations based on academic research and evidence from SEC enforcement actions, and conclude that confirmations often provide the auditor with unreliable evidence.

Another example of research on the reliability of evidence is the study of statistical-based models of analytical review procedures. The goal of these statistical models is to flag potential accounting errors, and the reliability of the models has been examined using simulation analysis (e.g., Kinney and Salamon 1982). A general problem is that the statistical models tend to over-identify potential errors (too many false positives), which reduces the reliability and cost-effectiveness of the models as diagnostic tools.

An important but under-researched topic with respect to audit evidence is the linkage between internal control systems and financial statement correctness. The logic of assessing internal control stems from the audit risk model that specifies that less evidence is needed from other audit tests when the internal control system is reliable and reduces the likelihood of an error in the financial statements. Given the centrality of control risk assessment in the audit risk model, it is surprising how little fundamental research has been undertaken.²⁰ In short, we lack basic knowledge of how control system reliability maps to the accuracy of the firm's financial statements (to which the

¹⁹ Monetary unit sampling attempted to bring more precision to audit evidence (e.g., Neter et al. 1978; Dworin and Grimlund 1984). The goal of this research was to develop more efficient sample sizes compared to classical sampling procedures, and to make more precise statistical estimates of the potential errors in financial statements, i.e., a narrower confidence interval around the point estimate of the dollar amount of error. Of course, statistical sampling models still must assume that the evidence gathered by the auditor is intrinsically reliable. Monetary sampling is an area of audit research that has had a direct impact on audit practices, particularly in the 1980s when statistical-based sampling was widely adopted by accounting firms. Monetary unit sampling still exists in the tool kit of audit procedures of the large accounting firms, but the trend has been to use smaller, non-statistical-based samples.

²⁰ One of the few studies is Knechel (1985) who assesses the reliability of a statistical model of control systems through the use of simulated accounting errors. An alternative approach to control risk assessment is reported by Price et al. (2010) who demonstrate that a commercially developed business risk metric (outside of an audit context) is more effective in predicting material accounting errors and irregularities than accounting-based risk measures.

auditor attests). Auditors seem to be aware of this as Mock and Wright (1999) find that the auditor's control risk assessment as documented in audit work papers has little effect on other audit-testing procedures. As a consequence, before Section 404 of the Sarbanes-Oxley Act mandated the formal evaluation of control systems, auditors had largely moved away from extensive testing of internal control systems precisely because it is unclear how to interpret the implication of a control weakness for the accuracy of the client's financial statements. This is still the case, despite the SOX mandate and the significantly higher audit fees it has created. Audit fees have increased more than 50 percent since 2001 (Audit Analytics 2010b), largely due to Section 404 compliance testing, yet it is unclear if audit quality has been positively affected by this effort because we still do not have a basic understanding of how (if at all) internal control systems map to financial statement reliability.²¹

A further reason that auditors have difficulty in assessing the reliability of evidence, or how it maps to financial statement accuracy, stems from the relative infrequency with which auditors encounter material errors and fraud (e.g., Ashton 1991; Caster et al. 2000; Nelson et al. 2002). In other words, the auditing profession does not have good base rate data to help the auditor determine if there is a significant probability of a material error or irregularity in the financial statements when s/he observes a particular set of diagnostic cues from the control system. There has long been a call for auditors to publicly share this kind of information in a national database, analogous to the National Transportation Safety Board, which collects data on accidents with a view to identifying and correcting systemic safety threats (American Institute of Certified Public Accountants [AICPA] 1978). Regrettably, the auditor's exposure to litigation (at least in the U.S.) makes the sharing of this kind of information highly unlikely.

In sum, audit standards mandate very few specific testing procedures. Instead, audit tests have evolved over time in an *ad hoc* manner and audit-testing procedures might be described as the "best practices" of the day. However, these "best practices" are not the product of a systematic research process or scientific verification program. Simply put, most of what auditors do is not scientifically grounded. To improve the quality of evidence on which auditors make decisions, a rigorous research program is needed that systematically evaluates the inherent reliability of evidence used in audits, and the relevance or mapping of audit evidence to the ultimate assertion being tested, namely, that the client's financial statements are fairly presented in accordance with generally accepted accounting principles. A related point is that we have a limited understanding of the consequences of aggregating audit evidence across multiple tests that are not strictly independent. In other words, how much evidence in total is required to render an opinion, and what is the actual audit risk on the engagement, given the relevance and reliability of the evidence that is collected? These are important topics for fundamental research, conceptually in terms of developing comprehensive models of audit testing, and both empirically and experimentally in terms of understanding what auditors and firms actually do in the audit process.²²

Audit Process

The audit process represents the implementation of audit inputs, i.e., the testing procedures that are applied by the engagement team. These are the decisions and judgments made by auditors with respect to the planning, collection, and interpretation of evidence in order to meet the broad

²¹ In the 1990s, some accounting firms changed to a business risk analysis rather than detailed internal control testing. The rationale for this change is that business risk assessment maps more directly to specific accounts that are at risk given the client's business model and industry. See Bell et al. (1997) for a discussion of the business risk approach. More recently, Bell et al. (2005) and Peecher et al. (2007) suggest that evidence that is outside of management's influence is more useful in the detection of financial statement fraud.

²² See Bell et al. (2005) for one attempt to articulate an integrated testing framework

requirement of audit standards to collect sufficient competent evidence in support of the audit report. A good example of such research is the recent study of brainstorming for client fraud assessment (Hutton and Gold 2010). The JDM research literature has made important contributions to understanding the details of the auditor's judgment and decision-making process such as auditing planning, risk assessment, group decision processes such as fraud brainstorming, the audit review process, and audit-quality control review. JDM research has been extensively reviewed in a number of books and papers and it is not discussed further here (e.g., Libby and Luft 1993; Solomon and Shields 1995; Trotman 1996; Nelson 2003; Nelson and Tan 2005; Peecher et al. 2007; Bonner 2008; Nelson 2009).

There is also an archival research stream on the audit process. This research is economic-based and views the audit process as a production function. The objective is to understand the inputs to the production process (hours and categories of staff), the efficiency of these inputs, and the substitution of these inputs under different audit conditions and outcomes. Examples of this research include O'Keefe et al. (1994), Bell et al. (2008), and Knechel et al. (2009).

Accounting Firms

Auditors work for accounting firms and the outcome of the audit process is an audit report that is issued in the name of the accounting firm, along with the client's audited financial statements, which can be viewed as the joint outcome of client inputs and proposed auditor adjustments (Antle and Nalebuff 1991), as resolved through the auditor-client negotiation process (Gibbins et al. 2010). As discussed earlier, firms are crucial to understanding audit quality because firms hire and train audit personnel, and incentivize auditors through compensation and other organizational policies. Firms also devise the audit programs and testing procedures that guide the evidence collection process, and firms have internal administrative structures to assure quality and compliance with their audit policies.

Accounting firm characteristics and their associations with audit quality have been investigated, primarily in archival research on earnings quality that was discussed earlier. Francis (2004) reviews the development of this literature, which began with the big firm/small firm dichotomy (Big 4/non-Big 4) and has progressed to examine differences within the dominant group of large accounting firms (within-Big 4 variation). The main source of variation that has been investigated is variation in industry expertise. Archival research has used accounting firm clienteles to measure the degree of firm's industry expertise, the logic being that firms with more clients in an industry will develop deeper expertise in those industries. Early studies such as Craswell et al. (1995) supported this prediction. More recent work has explored the question of whether industry expertise is firm-wide or office-specific (Ferguson et al. 2003; Francis et al. 2005). The evidence suggests there are both firm-level and office-specific dimensions to industry expertise and its effect on audit quality (Reichelt and Wang 2010). However, a recent paper by Francis and Yu (2009) finds that the size of the Big 4 practice office is the fundamental driver of audit quality rather than industry expertise. Larger offices have greater in-house expertise and therefore greater capacity to deliver higher quality audits. Yet another approach is taken by Carson (2009) who reports evidence that global industry expertise is priced in the audit market. At this stage it is clear that more research is needed to understand the source of industry expertise and its relation to global, country-level, and office-specific operations of large accounting firms.²³

²³ The triangulation of evidence among research approaches is very important, and auditor industry expertise is a good example of this. JDM research has explored in an experimental setting why industry experts make better decisions (Solomon et al. 1999; Low 2004). Archival research examines the same question using the accounting firm's clientele to infer the engagement team's industry expertise.

Research on the relation between accounting firms and audit quality is severely limited by the availability of data on characteristics of accounting firms. To date, research on this topic has relied on variables that can be constructed from public disclosures such as client-based measures of industry expertise and office size. However, these measures do not go inside the “black box” of the accounting firm’s organizational structure and operations, and several studies have collected private data to pursue these questions.²⁴ For example, how do the characteristics of the accounting firm’s management control system, such as the degree to which the firm is centralized or decentralized, affect the firm’s operations (Otley and Pierce 1995)? The decentralized control structure of Arthur Andersen in which local office partners were not obliged to adhere to executive office recommendations on client accounting matters has been suggested to have contributed to problems on the Enron audit.

We would also like to know more about the structure of partner compensation contracts, and how compensation affects the partner’s incentives and behavior (for examples of the limited research on this topic, see Trompeter [1994], Burrows and Black [1998], and Liu and Simunic [2005]). For example, is compensation tied to the partner’s personal client portfolio or is it based on the accounting firm’s overall performance? Partners will face more threats to their objectivity and independence if their compensation is locally tied to their personal portfolios or to office-level clienteles. Importantly, this threat exists when firm-wide profit-sharing pools are used if a partner’s units in the partnership are allocated on basis of the performance of his/her personal portfolio of clients or the performance of the partner’s engagement office. In sum, our ability to go further in understanding accounting firm characteristics will necessitate new data about accounting firms obtained either privately or through the consequence of new public disclosures as is happening in Europe and is discussed later.

In addition to the general characteristics of accounting firms, there are also engagement-specific characteristics of accounting firms that can affect audit quality. For example, the accounting firm’s tenure on an engagement might adversely affect objectivity if the auditor becomes too cozy with the client, although there is no evidence that this is the case (Johnson et al. 2002; Myers et al. 2003). Researchers have also studied the auditor’s fee dependence and the effect it has on client earnings quality (Frankel et al. 2002), the likelihood of issuing a going-concern audit report (Craswell et al. 2002; DeFond et al. 2002), or the perceptions of audit quality in the securities market (Francis and Ke 2006). Fee dependence can be measured at the engagement partner level, the engagement office level, or the firm level of analysis. In addition, fee dependency can be examined with respect to total fees from all services or discretionary fees from nonaudit services. Some studies use abnormal audit fees to test for auditor independence (Larcker and Richardson 2004). An abnormal fee is the residual or unexplained audit fee from a standard audit fee model, the idea being that the unexplained fee provides a measure of economic bonding between the auditor and client.

I am skeptical of the use of abnormal fees to measure auditor independence because we have no idea if fee residuals measure a threat to independence. Alternatively abnormal audit fees might simply capture abnormally high audit effort or the auditor’s pricing of (unobserved) client risk characteristics.

Another way in which accounting firms may affect audit quality occurs when former staff of the accounting firm hold a high-level executive position with the client. This can create a cozy relation between the auditor and the client that might compromise the auditor’s objectivity.

²⁴ There is also research on accounting firms that uses field studies to go inside the “black box” and to better understand how accounting firms shape the behavior of auditors; for example, Power (1991) who studies the socialization of accountants into the culture of the firm and the profession, and Dirsmith (1994) and Dirsmith and Covaleski (1985) who examine the role of accounting firm culture on auditor behavior.

Consistent with this concern, studies by Menon and Williams (2004) and Lennox (2005) report evidence that audit quality is lower when alumni of the accounting firm hold senior positions at client firms. These findings support efforts by the SOX legislation to regulate the revolving door between auditors and clients by requiring a one-year, cooling-off period before a former auditor can assume a senior executive position with a client.

A recent development has been the suggestion that accounting firms should measure and report “key indicators” of audit quality. The Advisory Committee Report on the Accounting Profession (United States Treasury 2008, section VIII, p. 14) recommends:

the PCAOB, in consultation with auditors, investors, public companies, audit committees, boards of directors, academics, and others, determine the feasibility of developing key indicators of audit quality and effectiveness and requiring auditing firms to publicly disclose these indicators.

To date, the PCAOB has not moved forward with the kind of broad-based, audit-quality metrics suggested by the Treasury report. However, effective in 2010 the European Union requires accounting firms to publicly disclose information about their operations, including their governance structure and internal control system, and information on partner remuneration (Article 40 of the EU 8th Company Directive Director). A recent report by the International Organization of Securities Commissions (IOSCO) also explores the idea of expanding the public information that accounting firms are required to report (IOSCO 2009). Of particular relevance is a section of the report that provides a list of possible “audit quality” disclosures that accounting firms might be required to make (IOSCO 2009, 14–17). Following the U.S. Treasury (2008) report, the proposed audit quality metrics are grouped into input and output measures. Three categories of input measures are identified:

- Experience, Competence, and Technical Resources (education and training)
- Workload (engagement-level workload data)
- Leverage (partner-staff ratios)

Four categories of output measures are proposed:

- Revenue Information (fees from various services, industries, geographic regions)
- Independence Matters (information about independence violations)
- Restatement and Inspection Results (number of client restatements and the firm’s regulatory inspection report)
- Client Acceptance and Dismissal (information on new clients and cases where dismissed)

The inputs mainly represent the experience and composition of the engagement team, averaged across all engagements of a firm. The problem is that there is insufficient research to know if this kind of aggregated data can tell us anything about audit quality. Further, given the office-level findings of Francis and Yu (2009) and others, it might be more important that input measures be reported for the individual engagement or engagement office rather than aggregated to the firm level. A remarkable feature of this report is that it is written as if no one has ever thought seriously before about the idea of measuring audit quality. For example, JDM research has extensively investigated the effects of the auditor’s experience and expertise on the quality of auditor decision making (Libby and Luft 1993; Nelson and Tan 2005). The IOSCO report serves to illustrate the chasm that exists between regulators and audit scholars. All too often when regulators decide to pursue a new idea, they fail to look closely at the extant research literature to see what might have already been done that is relevant. Indeed one objective of this essay is to highlight the wide range of research that has been conducted on audit quality. Other recent examples of policy-oriented

studies in which the extant research literature is largely ignored are the reports by Oxera Consulting (2006, 2007) that were commissioned by the U.K. government and European Commission.

I will conclude by saying that there may well be merit in public reporting by accounting firms and in greater transparency of their operations. However, the audit quality metrics listed in the IOSCO report are little more than that—just a list. These are not rigorously investigated measures that have been shown to systematically map to engagement-level audit quality. There would seem to be enormous potential for synergies between regulators and accounting firms working together with auditing scholars to evaluate the kinds of metrics that might be useful indicators of both overall accounting firm quality and engagement-specific audit quality.

Accounting Industry and Audit Markets

Accounting firms constitute an industry, although relatively little industry-level research has been undertaken in auditing scholarship. The industrial organization literature in economics shows that industry structure can affect economic behavior in markets, such as the level of product quality and the pricing of services (e.g., Pepall et al. 2008; Tirole 1988). In the case of auditing, the audit market for listed companies is dominated by four large accounting firms. The concentrated nature of the accounting industry suggests an oligopoly, and the large accounting firms often cooperate to advance a common set of interests such as lobbying for liability reduction (Andersen et al. 1992), or lobbying directly with members of Congress to oppose SEC policies that would have eliminated consulting for audit clients (Levitt 2002).²⁵

Despite the potential importance of industry structure on the economic conduct of accounting firms, there is very little research at this level of analysis. One example is Banker et al. (2003) who report evidence of scale economies that would explain, in part, why the accounting industry is dominated by large firms. While large-firm dominance might be the logical consequence of scale economies, regulators in the U.S., U.K., and Europe have all expressed concern over the growing market dominance by the Big 4 accounting firms, and the possible adverse affect it may have on audit quality due to the lack of competition (U.S. Treasury 2008; Oxera Consulting 2006, 2007). Two recent studies explore the effects of market concentration. Kallapur et al. (2010) examine audit market concentration in specific U.S. cities, and they find that greater audit concentration in a city leads to better quality earnings of the clients in those cities, which implies that competition (less concentration) is bad for audit quality. Francis et al. (2011) document a similar finding in a cross-country study of 40 countries where they find that the earnings quality of Big 4 clients is greater in a country when the Big 4 have a larger market share (less competition from non-Big 4 auditors). However, they also find that earnings quality declines when there is greater concentration within the Big 4 group (uneven market shares among the Big 4). In other words, Big 4 audit quality is higher when the Big 4 as a group have a more dominant market share relative to non-Big 4 firms, but concentration within the Big 4 group itself has the opposite effect. In sum, we have barely scratched the surface in our understanding of the role that industry structure plays in audit quality.

Institutions

The institutional setting in which audits are conducted refers to the legal system in a country that determines an auditor's legal responsibilities, as well as the broad set of institutions that regulate accounting and auditing practices and, therefore, create incentives for both individuals and accounting firms. In the United States this would include State Boards of Accountancy, which

²⁵ There is also research that examines the accounting profession and regulation from a more explicitly socio-political perspective such as Fogarty et al. (2006), Cooper and Robson (2006), and Suddaby et al. (2007).

license auditors, and the American Institute of Certified Public Accountants (AICPA), which writes the licensing examination and develops auditing standards for non-SEC registrants. It would also include the Financial Accounting Standards Board (FASB), which develops financial reporting standards. For SEC registrants, additional institutional regulation comes from the Securities and Exchange Commission, which mandates an audit for SEC registrants, registers those accounting firms that are eligible to practice before the Commission, and has administrative authority to punish auditors and accounting firms who participate in misleading reporting by SEC registrants. The SEC also has broad authority to mandate the form and content of financial reports filed with the Commission. Auditors who audit SEC registrants are also subject to regulation by the PCAOB, which issues audit standards for the audits of SEC registrants, and registers and inspects accounting firms as part of its quality-assurance mission. Despite the importance of these institutions, we have very little insight into their operations. An exception is Kinney's (1986) analysis of voting patterns while he served on the Auditing Standards Board of the AICPA. It is encouraging that the PCAOB is showing some transparency in its operations through its annual academic conference, and Gradison and Boster (2010) offer an informative inside history of the organization.

There are other important institutional mechanisms that provide oversight and monitoring of corporations—in addition to an independent audit—such as boards of directors and audit committees. These governance mechanisms can also have an affect on external auditing, and there has been considerable research in recent years linking audit quality to board characteristics. Seminal studies include Klein (2002) and Carcello and Neal (2000, 2003). More recent research has examined the effects of accounting expertise and financial expertise in audit committees on audit quality (Hoitash and Hoitash 2009; Hoitash et al. 2009). The findings of this literature generally support that companies with stronger boards (more independent directors and audit committees with accounting and financial expertise) hire better quality auditors (Big 4 and industry experts), and are less likely to dismiss auditors following going-concern audit reports. However, since governance structures are endogenous, it is unclear if good governance leads to the use of better auditors, or if “good firms” are simply more likely to have both good governance structures and good auditors. More research is needed to clarify this issue, although DeFond et al. (2005) provide evidence that good auditing and good governance are complementary.

Each country has its own unique institutions that are directly involved in the regulation and oversight of auditors. For many countries outside of the U.S., these institutions will include the International Accounting Standards Board, which issues international financial accounting and reporting standards, and the International Auditing and Assurance Standards Board, which issues international auditing and assurance standards. In addition, each country will also have its own set of institutions that regulate auditing, many of which adopt the international standards with minor changes related to local legal structures. Quick et al. (2008) describe some of these institutions for countries in the European Union.

Beyond the specific institutions of a country, there is also the broader effect of the legal system on the incentives of auditors. The legal system has an important role in defining an audit failure, the parties that can take legal action against auditors when there is an alleged failure, the standard of proof for determining if a failure occurs, and the legal remedy against auditors if there is failure. Auditors generally face more exposure to litigation in common law countries such as the United States and Australia where courts are used to settle disputes. In contrast, auditors generally face less direct legal exposure in code law countries such as Continental Europe because disputes in these countries are more likely to be handled administratively by an SEC-type of government agency (La Porta et al. 2006).

While institutions can directly affect individuals, such as the loss of a license to practice, the larger consequences flow to accounting firms and then filter down to individual auditors and engagement teams. For example, accounting firms with SEC registrants are exposed to scrutiny by

the SEC and PCAOB, as well as the potential for large-scale class action litigation, and this in turn will affect virtually all aspects of their business operations: who is hired, how they are trained and rewarded, the set of audit procedures that are used, and the firm's quality control and compliance processes.

Early institutional research on audit quality is largely theoretical, such as Dye (1993) who analyzes alternative legal liability regimes and their effects on auditor incentives and behavior. However, recent empirical research has also begun to explore the role of institutions on audit quality. Two broad research designs can be used. First, one can examine the role of institutions within a single country, and the research design in these studies focuses on the effects of a change in institutional arrangements. For example, the 1995 Private Securities Litigation Reform Act in the United States significantly reduced an auditor's liability exposure under U.S. securities law. The research question is whether this institutional change affected the auditor's business risk by reducing the consequences (costs) of low-quality auditing. Lee and Mande (2003) and Francis and Krishnan (2002) report evidence that audit quality declined (larger abnormal accruals and fewer going-concern reports), which is consistent with the change in auditor incentives brought about by the legal reform. Another important institutional change in the U.S. was the Sarbanes-Oxley legislation in 2002. Several studies have examined its general effect on earnings quality (Cohen et al. 2008), as well as more specific audit effects including the internal control assessment under Sections 303 and 404 (Ashbaugh-Skaife et al. 2007; Doyle et al. 2007; Hoitash et al. 2008).

The second approach to research design examines the effect of institutions through a cross-country analysis of institutional differences and the effects of these differences on the quality of auditing. For example, Francis and Wang (2008), show that earnings quality of Big 4 clients around the world is affected by the strength of the legal protection of investors in a country. They find that the quality of a Big 4 audit is no different from that of a non-Big 4 firm in countries with very weak investor protection. However, as investor protection regimes becomes stronger, large accounting firms have more incentives to protect their reputation and the quality of Big 4 audits improves relative to non-Big 4 firms. Other examples of cross-country studies include Seetharaman et al. (2002) who find that audit fees of U.K. firms that cross-list in the U.S. are higher, which they attribute to higher litigation costs in the U.S. and the need for more careful (higher quality) audits. Choi et al. (2009) build on this research and find that the cross-listing premium increases when the quality of legal regime in the cross-listing country increases relative to that of the home country. Khurana and Raman (2004) examine the cost of capital of Big 4 clients in four common law countries and report that Big 4 clients have a lower cost of capital in United States, but not in Australia, U.K., or Canada. They conclude that U.S. litigation exposure appears to drive Big 4 behavior in the U.S. and leads to higher quality audits, the effect of which flows through to clients and results in reduced information risk and therefore a lower cost of capital.

We have barely scratched the surface in our understanding of the role of institutions, and this is a very important direction for future archival research on audit quality. For example, in the United States is the main institutional driver of audit quality the SEC, the PCAOB, or is it a legal system in which it is far easier to sue auditors than any other country in the world? Alternatively, are all of these institutions equally important? Another issue is the role of auditing standards. Do standards matter, or is monitoring and enforcement by regulators more important than standards *per se* in achieving audit quality? These questions are of central important in assessing the role of particular institutions in achieving audit quality. This understanding is especially important to developing countries in identifying the kinds of institutional reforms that will be most effective in improving the quality of auditing and financial reporting practices in their countries.

To sum up, the framework in Table 1 starts with micro-level inputs to the audit process and concludes with macro-level institutional incentives. While all are relevant for understanding audit quality, I believe the importance flows in the opposite direction, with institutions shaping the

incentives of accounting firms to produce high-quality audits, and these effects filtering down to engagement teams and the decisions they make with respect to the collection and evaluation of evidence. Having said that, research is important for all levels in the framework to comprehensively understand the drivers of engagement-level audit quality. For archival scholars, the especially important areas of research are at the input level in assessing the reliability and relevance of audit evidence, and the role of accounting firms and institutions on audit quality.

Audit Consequences

Another way to assess audit quality is the economic consequences of audit outcomes on companies and external users. Several studies have examined the information content of the audit report, although a challenge with this research is that the audit report is generally released simultaneously with the 10-K, which makes it difficult to isolate the informational effect of the audit report (Bailey 1982). However, Dodd et al. (1984) study a sample of firms in which the audit report is publicly announced prior to the 10-K and they find that the market responds negatively to a qualified audit report. Loudder et al. (1992) identify a sample in which a qualified audit report is more likely to have been a surprise and also find a negative market reaction. More recently, Weber and Willenborg (2003) use a sample of microcap IPOs and document that the audit report at the time firms go public has predictive power with respect to post-listing returns and delistings. For these small firms, the audit report is more likely to be informative, given the lack of other information. Surprisingly, around 25 percent of these microcap firms actually go public with a going-concern audit report. Earlier IPO research documents that firms have lower underpricing (less information asymmetry) when audited by large accounting firms (Beatty 1989). In addition to the audit report, SOX mandates the disclosure of internal weaknesses by the auditor, and Hammersley et al. (2008) find that there is a negative market reaction to the disclosure of internal control weaknesses.

Another stream of research has examined the effect of auditing on the firm's cost of capital. Chang et al. (2009) show that firms with Big 4 auditors are able to obtain more equity financing, and Khurana and Raman (2004) document that U.S. firms with Big 4 auditors have a lower cost capital. With respect to debt, Pittman and Fortin (2004) and Mansi et al. (2004) document that the cost of debt is lower when a company is audited by a large accounting firm.

Other research documents that the stock market values earnings surprises more highly when earnings are audited by one of the Big 4 accounting firms (Teoh and Wong 1993). Balsam et al. (2003) report that earnings surprises are valued more highly when audited by an industry expert, and auditor industry expertise is also associated with a lower rate of fraudulent reporting by clients (Carcello and Nagy 2004). Research has also examined the economic consequences of audits on financial analysts who are a primary information intermediary. Behn et al. (2008) find that analysts have greater forecast accuracy and less forecast dispersion for those firms audited by a Big 4 auditor, although they find no effects for Big 4 industry expertise. The implication is that earnings are of higher quality when audited by a Big 4 auditor, which in turn makes the earnings more useful for information intermediaries.

In sum, the economic analysis of audit outcomes is important for two reasons. First, it demonstrates that auditing in general is valuable and has material economic consequences. Second, outcomes provide evidence of the effects of differential audit quality. Audits are perceived to be of higher quality by debt and equity markets when companies are audited by the larger accounting firms or firms with industry expertise. As with empirical research on accounting firms and institutions, we have barely scratched the surface on the economic consequences of auditing and the effects of audit quality on economic outcomes.

WHY AREN'T WE MAKING MORE PROGRESS?

Sullivan (1993) observed that most audit practitioners are unaware of audit research and would therefore say it has little impact on audit practice. This is probably still true today even though Bell and Wright (1995) provide specific examples of how audit research has affected both audit standards and audit practice. However, Bell and Wright (1995) also recognize obstacles in achieving research collaboration between practitioners and academics, including the focus by practitioners on short-term problems rather than more fundamental and long-term issues, and the research incentives of academics to pursue topics that may not necessarily be of interest or relevance to practice.

I expand on Bell and Wright (1995) and make the case that auditing research has direct potential to help both practitioners and regulators. For example, JDM research is important in helping accounting firms to better understand audit tasks where engagement teams may have difficulty and where audit judgments could be improved. Good examples of such research include O'Donnell and Schultz (2005) who assess the difficulties in using the business risk approach to audits, and Hutton and Gold (2010) who examine the effectiveness of alternative, fraud-brainstorming approaches. There are also related training implications. When accounting firms revise their audit methodologies, which they do periodically, it would seem almost self-evident that JDM scholars would be involved with firms in assessing the effectiveness of new audit-testing approaches. Yet to the best of my knowledge this does not occur, at least on a routine or regular basis.

Archival research in auditing offers important insights to practice management and the potential threats to audit quality. For example, office-level studies raise an important question about the ability of large firms to deliver consistent quality across engagement offices. More broadly, this research questions the efficacy of the office-based decentralized organization structure for the delivery of audits for SEC registrants, at least in instances where offices are small and may have only a few SEC registrants as clients. This is more common than one might imagine. Francis and Yu (2010) document that around 20 percent of Big 4 offices in the U.S. have three or fewer SEC registrants. Engagement-specific characteristics also seem to be important, and while accounting firms might not like to hear this, there is evidence that audit quality is lower when accounting firm alumni hold high-level executive positions in client firms. There is also evidence that client fee dependence may impair audit quality, or at least the perception of low audit quality by investors (Frankel et al. 2002; Francis and Ke 2006).

An equally strong case can be made with respect the importance of audit research for regulators. Research can help to assess the costs and benefits of proposed or new regulations; for example, the consequences of Sections 303 and 404 requirements of Sarbanes-Oxley (Ashbaugh-Skaife et al. 2007; Ashbaugh-Skaife et al. 2008; Hammersley et al. 2008). Another example is the informativeness of PCAOB inspection reports compared to the peer review process operated by the Public Oversight Board of the AICPA. Lennox and Pittman (2010) report evidence that the peer review report was actually more informative in assessing accounting firm quality because it contained an overall opinion on the quality of the accounting firm. In contrast, the PCAOB inspection report does not have a summary opinion, and the critical information is redacted (kept private) because firms are given one year to remediate problems, in which case no public disclosure is ever made of the weaknesses. A third example is the above-cited body of research that links accounting firm characteristics to the quality of client earnings. This stream of research would seem to be very helpful to the PCAOB in developing their inspection strategies and better targeting those engagements that are at risk for low-quality audits.

Given the potential relevance and importance of audit-quality research, why does it seem to have so little impact on practice and regulation? I believe there are three explanations:

1. Auditing practice and regulatory policy-making have not traditionally been science-based, hence there is little demand for research.
2. Even if there is a demand for audit research, existing research is not viewed as being relevant and useful.
3. Research is not demanded because it threatens the authority of practitioners and regulators.

The first explanation is that there is no research tradition in auditing or what might be called a science-based approach by accounting firms or regulatory bodies. This stands in contrast to a profession like medicine or even law where legal scholarship is frequently used in developing legal briefs and the supporting rationale for court decisions. As a consequence, little importance is given to research in developing audit practices and regulatory policies. It is encouraging that the U.S. Treasury (2008) made extensive reference to the audit research literature in its report, and that the PCAOB has commissioned a series of “synthesis papers” to summarize research findings in particular areas, although it remains unclear how these papers will affect policy-making. Another encouraging development is the AICPA’s Center for Audit Quality, which has started a research program to fund academic research on audit quality.

A second explanation is that even though the “idea” of research is viewed positively, the extant research in auditing is not seen as useful. While I believe that auditing research is relevant and useful, as argued above, we must accept the possibility that research is not necessarily viewed positively by practitioners and regulators (Sullivan 1993). In part, this problem arises because we have not been effective at communicating the value of auditing research. Our failures begin with our own undergraduate students who, for the most part (at least in the U.S.), get little or no exposure to accounting scholarship in the undergraduate curriculum, where the content is heavily driven by the CPA licensing exam. Why should our students suddenly value research when they become audit partners or regulators? As noted by Bell and Wright (1995), we need to make the case for research much earlier, starting with accounting undergraduates.

Beyond this, there is the well-known Q-R problem in scholarship (Ellison 2002), which explains in part the incentive of auditing scholars to do research that is potentially less relevant than it could be. The idea is quite simple. Q refers to the intrinsic importance or quality of a research project, and R is the rigor of the methodology and research design. Over time, the norms of science have increasingly emphasized R to the exclusion of Q. As a consequence, we tend to research those topics we can research rigorously. As a result, a lot of intrinsically important research questions do not get asked in the first place, or if they are undertaken, they probably do not get published in the best journals. This is a widespread problem in the applied social sciences, and one that we should also reflect on in accounting (Swanson et al. 2007). The upshot is that we need to do a better job of conducting research that is both relevant *and* rigorous, and in communicating its importance to practitioners and regulators. On this latter point, it is often said that practitioners and regulators have difficulty understanding research findings on a given topic, in part because there are multiple studies with sometimes conflicting results, and because the results are presented in technical statistical terms. There is clearly a need for reviews and syntheses of the research literature to make research findings more accessible by those outside the academy.

The third explanation is that research might be threatening to the authority of practitioners and regulators, particularly given that auditing is not a science-based practice. Thus, it is quite likely that research will identify areas where audits and regulations can be improved. For example, given the earlier discussion that little is known about the reliability and relevance of audit evidence, it is extremely difficult for auditors to accurately assess the true audit risk that is achieved on audit engagements. While this does not make an audit any less important, it does recognize that there are important limitations to current audit practices, something that accounting firms might prefer go unnoticed. Regulators might be similarly threatened by research findings that undermine their

regulatory authority. For example, regulators routinely mandate new requirements with no clear evidence of the need for such requirements or a careful evaluation of the potential consequences (cost and benefits) of policy proposals. In some cases, policy decisions are made even when known research findings do not support the need for regulatory actions. A good example is the SEC's push in 2000 to ban consulting services, despite a body of evidence in which, at the time, there was no compelling evidence that auditor objectivity is impaired by providing such services to clients.

Despite the "threats" to authority posed by science, the bigger point is that good research has the potential to identify important problems and weaknesses in the work of auditors and regulators. In a science-based world this should be viewed as a good thing, and the quality of both audit practice and regulatory decision-making would benefit by becoming more attuned to research, and more science-based in its thinking and operations. Hubris does not improve audit quality nor is it a long-term survival strategy. Criticism and self-reflection are precisely how we adapt to make things better in this world.

I conclude with the suggestion that the way forward in achieving better audit quality is greater openness from practitioners and regulators, and cooperation with scholars in what should be a shared goal: a better understanding of the multiple drivers of audit quality that can make audits better and can help the institutions that regulate auditing make cost-effective policies that will improve audit quality. As I have tried to convey throughout this essay, audit scholars have made a good start toward understanding the multiple facets of audit quality. However, there is a limit to how far we can go with current data and paradigms. Further progress will be best achieved through collaborative research among scholars, firms, and regulators, and this collaboration would ideally include private data from accounting firms and regulators that are needed to move beyond our current knowledge and to more fully understand and ultimately to improve audit quality.

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