

**INTERNAL AUDIT OUTSOURCING AND THE RISK OF  
MISLEADING OR FRAUDULENT FINANCIAL REPORTING:  
DID SARBANES-OXLEY GET IT WRONG?**

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**ABSTRACT:** The Sarbanes-Oxley Act (SOX) prohibits companies from outsourcing internal audit work to their external auditor based on the belief that such outsourcing arrangements create an economic bond that compromises audit quality and thus financial reporting quality. Using two proprietary data sources, we investigate whether companies that outsourced their internal audit function (IAF) to their external auditor pre-SOX had a higher risk of misleading or fraudulent external financial reporting (accounting risk). Our results indicate that, prior to SOX, outsourcing the work of the IAF to the external auditor is associated with *lower* accounting risk as compared to keeping the IAF in-house or outsourcing the work of the IAF to a third party other than the external auditor. These results are robust to the inclusion of controls for IAF and overall corporate governance quality as well as to a two-stage, least squares analysis to control for possible effects of endogeneity. These results do not provide support for SOX's prohibition of outsourced internal auditing services by external auditors.

**Key Words:** Internal Audit Function, Outsourcing, Sarbanes-Oxley Act, Corporate Governance, Financial Reporting Quality, and Accounting Risk

**Data Availability:** Contact the authors. Data provided by the Institute of Internal Auditors and Audit Integrity are subject to restrictions.

## 1. INTRODUCTION

The Sarbanes-Oxley Act of 2002 (SOX) was enacted in response to the major accounting frauds of the late 1990s and early 2000s, and represents a far-reaching legislative attempt to improve the quality of financial reporting in the United States (Klein [2003]). One change imposed by SOX was to prohibit the outsourcing of internal audit services to firms' external auditors. This part of the Act was primarily motivated by the belief that this type of outsourcing arrangement creates an economic bond between external auditing firms and their clients, thus compromising the ability of the external auditor to take strong stands against misleading or fraudulent financial reporting (Moore [2002]; Lindberg and Beck [2004]). External audit firms on the other hand, argued that providing client services—especially internal auditing—produced knowledge spillover gains, resulting in more efficient and effective audits (Plitch [2002]). Prior research examining this issue provides mixed results concerning the relation between auditor-provided nonaudit services and audit quality (e.g., see Francis [2006] and Kinney et al. [2004] for reviews of this literature). This paper uses two proprietary data sets to investigate the association between the choice to outsource internal audit services to the external auditor and the risk of misleading or fraudulent financial reporting.

Previous research has examined whether the *presence or absence* of an internal audit function (henceforth IAF) is associated with lower incidence of financial statement fraud (Beasley et al. [2000]; Coram et al. [2008]) or weaknesses in internal controls (Krishnan [2005]). These studies find that companies with an IAF are less likely to experience—but more likely to detect—fraud. Prior research also suggests that IAF quality is associated with a mitigation of earnings management (Prawitt, Smith, and Wood [2009]). We build on these studies by examining whether IAF sourcing, controlling for IAF quality characteristics, affects accounting

risk. More specifically, in order to distinguish between the competing economic bonding and knowledge spillover hypotheses, we investigate the associations between various possible IAF sourcing alternatives and the risk of future fraudulent or misleading accounting activities, which we refer to as “accounting risk.”

To address our research questions, we use two proprietary data sets. The first contains descriptive information on the IAFs of publicly traded companies from fiscal years 2000 through 2002. This archive, called the GAIN database, was collected for benchmarking purposes by the Institute of Internal Auditors (IIA). The IIA data provide a rich description of a relatively large sample of IAFs across the country. The proxy we use for accounting risk (AR) is a proprietary measure produced by Audit Integrity, LLP, a financial analytics organization. Audit Integrity uses publicly available information about accounting and governance as inputs to a model that measures the “overall risk of potentially fraudulent or misleading” financial reporting (Audit Integrity [2005]). Daines et al. [2008] evaluate several commercially developed governance ratings and find that Audit Integrity’s measure generally outperforms other ratings in its ability to predict restatements, class-action lawsuits, future operating performance, and future excess stock returns. Other research provides additional evidence that Audit Integrity’s risk measure effectively proxies for accounting risk (Xie [2006]; Bartov and Hayn [2007]; Charles et al. [2008]).<sup>1</sup>

Our results reveal that, consistent with the knowledge spillover hypothesis, companies that outsourced the IAF to their external auditor (pre-SOX) had lower accounting risk than (i) companies that outsourced to other Big N service providers, (ii) companies that outsourced to other non-Big N third-party service providers, and (iii) companies that kept their IAF in-house.

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<sup>1</sup> The AR measure has also been validated in a series of tests performed by Audit Integrity (Audit Integrity [2005]). For example, Audit Integrity finds that its risk measure is a better predictor of SEC actions than an accruals-based model.

The results also suggest that IAF quality does not significantly differ between in-house IAFs and IAFs that are outsourced to other Big N or non-Big N service providers. In supplemental tests we show that these results are not likely attributable to endogeneity between overall corporate governance quality and IAF quality or between the choice to outsource to the external auditor and the company's desired level of accounting risk.

In examining the relations between various sourcing arrangements and accounting quality, we control for IAF quality using measures derived from Auditing Standards (AICPA SAS No. 65 and PCAOB AS No. 5) and employed by prior research (see Prawitt, Smith, and Wood [2009]). In that context, we also find evidence that in this pre-SOX era, high quality IAFs (irrespective of the outsourcing choice) are associated with lower accounting risk.

This study is important for several reasons. First, the results of this study suggest that prior to SOX, outsourcing the IAF to the external auditor was associated with lower accounting risk than was outsourcing the IAF to another entity or keeping the IAF in-house. These results do not provide support for the SOX prohibition of accounting firms providing internal audit services for their external audit clients.<sup>2</sup> Second, this study adds to prior research suggesting that the IAF plays a role in the quality of financial reporting by providing preliminary evidence that IAF quality is inversely associated with the risk of misleading or fraudulent financial reporting.

The remainder of this paper proceeds as follows. In the next section, we discuss the relevant literature and develop our expectations. In section three we discuss methodology, followed by a discussion of results in section four. We conclude in section five by discussing the implications of our findings, limitations of our study, and areas for future research.

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<sup>2</sup> Lawmakers may not have had any expectation that prohibiting external auditors from providing internal audit services would improve auditors' "independence in fact" or demonstrably improve financial reporting quality. It is possible that their intent was to improve "independence in appearance" because of pressures to restore public confidence in financial reporting.

## **2. BACKGROUND AND EXPECTATIONS**

In the next two subsections we discuss the relation between IAF sourcing characteristics and accounting risk.

### **2.1 Internal Auditing and Accounting Risk**

The cost of misleading, fraudulent, or otherwise inaccurate financial reporting is significant to shareholders, managers, and the economy in general. Feroz et al. [1991] and Palmrose et al. [2004] find that companies experience average abnormal returns of -13 percent and -9 percent in the two-day window surrounding the announcement of a financial reporting failure, respectively. Moreover, Graham et al. [2002] estimate that the combined cost to the U.S. economy of the WorldCom and Enron scandals was in excess of \$35 billion.

Auditing plays a central role in financial reporting quality through, among other things, the deterrence of manipulation or misrepresentation of accounting information by management. The role of the external auditor in detecting and deterring fraudulent or misleading financial reporting has been studied extensively, including the effects of such auditor characteristics as firm size, specialization, and quality (for reviews of this literature see Francis [2004] and Nieschwietz et al. [2000]). However, the role of internal auditing, while clearly relevant to financial reporting quality, has remained relatively unexamined to this point (see Prawitt, Smith, and Wood [2009]).

A recent study by the accounting firm PricewaterhouseCoopers examines both “defalcation” and “financial statement misrepresentation” frauds and concludes that “of all the proactive internal control measures that a company can implement, internal auditing is the most effective” (PwC [2005]). Other research provides complementary evidence to these descriptive results. Archival research suggests that high quality IAFs are associated with less earnings

management (Prawitt, Smith, and Wood [2009]), lower likelihood of disclosing a material weakness in internal controls (Lin et al. [2008]), and lower external audit fees (e.g., Prawitt, Sharp, and Wood [2009]; Gramling et al. [2004]). In addition, Beasley et al. [2000] provides evidence that the presence of an IAF is negatively related to the incidence of fraud.<sup>3</sup>

## **2.2 IAF Sourcing and Accounting Risk**

While prior research suggests that internal auditing can play a role in financial reporting quality, the primary focus of this study is to examine whether the risk of misleading or fraudulent financial reporting depends on whether and to whom companies outsource their IAF. We consider two basic questions: (1) does outsourcing to the external auditor create knowledge spillover effects that result in lower levels of accounting risk, or (2) does outsourcing to the external auditor create an economic bond that results in higher levels of accounting risk? In examining these potential relations we consider and control for whether IAF quality (i.e., competence and objectivity) differs between outsourced and in-house providers. We discuss each question in the following subsections, followed by a discussion of unique aspects of our research design that distinguish our paper from previous studies.

### **2.2.1 Outsourced Internal Audit Providers vs. In-house Internal Audit Providers**

The use of external providers as internal auditors has a contentious history within the internal auditing profession, with proponents of both outsourcing and of keeping the IAF in-house vehemently arguing the superiority of their respective positions.<sup>4</sup> On one hand, proponents of keeping the IAF in-house contend that outsourced internal auditors do not know the business

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<sup>3</sup> Using a sample of alleged frauds by the SEC in AAERs, Beasley et al. [2000] demonstrate that companies in the technology, health care, and financial services industries that have experienced alleged financial statement fraud are more likely to have an IAF than an industry sample that is matched roughly on size. However, Beasley et al. [2000] do not control for other factors that may explain differences in having/not having an IAF, and use a restricted sample of firms.

<sup>4</sup> See Rittenberg and Covalleski [2001] for a discussion of the history of outsourcing in internal audit.

as well as in-house internal auditors, lack commitment to the company they are auditing, and may not adapt the auditing approach to the client's situation—all of which may reduce their ability to detect and/or deter inappropriate accounting (Grant Thornton [2007]). On the other hand, research has shown that outsourced internal auditors are perceived to be more objective by external auditors (Glover et al. [2008]) and more competent by finance directors (Carey et al. [2006]). In addition, outsourced internal auditors believe that they face greater legal liability than in-house internal auditors, which may affect their incentives regarding audit issues that influence the quality of external financial reporting (Ahlawat and Lowe [2004]).

We do not take an *a priori* position in the debate surrounding in-house versus outsourced internal auditing. Rather, we investigate empirically whether outsourcing to a third party is associated with the likelihood of future misleading or fraudulent external financial reporting, while controlling for IAF quality proxies relating to competence and objectivity as defined by external auditing standards.

### **2.2.2 Does Outsourcing to the External Auditor Create Knowledge Spillover or Economic Bonding?**

An important consideration in the outsourcing decision is the choice of the outsourced service provider. Before SOX, companies were permitted to outsource the IAF to their external auditor or to another third-party service provider. As discussed previously, SOX was a response to the accounting frauds of the late 1990s and early 2000s. Title II of the Act prohibited the provision of internal audit services by the external auditor because it was argued that such relationships create an economic bond between auditor and client, compromising both auditor independence and financial reporting quality. This view contrasts with the argument made by

external auditing firms who claimed that providing both internal and external auditing services created knowledge-spillover gains, thereby improving overall audit quality (Plitch [2002]).<sup>5</sup>

Outsourcing the IAF to the external auditor is a part of the larger debate over whether external auditors' provision of any services other than the external audit results in economic bonding or knowledge spillover (Francis [2006]; Kinney et al. [2004]). Francis [2006] reviews 40 years of research in this area and concludes "there is no 'smoking gun' evidence linking the provision of nonaudit services with audit failures." Kinney et al. [2004] provide a detailed review of the literature examining the relation between auditor-provided non-audit services and proxies for financial reporting quality—including proxies for earnings management, restatements, SEC enforcement actions, and shareholder class actions. They conclude that "there is some scattered evidence of a modest positive association between some NAS [non-audit service] fee measures and surrogates for reduced financial reporting quality. However, existence of the positive association that regulators and legislators presume remains largely undocumented for the post-1999 period."

After reviewing the literature, Kinney et al. [2004] conduct an empirical analysis of the relation between restatements and non-audit service fees paid for financial information systems design and implementation and for internal audit, tax, and other services. In comparing firms with material restatements to firms with no restatements, they find that non-restating companies pay significantly *more* to their external auditors for outsourced internal audit work than companies that have material restatements (see Table 4, Panel C of Kinney et al. [2004]). This univariate evidence suggests that outsourcing the IAF to the external auditor is significantly

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<sup>5</sup> Knowledge spillover in auditing occurs when a) information that is gained in providing a non-external audit service is shared with the external audit engagement team, thereby improving the quality of the external audit or b) information that is gained in providing the external audit is shared with the non-external audit service team, thereby improving the quality of the non-external audit service. In the context of internal audit outsourcing, it can be argued that external financial reporting might benefit from knowledge spillover in both directions.

negatively related to the occurrence of restatements. In multivariate tests, Kinney et al. [2004] report a negative relation between nonaudit service fees for internal audit work and restatements at large companies, but the coefficients are not statistically significant at conventional levels.<sup>6</sup>

Overall, the evidence in the literature does not provide strong support for either the knowledge spillover hypothesis or the economic bonding hypothesis. However, most of the research to date is not able to distinguish the type of nonaudit services provided by the external auditor. Further, in the case of outsourcing internal auditing to the external auditor, few studies have sufficient power to adequately test this relation and none have been able to control for the effects of IAF quality. Of all the services external auditors provided before the SOX prohibition, we believe internal audit outsourcing represents the greatest possibility for creating knowledge spillover effects. We therefore reexamine this issue using a relatively large sample of firms while controlling for IAF quality to determine the effect of outsourcing the IAF to the external auditor on accounting risk.

### **2.2.3 Research Design**

We design our tests to investigate knowledge spillover or economic bonding effects while controlling for overall IAF quality. Previous research has not distinguished between different outsourced service providers, which is important if internal audit quality differs among outsourced service providers. To control for differences, we include proxies for IAF competence and objectivity in our regression models and we separate outsourced service providers based on the nature of the outsourced service provider. Specifically, we categorize the IAF outsourcing arrangements as follows: Big N audit firm but not the client's external auditor (*Outsrc<sub>BigN</sub>*), Big N audit firm and the client's external auditor (*Outsrc<sub>EA</sub>*), or a service provider that is neither a

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<sup>6</sup> The authors note that the lack of significant results may be due to their small sample size.

Big N firm nor the client's external auditor (*OutsrcOther*).<sup>7</sup> Figure 1, Panel A provides a matrix to illustrate how separating the service providers into separate pools allows for a relatively clean test of our expectations.

To test for differences in accounting risk that might be attributable to the effectiveness of the overall sourcing arrangement, we test for differences between companies that outsource to a Big N service provider that is not the client's external auditor (*OutsrcBigN*), companies that use a non-Big N service provider that is not the client's external auditor (*OutsrcOther*), and companies that keep their IAF in-house (*In-house*). If one of these arrangements results in lower accounting risk, it suggests that that arrangement may be more effective than the others at reducing the risk of misleading or fraudulent financial reporting.

To test for differences in knowledge spillover, we examine how outsourcing to the external auditor (*OutsrcEA*) relates to the other arrangements. The cleanest possible test of whether outsourcing to a third party creates knowledge spillover is a comparison of whether accounting risk is lower for companies that outsource to a Big N external auditor (*OutsrcEA*) than for companies that outsource to another Big N service provider that is not the external auditor (*OutsrcBigN*), as this comparison is made within only Big N firms. If outsourcing to the external auditor results in lower accounting risk, *ceteris paribus*, such differences presumably will be attributable to knowledge spillover gains rather than quality differences *per se*, as the service providers are all Big N firms.

Testing for differences in accounting risk between outsourcing to the external auditor (*OutsrcEA*) and outsourcing to a third party other than a Big N provider (*OutsrcOther*) or between *OutsrcEA* and keeping the IAF in-house (*In-house*) may not provide as clean a test of knowledge spillover effects because there may be differences in the quality of auditing among these three

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<sup>7</sup> In our sample, all firms that outsourced to their external auditor used a Big N auditor.

types of providers. However, if there are no overall differences in accounting risk among these service providers (tested by comparisons between *Outsrc<sub>BigN</sub>*, *Outsrc<sub>Other</sub>*, and *In-house*), these comparisons may also provide evidence inconsistent with knowledge spillover. The different comparisons that we are able to make by isolating who provides the outsourced services allow a relatively clean archival test of the knowledge spillover hypothesis versus the economic bonding hypothesis.

*(Insert Figure 1 about here)*

### **3. DATA AND MODEL SPECIFICATION**

#### **3.1 Sample and Data**

To test our expectations, we use measures from two proprietary data sources: a measure of accounting risk developed by Audit Integrity, LLP and a dataset developed and maintained by the IIA relating to the IAFs of hundreds of U.S. companies. We combine data from these two sources with data from the Compustat, CRSP, and Risk Metrics databases to test our model. Application of our data requirements results in 353 firm-year observations from 166 companies in 38 different two-digit SIC code industries for the years 2000 through 2002 (see Table 1 for a description of how we arrived at our final sample).

*(Insert Table 1 about here)*

Our measure of accounting risk (AR) is provided by Audit Integrity, LLP. The company uses publicly available financial data to estimate the likelihood that reported financial information includes elements that are misleading or fraudulent. Audit Integrity's Web site (January 2009) describes the AR score as "a forensic assessment of the risk that financial results are misrepresented in public disclosures." It represents an objective, comprehensive measure of the "overall risk of potentially fraudulent or misleading" financial reporting at public companies.

Audit Integrity's objective is to “use publicly posted financial data to discriminate between fraudulent and nonfraudulent companies” (Audit Integrity [2005]). AR is the output of a proprietary model that evaluates practices and anomalies in public companies’ accounting activities and objectively assesses the risk of misreporting by using detailed historical data to identify suspicious patterns of financial activity. In sum, accounting risk is an output of Audit Integrity’s model and is intended as an *ex ante* estimate of the risk that companies are engaging in inappropriate financial reporting.<sup>8</sup>

The inputs to the Audit Integrity model are based strictly on publicly available information from SEC filings, financial statements (including footnotes), annual reports, company-specific press releases, insider sales filings, executive compensation data, litigation proceedings, and other sources.<sup>9</sup> The metrics Audit Integrity uses to calculate accounting risk are categorized at the highest level into the following risk groups: (i) expense recognition; (ii) revenue recognition; (iii) high risk events; and (iv) asset and liability valuation. Each risk category expands into multiple business issues or “games” that companies play to manipulate their results. Each issue or game, in turn, is measured by one or more metrics (ratios) and each metric is examined along three dimensions: (1) the percentage change from the prior year; (2) the number of standard deviations from industry average; and (3) the volatility over an eight-quarter period. Unusually large or small metric values that are recognized as being associated with high-risk behavior among known fraudulent companies are flagged.

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<sup>8</sup> We use Audit Integrity’s *ex ante* measure of the risk that financial results are misrepresented rather than *ex post* indications of actual accounting problems because we have access to IAF sourcing and quality data on a limited set of companies for which there is insufficient restatement, enforcement, or litigation data to examine our research question using an *ex post* measure (e.g., actual restatements).

<sup>9</sup> Market pricing data and data relating to companies’ IAFs are *not* used in the calculation of Audit Integrity's risk measure.

Audit Integrity's database of companies with inappropriate financial reporting was developed by analyzing firms that were successfully sued by the SEC for improper financial reporting behavior. Metrics which are shown by Audit Integrity's model to be the most highly predictive of the quality of accounting are given the highest weights in the computation of risk rankings. For example, the *Accounts Receivable over Sales* metric is given a high weighting in the model because accounts receivable buildup is highly related to accounting problems in the database of known fraudulent companies. Flagged risk metrics are weighted and summed into an overall risk value.<sup>10</sup>

Audit Integrity has performed extensive testing to validate its model. Test results indicate that Audit Integrity's risk measure accurately separates low and high-risk firms for every range of risk with reasonable levels of Type I and Type II error rates (Audit Integrity [2005]). Out-of-sample testing indicates that Audit Integrity's model is not over-fitted and performs well on hold-out samples (Audit Integrity [2005]). Audit Integrity has also compared their risk measure to accruals-based models of earnings manipulation and found that their model significantly outperforms the accruals-based models (Audit Integrity [2005]).<sup>11</sup>

The IIA GAIN database is a compilation of survey responses from Chief Audit Executives (CAEs) associated with IIA member organizations and thus includes a wide range of institutions (e.g., publicly-traded companies, private companies, educational institutions,

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<sup>10</sup> Audit Integrity also produces an "Accounting and Governance Risk" (AGR) measure, which is "a forensic measure of the transparency and statistical reliability of a corporation's financial reporting and governance practices." The measure represents a proprietary combination of data falling into two categories: "accounting risks" and "governance risks." We utilize the accounting risk component as our dependent measure because it focuses specifically on "the risk that financial results are misrepresented in public disclosures." The IAF is a component of corporate governance (IIA [2005]); including a corporate governance component in our dependent measure would likely contaminate our results in relation to the focus of our tests. The quoted citations included in this footnote are from Audit Integrity's Web site [January 2009].

<sup>11</sup> Academic research by Xie [2006], Bartov and Hayn [2007], Charles et al. [2008], and Daines et al. [2008] provides evidence that Audit Integrity's risk measures are effective proxies for accounting risk. We note that these papers use the "Accounting and Governance Risk" (AGR) measure, which does not remove the governance risks (see footnote 10) as their studies do not have the same endogeneity concerns as this study.

divisions within companies, and governmental institutions). The purpose of the survey is to provide benchmarking data to participating firms. The survey is approximately 30 pages long and covers various aspects of internal audit practice. A copy of the most recent survey can be found by searching for “GAIN benchmarking” on the IIA’s website (<http://www.theiia.org>). The survey has changed slightly from year to year; however, all of the questions included in this study were unchanged from 2000 to 2002.

In order to ensure a high response rate and increase the utility of the data for benchmarking purposes, the IIA promises responding firms anonymity if they participate in the survey. We performed a match of several self-reported fields in the survey with data items in Compustat in order to include appropriate control variables in our study. We matched on self-reported total assets, total revenues, and operating industry to identify firms. We include all firms for which we are able to match identically in a particular year or for which we identified a match in a previous year and then can use the unique identifier in the IIA data to identify subsequent or previous firm year responses.<sup>12</sup>

### 3.2 Accounting Risk Model Specification

To test our hypotheses, we estimate the following two cross sectional regression models:

Equation 1:

$$AR = \beta_0 + \beta_1 IAQuality + \beta_2 Outsrc + \beta_3 ACEffectiveness + \beta_4 AuditSpecialist + \beta_5 Gindex + \beta_6 Assets + \beta_7 Leverage + \beta_8 Complexity + \beta_9 Loss + \beta_{10} Return + \beta_{11} NYSE + \beta_{12-17} IndustryDummies + \beta_{18-19} YearDummies + \varepsilon$$

Equation 2:

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<sup>12</sup> The IIA granted us permission to use the matching procedure explained in the paper to find appropriate control variables. As reported in Prawitt, Smith, and Wood [2009], this matching procedure appears highly effective in correctly identifying firms in the database.

$$AR = \beta_0 + \beta_1 IAQuality + \beta_2 Outsrc_{EA} + \beta_3 Outsrc_{BigN} + \beta_4 Outsrc_{Other} + \beta_5 ACEffectiveness + \beta_6 AuditSpecialist + \beta_7 Gindex + \beta_8 Assets + \beta_9 Leverage + \beta_{10} Complexity + \beta_{11} Loss + \beta_{12} Return + \beta_{13} NYSE + \beta_{14-19} IndustryDummies + \beta_{20-21} YearDummies + \varepsilon$$

(See appendix for variable descriptions)

### 3.2.1 Independent Variables

To consider whether outsourcing reduces accounting risk, we first use an indicator variable that captures internal audit outsourcing to any type of outsourced internal audit service provider, *Outsrc* (see Equation 1). We then refine our tests by breaking the different types of outsource service providers into separate pools as previously discussed using the variables *Outsrc<sub>EA</sub>*, *Outsrc<sub>BigN</sub>*, *Outsrc<sub>Other</sub>* (see Equation 2). As depicted in Figure 1, we break service providers into separate pools to better control for quality differences between providers and to examine whether either the knowledge spillover or economic bonding hypothesis is supported by the data.

### 3.2.2 Control Variables

We include 18 control variables in our model. We include a composite measure similar to the one used by Prawitt, Smith, and Wood [2009] to capture internal audit quality. To form the measure, we dichotomize several measures of quality that are indicated by external auditing standards by assigning a value of one to the variable if it is above the median of our sample for that variable and zero if it is below the sample median. We then sum this measure to create *IAQuality*, a composite measure of internal audit quality potentially ranging from zero to six. A larger *IAQuality* score indicates a higher quality IAF. The quality measures we use when computing *IAQuality* are based on SAS 65, the standard that guides external auditors' evaluations of the quality of the IAF in determining the extent to which the external auditor can rely on its work (AICPA [1990]). SAS 65 stipulates that external auditors should evaluate the

competence and objectivity of and the work performed by the internal auditors. Following the standard, to proxy for competence we include the variables *Experience*, *Certification*, and *Training*; to proxy for objectivity we include the variable *CAEAC*; and to proxy for work performed we include the variable *TimeFin*. In addition, we include *IASize* to control for differing investment levels in the IAF.<sup>13</sup> Because higher quality IAFs can reasonably be expected to decrease accounting risk, we predict a negative coefficient on *IAQuality*.

To mitigate the possibility that our results are caused by our IAF characteristics proxying for a corporate governance construct, we include three measures to capture corporate governance effectiveness: *ACEffectiveness*, *AuditSpecialist*, and *Gindex*. Corporate governance can be seen as the end product of the collective decisions and judgments of the audit committee, management, the external auditor, and the IAF (IIA [2005]). We include a measure of each of these different components of corporate governance in order to increase the likelihood that our results are attributable to differences in sourcing arrangements and not other corporate governance mechanisms.

We form *ACEffectiveness* by creating a composite score of ten dummy variables suggested by the Blue-Ribbon Committee for audit committee effectiveness (BRC [1999]).<sup>14</sup> For each attribute the company possesses, we score the company one point and then sum the scores

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<sup>13</sup> We exclude 38 observations with internal auditing data points that we deemed as nonsensical. Nonsensical IAF values include reported average internal audit experience amounts greater than 30 years or equal to 0 years, percentage of certified internal auditors greater than 100 percent, time spent performing financial audits greater than 100 percent, and training hours greater than 160 hours.

<sup>14</sup> The ten questions relate to independence, financial literacy skills, assessing the committee's charter, fulfilling the charter, accountability for auditor relations, relation with external auditor, discussion of accounting, disclosure of reviews, and reviewing of quarterly reports. Qualitatively similar results are obtained if we average the ten items, or include any single item. The items are highly correlated and therefore we did not attempt to include multiple items in the same regression.

to create *ACEffectiveness*.<sup>15</sup> We expect that the higher the audit committee quality, the lower AR; thus we predict a negative coefficient for *ACEffectiveness*.

*AuditorSpecialist* is a dummy variable that indicates whether or not the external auditor is an industry specialist auditor.<sup>16</sup> We define industry specialist auditor in a similar fashion to Palmrose ([1986]); that is, an external audit firm is considered the industry specialist (*AuditorSpecialist* = 1) if the firm provides within-industry market share 30 percent greater than if the audit firms were to split the industry evenly among themselves. We expect to observe a negative coefficient on *AuditorSpecialist* because using an industry-specialist auditor should reduce accounting risk.

Finally, to proxy for management's role in corporate governance, we include Gompers et al's [2003] corporate governance measure—*Gindex*. *Gindex* is formed by giving an organization a point for each takeover defense or lack of shareholder rights for 24 different provisions. Higher *Gindex* scores suggest that management has greater relative power, which suggests lower corporate governance quality. We expect to observe a positive coefficient on *Gindex* score indicating the greater the management's power, the greater the risk of inappropriate financial reporting.

We include *Assets* in our model to control for differences in company size. As a company increases in size, monitoring the company becomes more difficult and the incentive to commit fraud increases as the amount that can be defrauded increases. We therefore expect a positive coefficient on *Assets*. We include *Leverage* because companies that are highly levered may face restrictive debt covenants. In order to avoid violating debt covenants, management may be more

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<sup>15</sup> A possible alternative measure for controlling for audit committee quality is the presence or absence of an audit committee. We cannot use this proxy as all but three firm-year responses in our sample indicate presence of an audit committee.

<sup>16</sup> An alternative measure of auditor quality is Big N versus non-Big N auditor. We do not include a measure of Big N auditor because virtually all firm year observations in our sample indicate an audit by a Big N auditor.

likely to make aggressive accounting decisions; therefore, we expect a positive coefficient on *Leverage*. We include *Complexity* because it is harder to monitor an organization that is more complex and therefore it is easier for management engage in inappropriate accounting and not be detected. We include *Loss* and *Return* in our model because we expect that if a company is performing poorly, management will have greater incentives to record accounting transactions aggressively. *Loss* is a dichotomous variable representing whether the company's net income was negative ( $Loss = 1$ ) or positive ( $Loss = 0$ ). *Return* is the annualized buy-and-hold stock return of the outstanding stock over the previous year. We expect a positive coefficient on *Loss* and a negative coefficient on *Return*. We include an indicator variable for *NYSE* because firms listed on this exchange are required to have an IAF, which may either result in firms deciding to employ a high quality IAF or to employ a token IAF simply to comply. We make no directional predictions related to *NYSE*.

We control for industry by including six industry dummy variables (controlling for industry at the one digit SIC code level) and we include two year dummy variables to control for changes over time. We make no explicit *ex ante* prediction about whether the risk of fraudulent or inappropriate accounting transactions has changed over time or whether it differs by industry and thus we do not present the results for these variables.

Table 2 presents descriptive statistics of the variables used to compute *IAQuality* (Panel A) and of the variables included in our models (Panel B). These descriptive statistics suggest that firm-year responses differ significantly in terms of IAF quality and represent a diverse range of respondents. The high degree of variation in internal audit quality increases the likelihood that the results of this study generalize to companies not included in the sample.

Panel C presents Spearman and Pearson correlations for the variables included in the model. Of the simple correlations, AR is negatively related to *Outsrc<sub>EA</sub>* (p-value < 0.05) but positively related to *Outsrc<sub>BigN</sub>*. Given that *Outsrc<sub>EA</sub>* and *Outsrc<sub>BigN</sub>* are both performed by Big N auditors, this is preliminary evidence to support the knowledge spillover hypothesis. It is also interesting to note that AR is significantly negatively related to *IAQuality* (p-value < 0.05).

*(Insert Table 2 about here)*

## 4. TEST RESULTS

### 4.1 Results Relating to Internal Audit Quality and Accounting Risk

Before focusing on our primary research question involving the effects of IAF sourcing on accounting risk, we explore the descriptive result from the correlation matrix involving internal audit quality (*IAQuality*) and accounting risk (AR) using multivariate regression. We report the results of these tests in Table 3. Panel A of Table 3 excludes *Outsrc* whereas Panel B includes *Outsrc*. In both panels, the results suggest that *IAQuality* is significantly negatively related to the AR scores in the expected direction (p-values < 0.05). Consistent with evidence reported by Prawitt, Smith, Wood [2009] relating to IAF quality and measures of earnings management, these results suggest that higher IAF quality is associated with lower accounting risk.

Note that although *IAQuality* is related to AR, *Outsrc* is not significantly related to AR (p-value > 0.10) in this analysis. However, *Outsrc* captures outsourcing of the IAF to any type of service provider. Thus, this result suggests that outsourcing in general is not related to AR. However, the results reported in the next subsection indicate that the effect of outsourcing on accounting risk depends on the nature of the service provider.

Of the control variables included in our model in Table 3, *AuditSpecialist*, *Assets*, *Leverage*, *Complexity*, and *Return* are statistically significant in the predicted directions (all p-values < 0.10), and *NYSE* is negatively related to AR.

(Insert Table 3 about here)

#### 4.2 Results Testing Internal Audit Outsourcing's Relation with Accounting Risk

Table 4 presents the results of testing the association between IAF outsourcing and AR by type of service provider. We regress AR on indicator variables that represent the specific IAF sourcing arrangement and other variables discussed previously. First, with respect to tests for differences in accounting risk across provider types, *OutsrcBigN* is not significant in the model (p-value > 0.10) and *OutsrcBigN* and *OutsrcOther* are not significantly different (p-value > 0.10). These results suggest that in terms of accounting risk, outsourcing the IAF to a Big N accounting firm is similar to outsourcing to a non-Big N accounting firm. However, outsourcing to a non-Big N accounting firm does appear to be associated with more accounting risk than keeping the IAF in-house, as the coefficient on *OutsrcOther* is positive and moderately significant in this model (p-value < 0.10).

With respect to the knowledge spillover vs. economic bonding hypotheses, the coefficient estimate for *OutsrcEA* is reliably lower than for *OutsrcBigN*, suggesting that external auditors are able to more effectively reduce accounting risk when they perform both the internal and external audit (p-value < 0.01). Although we find no difference in quality between *OutsrcBigN* and *OutsrcOther*, again consistent with knowledge spillover effects we find that accounting risk is significantly lower for *OutsrcEA* than for *OutsrcOther* (p-value < 0.01).<sup>17</sup> Finally, in a test of differences comparing outsourcing to the external auditor versus keeping the IAF in-house, we

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<sup>17</sup> While a comparison of *OutsrcOther* and *OutsrcEA* provides evidence of knowledge-spillover effects, there may be an overall difference in service quality between the two groups. For this reason, our comparison of the coefficients on *OutsrcEA* and *OutsrcBigN* is the cleanest test of knowledge spillover.

find evidence of lower accounting risk if the work of the IAF is outsourced to the external auditor (p-value < 0.01). This result provides further evidence of a knowledge spillover effect in light of the fact that we find no differences in AR between using a non-external auditor Big N service provider and keeping the IAF in-house. Overall, these results provide evidence consistent with the idea that knowledge spillover gains are achieved when the same firm conducts both internal and external auditing services.

The results for the control variables are the same as in Table 3 except in Table 4 the coefficient on *AuditSpecialist* is no longer statistically significant.

*(Insert Table 4 about here)*

### **4.3 Sensitivity Analyses**

In this section, we test the robustness of our results. We first attempt to assess the extent to which our results might be attributable to endogeneity. There are three potential reasons that an explanatory variable in our regression may be correlated with the error term: (1) a correlated omitted variable, (2) measurement error, or (3) simultaneity (Wooldridge [2003]). In our primary analysis we attempt to reduce measurement error and address potential correlated omitted variable concerns by including several theoretically derived control variables, including *ACEffectiveness*, *AuditSpecialist*, and *Gindex* as proxies measuring the overall quality of corporate governance of the organization.

In relation to simultaneity there are two possible concerns. First, a company may make the decision as to internal audit quality (including whether to outsource or not) simultaneously with the decision regarding an acceptable level of accounting risk. Similarly, the second concern is that a company may make the decision as to whether to outsource specifically to the external auditor simultaneously with the decision as to the acceptable level of accounting risk.

To rule out these two possibilities we conduct two Durbin-Wu-Hausman tests for endogeneity. The test for whether internal audit quality is endogenous with accounting risk is not significant (p-value > 0.10), suggesting endogeneity is not a concern.<sup>18</sup> The test of whether the choice to outsource to the external auditor and accounting risk is endogenous is significant (p-value < 0.05) suggesting the need to control for this potential endogeneity using a two-stage-least-squares approach.<sup>19</sup>

Since we detected a potential problem with endogeneity in relation to outsourcing to the external auditor and accounting risk, we conduct a supplementary two-stage-least-squares analysis.<sup>20</sup> In the first stage, we predict outsourcing to the external auditor by including one instrumental variable: the average *Outsrc<sub>EA</sub>* score by industry (*IndOutsrc<sub>EA</sub>*).<sup>21</sup> We include *IAQuality* because firms may seek to purchase special skills from outsourced providers if they do not have them in-house.<sup>22</sup> We also include *Assets*, *Leverage*, and *Complexity* in predicting internal audit quality, given the findings of Carcello et al. [2005] that these variables predict the size of the internal audit's budget. Since companies often outsource to reduce costs, we include

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<sup>18</sup> To predict *IAQuality* we follow Prawitt, Smith, and Wood [2009] and include the average *IAQuality* score by industry, the amount of inventory relative to assets, *Assets*, *Leverage*, and *Complexity*. To compute the Durbin-Wu-Hausman statistic we obtain the residuals from the regression of *IAQuality* on these variables and all the variables included in equation 2. We then perform the regression stipulated in equation 2 while including the residual from the first regression. The coefficient on the residual from the first equation is not significant, suggesting that OLS is consistent and that endogeneity is not a concern.

<sup>19</sup> To predict *Outsrc<sub>EA</sub>* for the first stage of the Durbin-Wu-Hausman test, we use the same equation as for testing *IAQuality* described in Footnote 19, except we substitute *Outsrc<sub>EA</sub>* for *IAQuality*. We explain our choice of variables for this prediction model in the text in relation to our two-stage-least-squares model.

<sup>20</sup> Identifying appropriate instruments is difficult in conducting a two-stage least squares analysis and finding incorrect instruments can lead to IV estimates that are more biased than simple OLS estimates. Larker and Rusticus [2008] provide an excellent discussion of the potential problems and limitations associated with using an instrumental variables approach.

<sup>21</sup> Consistent with prior research (e.g., see Erickson et al. [2008] and Prawitt, Smith, and Wood [2009]), we look to the industry average of our firm-specific independent variable for use as an instrumental variable. The industry-wide average of *Outsrc<sub>EA</sub>* is likely to be associated with an individual firm's *Outsrc<sub>EA</sub>* because internal audit practices in one firm are likely influenced by industry-wide practices. In addition, the industry-wide *Outsrc<sub>EA</sub>* is unlikely to be correlated with accounting risk because we do not find that accounting risk is highly concentrated in a few industries.

<sup>22</sup> We make no directional prediction as to the relation between *Outsrc<sub>EA</sub>* and *IAQuality* as firms with high and low *IAQuality* both have incentives to purchase services that enhance their quality.

variables that predict internal audit budgets.<sup>23</sup> We also include *NYSE* as the requirements of this listing may impact the choice to outsource to the external auditor. Finally, we include industry and year variables.

The results of the two-stage-least-squares regression are presented in Table 5. In Panel A, the instruments are effective in predicting outsourcing to the external auditor. In Panel B, the results are qualitatively similar in all respects to those discussed previously with one exception: *IAQuality* is no longer significantly related to AR (p-values > 0.10). Thus, this analysis provides additional support for our results that outsourcing the IAF to the external auditor is negatively associated with AR and that this association is not attributable to a simultaneous decision on whether to outsource to the external auditor and the level of accounting risk.

*(Insert Table 5 about here)*

Finally, a company may choose to outsource the IAF to *both* the external auditor and another third party. In this case, *Outsrc<sub>EA</sub>* will equal one and either *Outsrc<sub>BigN</sub>* or *Outsrc<sub>Other</sub>* will equal one. If we exclude the firm-years where a company outsourced to more than one provider (49 firm-years), the outsourcing results are qualitatively similar to those reported in all instances.<sup>24</sup>

## 5. SUMMARY

The primary purpose of this paper is to test whether the practice of outsourcing the IAF to a third party is related to accounting risk, which we define as the risk of misleading or fraudulent financial reporting activities. In relation to this question, we are particularly interested in

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<sup>23</sup> We do not directly include the internal audit budgets in the regressions because they are already included in *IAQuality*. We note that if we do include the internal audit budget in the prediction model, the results are qualitatively similar to those reported.

<sup>24</sup> We perform one additional test to explore the effects of the individual components of *IAQuality*. We rerun the full model (including all the different outsourcing arrangements) but instead of including *IAQuality* we include the components of *IAQuality*: *Experience*, *Certification*, *Training*, *CAEAC*, *TimeFin*, and *IASize*. Of these variables, we find that *Training* and *CAEAC* are negatively related to AR (p-values < 0.05) and *Certification* is moderately negatively related to AR (p-value < 0.10).

understanding whether the provider of the outsourced services—the external auditing firm or another third party—influences accounting risk. In testing for the effects of internal audit outsourcing, we attempt to control for IAF quality by making comparisons across specific pools of outsourced service providers and by including a measure for IAF quality in our multivariate analyses.

We employ two data sources that are relatively new to the accounting literature. To measure accounting risk, we use a proprietary measure developed by Audit Integrity, LLP. The second data source is an archive maintained by the IIA containing detailed benchmarking data relating to the IAFs of publicly traded companies. The intersection of these data sources subject to our data restrictions yields 353 firm-year observations from 166 different companies.

The results are strongly consistent with the idea that companies that outsource the work of the IAF to the external auditor (pre-SOX) have lower accounting risk as compared to any other outsourcing arrangement (i.e., a Big N provider that is not the client's external auditor or another non-Big N, non-external auditor provider) or compared to keeping the IAF in-house. These results are robust to a two-stage least squares analysis, which attempts to control for potential endogeneity. On balance, this evidence supports the prediction associated with the knowledge spillover hypothesis—the idea that external auditors are more effective when performing both internal and external audit services. This result casts doubt on the merits of SOX's prohibition on external auditors performing internal auditing services, which was motivated at least in part from the point of view that such relationships would create economic bonding and thus undermine audit quality. The results also suggest that IAF quality is associated with lower levels of accounting risk during the same pre-SOX time period.

This study has several limitations. First, although previous research provides evidence that Audit Integrity's AR score capture accounting risk, the validity of our results depend on the construct validity of the AR measure.<sup>25</sup> Second, the IAF data is collected into an archive from surveys completed by chief audit executives. This introduces two potential problems: (1) the data may not be representative of most IAFs in practice due to the choice to self-select into the survey and (2) the data may not be reliable. While the first concern remains as a limitation to the generality of our results, it is worth noting that the IIA's dataset is the only known dataset available to investigate the research questions posed in this paper and that this study's sample size is larger than most previously published internal auditing studies. To address the second concern, we have taken steps to verify the data to the extent possible, including using stringent data-matching inclusion criteria.<sup>26</sup> Even with the steps we have taken, the extent to which this study's results can be generalized to a larger population of firms should be interpreted with caution in view of the limitations inherent in the available data.

This study raises several important issues for future research. First, this study provides the first evidence of which we are aware that suggests that outsourcing the work of the IAF to the external auditor is associated with a lower risk of misleading or fraudulent financial reporting. Neither our work nor that of Kinney et al. [2004] provides support for regulator concern regarding the outsourcing of internal audit work to the external auditor. While these results are provocative, we believe further research on the role of the external auditor with respect to

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<sup>25</sup> Future research might examine the relation between internal audit outsourcing and the risk of misleading or fraudulent financial reporting using ex post measures of financial reporting problems such as restatements or SEC enforcement actions. However, this approach is not available to us as the intersection of the available internal audit data with restatement data does not result in a large enough sample to test these relations.

<sup>26</sup> One factor mitigating concern with self-report bias is that the data was collected by a third-party (the IIA) that was seeking to provide this data for benchmarking purposes. There is no apparent reason why companies would bias their reports in responding to the IIA or why any such self-reporting bias would be different across sourcing conditions. In other words, we view it as likely that any errors add noise rather than bias.

internal audit outsourcing and other auditor-provided non-audit services would be of value to legislators, regulators, and standard setters.

Another interesting avenue for future research is to examine whether companies can realize similar reductions in accounting risk by increasing the coordination and knowledge sharing between the IAF and external auditors. Felix et al. [1998] note that few companies currently achieve a high level of coordination between internal and external auditors.<sup>27</sup> Improved coordination and knowledge-sharing may facilitate enhanced financial reporting quality within the current regulatory environment.

Overall, the results of this study should be of use to individual companies seeking to reduce the risk of misleading or fraudulent financial reporting, to IAFs as they decide where to invest in improvement, to external auditors making decisions regarding reliance on the IAF's work, to regulators and legislators as they decide on policies governing outsourcing relations, and to academic researchers who seek a better understanding of corporate governance and the increasingly important role of the internal auditor.

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<sup>27</sup> Felix et al. [1998] define four levels of coordination: coexistence, coordination, integration, and partnering. Of the internal and external auditors surveyed, about 10 percent indicated a relationship of partnering and approximately an additional 10 percent indicated a relationship of integration.

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**FIGURE 1**

**Depiction of Predictions for Differences in Accounting Risk (AR) for Different Outsourcing Arrangements**

**Panel A:** Predictions for Differences in Accounting Risk (AR) for Different Outsourcing Arrangements

	<b>Outsrc<sub>EA</sub></b>	<b>Outsrc<sub>BigN</sub></b>	<b>Outsrc<sub>Other</sub></b>
<b>Outsrc<sub>BigN</sub></b>	Knowledge Spillover if Outsrc <sub>BigN</sub> > Outsrc <sub>EA</sub> (No Potential Quality Contamination)		
<b>Outsrc<sub>Other</sub></b>	Knowledge Spillover Outsrc <sub>Other</sub> > Outsrc <sub>EA</sub> (Potential Quality contamination)	AR Comparison: Outsrc <sub>Other</sub> vs. Outsrc <sub>BigN</sub>	
<b>In-house</b>	Knowledge Spillover if In-house > Outsrc <sub>EA</sub> (Potential Quality contamination)	AR Comparison: Outsrc <sub>In-house</sub> vs. Outsrc <sub>BigN</sub>	AR Comparison: Outsrc <sub>In-house</sub> vs. Outsrc <sub>Other</sub>

The *Outsrc<sub>BigN</sub> x Outsrc<sub>EA</sub>* cell offers the cleanest test of whether external auditors benefit from knowledge spillover effects and not overall quality differences or differences caused by economic bonding in reducing AR. The *Outsrc<sub>EA</sub> x Outsrc<sub>Other</sub>* and *Outsrc<sub>EA</sub> x In-house* also test this relation but may suffer from quality contamination effects relating to possible differences between service providers.

The *Outsrc<sub>Other</sub> x Outsrc<sub>BigN</sub>*, *In-house x Outsrc<sub>BigN</sub>*, and *In-house x Outsrc<sub>Other</sub>* cells offer an overall test of differences in accounting risk between internal auditing service providers. To the extent these pairs are not significantly different, this suggests similar levels of performance between these different sourcing arrangements.

**Panel B:** Results for Differences in Accounting Risk (AR) for Different Outsourcing Arrangements

	<b>Outsrc<sub>EA</sub></b>	<b>Outsrc<sub>BigN</sub></b>	<b>Outsrc<sub>Other</sub></b>
<b>Outsrc<sub>BigN</sub></b>	Outsrc <sub>BigN</sub> > Outsrc <sub>EA</sub>		
<b>Outsrc<sub>Other</sub></b>	Outsrc <sub>Other</sub> > Outsrc <sub>EA</sub>	NS	
<b>In-house</b>	In-house > Outsrc <sub>EA</sub>	NS	NS

If equation is written out in a cell, it suggests that there is a significant difference (p-value < 0.05) between variables in a multivariate test using a two-stage least squares analysis (see Table 5). If “NS” is listed, it suggests there is not a significant difference between variables.

**TABLE 1**  
**Derivation of Sample, 2000 to 2002**

<b>Description</b>	<b>Sample Size</b>
Firm-year observations in internal auditing database	3,021
Less observations with no reported data in Compustat and CRSP	(2,368)
Less observations with no AR values	(69)
Less observations with missing data items for model estimation	(193)
Less observations where IAF reported values are nonsensical	(38)
<b>Firm-years available for final sample</b>	<b>353</b>

The final sample of 353 firm-years are from 166 different companies from 38 different two-digit SIC code industries. Note that the internal auditing database covers a wide range of institutions, including publicly-traded companies, private companies, educational institutions, divisions within companies, and educational and governmental institutions.

Nonsensical IAF values include reported average internal audit experience amounts greater than 30 years, percentage of certified internal auditors greater than 100 percent, time spent performing financial audits greater than 100 percent, and training hours greater than 160 hours.

**TABLE 2**  
**Descriptive Statistics and Correlations between Variables**

**Panel A:** Descriptive Statistics of Internal Audit Characteristics

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Min</b>	<b>P25</b>	<b>Median</b>	<b>P75</b>	<b>Max</b>
IAQuality	2.72	1.16	0.00	2.00	3.00	4.00	5.00
Experience	6.43	4.35	1.00	3.00	5.00	8.00	28.00
Certification	0.59	0.31	0.00	0.40	0.55	0.73	2.00
Training	59.26	26.43	0.00	40.00	60.00	79.00	160.00
CAEAC	0.60	0.49	0.00	0.00	1.00	1.00	1.00
TimeFin	33.14	21.72	0.00	12.00	39.00	50.00	80.00
IASize	0.67	1.43	-0.79	-0.18	0.27	1.01	9.71

**Panel B:** Descriptive Statistics of Variables Included in our Sample

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Min</b>	<b>P25</b>	<b>Median</b>	<b>P75</b>	<b>Max</b>
AR	48.27	20.49	3.00	34.00	48.00	63.00	94.00
Outsrc	0.63	0.48	0.00	0.00	1.00	1.00	1.00
Outsrc <sub>CEA</sub>	0.24	0.43	0.00	0.00	0.00	0.00	1.00
Outsrc <sub>BigN</sub>	0.32	0.47	0.00	0.00	0.00	1.00	1.00
Outsrc <sub>Other</sub>	0.32	0.47	0.00	0.00	0.00	1.00	1.00
ACEffectiveness	9.15	2.56	0.00	10.00	10.00	10.00	10.00
AuditSpecialist	0.46	0.50	0.00	0.00	0.00	1.00	1.00
Gindex	9.88	2.42	4.00	8.00	10.00	11.00	16.00
Assets	8.99	1.29	5.48	8.02	9.10	9.89	12.40
Leverage	0.50	0.14	0.08	0.41	0.50	0.58	1.21
Complexity	3.59	2.16	1.00	1.00	4.00	5.00	10.00
Loss	0.20	0.40	0.00	0.00	0.00	0.00	1.00
Return	0.02	0.44	-0.92	-0.21	-0.03	0.16	3.31
NYSE	0.93	0.25	0.00	1.00	1.00	1.00	1.00

(Continued on next page)

TABLE 2 – Continued from Previous Page

Panel C: Spearman and Pearson correlations (Below/Above the diagonal, respectively)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1-AR		<b>-0.13</b>	0.01	<b>-0.12</b>	<i>0.10</i>	0.04	0.02	-0.02	-0.06	<b>0.19</b>	<b>0.11</b>	0.05	<b>0.14</b>	<b>-0.18</b>	<b>-0.15</b>
2-IAQuality	<b>-0.13</b>		0.09	<b>0.16</b>	-0.01	<b>0.14</b>	-0.08	-0.03	-0.05	<b>-0.11</b>	0.01	0.09	-0.05	0.07	<i>0.10</i>
3-Outsrc	0.00	0.09		<b>0.43</b>	<b>0.50</b>	<b>0.49</b>	0.07	0.05	0.03	0.08	<i>0.09</i>	-0.06	0.00	-0.05	0.03
4- Outsrc <sub>CEA</sub>	<b>-0.11</b>	<b>0.15</b>	<b>0.43</b>		<b>0.15</b>	0.04	0.04	<b>0.13</b>	-0.01	0.04	<b>0.15</b>	<i>-0.09</i>	-0.01	0.04	0.05
5-Outsrc <sub>BigN</sub>	<i>0.09</i>	-0.01	<b>0.50</b>	<b>0.15</b>		<b>0.17</b>	0.07	-0.01	<b>0.19</b>	0.06	0.03	<i>-0.10</i>	-0.02	-0.06	-0.05
6-Outsrc <sub>Other</sub>	0.04	<b>0.15</b>	<b>0.49</b>	0.04	<b>0.17</b>		<b>0.18</b>	0.00	-0.01	-0.01	-0.01	-0.05	<i>-0.09</i>	<i>0.09</i>	-0.01
7-ACEffectiveness	-0.03	<i>-0.09</i>	0.08	0.03	0.02	<b>0.18</b>		0.05	0.03	0.05	0.05	-0.04	0.08	0.00	-0.04
8-AuditSpecialist	-0.01	-0.02	0.05	<b>0.13</b>	-0.01	0.00	0.07		<b>-0.11</b>	<i>0.10</i>	0.09	0.07	-0.04	-0.02	<b>0.16</b>
9-Gindex	-0.06	-0.02	0.02	-0.03	<b>0.18</b>	0.01	0.00	<i>-0.10</i>		-0.02	0.01	0.07	<i>-0.10</i>	-0.03	<b>0.11</b>
10- Assets	<b>0.17</b>	<b>-0.13</b>	0.07	0.02	0.06	-0.01	0.06	<b>0.11</b>	-0.07		0.05	0.07	0.01	<b>-0.15</b>	0.04
11- Leverage	<b>0.11</b>	0.04	<i>0.10</i>	<b>0.14</b>	0.01	0.03	0.05	0.08	0.01	0.06		-0.05	0.04	-0.04	<b>0.21</b>
12 -Complexity	0.06	<i>0.10</i>	-0.02	-0.08	-0.07	-0.03	-0.04	0.06	<i>0.10</i>	0.05	-0.02		<i>0.09</i>	-0.07	<b>0.12</b>
13 - Loss	<b>0.13</b>	-0.05	0.00	-0.01	-0.02	<i>-0.09</i>	0.04	-0.04	<i>-0.10</i>	0.02	0.03	<i>0.10</i>		<b>-0.18</b>	<b>-0.15</b>
14 - Return	<b>-0.19</b>	<b>0.15</b>	-0.06	0.06	-0.05	0.09	0.02	0.02	0.00	-0.11	0.00	-0.02	<b>-0.20</b>		0.00
15 - NYSE	<b>-0.16</b>	<b>0.10</b>	0.03	0.05	-0.05	-0.01	-0.07	<b>0.16</b>	0.12	0.02	<b>0.17</b>	<b>0.12</b>	<b>-0.15</b>	0.07	

*Italics* – p-value ≤ 0.10; **Bold** – p-value ≤ 0.05

See Appendix for variable descriptions.

**TABLE 3**  
**Multivariate Tests of Relation between Composite Internal Audit Function Quality Measure and AR Scores**

Variable	Hypothesized	Panel A		Panel B	
	Sign	$\beta$	z-value	$\beta$	z-value
Intercept	-/+	3.534	9.52***	3.533	9.51***
IAQuality	-	-0.061	-1.86**	-0.061	-1.83**
Outsrc	-/+	--	--	-0.017	-0.25
ACEffectiveness	-	-0.007	-0.46	-0.006	-0.45
AuditSpecialist	-	-0.096	-1.38*	-0.095	-1.37*
Gindex	+	-0.009	-0.65	-0.009	-0.63
Assets	+	0.052	1.79**	0.053	1.82**
Leverage	+	0.616	2.56***	0.621	2.61***
Complexity	+	0.029	1.77**	0.029	1.73**
Loss	+	0.060	0.88	0.060	0.87
Return	-	-0.163	-2.40**	-0.164	-2.40***
NYSE	-/+	-0.362	-3.61***	-0.363	-3.63***
Adjusted R <sup>2</sup>		0.095		0.092	

Cluster-adjusted standard errors are used to compute z-statistics. Industry and year effects are repressed for presentational ease.

\*\*\*, \*\*, \* indicate statistical significance at the p-value  $\leq 0.01$ , 0.05, and 0.10 levels respectively. P-values represent one-tailed tests when a specific direction is predicted and the sign of the coefficient is consistent with that prediction

See the Appendix for variable descriptions.

**TABLE 4**  
**Multivariate Tests of Relation between Outsourcing Measure and AR Scores**

Variable	Hypothesized		
	Sign	$\beta$	z-value
Intercept	-/+	3.443	9.72***
IAQuality	-	-0.061	-1.89**
Outsrc <sub>EA</sub>	-/+	-0.202	-2.33**
Outsrc <sub>BigN</sub>	-/+	0.104	1.51
Outsrc <sub>Other</sub>	-/+	0.121	1.82*
ACEffectiveness	-	-0.007	-0.49
AuditSpecialist	-	-0.071	-1.03
Gindex	+	-0.012	-0.89
Assets	+	0.053	1.79**
Leverage	+	0.700	3.03***
Complexity	+	0.027	1.65**
Loss	+	0.073	1.12
Return	-	-0.168	-2.52***
NYSE	-/+	-0.328	-3.18***
Test of Outsrc <sub>BigN</sub> = Outsrc <sub>EA</sub>		F = 8.74***	
Test of Outsrc <sub>Other</sub> = Outsrc <sub>EA</sub>		F = 11.24***	
Test of Outsrc <sub>Other</sub> = Outsrc <sub>BigN</sub>		F = 0.03	
Adjusted R <sup>2</sup>		0.133	

Cluster-adjusted standard errors are used to compute z-statistics. Industry and year effects are repressed for presentational ease.

\*\*\*, \*\*, \* indicate statistical significance at the p-value  $\leq 0.01$ , 0.05, and 0.10 levels respectively. P-values represent one-tailed tests when a specific direction is predicted and the sign of the coefficient is consistent with that prediction.

See the Appendix for variable descriptions.

**TABLE 5**  
**Reperformance of Tests Using Two-Stage Least Squares**

**Panel A:** First Stage Model to Explain Outsourcing to the External Auditor (*Outsrc<sub>EA</sub>*)

	<b>Intercept</b>	<b>IndOutsrc<sub>EA</sub></b>	<b>IAQuality</b>	<b>Assets</b>	<b>Leverage</b>	<b>Complexity</b>	<b>NYSE</b>
Prediction	+/-	+	+/-	+	+	+	+/-
Coefficient	-0.563	1.130	0.041	0.027	0.278	-0.004	0.053
t-value	-3.23***	3.08***	2.38**	1.86**	2.01**	-0.49	0.7

**Panel B:** Second Stage Model to Test Relation between Predicted Outsourcing to the External Auditor and Accounting Risk

<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>z-value</b>
Intercept	-/+	3.004	6.46***
IAQuality		-0.019	-0.39
Outsrc <sub>EA</sub> Prediction	-/+	-1.014	-1.20
Outsrc <sub>EA</sub>	-/+	-0.250	-1.74**
Outsrc <sub>BigN</sub>	-/+	0.070	0.83
Outsrc <sub>Other</sub>	-/+	0.056	0.85
ACEffectiveness	-	-0.006	-0.39
AuditSpecialist	-	-0.074	-0.96
Gindex	+	-0.011	-0.73
Assets	+	0.082	2.50***
Leverage	+	0.975	2.67***
Complexity	+	0.023	1.30*
Loss	+	0.107	1.49*
Return	-	-0.153	-2.25**
NYSE	-/+	-0.317	-2.59***
Test of Outsrc <sub>BigN</sub> = Outsrc <sub>EA</sub>		F = 7.79***	
Test of Outsrc <sub>Other</sub> = Outsrc <sub>EA</sub>		F = 7.61***	
Test of Outsrc <sub>Other</sub> = Outsrc <sub>BigN</sub>		F = 0.90	
Adj. R <sup>2</sup>		0.145	

Cluster-adjusted standard errors are used to compute t-statistics in Panel B. Industry and year effects are repressed for presentational ease.

\*\*\*, \*\*, \* indicate statistical significance at the p-value  $\leq 0.01$ , 0.05, and 0.10 levels respectively. P-values represent one-tailed tests when a specific direction is predicted and the sign of the coefficient is consistent with that prediction

See the Appendix for variable descriptions.

## APPENDIX

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Where :

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ACEffectiveness	=	A composite score of ten dummy variables formed by scoring a company one point for each Blue-Ribbon Committee for audit committee effectiveness attribute the company's audit committee possesses.
AR	=	Accounting Risk, based on Audit Integrity's Accounting Risk ranking (with governance component removed). The ranking ranges between 0 and 100, with 0 being the most conservative ranking and 100 being the most risky. Audit Integrity estimates this measure quarterly. We average the four quarters for each year to come up with an annual measure (natural log used in model).
Assets	=	Total assets (Data6) of a company (natural log used in testing).
AuditSpecialist	=	A dichotomous variable that indicates whether the external auditor is an industry specialist auditor or not. We define industry specialist auditor as a Big N audit firm that provides within-industry market shares 30 percent greater than if the audit firms were to split the industry evenly among themselves.
CAEAC	=	A dichotomous variable representing whether the CAE reports to the audit committee (yes, CAEAC = 1; no, CAEAC = 0).
Certification	=	The percent of internal auditors who have the CIA or CPA certification. (Number of auditors with the CIA or CPA certification / Total staff in the IAF).
Complexity	=	The number of operating segments that the company has.
Experience	=	Average number of years of internal audit experience of the internal auditors.
Gindex	=	Corporate governance metric computed by Gompers et al. [2003]. For years the metric was not computed (i.e., 2001, 2003, and 2005), the average of the metric for the year before and after the missing year was used. A higher value suggests that management has greater power, which suggests lower corporate governance quality.
IAQuality	=	A single composite score measuring the quality of the IAF. The variable can range from zero to six with zero representing the lowest quality and six representing the highest quality. The score is formed by assigning a value of one to scores above the median of the entire sample for Experience, Certification, CAEAC, TimeFin, Training, and IASize, and summing together.
IASize	=	The average dollar amount spent on internal auditing for the industry divided by the average total assets of the industry subtracted from the dollar amount spent on internal auditing per company divided by the company's total assets. This amount is then divided by the average dollar amount spent on internal auditing for the industry divided by the average total assets of the industry.
In-House	=	A dichotomous variable indicating whether the company keeps some or all of its IAF work in-house or outsources it to a third-party, irrespective of who the third-party is, or not (yes =1, no = 0).

IndOutsrc <sub>EA</sub>	=	The average of <i>Outsrc<sub>EA</sub></i> at the industry level (use self-report industry categorization).
IndustryDummies	=	Dichotomous variables used to represent different industries at the one digit SIC code level.
Leverage	=	The sum of long term debt (Data9) and current liabilities (Data5) of a company divided by total assets (Data6).
Loss	=	A dichotomous variable representing whether the company experienced a loss in the last fiscal year (yes, Loss = 1; no, Loss = 0).
NYSE	=	A dichotomous variable indicating whether the company is traded on the NYSE or not (yes = 1, no = 0).
Outsrc	=	A dichotomous variable indicating whether the company outsources some or all of its IAF work to a third-party, irrespective of who the third-party is, or not (yes = 1, no = 0).
Outsrc <sub>BigN</sub>	=	A dichotomous variable indicating whether the company outsources some or all of its IAF work to a public accounting firm other than the external auditor or not (yes = 1, no = 0).
Outsrc <sub>EA</sub>	=	A dichotomous variable indicating whether the company outsources some or all of its IAF work to the external auditor or not (yes = 1, no = 0).
Outsrc <sub>EA</sub> Prediction	=	The predicted value of outsourcing to the external auditor from regression in Table 5 Panel A.
Outsrc <sub>Other</sub>	=	A dichotomous variable indicating whether the company outsources some or all of its IAF work to a third party other than a public accounting firm or not (yes = 1, no = 0).
Return	=	The annualized buy-and-hold return for the previous year.
TimeFin	=	The percentage of time the IAF spends performing financial type tasks.
Training	=	The actual, average amount of training hours internal auditors attend during the year.
YearDummies	=	Dichotomous variables used to represent different years in the sample.

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