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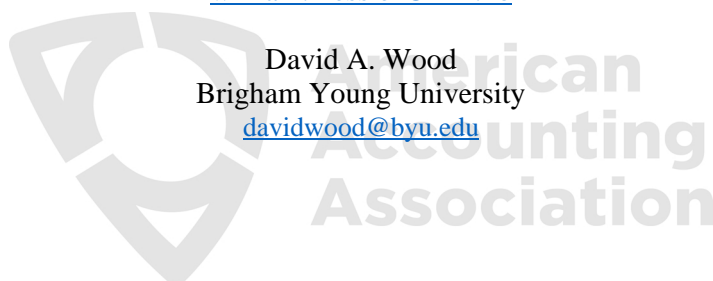
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The Association between Internal Audit Operations-Related Services and Firm Operating Performance

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The Association between Internal Audit Operations-Related Services and Firm Operating Performance

ABSTRACT

In this paper, we examine whether operations-related services (ORS) provided by the internal audit function (IAF) bring economic benefits to firms. Using a sample constructed by matching a global internal auditor survey with public firms' data in Compustat, we find that the extent of the IAF's involvement in ORS has a significant positive association with operating performance. Further, by decomposing ORS into traditional assessment services (e.g., operational audit) and more business-oriented facilitation services (e.g., strategy consulting), we document that assessment services are prevalent in the IAFs whereas facilitation services are less frequent. Both types of services have a positive effect on operating performance. Moreover, we find that the positive relation between ORS and operating performance is only achieved for companies that follow a defender (as opposed to a prospector) business strategy and that extensively outsourcing internal audit activities reduces the positive effect of ORS on operating performance. Overall, our findings shed light on the current debate about the value added by the IAF.

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The Association between Internal Audit Operations-Related Services and Firm Operating Performance

I. INTRODUCTION

Research on the internal audit function (IAF) has grown considerably in recent years, but it is still in its infancy (DeFond and Zhang 2014). The existing literature has focused extensively on two aspects of the IAF: (1) external auditors' decision to rely on the IAF and the consequences of such reliance on audit fees and audit efficiency¹ and (2) the IAF's role in improving internal controls over financial reporting, deterring earnings management, and detecting fraud (e.g., Prawitt, Smith, and Wood 2009; Lin, Pizzini, Vargus, and Bardhan 2011; Ege 2015; Abbott, Daugherty, Parker, and Peters 2016). While it is true that the IAF provides critical audit and assurance services for the financial reporting process, the IAF has a long tradition of "spend[ing] considerable time on consulting or operational-oriented work, with the objective of enhancing the organization's effectiveness and efficiency" (Hermanson and Rittenberg 2003, p54). This paper expands academic accounting research to study the effects of IAF's focus on operational-related services (ORS).

While there is growing evidence supporting the IAF's important role in financial reporting, little research has addressed the benefits of the IAF in a broader sense. In this paper, we are the first to explore with archival data the economic consequences of the IAF's involvement in ORS. Investigating the economic value of the IAF beyond financial reporting is timely and important as surveys suggest that, after a temporary shift to financial controls due to the high-profile financial scandals in the early 2000s and the resulting increased regulatory attention (e.g., SOX 2002), IAFs are now returning to perform many of the operations-related activities, including operational audits, they performed before SOX in order to make them more

¹ See Bame-Aldred, Brandon, Messier, Rittenberg, and Stefaniak (2012) for a review of this literature.

business-oriented (Warren, Hanna, and Youngberg 2011; PricewaterhouseCoopers 2014; Sarens and De Beelde 2006). Such phenomenon is partly due to the demand from directors and managers who perceive the strategic advice provided by the IAF, such as advice on development of risk management and cost effectiveness, to be particularly relevant to companies' business activities (PricewaterhouseCoopers 2009, 2014).

We focus on the extent of the IAF's involvement in ORS and investigate whether such services bring economic benefits to firms. ORS are services provided by the IAF linked to firms' operations and strategic development. Proponents of the IAF providing ORS argue that such services can be value-adding, particularly because internal auditors are likely to have insightful information due to their exposure to various aspects of a firm's operations. As a valuable information source, the IAF can support directors and managers in making better decisions (Gramling, Maletta, Schneider, and Church 2004; Protiviti 2007). For instance, the IAF can identify inefficiencies in operational processes and make suggestions for improvement in resource allocation and cost savings; evaluate whether risks are managed appropriately and whether risk-taking is aligned with a firm's overall strategy (Carcello, Eulerich, Masli, and Wood 2019; and help directors and managers identify areas where efficiencies or innovations might be achieved, thereby assisting them in exploiting business opportunities (COSO 2004).

However, there are concerns about the IAF's involvement in providing ORS. In particular, social pressure can occur when internal auditors are extensively involved in providing consulting services and working too closely with management (Fern 1985; Fraser and Henry 2007), which in turn may impair the internal auditors' independence and objectivity (Brody and Lowe 2000; Christopher, Sarens, and Leung 2009). In addition, some argue that IAFs may not possess the expertise to deliver quality ORS (Fraser and Henry 2004; Page and Spira 2004). Thus, the

benefits of IAFs providing ORS remain an empirical question. We attempt to shed light on this issue by investigating whether the IAF's involvement in ORS is associated with better firm operating performance.

Our sample consists of 268 survey responses from the 2010 Common Body of Knowledge (CBOK) global internal auditor survey that are matched with public firms' data in Compustat (North America and Global). To measure the extent of the IAF's involvement in ORS, we rely on survey questions that capture various IAF characteristics relevant to ORS. Our selection of measurement items is based on prior studies as well as insights from experts with extensive experience in internal audit. Specifically, the items included in our ORS measure pertain to the tasks performed by the IAF, the skills desired by the IAF, the IAF's involvement in providing strategic advice, the degree of the IAF's engagement in consulting services vis-à-vis assurance services, and the perception of the IAF being value-adding. Using a two-stage regression with an instrumental variable, we find that the extent of the IAF's involvement in ORS has a significant positive association with operating performance measured by return on net operating assets (RONA). In our robustness tests, we pay particular attention to the measure of ORS and find that our result is robust to various alternative constructions of the ORS variable. The result is also robust to alternative measures of operating performance and a propensity score matching approach.

We perform additional testing about the effects of different types of ORS. One helpful breakdown of ORS is into assessment- and facilitation- oriented services. As defined by Anderson (2003), assessment services are engagements in which the internal auditors, by evaluating various aspect of operation effectiveness and efficiency, renders useful information to management without providing recommendations; facilitation services, in contrast, are

engagements in which the internal auditors focus on providing recommendations to management for the purpose of promoting changes. We find that assessment-oriented services such as operational audits are prevalent in the IAFs, whereas facilitation-oriented services are less common, indicating that the IAF's advisory role is still evolving. Moreover, both types of ORS have a significant and positive association with RONA, suggesting that the IAFs have multiple ways to exert positive influence on firm performance and these different services are likely incremental to each other.

We also examine two important factors that may moderate the relationship between the IAF's involvement in ORS and operating performance. First, we expect to observe a stronger relation between ORS and RONA if the company's operating improvements focus on cost efficiency rather than on development of new products. Companies that focus on creating new products or expanding to new markets are less likely to benefit from the IAF providing ORS as these are not skillsets typically developed within the IAF. Consistent with this expectation, we find that the association between ORS and RONA is observed for companies that follow a defender rather than a prospector business strategy.² Second, we expect the association between ORS and performance to be more pronounced when firms keep internal audit in-house rather than outsourcing it to a third party (Rittenberg and Covaleski 1997 2001; Prawitt, Sharp, and Wood 2012). As argued by Burton, Emmett, Simon, and Wood (2012), in-house IAFs are well positioned to give operational and strategic advice as they have a deep knowledge of the company's organizational structure and operations. Consistent with their arguments, Burton et al.

² We follow Miles and Snow's (1978, 2003) organizational strategy typology that classifies firms into prospectors, defenders, and analyzers. These three strategies constitute a strategy continuum, with prospectors at one end and defenders at the other. We focus on the two distinct strategies at the ends of the strategy continuum. Prospectors are innovative companies that grow through exploiting new products and new markets. Prospectors emphasize organizational and technological flexibility so that firms can respond rapidly to market changes, even though such flexibility is achieved at the expense of efficiency in the production. In contrast, defenders are companies having a narrow market focus and growing through cautiously incremental market penetration and cost savings. Defenders emphasize efficiency in the production and distribution.

(2012) find experimental evidence that managers rely more on recommendations by in-house than outsourced internal auditors in some situations. We similarly find that the association between ORS and RONA is stronger in companies that keep their IAFs in-house than companies that outsource significant portions of their internal audit activities to a third party.

To provide further evidence on the drivers of the observed positive association between ORS and operating performance, we perform a DuPont Analysis and find that the IAFs that provide more ORS are associated with a higher asset turnover ratio and greater operating profit margin but not related to the equity multiplier. This suggests that IAFs involved in providing ORS can improve the efficiency and effectiveness of the organization's operations.

Finally, in investigating potential downsides of using the IAF to provide ORS, we test whether providing ORS is associated with more earnings management. The results show that there is no statistically significant relation between the extent of ORS provided by the IAF and earnings management measured by discretionary accruals; thus, it does not appear that providing ORS compromises internal auditors' ability to provide objective, independent evidence for financial reporting purposes.

This study makes several contributions to the literature. To our knowledge, this is the first archival paper that investigates the economic consequences of the IAF beyond financial reporting. Findings in this paper shed light on the current debate about the value added by the IAF. As noted by Carcello et al. (2019), when the Nasdaq stock exchange proposed to require companies to have an IAF, the exchange received 16 comment letters. Thirteen (81 percent) of the letters opposed this requirement. One of the chief complaints was that there was not sufficient evidence of the IAF adding value to justify its cost. This paper provides new evidence of the value of IAFs, as they are not only associated with improved financial reporting outcomes

but are also associated with improvements in firms' operations. Given the relative dearth of archival internal audit research (DeFond and Zhang 2014), this paper makes a significant contribution to the internal audit literature and the larger empirical auditing literature.

At a broader level, this study complements the recent literature on the economically significant effect of a firm's control system on the firm's operations (e.g., Cheng, Dahliwal and Zhang 2013; Feng, Li, McVay, Skaife 2015). Since the IAF is part of the management control system and the corporate governance structure, this study also contributes to the management accounting and corporate governance literature. As noted by Labro (2015), research on the information produced by the control system to support decision-making is lacking, although managers and directors in practice demand decision-facilitating information in making operational and strategic decisions. This study adds to the literature by showing empirical evidence that the operations-relevant work performed by the IAF is associated with better operating performance. Overall, findings in this study suggest that the value added by the IAF can go beyond financial reporting and should be of interest to a broad audience including directors, managers, standard setters, and accounting academics.

II. BACKGROUND AND PRIOR LITERATURE

The IIA defines internal audit as “an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control and governance processes” (IIA 1999). When the IIA first introduced this new definition of internal audit, managers and directors considered the new definition to finally be consistent with practice (Nagy and Cenker 2002). In fact, the IAF has long been providing a variety of services ranging from traditional financial and compliance

audits to recommendations on operations, risk management, and strategic development (KPMG 2010).

Prior literature documents supporting evidence on the important role of the IAF for financial reporting. For example, a high-quality IAF is associated with improved internal controls over financial reporting (Lin et al. 2011), less earnings management (Prawitt et al. 2009), reductions in financial reporting risk (Prawitt et al. 2012; Carcello et al. 2019), and less management misconduct (Ege 2015). Indeed, Liu (2017) finds that the market punishes companies that do not have an IAF. In addition, external auditors increase their reliance on the work done by internal auditors when their perception of internal auditor objectivity increases (Maletta 1993; DeZoort, Houston, and Peters 2001), which leads to lower external audit fees and higher audit efficiency (Felix, Gramling, and Maletta 2001; Messier, Reynolds, Simon, and Wood 2011; Prawitt, Sharp, and Wood 2011; Pizzini, Lin, and Ziegenfuss 2015).

Although there is extensive evidence that the IAF plays an important role in financial reporting, to our best knowledge, archival auditing research is largely silent on the role assumed by the IAF in providing services related to operations (IIA 1999; Anderson 2003; KPMG 2010; Bame-Aldred et al. 2012).³ Proponents of IAFs providing ORS claim that the IAF is well positioned to give operational and strategic advice, given internal auditors' deep knowledge about the firms' organizational structure and operations. Therefore, the ORS provided by the IAF can add value to firms because such services can be a credible source of information for

³ There is limited experimental and survey research that examines using the IAF for non-financial reporting services. In addition to that discussed in the text, Burton, Starliper, Summers, and Wood (2015) and Bartlett, Kremin, Saunders, and Wood (2017) examine how internal audit consulting services impact the recruiting of accounting students and business professionals, respectively, into internal auditing. They find that IAFs that provide consulting services and are used as a management training ground attract more accountants into the field, but that providing consulting services does not impact business professionals' interest in working in internal auditing.

managers and directors when making operational and strategic decisions.⁴ Consistent with these arguments, Burton et al. (2012) show experimentally that managers rely on and are influenced by the operational recommendations of internal auditors, especially if the internal auditors are in-house.

From the practitioner's perspective, stakeholders are increasingly expecting internal auditors to act as a "trusted advisor" rather than a pure "assurance provider" (PricewaterhouseCoopers 2009). Although the IAF's role in financial reporting and compliance was prominent during the years immediately following the passage of the Sarbanes-Oxley Act and similar regulations around the world, surveys demonstrate that new demands from directors and managers require the IAF to refocus effort beyond regulatory compliance issues and to expand its historical role from value preservation to value creation (KPMG 2009). To meet these rising expectations, internal auditors extended their involvement in performance-relevant activities, such as consultancy in operations and strategies (PricewaterhouseCoopers 2009). Given the trend of IAFs rebalancing their assurance and consulting services and refocusing on operations-relevant activities, it is timely to investigate the benefits of the IAF providing ORS.

III. HYPOTHESIS DEVELOPMENT

The IAF serves as a valuable information source for managers and directors (Gramling et al. 2004) and plays a critical role in supporting their decision-making (Protiviti 2007). Accordingly, the role of the IAF's ORS in helping firms achieve better operating performance stems from the useful and relevant information that the IAF provides to managers and directors who then use this information to make better business decisions. As we discussed before, ORS provided by the IAF can be categorized into assessment- and facilitation-oriented services

⁴ In a similar spirit, Bae, Choi, Dhaliwal, and Lamoreaux (2016) document that external auditors' knowledge and resources are associated with better client investment efficiency, consistent with external auditors providing informational advantage to their clients in a general investment setting in addition to financial reporting.

(Anderson 2003).⁵ Assessment-oriented services, such as evaluating operational controls and estimating savings from outsourcing activities, are likely to be associated with better operating performance because such services assist managers in identifying deficiencies in operations, which in turn improves operational efficiency as well as enhances resource allocation and cost savings.

Facilitation-oriented services relate to internal audit engagements that attempt to provide strategic advice and recommendations that promote changes. A large portion of facilitation-oriented services are consulting services in which internal auditors assist managers in developing strategic plans through analyzing strengths and weaknesses in organizations. Examples of facilitation services include evaluating risks associated with entering a new market and providing recommendations for managing the risks. Facilitation services provided by the IAF are likely to be associated with better operating performance because such services assist managers and directors in risk identification and management, development of strategic plans, and performance measurement.

In practice, assessment and facilitation-oriented services are usually interrelated. The IAF assesses the efficiency in operations and identifies deficiencies and risks, and then based on the assessment, makes recommendations to managers and directors to address deficiencies, manage risks, and develop strategies. The following example is based on an extract from an internal audit

⁵ Some internal auditors may also provide remediation services related to operations. In this paper, we only consider assessment services and facilitation services, because in providing remediation services the internal auditors assume a role to remediate problems on behalf of managers. However, directly remediating problems is a management function that internal auditors should not take. For instance, in the IIA's position paper about the role of internal auditing in enterprise-wide risk management (IIA 2009), the IIA explicitly states that the IAF should not assume any management responsibility.

report provided to one of the researchers during one of four interviews that preceded the start of the current research.⁶

The IAF of the company conducted reviews of the R&D department and the electronic purchasing department. The R&D department outsourced some activities and the review revealed that there was a lack of a formalized project management process in the R&D department. This deficiency affected the identification of resource requirements, the calculation of resource/project costs, and the tracking of project progress/costs, leading to the potential miscalculation of the benefits-costs tradeoffs of the outsourcing project and hence the misuse of company funds. Similarly, in the electronic purchasing department, the IAF found a significant risk because the monitoring of supplier phase-out was not sufficient. Although supplier phase-out due to insolvency is not frequent, it could cause the company a huge problem if the supplier is not able to meet future commitments due to financial constraints. Based on the findings, the IAF made recommendations on implementing a formalized project management process as well as improving the monitoring of supplier's economic development and putting back-up solutions in place. The recommendations were taken by the managers, which in turn led to more accurate calculation of resources needs and corresponding costs, more transparency and more efficient use of capital, and better risk management and preparation for negative events.

This quote illustrates how the IAF can provide non-financial reporting recommendations that improve efficiency, identify operating risks, and ultimately reduce costs. In general, the four interviewees agree that there is an increasing tendency for managers to ask for the “business view” from the internal auditors on non-financial reporting issues, given the knowledge that internal auditors have of different departments and processes. For instance, one interviewee indicated that the IAF in her company was extensively involved in cost saving initiatives. Top managers had a high interest in this work so as to identify cost saving improvements in their departments and to validate their previous cost saving programs. The preceding discussion

⁶ We conducted the four interviews from June to August 2014 as an initial step to orient ourselves to the topic. All interviewees have extensive experience in internal auditing. At the time the interviews took place, two interviewees were CAEs. The third one was Chief Risk Officer (CRO) but had been CAE before becoming CRO. The last one was in academia but had been an internal audit manager before entering academia. The purpose of the interviews was to get practitioners' perceptions and insights on the ORS provided by the IAF and the value added by the IAF. The interviews revealed that in recent years the management team increasingly relied on the IAF to get a comprehensive view of the company and counted on the IAF to have solutions and plans on improving operational efficiency, cost savings, and risk management. One interviewee kindly provided us with three internal audit reports and agreed that we could use the findings in the reports as examples in our study under the condition of anonymity.

predicts that there is likely to be a positive association between the IAF's involvement in ORS and operating performance. Hence, we hypothesize the following:

Hypothesis: The extent of ORS provided by the IAF is positively associated with operating performance.

While the potential for the IAF to improve decision-making suggests a positive relationship between the ORS engaged by the IAF and firm operating performance, we acknowledge that two issues might arise that attenuate such a positive association. First, there is a debate about whether internal auditors have the appropriate competencies to respond to the demand from managers and directors to perform ORS. For example, internal auditors self-report that they balance accounting/finance and operational skills (IIA 2015) while others argue that internal auditor training does not focus sufficiently on developing adequate business knowledge (Fraser and Henry 2004; Page and Spira 2004) and that internal audit may not be able to attract sufficient high-quality candidates to deliver quality ORS (Burton et al. 2015; Bartlett et al. 2016, 2017). Second, there is a concern that providing consulting ORS may cause internal auditors to perceive managers as their "clients" and hence take positions that are in the best interests of managers at the expense of objectivity (Brody and Lowe 2000; Ahlawat and Lowe 2004; Christopher et al. 2009). Such consulting services may also expose internal auditors to a self-review threat if they have to audit the activities to which they have provided recommendations. To the extent that the impaired objectivity may lead to reduced quality of the assurance services provided by the IAF because internal auditors tell managers what they think the managers want to hear rather than reporting objectively in operational settings, providing consulting ORS may not be associated with improved organizational performance. In short, internal auditors' lack of appropriate competencies and/or impaired objectivity in providing consulting ORS could potentially weaken the association between ORS and firm operating performance.

IV. RESEARCH DESIGN

Sample and Data

The IAF data used in this study comes from the 2010 CBOK global internal audit survey conducted by the IIA. CBOK is the world's largest ongoing survey that aims at studying the internal audit profession and internal audit practices globally.⁷ Participants in the survey are internal audit practitioners at all levels. The survey asked a wide range of questions, such as internal auditors' personal characteristics (e.g., education and experience), features of the organizations where the internal auditors work (e.g., locations and types of the organizations), and internal audit practices (e.g., activities performed by the internal auditors and technologies used by the internal auditors).⁸

Since the 2010 CBOK survey was conducted at the beginning of 2010, we match the responses with public firms in Compustat (North America and Global) at the end of year 2009. The matching procedure is as follows. In the survey, there are 5,942 responses from publicly listed companies with country identified. We require respondents to be a CAE because the CAE has the greatest understanding of the IAF, and most of the key questions in the survey that are used to measure the extent of an IAF's involvement in ORS were only shown to respondents at the CAE level.⁹ Retaining only responses from CAEs reduces the sample to 1,527, representing

⁷ Three surveys were conducted in 2006, 2010, and 2015, respectively. The surveys were carried out by the IIA's member associations around the world, and the survey responses were subsequently aggregated to the IIA's headquarters. We use the 2010 CBOK survey rather than the other surveys because email addresses were only provided in the 2010 survey. Without respondents voluntarily providing email addresses, we are unable to match relatively precisely the survey responses with firms in Compustat.

⁸ The IIA now divides CBOK into two parts: the Practitioner Survey and the Stakeholder Survey. The Practitioner Survey targets internal audit practitioners and collects information about internal auditors' characteristics and internal audit practices, whereas the Stakeholder Survey is concerned about the perspectives from senior managers, audit committee, and boards. The 2010 CBOK survey used in this study falls into the category of Practitioner Survey. For more information about CBOK, please refer to the IIA website at www.theiia.org.

⁹ Participants in the 2010 CBOK survey were internal audit practitioners at all levels, including CAEs, service providers, internal audit management, internal audit seniors, and internal audit staff. We only use survey responses from CAEs because we believe that only CAEs possess the knowledge to answer some of the survey questions used in this study (e.g. the extent of outsourcing activities and the degree of consulting services provided by the IAF vis-

roughly 25 percent of all responses from publicly listed companies. We match the survey responses from the U.S. and non-US countries with public firms in Compustat North America and Compustat Global, respectively. Matching is performed by merging the domain names of the email addresses self-reported by the survey respondents with the domain names of firms' websites.¹⁰ Eight hundred and fifty-seven CAE respondents provided contact email addresses, and 370 were successfully matched with public firms in Compustat.¹¹ Fifty-five firms have missing financial information and are deleted from the sample.¹² Like prior studies, we subsequently drop 27 firms in the financial industry (i.e., firms with two-digit SIC codes 60-69), leaving 268 firms in the sample for empirical analyses. Table 1 outlines the sample matching and selection procedure. The sample firms come from a variety of countries and industries. U.S. firms make up a large portion of the sample (35%), followed by Japanese firms (15%) and Taiwanese firms (10%). The remaining 40 percent of the sample firms come from 31 other countries. Regarding the industry distribution, about half of the firms (55%) belong to the manufacturing industry (i.e., firms with two-digit SIC codes 20-39), and the rest come from other

à-vis assurance services). Our conjecture is confirmed by the IARF that a majority of key questions about IAF characteristics and activities were only shown to respondents who identified themselves as CAEs. As an additional check, we also tried to match survey responses at all levels with public firms in Compustat. Consistent with our conjecture, matched non-CAE responses are not usable because of missing answers to the questions needed in this study.

¹⁰ The IIA permitted us to match the survey responses with firms in publicly available databases under the conditions of anonymity and confidentiality. When conducting matching, we require that the domain name of a company's website exactly match the domain name of the email address provided by the respondent. For example, if the email address provided by the respondent is aaa@xyz.com, it is matched with the firm whose website also ends with xyz.com. We delete the responses whose email addresses contain "gmail", "hotmail", "yahoo", or "163" because those email addresses are not useful for the identification of the firms but confound the matched results. We note that when we compare the responses for those with and without an email in terms of company size, industry, and country the two samples are reasonably similar.

¹¹ There might be a concern that our sample is not representative if firms with CAEs providing email addresses are materially different from firms with CAEs not disclosing such information. To address this concern, we compare country and industry distributions as well as company size of firms with CAEs who provided email addresses to those with CAEs who did not provide information on email addresses. We find that there are no systematic differences between the two groups of CAEs, which mitigates the concern that our sample is biased.

¹² Values of some key variables (e.g., assets, income before extraordinary items, the number of common shares, and market price) are missing for some non-US matched firms. To keep the sample as large as possible, for missing values in Compustat, we manually collect as much information as possible from firms' annual financial statements obtained from firms' websites, Bloomberg, and Yahoo Finance.

industries including mining, construction, transportation, communication, utilities, wholesale, retail, and services.

(Insert Table 1 about here)

Key Variable Measurement

The key variable of interest in this study is the extent of IAF's involvement in ORS. We use a comprehensive set of items based on the CBOK survey questions to measure this construct. We first analyzed every question in the 2010 CBOK survey and retained questions that are potentially relevant to measuring the degree of ORS provided by the IAF. We then interviewed five individuals with extensive expertise and experience in internal auditing and conducted a small survey to obtain their insights on how the ORS should be measured using the 2010 CBOK survey.¹³ Combining our in-depth analysis of the retained questions and the experts' opinions, we select five dimensions of the IAF to measure its involvement in ORS: the types of tasks performed by the IAF (*IAF_Task*), the skills desired for the IAF (*IAF_Skill*), the role played by the IAF in strategy development (*IAF_Strategy*), the degree of emphasis that the IAF puts on consulting services vis-à-vis financial assurance services (*IAF_Emphasis*), and the perception of value creation of the IAF (*IAF_Perception*).

The five aspects intuitively make sense as they are expected to reflect the extent of ORS engaged by the IAF. First, an IAF's greater involvement in ORS should be reflected as the IAF performing more tasks associated with ORS and possessing and developing skills suitable for ORS. Second, unlike services related to financial reporting which are largely related to assurance,

¹³ The five experts were different from the four interviewees previously described. The five experts include the following: (1) a current chief audit executive of an international, publicly traded company with more than 30 years of experience; (2) a recently retired chief audit executive for a multinational, publicly traded company with more than 25 years of experience; (3) a current chief audit executive of a private educational institution with more than 15 years of experience; (4) an internal audit global analytics manager with more than 7 years of experience, and (5) a professor of internal audit with more than 13 years of experience. All of the experts were blind to the research question of the study. We would also like to thank an anonymous reviewer for helping us refine the ORS measure.

a lot of ORS are consulting services pertaining to risk management and strategy development (Anderson 2003). As such, a greater extent of ORS involved by an IAF is likely reflected as the IAF participating more in strategy development and putting more emphasis on consulting services. Finally, given the increasing expectations from managers and board members that IAFs provide value-adding services if they proactively engage in delivering insights and recommendations for operations, risk management, and strategy development (PwC 2015), the IAFs involved extensively in ORS are expected to view themselves more value-adding.

The CBOK survey questions related to *IAF_Task* and *IAF_Skill* were presented in a way that multiple options were listed for the respondents to choose from. To select the tasks and skills that are relevant to ORS, we asked the experts to rate all of the possible options that CBOK included for these questions and report whether each item is related to ORS, financial reporting services, or both. We select the items that are deemed by the experts as highly relevant to the ORS.¹⁴ Appendix A presents explanations of how each aspect is measured. Note that the score of each aspect is scaled by the maximum score that can be possibility received for that aspect. As such, the value of each aspect ranges from zero to one.

Following prior IAF studies (e.g., Prawitt et al. 2009), we take the sum of the five aspects as an aggregated value indicating the degree of the IAF's involvement in ORS (*ORS*). We treat firms with values of *ORS* higher than the sample median as firms having high-ORS IAFs and assign a value of one to the indicator variable *HORS*; those having values of *ORS* lower than the sample median are firms with low-ORS IAFs and are assigned a value of zero to the indicator

¹⁴ In the 2010 CBOK survey, the questions related to *IAF_Task* and *IAF_Skill* contains 25 tasks and 18 potential skills, respectively. The question related to *IAF_Task* asked the respondents to indicate whether the task is performed "Today" or is expected to be performed "In 5 years time". We use the answers related to tasks performed "Today".

variable *HORS*. The variable *HORS* is our main tested variable in the empirical analysis.¹⁵ We also conduct multiple sensitivity analyses around the *ORS* variable to ensure the robustness of our findings. Moreover, as we discussed before, the ORS performed by the IAF can be assessment- or facilitation-oriented, and the implications of the two types of ORS could potentially be different. We thus conduct several additional analyses to test the effect of assessment- ORS and facilitation-oriented ORS separately. Details of the sensitivity analyses and additional tests are reported later in the paper.

Dealing with Endogeneity Concerns

As with all cross-sectional, archival analyses, there is the possibility that results we observe are due to endogeneity and not to the IAF's ORS. Before discussing statistical techniques that we use to reduce concerns related to endogeneity, we first discuss theoretical reasons and prior research that suggests endogeneity is unlikely driving the results we observe later in our empirical analysis. As discussed previously, internal audit is required to perform many different tasks in the organization. What work the IAF actually performs is decided through negotiation with management, the board (or sometimes the audit committee), and the head of internal audit. Indeed, internal audit best practices call for internal audit to serve both the audit committee and management (Abbott et al. 2010; Hoos, Messier, Smith, and Tandy 2018); thus, rarely does one group completely decide what internal audit does. Given the complex relation between internal audit and other groups, prior research shows relatively low correlations between the presence and/or quality of the IAF and other governance stakeholders, suggesting results measuring the IAF are not likely proxying for these other stakeholders (e.g., see Prawitt et

¹⁵ There might be a concern that separating the sample firms into low- and high-ORS makes the *HORS* variable confounded with firms' countries or industries. However, we do not find discernable patterns in country or industry distributions across low- and high-ORS firms, suggesting that the variable *HORS* is unlikely to be confounded with firms' countries or industries, and our results are unlikely to be driven by high-ORS IAFs located in certain countries or industries.

al. 2009, 2012; Christ et al. 2015; Sarens and Abdohmohammadi 2011; Wan-Hussin and Bamahros 2013).

In addition, prior studies examining potential endogeneity concerns relative to internal auditing have employed multiple different statistical techniques and examined multiple different dependent variables including the relation between internal audit variables and earnings manipulation, fraud, external audit fees, and external audit delay (e.g., see Abbott et al. 2016; Ege 2015; Goodwin-Stewart and Kent 2006; Prawitt et al. 2009, 2012; Christ et al. 2015; Sarens and Abdolmohammadi 2011; Wan-Hussin and Bamahros 2013). In all cases, endogeneity did not seem to be a severe problem

Given the theoretical arguments and research showing that multiple different outcomes are not endogenously determined with internal audit choices, we believe it is unlikely that in our situation endogeneity will explain the results. Nevertheless, we use several statistical techniques to provide greater evidence that endogeneity is unlikely driving our results. In addition to including various control variables, we employ a two-stage treatment regression, propensity-score matching approach, and several cross-sectional tests to reduce the likelihood that our results are attributable to endogeneity. Our results are robust to these choices.

Empirical Model

We estimate the following two-stage regression to test our hypothesis. In the first stage (Equation 1), we predict sample firms' likelihood of having a high-ORS IAF and calculate the inverse Mills ratio (*IMR*). We then add *IMR* into the second-stage regression (Equation 2) in which we test the relation between high-ORS IAFs and operating performance.

$$HORS_{i,t} = \alpha_0 + \alpha_1 Country_ORS_{i,t} + \sum \alpha_k DETERMINE_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

$$RONA_{i,t} = b_0 + b_1 HORS_{i,t} + \sum b_k CONTROL_{i,t} + IMR + \eta_{i,t} \quad (2)$$

A key element in performing two-stage regression is to include an exclusion restriction in the first-stage prediction model (Lennox, Francis, and Wang 2012). We use country-level median value of *ORS* (*Country_ORS*) as the exclusion restriction in our analysis. *Country_ORS* is calculated based on all CAE survey responses in a country (matched and unmatched with Compustat) with available information of the items needed to measure *ORS*. We expect that an individual IAF's involvement in *ORS* is very likely influenced by the common practices within its home country, but the general practices of the IAFs in a country should not directly influence individual firms' operating performance.

In addition to *Country_ORS*, we add a set of other determinant variables which are represented by variable *DETERMINE* in Equation (1). Specifically, given that larger firms and firms with better future prospects have greater demand for operations-related information, we add firm size (*LogAT*), sales growth (*GROWTH*), leverage ratio (*LEV*), and market-to-book ratio (*MTB*). In addition, we control for a firm's cash (*CASH*) on hand which influences investments in the IAF (Carcello, Hermanson, and Raghunandan 2005; Anderson, Christ, Johnstone, and Rittenberg 2012). Firm performance can also influence the extent of *ORS* performed by the IAF and thus we add lagged operating performance (*Lag_RONA*) into the model. On the one hand, well-performing firms may need more *ORS* from the IAF to sustain its performance; on the other hand, firms with low operating performance may have stronger incentives to increase the *ORS* provided by the IAF in order to enhance performance. The relationship between lagged operating performance and the IAF's *ORS* is also indicative of whether reverse causality is likely in our setting. Moreover, we add capital expenditure (*CAPX*) to control for a firm's investing activities as well as the standard deviation of operating cash flows (*STD_OCF*) to control for a firm's operating risk. We also include a variable to indicate whether a firm has experienced

restructuring (*RESTR*). We add discretionary accruals (*ABA*) to proxy for a firm's financial reporting quality. Discretionary accruals are calculated based on the modified Jones model (Jones 1991; Kothari, Leone, and Wasley 2005). Furthermore, given the possibility that a firm's business strategy can influence its incentive to position the IAF in the company, we add business strategy into the model. *DEFENDER* is an indicator variable that equals one if a firm adopts a defender strategy, and zero otherwise.¹⁶ Considering the mandatory requirement of having an IAF in the New York Stock Exchange (*NYSE*) and the potential impact of such a requirement on the IAF's incentives, we explicitly control for whether a firm is listed or cross-listed in the NYSE. Finally, we add industry competition measured by Herfindhal index (*HINDEX*) at country-industry-year level to capture the possible effect of external market environment on the firms' incentives to demand ORS from the IAF. We note that firm-level determinant variables are lagged values relative to the year in which the extent of the IAF's ORS is measured.

While the degree of ORS provided by the IAF can be influenced by firm characteristics, it can also be affected by the IAF's own features. We therefore augment the model with several variables that proxy for the IAF-level characteristics. We add the age of the IAF (*IAFAGE*), given the possibility that older and more mature IAFs may differ significantly from new and younger IAFs. Moreover, we include CAEs' experience in management (*CAEEXP*) as a proxy for the IAF's competency in providing ORS and the IAF's direct reporting line to audit committee or board of directors as a proxy for the IAF's independence (*REPORTLINE*). The

¹⁶ To measure the business strategy adopted by a firm, we follow Bentley et al. (2013) and construct a discrete measure of whether a company is a *DEFENDER*. We incorporate six firm characteristics into the composite strategy measure: (1) the ratio of research development to sales, (2) the ratio of employees to sales, (3) the sales growth, (4) the ratio of SG&A to sales, (5) the standard deviation of total employees, and (6) the net PPE to total assets. All variables are computed using a rolling average over the prior five years. We rank each variable into quantiles within each country-industry, with observations in the highest quintile receiving a score of 5 and observations in the lowest quintile receiving a score of 1. We then sum the scores across the six variables so that firms having lower (higher) total scores are more defender-type (prospector-type). A firm is assigned a value of one for variable *DEFENDER* if its score is below the sample median score, and zero otherwise.

extent of IAF outsourcing (*OUTSOURCE*) and the IAF's status (*STATUS*) are also included. To measure the extent of IAF outsourcing, we use the survey question asking the respondents to indicate the percentage of IAF activities that are outsourced. The respondents were given six options: no co-sourcing/outsourcing, 10% or less, 11-25%, 26-50%, 51-74%, 75% or higher. Following Abbott et al. (2016), we consider a firm to be extensively outsourcing internal audit activities if the co-sourcing/outsourcing ratio is larger than 25 percent.¹⁷ We define IAFs having a high status if the survey respondents indicated "Agree" or "Strongly Agree" to the following statement in the survey: "Your internal audit activity has sufficient status in the organization to be effective". Finally, we control for U.S., Taiwanese, and Japanese firms, since firms from each of the three countries make up a relatively large portion of the sample.

In the second-stage analysis presented by Equation (2), return on net operating assets (*RONA*) is used as our key proxy for operating performance. Control variables are represented by the variable *CONTROL* in the equation. We include all determinant variables in Equation (1) as the control variables in Equation (2) and include industry fixed effects. All variables are formally defined in Appendix B.

V. RESULTS

Descriptive Statistics

Panel A of Table 2 summarizes descriptive statistics of the variables that we use to construct the composite measure of the IAF's involvement in ORS. The average, minimum, and maximum value of *ORS* is 1.740, 0.0, and 4.189, respectively, suggesting a relatively high degree of variation with respect to the IAFs' involvement in ORS. We note that ORS-related skills are not extensively demanded in the IAFs, as suggested by the mean value of 0.246 for *IAF_Skill*.

¹⁷ Abbott et al. (2016) use 20 percent as the cut-off. Since we do not have that cut-off in the six options given to the respondents in the 2010 CBOK survey, we use 25 percent as the cut-off to indicate significant IAF outsourcing.

The mean value of *IAF_Task* is 0.393, indicating that on average IAFs in our sample perform some ORS-related tasks. However, when we decompose *IAF_Task* into specific activities, results show that most IAFs in our sample (91 percent) do conduct operational audits, consistent with the prevalence of the IAFs conducting assessment-oriented ORS. We also find that 30.6 percent of respondents replied that their IAFs play an advisory role in strategy development, and 20.5 percent of respondents indicated that their IAFs give at least equal weight to consulting services vis-à-vis assurance services. More than half of the respondents strongly agreed that their IAFs add value. Overall, these descriptive statistics imply that ORS related to traditional assessment services (e.g., operational audits) are prevalent in IAFs, whereas the IAFs' involvement in ORS related to business-oriented facilitation services (e.g., strategy advisory services) is still emerging.

Panel B of Table 2 presents descriptive statistics of key firm-level characteristics. Companies in our sample have a mean (median) natural logarithm of total assets of 7.271 (7.323). They are generally profitable, with the mean (median) *RONA* of 0.038 (0.046). The mean (median) sales growth ratio is -7 percent (-8 percent), which is likely due to the economic downturn in year 2009. Capital expenditure relative to sales is about 5 percent, and approximately 19 percent of the firms experienced restructuring. About 22 percent of the sample firms are listed (or cross-listed) in the NYSE. On average, IAFs have been put in place in the sample firms for 7-10 years.¹⁸

(Insert Table 2 about here)

¹⁸ We measure the age of an IAF based on question No.15 in the 2010 CBOOK survey. Instead of asking respondents to provide a specific number of years that their IAFs has been put in place, the question presented eight options for the respondents to choose from: 0-2 years, 3-4 years, 5-6 year, 7-10 years, 11-25 years, 26-50 years, 51-100 years, and 100 years or more. We code the eight options from one to eight, with a larger value indicating a longer term. The mean value of *IAFAGE* is four which corresponds to 7-10 years.

Univariate Analysis

Table 3 presents the results of univariate comparisons between high-ORS and low-ORS IAFs. The comparisons show that, compared with low-ORS IAFs, high-ORS IAFs have a significantly higher *RONA*, which is consistent with our prediction. We note that firms with high-ORS IAFs are not significantly different from firms with low-ORS IAFs in various firm-level characteristics, including firm size, leverage ratio, capital expenditure ratio, cash flow volatility, market-to-book ratio, discretionary accruals, and experiencing restructuring. We do find that firms with high-ORS IAFs have higher sales growth and hold marginally more cash. Moreover, the percentage of firms listed (or cross-listed) in the NYSE is higher for low-ORS IAFs than for high-ORS IAFs. The industries are more competitive for high-ORS IAFs than for low-ORS IAFs, which implies that harsher external market environment increases firms' demand for ORS from the IAF. Regarding the IAF-related characteristics, we find that CAEs' management experience as well as IAFs' status and age are much lower in low-ORS IAFs than in high-ORS IAFs.

(Insert Table 3 about here)

Multivariate Analysis

Table 4 presents the main results of the multivariate analysis for testing our hypothesis. Column (1) of Table 4 shows the results of the first-stage prediction model. The significant and positive coefficient on *Country_ORS* is consistent with our prediction that the extent of ORS performed by an individual IAF is significantly influenced by the common practices in the IAF's home country. The results also show that companies with greater CAE experience in management and operating in a more competitive industry are more likely to use the IAF to provide ORS. Furthermore, IAFs in firms listed or cross-listed in the NYSE are less extensively

involved in ORS. We note that the coefficient on *Lag_RONA* is not statistically significant, suggesting that the lagged operating performance does not have a significant predictive power of the ORS performed by the IAF. This result alleviates the concern that the positive relation between the IAF's ORS and operating performance is driven by reverse causality.

Column (2) of Table 4 provides the results of the second-stage analysis which tests the association between the IAF's involvement in ORS and operating performance. Consistent with our prediction, the coefficient on *HORS* is positive and statistically significant, suggesting a positive relation between the extent of ORS engaged by the IAF and operating performance, after controlling for the choice to demand the IAF to provide ORS. In terms of the economic significance, the coefficient on *HORS* is 0.045, meaning that if a company has above the median amount of ORS provided by the IAF, it has about 4.5 percent higher RONA than a company below the median.¹⁹ This increase in RONA is economically meaningful as the median RONA for the sample is 4.6 percent.

Results on control variables are in general in line with prior literature. We document that firms with higher sales growth have better RONAs, whereas firms with higher leverage ratio, more volatile operating cash flows and experiencing restructuring have lower RONAs. Moreover, positive discretionary accruals are associated with better RONA, and lagged RONA has a strong predictive power for current year RONA.

(Insert Table 4 about here)

Robustness Checks

¹⁹ When we use the continuous variable *ORS* (whose value can possibly range from 0 to 5) and perform Ordinary Least Squares (OLS) regression, the coefficient on *ORS* is 0.021 ($p = 0.002$). The magnitude of the coefficient on *ORS* is similar to the findings in prior literature studying the effect of corporate governance and risk management on operating performance. For example, Baxter, Bedard, Hoitash, and Yezegel (2013) document that their measure of risk management quality (whose values range from 1 to 6) is associated with higher ROA, and the coefficient on risk management quality is 0.014.

We perform several sensitivity analyses to verify the robustness of our results. We begin the sensitivity tests by examining if our results are robust to various alternative constructions of the *ORS* variable, given that it is the key variable of interest in this study. First, we examine whether our results are sensitive to any component of the *ORS* measure. We find that if we exclude any one of the five components of the variable, our results remain unaffected. Second, instead of adopting the equal-weighting approach to aggregate the measurement items, we use a principal component analysis to combine the measurement components, which allows the components to have different weights on the *ORS* variable rather than assuming they all have the same effect. Our results hold for this alternative way to measuring *ORS* (coefficient = 0.041; $p = 0.003$). Third, we develop the *ORS* measure using a less restrictive approach in which we include more items for *IAF_Task* and *IAF_Skills*.²⁰ Again, our results hold (coefficient = 0.033; $p = 0.010$). Overall, these sensitivity analyses provide evidence for the robustness of our results.

As an additional way to rule out endogeneity induced by the observable differences between firms with high-*ORS* *IAFs* and those with low-*ORS* *IAFs*, we adopt a propensity score matching (PSM) procedure. We use firms from the U.S., Japan, and Taiwan for PSM, as only those countries have enough observations for the matching purpose. Setting the maximum acceptable difference of propensity scores to be 0.1, we match each high-*ORS* *IAF* with a low-*ORS* *IAF* that has the closest propensity score from the same country. When executing PSM, we impose common support and conduct the matching without replacement. Among the 161 firms from the U.S., Japan, and Chinese Taiwan, 43 pairs of *IAFs* are matched. Panel A of Table 5

²⁰ Specifically, based on the experts' opinions, the following tasks are chosen to be relevant to *ORS* when measuring *IAF_Task* under the less restrictive approach: corporate governance reviews, operational audits, project management assurance / audits of major projects, security assessment and investigations, disaster recovery testing and support, review addressing linkage of strategy and company performance, social and sustainability, and quality/ISO audits. For *IAF_Skill*, the following items are considered to be relevant to *ORS* under the less restrictive approach: operational and management research skills, business process analysis, understanding business, ISO/quality knowledge, total quality management, balanced scorecard, risk analysis and control assessment techniques, and governance, risk, and control tools and techniques.

reports the variable comparisons between low-ORS IAFs and high-ORS IAFs after the matching procedure. It shows that we achieve the covariates balance in the matched sample.

We then compare mean *RONAs* between high-ORS IAFs and matched low-ORS IAFs. Untabulated results show that the mean *RONA* of high-ORS IAFs is 0.051 whereas the mean *RONA* of low-ORS IAFs is -0.016. The difference is statistically significant ($t = 1.582$; $p = 0.058$, one-tailed). Following the suggestions in Shipman, Swanquist, and Whited (2016), we also perform a multivariate regression within the matched sample, including all variables in PSM as control variables. Results of the multivariate regression are presented in Panel B, Table 5. The coefficient of *HORS* remains positive and statistically significant, confirming our finding of a positive relation between the ORS engaged by the IAF and firms' operating performance.

(Insert Table 5 about here)

Finally, we also test the robustness of our findings by using alternative measures of operating performance and find consistent results. Specifically, when we adjust *RONA* by country-industry median *RONA* and re-estimate the regression, the coefficient on *HORS* remains significant and positive. Moreover, given that some countries in our sample have very few observations, we verify if our results are driven by those countries by excluding countries with no more than three observations from the analysis. Our results remain unchanged. We also re-estimate the regressions using three-year data (2008-2010), assuming that the IAF characteristics and hence the extent of ORS provided by the IAF likely remain stable in a short-run (Abbott et al. 2016), and we find similar results. Finally, adding back financial institutions does not influence our results.

VI. ADDITIONAL ANALYSIS

Analysis of Assessment and Facilitation ORS

ORS are made up of many different types of services which can be assessment- or facilitation-oriented. As we mentioned before, while assessment ORS is a traditional task within the scope of the IAF's work, facilitation ORS is more of an emerging phenomenon accompanied with internal auditors increasingly positioning themselves as a "trusted advisor" rather than a "watchdog". The question is whether assessment and facilitation ORS both have a positive association with operating performance and, if so, whether the facilitation ORS have an incremental effect on operating performance in addition to the assessment ORS. To shed light on this issue, we construct a variable measuring the degree of facilitation-oriented ORS (*ORS_Facilitation*) by summing up *IAF_Strategy*, *IAF_Emphasis*, and *IAF_Perception*. Conceptually, since those three aspects pertain to the IAF's strategic advisory role, its emphasis on consulting services and the degree of value added, they should be closely related to facilitation ORS. Based on the median value of *ORS_Facilitation*, we divide the sample firms into high in facilitation ORS and low facilitation ORS and construct an indicator variable *HORS_Facilitation*. We regress *RONA* on *HORS_Facilitation* to see whether facilitation ORS has a positive relation with operating performance. We also regress *RONA* on *HORS_Facilitation* together with two dummy variables that indicate firms with a high value for operations-related tasks (*HIAF_Task*) and skills (*HIAF_Skill*) to examine whether *HORS_Facilitation* has an incremental effect on performance. Results, reported in column (1) in Panel A of Table 6, show that *HORS_Facilitation* alone has a positive association with *RONA*. When *HIAF_Task*, *HIAF_Skill*, and *HORS_Facilitation* are added together into one regression, results in column (2) of Panel A, Table 6 show that the coefficients of three variables all appear

positive and statistically significant, suggesting that each component of ORS has an incremental effect on performance relative to the other variables.

As an alternative way to test the incremental effect of facilitation-oriented ORS, we focus on the tasks performed by the IAF. Specifically, we decompose *IAF_Task* into operational audits and other ORS relevant tasks. *TASK_OA* equals one if the IAF performs operational audits, and zero otherwise. *HTASK_OtherORS* is an indicator variable that equals one if the aggregated value of other operations-related tasks is above the sample median, and zero otherwise. We then analyze these two variables either separately or jointly. Results presented in Panel B of Table 6 show that both variables have a positive relation with *RONA* when analyzed separately. When considered together, each of them has a positive effect on *RONA*, suggesting that operations-related tasks other than traditional operational audits have an incremental positive influence on operating performance. Taken together, we interpret these results to suggest that internal audit has multiple ways to improve performance and that these different ways are incremental to each other.

(Insert Table 6 about here)

IAF's Role in Cost Management: Analysis of Business Strategy

Companies adopt significantly different strategies to compete in the marketplace. Miles and Snow (1978, 2003) discuss a continuum of strategies with defenders and prospectors as key ends of the spectrum. Bentley, Omer, and Sharp (2013) summarize the key differences between defenders and prospectors. Defenders focus heavily on cost reduction, efficiency, stability, minimal R&D, and strict centralized control to ensure efficiency. In contrast, prospectors focus on innovation, extensive R&D, marketing, and decentralized control. Our expectation is that IAFs in companies following the defender strategy are more likely to have significant influence on decision makers through the types of ORS performed by the IAF. That is, the talents and

strengths of the IAF are more likely to be on making recommendations to improve efficiencies and cost reductions, not on marketing and new product development. Thus, we expect the relation between RONA and ORS to be stronger for companies following a defender strategy than companies following a prospector strategy.

To test this expectation, we interact the business strategy variable *DEFENDER* with *HORS* and test how the relationship between *HORS* and *RONA* varies with business strategy. As presented in Panel A of Table 7, variable *HORS* captures the effect of *HORS* on *RONA* when firms adopt a prospector strategy (i.e., when *DEFENDER* = 0), and the interaction term *HORS*×*DEFENDER* captures the incremental influence of *HORS* on *RONA* when firms adopt a defender strategy. The results show that the significant relation between *RONA* and *HORS* is only observed for companies that follow the defender strategy as the coefficient on *HORS* itself is not statistically significant but the interaction term *HORS*×*DEFENDER* turns out to be positive and statistically significant.

IAF Outsourcing

IAFs can differ between organizations by whether the company keeps the IAF in-house or outsources significant portions of the IAF to a third party. Prior research shows many benefits to outsourcing including lower risk of financial statement misstatements, increased perceptions of objectivity, and increased reliance by external auditors (e.g., Ahlawat and Lowe 2004; Glover, Prawitt, and Wood 2008; Brandon 2010; Desai, Gerard, and Tripathy 2011; Prawitt et al. 2012). In contrast to these positives of outsourcing, in-house internal auditors are likely to have superior knowledge of the organization (Pelfrey and Peacock 1995; Rittenberg and Covaleski 1997, 2001), including better understanding of the culture, processes, controls, and risks which should provide internal auditors with an advantage in “proprietary knowledge” when making recommendations

(Matusik and Hill 1998). As argued and shown experimentally by Burton et al. (2012), the superior knowledge of in-house internal auditors results in managers relying more on in-house internal audit operational recommendations than outsourced internal audit recommendations in some situations. With our data, we extend this research by testing whether IAF outsourcing influences the relation between ORS and RONA.

We interact *OUTSOURCE* and *HORS* to see whether the effect of *HORS* on *RONA* is moderated by *OUTSOURCE*. Panel B of Table 7 shows that the coefficient of *HORS* is positive and statistically significant, suggesting that *HORS* has a positive effect on *RONA* with firms keep their IAFs in-house. The negative coefficient of the interaction term *HORS*×*OUTSOURCE* indicates that the positive relation between *HORS* and *RONA* observed for firms with their IAFs maintained in-house significantly reduces in companies outsourcing a considerable portion of their IAFs. Such result is consistent with the experimental work of Burton et al. (2012) that outsourcing internal audit activities to a third party can, under certain circumstances, undermines the benefits that can be brought by the IAF.

(Insert Table 7 about here)

DuPont Analysis

To shed additional light on how the IAFs providing ORS can improve operating performance, we perform the DuPont Analysis, decomposing return of equity (ROE) into the asset turnover ratio, profit margin, and the equity multiplier. Untabulated results indicate that high-ORS IAFs are positively associated with asset turnover (coefficient = 1.134; $p = 0.016$) and operating profit margin (coefficient = 0.016; $p = 0.087$) but have no effect on the equity multiplier (coefficient = 0.111; $p = 0.802$). This is consistent with our expectation that internal auditors providing ORS provide suggestions for ways to improve efficiency (asset turnover) and

effectiveness of operations (profit margin) but have little effect on the strategic debt choices (equity multiplier) that are made by senior management.

The Effect of ORS on Financial Reporting Quality

To deal with the concern that ORS provided by the IAF, especially ORS related to consulting services, might be detrimental to the internal auditors' objectivity and hence impair the IAF's role in providing high-quality assurance services to financial reporting, we test for evidence of the relationship between ORS provided by the IAF and earnings management. Specifically, we regress discretionary accruals (*ABA*) on *HORS* or *HORS_Facilitation* and other determinants of discretionary accruals. Untabulated results show no significant association between *HORS* and *ABA* (coefficient = 0.002; $p = 0.804$) or between *HORS_Facilitation* and *ABA* (coefficient = -0.003; $p = 0.755$). Thus, we do not find evidence in our sample that the IAF's involvement in providing ORS harms financial reporting quality.

VII. CONCLUSION

The IAF has become a common feature of medium to large companies worldwide (Mennicken and Power 2013), and it has gained enhanced status within companies. While prior literature documents consistent evidence that the IAF provides important assurance services in financial reporting and fraud detection (Lin et al. 2011; Prawitt et al. 2009; Ege 2015; Abbott et al. 2016), we explore the benefits associated with the operations-related services provided by the IAF. Using a unique sample of data on IAFs from around the world, we find a positive relation between the ORS provided by the IAF and operating performance. This relation suggests that the ORS provided by the IAF can serve as a valuable source of information to managers and directors who need decision-facilitating information to make better operation and strategic decisions.

We also provide additional tests to show key moderators of the effect of ORS on operating performance. Specifically, we find that the relation between ORS and operating performance is achieved for companies that follow a defender (as opposed to a prospector) business strategy. Furthermore, adding to research examining the costs and benefits of outsourcing the IAF, we find that companies extensively outsourcing the work of the IAF to a third-party do not see the same benefits to operating performance as companies that retain the IAF in-house.

This research has certain limitations. First, like all other studies using survey data, it relies on the assumption that survey respondents have provided correct information about the characteristics and practices of their IAFs. Second, since the 2010 CBOK survey was conducted at a specific time, we are unable to test whether changes in the ORS provided by the IAF can lead to changes in operating performance. Although we conduct several robustness checks to address the potential endogeneity concern, our findings should be more appropriately interpreted as associations rather than strict causal relations. Third, the data was collected during troubled economic times, and thus the results may not generalize to more stable economic periods. Fourth, the 2010 CBOK survey did not collect information about IAF size. Although this variable is likely correlated with firm size and IAF age, future researchers should control for IAF size when analyzing the effects of the IAF on important outcome variables. Finally, this study does not tackle the interaction between managers' characteristics and the ORS provided by internal auditors. For example, managers with high ability may perceive ORS as less valuable and hence demand less ORS from the internal auditors; or managers with high ability may understand the value of internal auditors better and may be good at using the ORS provided by the internal auditors to enhance firm performance. We leave this question to future research.

Overall, our paper is an initial move to investigate whether the IAF can add economically significant value beyond financial reporting. Documenting a significant association between the ORS provided by the IAF and operating performance enhances our knowledge of the IAF's role in companies. Future research might re-investigate this topic by examining whether changes of IAF's ORS can lead to improvement in performance when more data is available. Future research might also consider whether IAFs designed as management training grounds are more or less effective when providing operations-related services (Carcello, Eulerich, Masli, and Wood 2018).



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Appendix A
Measure IAF's Involvement in ORS

Dimension	Definition	Question in CBOK 2010
<p>Tasks Performed by IAF <i>(IAF_Task)</i></p>	<p>This variable measures the tasks performed by an IAF. The IAF's tasks are indicative of the IAF's involvement in ORS if the IAF performs the following activities: (1) operational audits, (2) security assessments and investigations, (3) reviews addressing linkage of strategy and company performance, (4) social and sustainability (corporate social responsibility, environmental) audits, and (5) quality/ISO audits. 1 point is assigned to each item listed above if the item is selected by a respondent, and 0 otherwise. The value of this variable is calculated as the points received by an IAF scaled by the maximum points that can be possibly achieved for this aspect (i.e., 5).</p>	<p>#39</p>
<p>Skills Desired for IAF <i>(IAF_Skill)</i></p>	<p>This variable measures the desired skills of an IAF. Desired skills are indicative of the IAF's involvement in ORS if the following skills are chosen by a respondent: (1) operational and management research skills, (2) business process analysis, (3) understanding business, (4) ISO/quality knowledge, (5) total quality management, and (6) balance scorecard. 1 point is assigned to each item listed above if the item is selected by a respondent, and 0 otherwise. The value of this variable is calculated as the points received by an IAF scaled by the maximum points that can be possibly achieved for this aspect (i.e., 6). We measure the desired skills for the head of IAF, the managers, and the internal audit staff, respectively. We then take the average of the desired skill scores from the three personnel levels to form the overall score of desired skills of the IAF.</p>	<p>#45</p>

Involvement in Strategy Development <i>(IAF_Strategy)</i>	This variable measures an IAF's role in providing advisory services in strategy development. The variable equals 1 if the respondent replied "Applies" to the following question: "internal auditors in the organization have an advisory role in strategy development", and 0 otherwise.	#48
Emphasis on Consulting Services <i>(IAF_Emphasis)</i>	This variable measures the extent of consulting services provided by an IAF. The variable equals 1 if the respondent replied "Does not apply" to the following question: "The internal audit activity places more emphasis on assurance than consulting services", and 0 otherwise.	#48
Perception of Value Creation of IAF <i>(IAF_Perception)</i>	This variable measures respondents' perception regarding the IAFs' role in adding value. The variable equals 1 if the respondent replied "Strongly Agree" to the following question: "You internal audit activity adds value", and 0 otherwise.	#25b

This appendix presents the five aspects included in the measure of ORS and their respective measurements based on the CBOK survey questions.

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Appendix B Variable Definitions

Variables	Definitions
<i>ORS</i>	a composite measure of the extent to which an IAF is involved in providing operations-related services (see Appendix A for details)
<i>HORS</i>	an indicator variable equal to 1 for IAFs that are highly involved in ORS (i.e., with the <i>ORS</i> value larger than the sample median), and 0 otherwise
<i>HORS_Facilitation</i>	an indicator variable equal to 1 for IAFs that are highly involved in facilitation-oriented ORS, and 0 otherwise, where facilitation-oriented ORS is measured by aggregating <i>IAF_Strategy</i> , <i>IAF_Emphasis</i> , and <i>IAF_Perception</i> (see Appendix A for variable details)
<i>HIAF_Task</i>	an indicator variable equal to 1 for IAFs that are highly involved in conducting ORS relevant tasks (i.e., with the value of <i>IAF_Task</i> larger than the sample median), and 0 otherwise
<i>HIAF_Skill</i>	an indicator variable equal to 1 for IAFs in which ORS relevant skills are highly desired (i.e., with the value of <i>IAF_Skill</i> larger than the sample median), and 0 otherwise
<i>TASK_OA</i>	an indicator variable equal to 1 for IAFs involved in operational audits, and zero otherwise.
<i>HTASK_OtherORS</i>	an indicator variable equal to 1 for IAFs that are highly involved in other operations-related tasks, and zero otherwise, where other operations-related tasks are the tasks other than operational audits that are included in measuring <i>IAF_Task</i> (see Appendix A for variable details)
<i>RONA</i>	return on net operating assets, calculated as net income before extraordinary items to net operating assets
<i>LogAT</i>	firm size, calculated as the natural logarithm of total assets in US dollars
<i>GROWTH</i>	sales growth, calculated as the percentage of sales change from prior year to current year
<i>LEV</i>	leverage ratio, calculated as total liabilities to total assets
<i>CASH</i>	cash ratio, calculated as total cash and short-term securities to total assets
<i>CAPX</i>	capital expenditure, calculated as total capital expenditure to total sales
<i>STD_OCF</i>	volatility of operating cash flows, calculated as standard deviation of operating cash flows to total assets in the past five years
<i>ABA</i>	discretionary accruals measured by modified Jones (1991) model (Kothari et al. 2005) using all firms in Compustat on a country-industry-year basis
<i>MTB</i>	market-to-book ratio, calculated as total year-end market cap to total common equity
<i>RESTR</i>	an indicator variable equal to 1 if restructuring expenses are larger than 0, and 0 otherwise
<i>NYSE</i>	an indicator variable equal to 1 if a firm is listed or cross-listed in the New York Stock Exchange, and 0 otherwise
<i>IAFAGE</i>	IAF age, ranging from 1 to 8 based on Question No.15 in the 2010 CBOK survey

<i>CAEEXP</i>	an indicator variable equal to 1 if the CAE reported in the survey that he/she has professional experience in management, and 0 otherwise
<i>REPORTLINE</i>	an indicator variable equal to 1 if the IAF reports directly to audit committee or board of directors, and 0 otherwise
<i>OUTSOURCE</i>	an indicator variable equal to 1 if the IAF outsources more than 25% of the IAF activities, and 0 otherwise
<i>STATUS</i>	an indicator variable equal to 1 if the IAF has sufficient status in the company, and 0 otherwise
<i>DEFENDER</i>	an indicator variable equal to 1 if a firm is classified as adopting the "defender" business strategy, and 0 otherwise
<i>Country_ORS</i>	country level median value of <i>ORS</i> based on all CAE responses (matched and unmatched) from a country that have available information on the measurement items of <i>ORS</i>
<i>HINDEX</i>	intensity of industry competition calculated as Herfindahl index at country-industry-year level



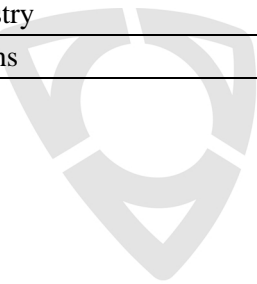
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Table 1
Sample Selection

Original survey responses from publicly listed companies with country identified	5,942
Less:	
Non-CAE survey responses	-4,415
CAE responses having missing email addresses	-670
<hr/>	
CBOK CAE responses eligible for matching	857
Less:	
Responses not matched with firms in Compustat (North America and Global)	-487
<hr/>	
Number of firms matched with CBOK responses	370
Less:	
Firms having missing values	-75
Firms from financial industry	-27
<hr/>	
Sample used for regressions	268



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Table 2
Descriptive Statistics

Panel A: IAF characteristics

Variable	N	Mean	Median	STD	Min	Max
<i>IAF_Task</i>	268	0.393	0.400	0.221	0.000	1.000
<i>IAF_Skill</i>	268	0.246	0.222	0.116	0.000	0.667
<i>IAF_Strategy</i>	268	0.306	0.000	0.462	0.000	1.000
<i>IAF_Emphasis</i>	268	0.205	0.000	0.405	0.000	1.000
<i>IAF_Perception</i>	268	0.590	1.000	0.493	0.000	1.000
<i>ORS</i>	268	1.740	1.678	0.908	0.000	4.189
<i>HORS</i>	268	0.451	0.000	0.499	0.000	1.000

Panel B: Firm characteristics

Variable	N	Mean	Median	STD	Min	Max
<i>RONA</i>	268	0.038	0.046	0.186	-0.936	0.602
<i>LogAT</i>	268	7.271	7.323	1.732	2.998	12.757
<i>GROWTH</i>	268	-0.073	-0.078	0.271	-0.598	1.547
<i>LEV</i>	268	0.162	0.137	0.150	0.000	0.607
<i>CASH</i>	268	0.116	0.090	0.104	0.000	0.492
<i>CAPX</i>	268	0.046	0.036	0.040	0.000	0.240
<i>SD_CFO</i>	268	0.045	0.036	0.036	0.004	0.182
<i>MTB</i>	268	1.799	1.300	1.503	0.211	6.223
<i>ABA</i>	268	-0.001	0.000	0.077	-0.293	0.223
<i>RESTR</i>	268	0.190	0.000	0.393	0.000	1.000
<i>IAFAGE</i>	268	4.168	4.000	1.421	1.000	7.000
<i>NYSE</i>	268	0.224	0.000	0.418	0.000	1.000
<i>CAEEXP</i>	268	0.534	1.000	0.500	0.000	1.000
<i>REPORTLINE</i>	268	0.336	0.000	0.473	0.000	1.000
<i>HINDEX</i>	268	0.228	0.106	0.255	0.009	1.000
<i>OUTSOURCE</i>	268	0.243	0.000	0.429	0.000	1.000
<i>STATUS</i>	268	0.813	1.000	0.390	0.000	1.000
<i>DEFENDER</i>	268	0.448	0.000	0.498	0.000	1.000
<i>US</i>	268	0.351	0.000	0.478	0.000	1.000
<i>JAPAN</i>	268	0.146	0.000	0.353	0.000	1.000
<i>TAIWAN</i>	268	0.104	0.000	0.306	0.000	1.000

Table 3
Univariate Analysis

Panel A: Univariate Comparison of Key IAF Characteristics

Variables	IAFs low in ORS (No. of Obs = 147)		IAFs high in ORS (No. of Obs = 121)		Mean Difference (t-Statistic)	Median Difference (z-Statistic)
	Mean	Median	Mean	Median		
<i>CAEEXP</i>	0.469	0.000	0.612	1.000	-2.337**	-2.318**
<i>REPORTLINE</i>	0.320	0.000	0.355	0.000	-0.613	-0.614
<i>OUTSOURCE</i>	0.279	0.000	0.198	0.000	1.532	1.528
<i>STATUS</i>	0.762	1.000	0.876	1.000	-2.404**	-2.382**
<i>IAFAGE</i>	3.946	4.000	4.438	5.000	-2.860***	-2.905***

Panel B: Univariate Comparison of Key Firm Characteristics

Variables	IAFs low in ORS (No. of Obs = 147)		IAFs high in ORS (No. of Obs = 121)		Mean Difference (t-Statistic)	Median Difference (z-Statistic)
	Mean	Median	Mean	Median		
<i>RONA</i>	0.017	0.038	0.063	0.060	-2.029**	-2.934***
<i>LogAT</i>	7.159	6.872	7.406	7.566	-1.162	-1.470
<i>GROWTH</i>	-0.105	-0.087	-0.033	-0.068	-2.192**	-1.613
<i>LEV</i>	0.544	0.551	0.540	0.576	0.152	-0.120
<i>CASH</i>	0.106	0.077	0.127	0.108	-1.636	-1.857*
<i>CAPX</i>	0.043	0.035	0.049	0.038	-1.358	-1.545
<i>SD_CFO</i>	0.042	0.036	0.048	0.036	-1.406	-0.976
<i>MTB</i>	1.810	1.380	1.786	1.169	0.128	0.735
<i>ABA</i>	-0.005	0.000	0.004	0.000	-0.938	-0.924
<i>RESTR</i>	0.224	0.000	0.149	0.000	1.573	1.569
<i>NYSE</i>	0.286	0.000	0.149	0.000	2.703***	2.672***
<i>DEFENDER</i>	0.463	0.000	0.430	0.000	0.536	0.537
<i>HINDEX</i>	0.191	0.099	0.274	0.163	-2.676***	-2.616***

***, **, * represent p-values significant at the 0.10, 0.05, and 0.01 levels respectively, based on two-tailed tests. For purposes of this table, IAFs are categorized as high (low) in ORS if the variable *ORS* is larger (smaller) than the sample median. The sample size slightly differs between high-*ORS* and low-*ORS* IAFs because there are thirteen observations that have exactly the median value of *ORS*. Those observations are assigned to the low-*ORS* subsample. See the Appendix for the variable descriptions.

Table 4
Multivariate Analysis: Relation between ORS and RONA

Independent Variables	First-Stage Regression		Second-Stage Regression	
	Dependent Variable = <i>HORS</i>		Dependent Variable = <i>RONA</i>	
	Coefficient	z-Statistic	Coefficient	t-Statistic
<i>HORS</i>			0.045***	(3.469)
<i>LogAT</i>	-0.015	(-0.222)	0.011	(1.336)
<i>GROWTH</i>	0.090	(0.276)	0.109**	(2.560)
<i>LEV</i>	-0.055	(-0.102)	-0.161**	(-2.328)
<i>CASH</i>	2.026**	(2.046)	0.225*	(1.979)
<i>CAPX</i>	-0.133	(-0.087)	0.060	(0.421)
<i>SD_CFO</i>	1.262	(0.528)	-0.385**	(-2.303)
<i>MTB</i>	-0.002	(-0.764)	0.014	(1.444)
<i>ABA</i>	1.233	(1.001)	0.717**	(2.241)
<i>RESTR</i>	0.142	(0.578)	-0.031***	(-3.811)
<i>IAFAGE</i>	0.182***	(2.766)	0.031***	(2.893)
<i>NYSE</i>	-0.420	(-1.545)	-0.056**	(-2.104)
<i>Lag_RONA</i>	-0.154	(-0.356)	0.362***	(12.449)
<i>CAEEXP</i>	0.370**	(2.197)	0.043	(1.552)
<i>REPORTLINE</i>	0.072	(0.384)	-0.002	(-0.111)
<i>HINDEX</i>	0.738*	(1.673)	0.106**	(2.547)
<i>OUTSOURCE</i>	-0.148	(-0.748)	-0.017	(-0.957)
<i>STATUS</i>	0.333	(1.443)	0.106***	(2.799)
<i>DEFENDER</i>	0.082	(0.429)	0.058***	(7.010)
<i>US</i>	-0.367	(-1.313)	-0.070**	(-2.179)
<i>JAPAN</i>	-0.393	(-1.106)	-0.108***	(-4.784)
<i>TAIWAN</i>	-0.156	(-0.373)	-0.017	(-0.568)
<i>IMR</i>			0.280***	(2.968)
<i>Country_ORS</i>	0.641**	(2.101)		
<i>CONSTANT</i>	-2.317***	(-2.913)	-0.426**	(-2.058)
Industry Fixed Effects	No		Yes	
Observations	268		268	
Pseudo/Adjusted R ²	0.130		0.565	

***, **, * represent p-values significant at the 0.10, 0.05, and 0.01 levels respectively, based on two-tailed tests. See the Appendix for variable descriptions.

Table 5
Propensity Score Matching based on firms from the U.S., Japan, and Taiwan

Panel A: Test of Covariate Balance

Variables	IAFs low in ORS (No. of Obs = 43)		IAFs high in ORS (No. of Obs = 43)		Mean Difference (t-statistics)	Median Difference (z-statistics)
	Mean	Median	Mean	Median		
<i>LogAT</i>	7.083	6.734	7.059	7.400	0.066	-0.099
<i>GROWTH</i>	-0.109	-0.097	-0.122	-0.139	0.342	0.445
<i>LEV</i>	0.552	0.585	0.524	0.559	0.646	0.566
<i>CASH</i>	0.113	0.082	0.117	0.099	-0.192	-0.030
<i>CAPX</i>	0.048	0.031	0.046	0.041	0.129	-1.214
<i>SD_CFO</i>	0.047	0.039	0.047	0.031	0.025	0.713
<i>MTB</i>	1.615	1.432	1.676	1.360	-0.228	0.307
<i>ABA</i>	-0.018	-0.010	-0.007	-0.005	-0.602	-0.402
<i>RESTR</i>	0.279	0.000	0.279	0.000	0.000	0.000
<i>IAFAGE</i>	4.233	4.000	4.698	5.000	-1.579	-1.678*
<i>NYSE</i>	0.512	1.000	0.372	0.000	1.301	1.295
<i>Lag_RONA</i>	0.020	0.071	0.063	0.054	-1.051	0.030
<i>CAEEXP</i>	0.488	0.000	0.581	1.000	-0.858	-0.860
<i>REPORTLINE</i>	0.256	0.000	0.372	0.000	-1.157	-1.155
<i>HINDEX</i>	0.099	0.077	0.112	0.082	-0.606	-0.177
<i>OUTSOURCE</i>	0.209	0.000	0.209	0.000	0.000	0.000
<i>STATUS</i>	0.814	1.000	0.837	1.000	-0.281	-0.283
<i>DEFENDER</i>	0.558	1.000	0.605	1.000	-0.433	-0.435

Panel B: Multivariate regression results based on PSM sample

Dependent Variable = <i>RONA</i>		
Independent Variables	Coefficient	t-Statistic
<i>HORS</i>	0.054**	(1.687)
<i>LogAT</i>	0.033**	(2.060)
<i>GROWTH</i>	0.328***	(2.771)
<i>LEV</i>	0.119	(0.898)
<i>CASH</i>	-0.034	(-0.167)
<i>CAPX</i>	1.304**	(2.345)
<i>SD_CFO</i>	-0.013	(-0.026)
<i>MTB</i>	0.008	(0.459)
<i>ABA</i>	0.961***	(3.000)
<i>RESTR</i>	0.012	(0.247)
<i>IAFAGE</i>	0.016	(1.423)
<i>NYSE</i>	-0.049	(-1.120)
<i>Lag_RONA</i>	0.574***	(4.653)
<i>CAEEXP</i>	-0.079**	(-2.178)
<i>REPORTLINE</i>	-0.059	(-1.376)
<i>HINDEX</i>	-0.037	(-0.169)
<i>OUTSOURCE</i>	-0.007	(-0.160)
<i>STATUS</i>	0.024	(0.404)
<i>DEFENDER</i>	0.078**	(2.015)
<i>CONSTANT</i>	-0.393**	(-2.030)
Industry Fixed Effects	Yes	
Observations	86	
Adjusted R ²	0.574	

***, **, * represent p-values significant at the 0.10, 0.05, and 0.01 levels respectively, based on one-tailed tests. See the Appendix for variable descriptions.

Table 6
Analysis of Assessment ORS and Facilitation ORS

Panel A: Analyses of IAF Tasks, Skills, and Facilitation Services

Independent Variables	(1)		(2)	
	Dependent Variable = <i>RONA</i>		Dependent Variable = <i>RONA</i>	
	Coefficient	t-Statistic	Coefficient	t-Statistic
<i>HIAF_Task</i>			0.040***	(2.889)
<i>HIAF_Skill</i>			0.034*	(1.624)
<i>HORS_Facilitation</i>	0.045***	(3.099)	0.040***	(2.986)
<i>LogAT</i>	0.010	(1.075)	0.011	(1.250)
<i>GROWTH</i>	0.003***	(3.967)	0.003***	(3.345)
<i>LEV</i>	-0.146**	(-1.853)	-0.137**	(-1.936)
<i>CASH</i>	-0.089	(-0.680)	-0.134	(-1.109)
<i>CAPX</i>	0.124	(0.856)	0.088	(0.546)
<i>SD_CFO</i>	-0.622***	(-2.850)	-0.548**	(-2.703)
<i>MTB</i>	0.017*	(1.537)	0.018**	(1.704)
<i>ABA</i>	0.720**	(2.404)	0.729**	(2.493)
<i>RESTR</i>	-0.040***	(-4.886)	-0.040***	(-5.291)
<i>IAFAGE</i>	0.000	(0.055)	-0.001	(-0.161)
<i>NYSE</i>	0.021	(0.631)	0.029	(0.843)
<i>Lag_RONA</i>	0.364***	(9.509)	0.362***	(9.780)
<i>CAEEXP</i>	-0.023	(-0.676)	-0.027	(-0.825)
<i>REPORTLINE</i>	-0.019*	(-1.379)	-0.016	(-1.288)
<i>HINDEX</i>	0.033	(0.785)	0.031	(0.796)
<i>OUTSOURCE</i>	0.013	(1.038)	0.012	(0.973)
<i>STATUS</i>	0.041**	(2.286)	0.035**	(2.344)
<i>DEFENDER</i>	0.030**	(2.633)	0.031**	(2.493)
<i>US</i>	-0.005	(-0.190)	-0.001	(-0.038)
<i>JAPAN</i>	-0.031	(-1.047)	-0.021	(-0.657)
<i>TAIWAN</i>	0.053**	(1.694)	0.053**	(1.884)
<i>CONSTANT</i>	0.057	(0.635)	0.023	(0.275)
Industry Fixed Effects	Yes		Yes	
Observations	268		268	
Adjusted R ²	0.451		0.462	

Panel B: Operational Audits versus Other Operations-Related Services

Independent Variables	(1)		(2)		(3)	
	Dependent Variable = <i>RONA</i>		Dependent Variable = <i>RONA</i>		Dependent Variable = <i>RONA</i>	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
<i>TASK_OA</i>	0.054**	(1.782)			0.042*	(1.353)
<i>HTASK_OtherORS</i>			0.043***	(2.738)	0.040**	(2.531)
<i>LogAT</i>	0.010	(1.016)	0.010	(1.146)	0.011	(1.190)
<i>GROWTH</i>	0.003***	(5.282)	0.003***	(3.906)	0.003***	(3.269)
<i>LEV</i>	-0.121**	(-2.095)	-0.146**	(-2.011)	-0.154**	(-2.060)
<i>CASH</i>	-0.069	(-0.534)	-0.100	(-0.731)	-0.104	(-0.769)
<i>CAPX</i>	0.140	(0.850)	0.179	(1.120)	0.163	(1.014)
<i>SD_CFO</i>	-0.526**	(-2.567)	-0.565**	(-2.600)	-0.554**	(-2.457)
<i>MTB</i>	0.000	(1.463)	0.017	(1.552)	0.017	(1.539)
<i>ABA</i>	0.724**	(2.470)	0.742**	(2.498)	0.761**	(2.437)
<i>RESTR</i>	-0.035***	(-3.404)	-0.045***	(-5.776)	-0.041***	(-4.984)
<i>IAFAGE</i>	-0.001	(-0.181)	-0.000	(-0.008)	-0.001	(-0.132)
<i>NYSE</i>	0.022	(0.770)	0.024	(0.737)	0.027	(0.931)
<i>Lag_RONA</i>	0.388***	(12.219)	0.361***	(9.376)	0.359***	(8.931)
<i>CAEEXP</i>	-0.025	(-0.689)	-0.022	(-0.679)	-0.022	(-0.697)
<i>REPORTLINE</i>	-0.013	(-0.950)	-0.016	(-1.390)	-0.015	(-1.243)
<i>HINDEX</i>	0.050	(1.246)	0.038	(1.001)	0.040	(1.040)
<i>OUTSOURCE</i>	0.017	(1.270)	0.007	(0.593)	0.008	(0.648)
<i>STATUS</i>	0.048***	(2.869)	0.048**	(2.718)	0.046***	(2.849)
<i>DEFENDER</i>	0.026**	(1.945)	0.035***	(3.332)	0.035***	(3.197)
<i>US</i>	0.001	(0.066)	-0.003	(-0.107)	-0.003	(-0.136)
<i>JAPAN</i>	-0.038	(-1.584)	-0.030	(-1.039)	-0.029	(-1.003)
<i>TAIWAN</i>	0.060**	(1.901)	0.039	(1.333)	0.043	(1.474)
<i>CONSTANT</i>	0.018	(0.196)	0.039	(0.449)	0.008	(0.096)
Industry Fixed Effects	Yes		Yes		Yes	
Observations	268		268		268	
Adjusted R ²	0.427		0.449		0.451	

***, **, * represent p-values significant at the 0.10, 0.05, and 0.01 levels respectively, based on two-tailed tests. See the Appendix for variable description

Table 7
Cross-Sectional Analyses

Panel A: Business Strategy Test

Dependent Variable = <i>RONA</i>		
Independent Variables	Coefficient	t-Statistic
<i>HORS</i>	0.004	(0.327)
<i>DEFENDER</i>	0.003	(0.200)
<i>HORS</i> × <i>DEFENDER</i>	0.067***	(3.300)
<i>LogAT</i>	0.009	(1.171)
<i>GROWTH</i>	0.111**	(2.398)
<i>LEV</i>	-0.159***	(-3.918)
<i>CASH</i>	-0.085	(-0.730)
<i>CAPX</i>	0.180	(1.040)
<i>SD_CFO</i>	-0.583**	(-2.652)
<i>MTB</i>	0.017	(1.617)
<i>ABA</i>	0.688**	(2.155)
<i>RESTR</i>	-0.030***	(-3.540)
<i>IAFAGE</i>	-0.001	(-0.181)
<i>NYSE</i>	0.019	(0.759)
<i>Lag_RONA</i>	0.367***	(12.789)
<i>CAEEXP</i>	-0.023	(-0.647)
<i>REPORTLINE</i>	-0.015	(-1.436)
<i>HINDEX</i>	0.065*	(1.936)
<i>OUTSOURCE</i>	0.011	(0.841)
<i>STATUS</i>	0.032**	(2.378)
<i>US</i>	0.010	(0.510)
<i>JAPAN</i>	-0.013	(-0.399)
<i>TAIWAN</i>	0.068***	(2.972)
<i>CONSTANT</i>	0.015	(0.236)
Industry Fixed Effects	Yes	
Observations	268	
Adjusted R ²	0.475	

Panel B: Outsourcing Test

Independent Variables	Dependent Variable = <i>RONA</i>	
	Coefficient	t-Statistic
<i>HORS</i>	0.045**	(2.027)
<i>OUTSOURCE</i>	0.032	(1.138)
<i>HORS</i> × <i>OUTSOURCE</i>	-0.040*	(-1.321)
<i>LogAT</i>	0.005	(0.641)
<i>GROWTH</i>	0.143***	(4.404)
<i>LEV</i>	-0.107**	(-2.540)
<i>CASH</i>	-0.043	(-0.440)
<i>CAPX</i>	-0.049	(-0.298)
<i>SD_CFO</i>	-0.651***	(-3.954)
<i>MTB</i>	0.000**	(2.488)
<i>ABA</i>	0.029	(0.364)
<i>RESTR</i>	-0.039***	(-3.508)
<i>IAFAGE</i>	0.003	(0.375)
<i>NYSE</i>	0.029	(1.009)
<i>Lag_RONA</i>	0.373***	(9.568)
<i>CAEEXP</i>	-0.030	(-0.859)
<i>REPORTLINE</i>	-0.014	(-1.324)
<i>HINDEX</i>	0.031	(0.822)
<i>DEFENDER</i>	0.037**	(2.637)
<i>STATUS</i>	0.027	(1.629)
<i>US</i>	-0.017	(-0.788)
<i>JAPAN</i>	-0.056***	(-2.883)
<i>TAIWAN</i>	0.069***	(3.099)
<i>CONSTANT</i>	0.075	(1.191)
Industry Fixed Effects	Yes	
Observations	268	
Adjusted R ²	0.406	

***, **, * represent p-values significant at the 0.10, 0.05, and 0.01 levels respectively, based on one-tailed tests. See the Appendix for variable descriptions.