Internal Audit Function Quality and Operating Performance Recovery: Evidence from Recent Post-Financial-Crisis Period

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Abstract: Standard-setters and internal audit practitioners have claimed for years that a high-quality internal audit function (IAF) should be beneficial for firms' operations. In this paper, I attempt to provide the initial empirical evidence on this issue. Replying on a unique set of archival IAF data, I use the recent post-financial-crisis period as the research setting and test whether high-quality IAFs are helpful for firms to recover from the financial crisis. Defining performance recovery as reaching a firm-specific performance benchmark calculated in the pre-financial-crisis period, I find that the speed of performance recovery is significantly quicker for firms with high-quality IAFs than for firms with low-quality IAFs. Furthermore, I document that firms with high-quality IAFs have more efficient investments, which can be one of the reasons why such firms experience quicker performance recovery after the financial crisis. Overall, I demonstrate that a high-quality IAF plays an important role in supporting managers and board of directors in decision making, which can have significant positive influence on firms' performance.

Keywords: internal audit function, internal audit quality, firm performance, financial crisis

1. Introduction

The impact of corporate governance on firm performance has long attracted researchers' attention (e.g., Gomper et al. 2003; Larcker et al. 2007; Armstrong et al. 2010). In this paper, I investigate an increasingly important but under-researched corporate governance mechanism, namely the internal audit function (IAF), and its effect on firm performance. The Institute of Internal Auditors (IIA) defines internal auditing as "an independent, objective assurance and consulting activity designed to add value and improve an organization's operation" (IIA, 2012). The glossary of the IIA's International Professional Practice Framework (IPPF) explains the added value of an IAF as "[…] improving opportunities to achieve organizational objectives, identifying operational improvement, and/or reducing risk exposure through both assurance and consulting services" (IIARF, 2009). Despite the above stated goal of internal auditing in improving operation, there is very little direct evidence supporting the relation between IAF and firms' operating performance, perhaps partly because the research on IAF is still in its infancy (DeFond and Zhang, 2014). In the current study, I attempt to provide some initial empirical evidence on this issue.

Considering the IAF's crucial supporting role in decision making and its increasing involvement in risk management, I specifically investigate the relationship between IAF quality and firms' operating performance recovery in the recent post-financial-crisis period where uncertainty and risk is of great concern. I choose this particular research setting because how to recover and recover faster is a key issue faced by companies worldwide after the financial crisis. Even though IAFs may be unable to prevent firms from performance decrease or losses in sudden and catastrophic market declines because no firm is immune to macroeconomic downturns, high-quality IAFs should help firms recover after the crisis because recovery relies more on firm-specific decisions.

The Integrated Framework of Enterprise Risk Management released by COSO (2004)[1] posits that IAFs have the key supporting responsibilities to help firms achieve strategic and operational objectives. All activities within an organization are potentially within the scope of internal auditor's responsibility (COSO, 2013). According to Brian Schwartz, the internal audit leader at Ernst & Young in the U.S., "more and more [internal] audit functions are moving in the direction of doing more audits regarding operational and strategic risks, as opposed to just financial or compliance risks" (Kelly, 2012). As a key information resource for the management and the board of directors, high-quality IAFs can help firms recover faster from the crisis because high-quality IAFs can assist the management and the board of directors to make better decisions. First, high-quality IAFs can promote risk awareness that facilitates better operational and strategic decision making (Hoyt and Liebenberg, 2011). The better decisions can, to some extent, reduce the likelihood and impact of extreme, negative financial events that could incur direct costs (e.g., losses and bankruptcy) and indirect costs (e.g., reputational relationships with customers and suppliers) to the firm (Pagach and Warr, 2010). Second, through more efficient risk identification, more accurate risk impact assessment, and more timely and reliable information disclosure and communication, high-quality IAFs can enable the management and the board of directors to better react to market shocks, to avoid taking actions that may give rise to additional risks, and to seize opportunities when market rebounds. Third, high-quality IAFs can lead to better internal control (Lin et al. 2011) and increase financial reporting quality (Prawitt et al. 2009), which in turn mitigates both adverse selection and moral hazard (Biddle

[1] COSO stands for the Committee of Sponsoring Organizations of the Treadway Commission.

and Hilary, 2006; Biddle et al. 2009). The enhanced transparency and reduced information asymmetry can help firms attract external capital and allocate the limited resources more effectively and efficiently, hence improving investment efficiency and facilitating recovery.

To empirically test the relation between IAF quality and firms' performance recovery after the recent financial crisis, I construct a unique archival IAF sample by matching proprietary global internal auditor survey data from the IIA with public data in Worldscope.[2] As there is no consensus with respect to the definition of IAF quality, I self-construct an IAF quality measurement model based on the International Standards for the Professional Practice of Internal Auditing (IIA, 2013; hereafter the Standards) which is the most widely adopted standards for the practices of internal auditing. Specifically, I define IAF quality to be composed of four quality dimensions representing the IAF's competence, independence, planning and reporting activities, and quality assurance and improvement practices. Each of the quality dimensions is measured by several items from the survey questions, and the overall IAF quality is measured by all measurement items of the four quality dimensions. To form a composite score of IAF quality, I use two methods to aggregate the measurement items. In the first method, I take the average of the measurement items for each quality dimension as the score for that quality dimension, and treat the mean of the four quality dimensions as the score for the overall IAF quality (equal-weighting approach). In the second approach, I rely on Partial Least Squares Path Modeling (PLS-PM) to estimate the hierarchical measurement model of IAF quality in which quality dimensions are the first-order latent variables and the overall IAF quality is the second-order latent variable. The PLS-PM estimation procedure generates the weights of the measurement items that maximize the sum of correlations between the quality dimensions and the overall IAF

[2] The matching between the survey responses and firms in Worldscope is permitted by the Institute of Internal Auditors Research Foundation. Detailed sample selection and matching procedure is discussed in section 3.

quality. The estimated weights are then used to compute the scores for the quality dimensions and the overall IAF quality (PLS-PM approach).[3]

In the main analysis, I use the IAF quality score obtained from the PLS-PM approach because it avoids arbitrarily assigning equal weights to the measurement items. Nevertheless, my results remain unchanged if I use the IAF quality score from the equal-weighting approach. I measure operating performance by return on assets (ROA). I define performance recovery as reaching a firm-specific benchmark ROA calculated in the pre-crisis period 2006-2007, and specify the recovery period after the crisis to cover from the first quarter of 2010 to the last quarter of 2012. Using duration analysis based on Cox proportional hazard model (Cox, 1972), I find a significant positive association between IAF quality and firms' speed of performance recovery, after controlling for various firm characteristics as well as industry and country effects. Such positive association is robust to alternative measures of performance, a different specification of recovery period, a different definition of pre-crisis period to calculate the benchmark performance, and a different data structure with time-varying control variables. Additional Poisson regression of recovery duration offers corroborating evidence.

Among the several reasons for a high-quality IAF to contribute to the performance recovery, the potential positive impact of IAF quality on investment efficiency can be of particular importance in the post-financial-crisis period. This is because most firms are cash constrained and external capital is scarce. As a result, how to attract capital and use the limited capital in an efficient manner turns to be a key factor affecting firms' performance after the crisis. To further shed light on the issue, I test the relationship between IAF quality and investment efficiency. Empirical analysis shows that IAF quality is indeed positively associated with firms' investment

[3] Figure 1 depicts the overall structure of the IAF quality measurement model, and Appendix A presents detailed information regarding the measurement items. Please refer to Jiang et al. (2014) for more details about the IAF quality measurement model.

efficiency, regardless of whether investment efficiency is measured by the investment expenditure sensitivity to investment opportunities (Chen et al. 2011; Bushman et al. 2007; Stein, 2003; Lang et al. 1996) or the investment sensitivity to cash flow (Hovakimian and Hovakimian 2009; Biddle and Hilary, 2006).

Although there are good reasons to believe that high-quality IAFs should contribute to performance recovery after the financial crisis, it is still worth noting that the effect of IAF quality on performance recovery can be dominated by other corporate governance mechanisms such as the board of directors, audit committees, and management. To tease out the potential confounding effects, I specifically control for the features of those corporate governance mechanisms in the analysis. In addition, I perform a two-stage Poisson regression to address the potential endogenous issue and my results still hold. Moreover, since managing risk is so important in the post-financial-crisis period, the impact of IAF on performance recovery may depend on both IAF quality and the extent to which an IAF is involved in risk management rather than the IAF quality alone. To address this concern, I test the effects of both IAF quality and the extent to which the IAF is involved in risk management on performance recovery together. Result shows that the positive effect of IAF quality on performance recovery remains unchanged when the extent of IAF's involvement in risk management is included. Nevertheless, more extensive involvement in risk management by the IAF does have an incremental positive effect on performance recovery after the IAF quality is controlled for. Such result implies that both IAF quality and the IAF's involvement in risk management are important for performance recovery after the financial crisis.

To my best knowledge, this is the first study providing empirical evidence supporting the positive influence of high-quality IAFs on firms' operating activities. By showing that firms with high-quality IAFs have faster operating performance recovery after the recent global financial crisis, I demonstrate the importance of high-quality IAFs to the better corporate performance. Such a finding is particularly interesting because the IAFs are increasingly involved in risk-management-related and strategic consulting activities. Moreover, by establishing the positive association between IAF quality and firms' investment efficiency, I further illustrate a potential important channel through which high-quality IAFs contribute to quicker firm performance recovery.

The findings in this study have implications for the current debate about the value of internal auditing. Although there have been increasing prevalence and an enhanced status of IAFs in companies in recent years around the world,[4] the post-financial-crisis period has observed an emergence of disappointments and criticisms about the added value of IAFs (Lenz and Sarens, 2012). Board of directors as well as managers were questioning what internal auditors, who are perceived as experts in risk management and internal control, can really bring to the companies. Such doubts on the value of IAFs could have negative consequences on the IAFs, such as reduced recognition and respect and budget cuts (Sarens, 2014). My results demonstrate that high-quality IAFs do bring benefits and value to companies so that it is important for managers and board members to increase the quality of IAFs. The findings should also be of interest to other audience including standard setters, internal audit practitioners, and accounting researchers.

The remainder of the paper is organized as follows. The next section presents the background information regarding the IAF's role in risk management and internal control, and

[4] For example, since 2004 the New York Stock Exchange has mandated listed companies to have an IAF. NASDAQ is now considering a similar requirement (SEC, 2013). In the non-U.S. setting, regulators in many countries are also putting more emphasis on the IAF. The prevalence of internal auditors can be illustrated by the increasing IIA membership. According to the website of IIA, it now has more than 180,000 members from around 190 countries.

develops hypothesis. Section 3 illustrates sample construction and selection procedure, followed by section 4 which discusses research design. Section 5 summarizes the main empirical results, and section 6 presents robustness tests and additional analysis. Section 7 concludes the paper.

2. Background and Hypothesis Development

In this section, I will first discuss about the recent trend with respect to the IAF's involvement in risk management and business/strategy consulting activities. Then, I will develop two main hypotheses.

2.1 The involvement of IAF in enterprise risk management

Good corporate governance mechanisms are found to have explanatory ability for firms' future operating performance (Larcker et al. 2007). As one part of the corporate governance structure, the IAF has the key supporting responsibilities to help firms achieve strategic and operational objectives (COSO, 2013). The IIA defines internal audit as "an independent, objective assurance and consulting activity designed to add value and improve an organization's operation. 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). Besides its important role in internal control which has been documented in prior literature (Lin et al. 2011), the IAF is found to be increasingly involved in risk management and strategic consulting activities. Since COSO issued its Enterprise Risk Management – Integrated Framework (COSO, 2004), there has been a move worldwide that internal auditors provide assurance and consulting services (IIA, 2012) for enterprise risk management that incorporates both internal control and risk management[5] (Sarens and De Beelde, 2006). The global internal auditor survey conducted by the IIA in 2010 reveals that 57% of the IAFs around the world perform audits of enterprise risk management processes. For those who responded that their IAFs were not involved in such audits at the time the survey took place, 20% believed that they would perform such audits within the next five years. A survey from PricewaterhouseCoopers (2009) also indicates that the composition of internal audit activities is changing, with strategic, business, and operational risk categories being the fastest-growing areas of the focus of IAFs. For example, the survey respondents replied that their internal audit departments allocated at least 25% of the resources to traditional financial risk during the earlier Sarbanes-Oxley period, but the ratio dropped to 21% in 2009. On the contrary, the ratio of resource allocation for strategic/business category increased from 13% to 38%. In addition, Arena et al. (2010) investigate the dynamics in implementing enterprise risk management, revealing that internal auditors play a central role in controlling uncertainty and they increasingly aspire to a greater role in risk management. Among the three companies surveyed in the study, the Chief Audit Executives (CAEs) were responsible for the monitoring of the risk management process or even the whole enterprise risk management program.

2.2 Hypothesis Development

IAF Quality and Firm Performance Recovery after Financial Crisis

[5] COSO defines enterprise risk management as "a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives" (COSO, 2004). According to COSO (2004), internal control is an integral part of enterprise risk management. The Enterprise Risk Management - Integrated Framework encompasses internal control, forming a more robust conceptualization and tool for management. Nevertheless, the Internal Control - Intergraded Framework remains in place because this framework has stood the test of time and is the basis for existing rules, regulations, and laws.

A survey conducted by Ernst & Young (2008) reports that most CAEs believe that their IAF has a positive impact on the overall control and risk management efforts, which in turn positively affects the company's performance. Nevertheless, the effect of IAF on both control and risk management depends on the quality of the IAF. Richard Chambers, the president and CEO of the IIA, once stated: "the risks services internal audit provides are only credible and reassuring as the quality of the audit organization CAEs build and manage" (Chambers, 2013).[6] Only a high-quality IAF is expected to be associated with better internal control and risk management, which can be crucial for firms' performance in a context where risk is a significant concern, such as the recent post-financial-crisis period. In line with this argument, I specifically explore the relationship between IAF quality and firm performance recovery in the recent post-financial-crisis period.

The reason why I focus on performance recovery is as follows. Since the crisis was an exogenous macroeconomic shock (Malul et al. 2011; Hooren et al. 2014), high-quality IAFs might not have been able to prevent firms from suffering performance decrease or losses due to the sudden and catastrophic market decline. Such a microeconomic downturn most likely affected every firm negatively. However, the advantages of having a high-quality IAF is expected to come into prominence when firms struggled to recover after the crisis, since the performance recovery relies more on firm-specific decisions. Just as the saying goes: "you may not be able to prevent the fire, but you can be a good fire fighter". High-quality IAFs could be of great importance in assisting the management and the board of directors in the post-financial-

[6] In the same article, Richard Chambers emphasizes several aspects to which CAEs should pay attention to ascertain the quality of IAF. Those aspects include developing risk-based audit plans, frequently updating audit plans, training staff to have an understanding of the organization and industry and making them competent to assess the key risks to business strategies and operations, conducting external quality assessment in a regular basis, and practicing in conformance with the International Standards for the Professional Practice of Internal Auditing. All these aspects are incorporated in my IAF quality measurement model.

crisis period, enabling them to make the right and timely decisions that are critical for the firm performance recovery.

First, firms with high-quality IAFs are generally better prepared for negative events. Typically each year a high-quality IAF develops an internal audit plan on the basis of a risk-based approach aligned with organizational objective and stakeholder priorities. Areas of review can be broad, including, for example, compliance with code of conduct, design of the risk assessment process, reporting of data quality, and reporting of specific transactions and controls. High-quality IAFs are more likely to conduct high-quality reviews that identify key existing risks and hence prepare firms for potential negative events. The real-world anecdotal evidence can well support this point. For instance, here is an example extracted from a real internal audit report of a large technology company.[7] The IAF of the company conducted a review of the company's electronic purchasing department and found that severe control system deficiency and risks existed 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 IAF's recommendation, the company improved the monitoring of supplier's economic development, better assessing any related financial and business risks and putting back-up solutions in place. When the financial crisis indeed occurred and the supplier was insolvent, the company was better prepared to the supplier phase-out and therefore could react to this negative event in a more proactive matter.

Second, high-quality IAFs, through their consulting activities, can coach the management in responding to risky events. For example, high-quality IAFs can assist the management to choose

[7] Due to confidentiality, the name of the company cannot be disclosed.

the right actions so as to reduce the risk likelihood and impact or to avoid activities that may give rise to additional risks. My own interviews with several experienced internal auditors[8] indicate that, in the post-financial-crisis period, the internal auditors became more like a business partner of the management team that relied on the IAF to get a comprehensive view of the company. The management team also often counted on the IAF to have solutions/plans. High-quality IAFs are more likely to come up with effective plans due to their high-quality reviews, and they are also more likely to help the management implement those plans in a timelier manner.

Third, by effectively assessing the relevant uncertainty and its impact (negative or positive), high-quality IAFs not only facilitate efficient risk responses but also assist the management to identify and seize new opportunities (COSO, 2004) when the markets rebound after the financial crisis. According to COSO (2004), uncertainty presents both risk and opportunity. In the post-financial-crisis period, uncertainty is widespread and thereby the evaluation of uncertainty becomes especially important to differentiate risk from opportunity. As a high-quality IAF is supposed to conduct more accurate assessments of the impact of relevant uncertainty, it can enable the management to effectively deal with uncertainty and the associated risk and opportunity, therefore enhancing the firm's capacity to build value.

Fourth, high-quality IAFs can increase transparency and financial reporting quality, therefore reducing information asymmetry and making it easier for firms to get external capital. In addition, high-quality IAFs can improve the estimations of resources and costs and prevent misuse of company funds, therefore enhancing the efficiency of resource allocation and capital deployment. Such a positive effect on investment efficiency by high-quality IAFs can be particularly important in the post-crisis period as most firms were cash constrained and external

[8] The interviews were conducted from June to August 2014. The interviewees have more than ten-year experience in internal auditing, and all of them were used to be or are currently the Chief Accounting Officer or Chief Audit Executives.

capital was limited. The high-quality IAF's role in helping firms use the limited capital in a more efficient manner can be an essential factor for firms to recover after the financial crisis.

In sum, the above arguments lead me to propose the following hypothesis:

H1: IAF quality is positively associated with firms' performance recovery after the crisis.

IAF Quality and Investment Efficiency

Among the aforementioned reasons for high-quality IAFs to contribute to firms' performance recovery, the positive impact of high-quality IAFs on making efficient investments appears especially important because most firms were cash constrained after the crisis and external capital was scarce. As already discussed, high-quality IAFs can increase firms' investment efficiency by helping the management prevent the misuse of capital and improve resource allocation. Here is a specific example from a real internal audit report. Depending on the risk-based auditing plan, the IAF of the company decides to conduct a review of the R&D department which was outsourcing some projects that could pose a risk to the company. The review revealed that there was a lack of formalized project management process and such deficiency affected the identification of resource requirements, the calculation of resource/project costs, and the tracking of project progress/costs. Such deficiency could lead to the potential miscalculation of the benefits-costs tradeoffs of the outsourcing project and thus the misuse of company funds. Because of the IAF's finding, a formalized project management process was put in place, which facilitated more accurate calculation of resources needs and corresponding costs, thereby resulting in more transparency and more efficient use of capital.

The role of high-quality IAFs in improving the efficiency of resource allocation can also be demonstrated by the fact that high-quality IAFs can assist the management in identifying investable projects. High-quality IAFs, through more effective risk identification and assessments, can help the management team differentiate events negatively impacting the achievement of objectives from those positively affecting the achievement of objectives, supporting value creation and preservation (COSO, 2004). Moreover, the better financial reporting quality resulted from better IAFs (Prawitt et al. 2009; Ege, 2014) could allow cash constrained firms to attract external capital by making their positive net-present-value (NPV) projects more visible to investors, therefore reducing adverse selection (Biddle et al. 2009; Biddle and Hilary, 2006). Finally, high-quality IAFs, through improving transparency, can curb managerial incentives to engage in opportunistic behaviors (e.g., empire building) that are value-destroying. Given the importance of investment efficiency which is measureable on the basis of prior literature, I specifically test the relationship between IAF quality and firms' investment efficiency and make the following hypothesis:

H2: IAF quality is positively associated with firms' investment efficiency.

3. Sample and Data

Table 1 outlines the sample matching and selection procedure. The data used in this study comes from a matched sample between publicly available data in Worldscope and private IAF data in a global internal auditor survey from the IIA.[9] The global internal auditor survey was conducted in early 2010 by the IIA and was a part of the Common Body of Knowledge (hereafter, CBOK; the survey used in this study is named CBOK 2010). In the survey, there are 5906 responses from publicly listed companies with country identified. To keep the responses comparable across firms, I retain only those from CAEs[10]. After removing responses that have

[9] The matching process is permitted by The Institute of Internal Auditors Research Foundation.

[10] In the CBOK 2010 survey, the questions related to internal auditors' competence are personal questions about the individual respondents. As a result, to avoid comparing a CAE's competence in company A with an internal audit staff's competence in Company B, I use only responses from CAEs.

missing values for the matching variables, 721 responses are left eligible for matching. Those responses are then merged with the public firms from the same country in Worldscope. The matching process is based on merging firms' 2009 year-end[11] total assets, total sales, industry, and the domain names of firms' websites with relevant information provided by the survey respondents.[12,13] 329 unique firms were matched with survey responses. After dropping firms with missing values in the empirical models, I finally have 307 firms for the analysis of performance recovery.

For the tests of investment efficiency, I use data from 2010 to 2012 based on the 307 firms in the recovery analysis. 916 firm-year observations are available when investment efficiency is measured by the sensitivity of investment expenditure to investment opportunities, whereas 909 firm-year observations are retained when investment efficiency is measured as the investment sensitivity to cash flows (investment efficiency measures are explained in details later in the research design section). Table 2 displays the sample distribution by country for different analyses included in the paper.

It should be noted that like all other samples based on survey data, the sample in my study may have selection bias because it is not randomly drawn. However, this is the first time that an international archival IAF data is available at such detailed company level, and descriptive statistics (see Table 3) show that my sample indeed captures a wide range of IAF quality (IAF quality measure will be discussed with details in the next section). Moreover, any self-selection

[11] Because the CBOK survey was conducted in the early 2010, I assume that the information provided by the respondents regarding assets, sales, and industry is closest to the firms' actual financial data by the end of year 2009.
[12] I require that the domain names are exactly matched. For example, if the email address provided by the respondent is aaa@xyz.com, it is matched with the firm whose investor relation contact email or website also ends with xyz.com. I 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.
[13] In CBOK, the questions about total assets and total sales are asked in a way that the respondents only need to choose the ranges rather than providing exact numbers. As a result, I consider a match to be correct if for the same variable, the value from Worldscope falls into the range that has been chosen by the CBOK response.

bias would be most likely to work against finding any result supporting my expectations. Nevertheless, to somehow address the concern that firms with good IAFs are more likely to respond to the survey and hence be selected into the sample, I follow the survey literature (Malhotra et al. 2012) and compare the IAF quality of firms submitting early responses with that of firms giving late responses. If firms having good IAFs indeed are more likely to respond the survey, they are probably more likely to answer the survey in a timely basis, leading to a systematic difference of IAF quality between firms with early responses and firms with late responses. The classification of early versus late responses is based on the date when the respondents completed the survey. Untabulated results show that the mean and median IAF quality score[14] of firms providing early responses does not statistically differ from that of firms having late responses.[15]

4. Research Design

In this section, I first illustrate the measurement model of IAF quality and the methods adopted to derive the composite score of IAF quality. Then, I discuss the empirical models used to test the hypotheses.

4.1 Measuring IAF quality

The IAF quality measure is based on Jiang et al. (2014). Specifically, relying on the Standards (IIA, 2013), I define that IAF quality consists of four quality dimensions representing the desirable attributes and practices of the IAF. While the desirable attributes include the IAF's

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[14] Please refer to section 4.1 for a detailed discussion regarding the construction of IAF quality score.

[15] Two sets of comparison were performed. In the first comparison, I rank sample firms according to their completion date of survey. Then, I divide the firms into early responses and late responses by the mid-point and compare the mean and median IAF quality score across the two sub-samples. In the second comparison, I rank firms into quartiles based on the completion date of survey and compare the IAF quality score of firms in the first quartile (earliest responses) with that of firms in the fourth quartile (latest responses).

competence and independence,[16] the desirable practices encompass the IAF's planning and reporting practices (Plan_report) as well as the IAF's quality assurance and improvement practices (Quality_assure). Each quality dimension is measured by several items derived from the CBOK 2010 survey questions and the overall IAF quality is expected to be measured by all measurement items of the four quality dimensions. Appendix A presents the definition of each quality dimension, the corresponding measurement items of each quality dimension, and the data source (i.e., the survey question number) of each measurement item in CBOK 2010.

I use two methods to aggregates the measurement items to form the composite IAF quality score for each sample firm. In the first method, I treat the average of the measurement items of a quality dimension as the score for that dimension, and then I take the mean of the four quality dimensions as the score for the overall IAF quality (i.e., the equal-weighting approach). In the second method, I use Partial Least Squares Path Modeling (PLS-PM)[17] to estimate the hierarchical measurement model of IAF quality which is depicted in Figure 1 (i.e., the PLS-PM approach). As shown in the figure, I define the overall IAF quality (i.e., IAFQ in the figure) as the second order latent construct and the IAF quality dimensions as the first order latent constructs. The overall IAF quality model has two parts: (1) the measurement model (i.e., the outer part of the model) in which each quality dimension is measured by its respective measurement items and the overall IAF quality is measured by all measurement times, and (2) the structural model (i.e., the inner part of the model) which establishes the relationships between

[16] Prior literature usually uses objectivity instead of independence. However, according to the recent practice guide from the IIA, independence and objectivity are two different constructs. Independence refers to the "freedom from conditions that threaten the ability of internal audit activity to carry out internal audit responsibilities in an unbiased manner…[whereas] objectivity is an unbiased mental attitude that allows internal auditors to perform engagements in such a manner that they believe in their work product and that no quality compromises are made" (IIA, 2011). Survey items used in this study, such as reporting line and hiring practices, are more related to internal auditors' independence rather than objectivity. Moreover, mental attitude is impossible to measure based on the survey data. As a result, I use independence as the second desirable attribute instead of objectivity.

[17] Please refer to Jiang et al. (2014) for a detailed discussion about the advantages of using PLS-PM.

the quality dimensions and the overall IAF quality. The PLS-PM estimation process generates the weights of the measurement items which maximize the sum of the correlations between the quality dimensions and the overall IAF quality. Those estimated weights are then used to calculate the scores for the quality dimensions and the overall IAF quality.

The IAF quality scores obtained from the two approaches are highly correlated (correlation = 0.93). In the analysis, I use the score derived from PLS-PM appraoch because it avoids arbitrarily assigning equal weights to the measurement items. However, the results are not affected by using the IAF quality score obtained from the equal-weighting approach.

4.2 Analyzing performance recovery after financial crisis

I measure firms' operating performance by return on assets (ROA)[18] which is computed as net income scaled by total assets.[19] To measure the duration that each firm took to recover after the crisis, I need first to define and compute the reference ROA in the pre-financial-crisis period. To do so, for each sample firm, I calculate the quarterly ROA from the first quarter of 2006 to the fourth quarter of 2007, and treat the average of the maximum and minimum quarterly ROA as the reference ROA. I then compute the quarterly ROA for each firm from the first quarter of 2010 to the fourth quarter of 2012 (12 quarters in total, hereafter the recovery period). If a firm reached the reference ROA in any quarter during the recovery period, it is considered as a survival. Those firms whose quarterly ROAs in the recovery period never reached the reference ROA are treated as non-survivals. I then measure the recovery duration (T) by the number of

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[18] There is a concern that because ROA relies on earnings, it is subject to earnings management which may affect my inferences. For example, firms might take a big bath during the crisis in order to show strong recovery after the crisis. However, according to prior literature (e.g., Prawitt et al. 2009), firms with low-quality IAFs are more likely to engage into earnings management such as taking a big bath. Accordingly, while investigating firms' earnings management during the crisis time is beyond the scope of this paper, earnings management would be most likely to bias against finding evidence supporting my expectations. Nevertheless, in order to control the impact of earnings management on performance recovery, I add a composite measure of earnings quality, which takes into account earnings smoothness, predictability, conservatism and accrual quality, into the model as an additional control variable. Results remain unchanged with the inclusion of earnings quality measure.

[19] Results remain unchanged if ROA is computed as earnings before interests and taxes divided by total assets.

quarters each firm took to reach the reference ROA for the first time during the recovery period. Recovery duration for non-survivals is assigned the value of 12. Figure 3 presents graphically the research design for performance recovery analysis.

Since the recovery duration in my research context does not end naturally (i.e., the end of the recovery period is truncated at the fourth quarter of 2012, so firms recovered after 2012 are not observed), recovery duration in my sample is right-censored. To overcome this problem, I conduct a survival analysis using Cox proportional hazard model (Cox, 1972) instead of the traditional OLS regression which requires the recovery duration distribution to be log-normal and the duration not to be right-censored. Hazard model requires no assumption of duration distribution and allows right-censoring. In the current study, recovery hazard is the probability that a firm recovers in a particular quarter, given that it has not recovered in the previous quarters. The Cox proportional hazard model specifies a common baseline hazard for all firms but allows individual firm's hazard function to differ according to the observed covariates. The baseline hazard is nonparametric because it does not need to be specified in any functional format. I use Cox model because my interest is to test whether a firm's likelihood of recovery in each quarter is increasing in IAF quality even without knowing the baseline hazard.

The following equation is the Cox hazard model used in this study:

$$h(T_i)=h_0(T_i)\exp(\varphi_1 IAFQ_i + \sum FirmControls_i + IndustryFixed + CountryFixed) \qquad (1)$$

where for each firm i , variable T is the number of quarters from the beginning of recovery period (i.e. first quarter of 2010) to the quarter that firm i recovered (i.e., the quarter when firm i's ROA reached its reference ROA for the first time during the recovery period). For example, if the ROA of firm i in the second quarter of 2010 is equal to or larger than firm i's reference ROA, variable T for firm i is 2. IAFQ is the IAF quality score. In the above Cox hazard model, because recovery duration extends each quarter as recovery does not occur, recovery hazard is inversely related to recovery duration. Accordingly, a positive coefficient of IAFQ indicates that recovery hazard increases in IAF quality, and hence recovery duration decreases in IAF quality.[20] It is worth noting that the IAF quality measure is used as a lagged value in the above analysis. As the IAF quality measure is constructed based on the global internal auditor survey conducted by the IIA at the beginning of 2010, this measure is expected to be indicative of IAF quality in year 2009 which is before the recovery period starts in the main analysis.

To address the issue that certain firm characteristics determine firms' incentives to have a high-quality IAF and firm performance recovery simultaneously (i.e., good firms are more likely to have better IAFs and are also more likely to recover faster), I control for several firm characteristics that are expected to influence both firm performance and the adoption of a high-quality IAF.[21] In the above equation (1), FirmControls are lagged firm-level control variables measured at the 2009 year-end. According to Jiang et al. (2014), larger and more complex firms are more likely to have better IAFs. Those firms may have either quicker recovery due to more resources and better diversification or slower recovery due to the operational complexity. As a result, I control for firm size which is measured by the logarithm of total assets (LogAT) and firm complexity which is measured by the logarithm of the number of business segments (SEGMENT) and the ratio of foreign sales to total sales (FORSALE). In addition, since firms with better growth prospects are both more likely to develop a high-quality IAF and to recover faster, I add the book-to-market ratio (BTM) into the model to control for firms' growth

[20] There are 12 firms whose ROAs were never below the benchmark ROAs during the crisis period. By default, these 12 firms are coded as being recovered in the first quarter of 2010. To tease out the potential bias that may be resulted from these firms, I drop the 12 firms from the sample in an additional analysis as a robustness check. Results remain unchanged.

[21] Besides the inclusion of a variety of control variables, several robustness checks are also performed which are discussed in section 6.

opportunities. Moreover, firms with high leverage and low cash flows may be too constrained in capital to recover quickly and those firms are less likely to invest in IAFs as well. Accordingly, I include the leverage ratio measured as the total long-term debt to total assets (LEV) and operating cash-flow level measured as total cash flows from operating to total assets (CFO). Furthermore, as prior literature also finds that firms' ownership structure and crosslisting status influence firm performance, those two variables, namely the percentage of closely held shares (CLOSEHELD) and an indicator variable of whether a firm is crosslisted in major U.S. stock exchanges (CROSSLIST), are also included. It is also possible that firms with high-quality IAFs are less adversely affected by the crisis so that they recover faster. To address this concern, I control for the performance decline during the crisis. Performance decline (chgROA) is calculated as the difference of ROA between the reference ROA and the minimum quarterly ROA in the crisis period (i.e., from the first quarter of 2008 to the last quarter of 2009). Finally, since Jiang et al. (2014) find that IAF quality is influenced by the features of other corporate governance mechanisms which can also influence performance recovery, those corporate governance variables are also added, including board monitoring intensity (BODMOI), audit committee diligence (ACMEET), and CEO power (CEOPOWER). In addition to firm-level control variables, I also control for industry fixed effects (IndustryFixed)[22] and country fixed effects (CountryFixed).[23] Considering the possible recovery dependence across firms in the same economic regions/markets, standard errors are adjusted by clustering region-economic blocks.[24]

[22] The results remain unchanged if financial institutions are excluded from the analysis.
[23] Although country fixed are added, there may be a concern that it is the differences of the macro-economic environments across countries that influence firms' recovery. To address this issue, I add the average annual GDP growth from 2010 to 2012 for each country as an additional variable. As expected, GDP growth has a significant positive relation with recovery hazard. Nevertheless, the coefficient of IAFQ still remains positive and significant when GDP growth is included into the model. Moreover, the results are not affected by the exclusion of U.S. firms.
[24] Regional-economic blocks are classified based on MSCI's regional indexes. Sample countries are grouped into seven regional-economic blocks based on countries' economic development (developed, emerging, and frontier) and

In order to contrast the difference between high-quality versus low-quality IAFs, I replace IAFQ with HIAFQ in another set of analysis. HIAFQ is an indicator variable for high-quality IAFs, which takes value of 1 if a firm's IAFQ is larger than the sample median, and 0 otherwise. Appendix B summarizes all variable definitions.

4.3 Analyzing investment efficiency

My first measure of investment efficiency is based on the sensitivity of investment expenditure to investment opportunities proxied by lagged Tobin's Q (Chen et al. 2011; Bushman et al. 2007; Stein 2003; Lang et al. 1996). The following regression model is adopted:

$$\begin{aligned} INV_{i,t} &= \alpha_0 + \alpha_1 HIAFQ_{i,t-1} + \alpha_2 TQ_{i,t-1} + \alpha_3 HIAFQ\_TQ_{i,t-1} \\ &+ \sum FirmControls_{i,t-1} + IndustryFixed + CountryFixed + \varepsilon_{i,t} \end{aligned} \tag{2}$$

where for each firm i in year t, INV is investment expenditure, calculated as the sum of capital expenditure, research and development expenses, and acquisition of assets, minus sales of property, plants, and equipment, scaled by beginning total assets. HIAFQ is the same indicator variable for high-quality IAFs. TQ is Tobin's Q, measured as the sum of the market value of equity and book value of total liabilities, divided by book value of total assets. HIAFQ_TQ is the interaction term between HIAFQ and TQ. Following prior literature (e.g., Chen et al. 2011), a set of firm-level control variables are also added, including the natural logarithm of total assets (LogAT), leverage ratio calculated as total long-term debt to total assets (LEV), cash flow from operating scaled by total assets (CFO), dividends payout which is an indicator variable equal to 1 if a firm pays dividends, and 0 otherwise (DIV), the percentage of closely held shares (CLOSEHELD), the standard deviation of cash flow from operating (sd_CFO), an indicator variable of whether a firm is crosslisted in major U.S. stock exchanges (CROSSLIST), and

geographic location (Americas, Europe, Middle-east and Africa, and Asia). Table 2 presents some details of the classification of regional-economic blocks for each sample country.

whether a firm is audited by Big4 auditors (Big4). Like before, as IAF quality and investment efficiency can both be influenced by other corporate governance mechanisms, I also add proxies for board monitoring intensity (BODMONI), audit committee diligence (ACMEET), and CEO power (CEOPOWER). Note that all firm-level variables are lagged values.

In the above equation, α_2 is predicted to be positive, as firms are expected to invest more when the investment opportunities increase. α_3 is the coefficient of interest which captures the incremental effect of high-quality IAFs on the relationship between investment expenditure and investment opportunities. A significant positive α_3 indicates that high-quality IAFs reinforce the association between investment expenditure and investment opportunities and therefore enhance investment efficiency.

My second measure of investment efficiency relies on the concept of investment sensitivity to cash flows and is derived from Hovakimian and Hovakimian (2009) and Biddle and Hilary (2006). Investment sensitivity to cash flows is an inverse measure of investment efficiency. According to Tobin (1969) and Hayashi (1982), firms invest until the marginal return is zero so that there should not be an association between internally generated cash flows and investment in the neoclassical setting where market is perfectly efficient. However, because of adverse selection caused by the information asymmetry between managers and investors, investors withhold capital because they expect that managers will exploit the private information to issue securities at inflated prices. Similarly, when firms have excess cash, the moral hazard problem can lead managers to pursue perquisite consumption such as empire building rather than returning excess cash to investors. Both adverse selection and moral hazard problems will increase the sensitivity of investment to internally generated cash flows. If a high-quality IAF is expected to address the issues related adverse selection due to better financial reporting and mitigate the problems with respect to moral hazard due to better internal control and increased transparency within the firm, firms with a high-quality IAF should have lower investment sensitivity to cash flows.

The following model is employed to calculate the investment sensitivity to cash flows for each firm in each sample year during the period 2010-2012, over a rolling ten-year window.

$$\mathrm{CFSI}_{i,t} = CFWAI_{i,t} - AI_{i,t} = \frac{1}{n}\sum_{s=1}^{t}[(CF_{i,s} / \sum_{s=1}^{t} CF_{i,s}) * I_{i,s}] - \frac{1}{n}\sum_{s=1}^{t} I_{i,s} \quad (3)$$

where for each firm i in year t, CFSI is investment sensitivity to cash flows, and it is the measure for investment efficiency. CFWAI is the cash-flow-weighted time-series average investment, whereas AI is the un-weighted arithmetic time-series average investment. CF is cash flow, and I is investment. As before, investment is calculated as the sum of capital expenditure, research and development expenses, and asset acquisition, minus sales of property, plants, and equipment. Both cash flow and investment are deflated by lag total capital. The intuition of the above measure is that if a firm's investment is not influenced by its available cash flows, there should be no difference between CFWAI and AI. However, if a firm tends to invest more in years with high cash flows and less in years with low cash flows, the value of CFSI will be larger. In this sense, larger values of CFSI indicate lower investment efficiency.

Using the following regression, I test the relationship between IAF quality and investment efficiency measured by CFSI:

$$\mathrm{CFSI}_{i,t} = \alpha_0 + \alpha_1 IAFQ_{i,t} + \sum FirmControls_{i,t} + Industryfixed + CountryFixed + \varepsilon_{i,t} \quad (4)$$

where for each firm i in year t, IAFQ is the IAF quality score. FirmControls are the same firm-level control variables included in equation (2) plus book-to-market ratio (BTM). In the above equation, α_1 captures the effect of IAF quality on CFSI. A significant negative α_1 indicates that

CFSI decreases in IAF quality and hence investment efficiency increases in IAF quality (recall that larger values of CFSI mean lower investment efficiency).

5. Main Results

Descriptive statistics for each set of the analyses are presented from Panel A to Panel C in Table 3. As already mentioned, because of different data requirements, the sample size varies across tests. Untabulated results show that the mean reference ROA in the pre-financial-crisis period is 0.031 for firms with high-quality IAFs and 0.028 for firms with low-quality IAFs, and the difference is not statistically significant. To address the concern that firms with high-quality IAFs recover faster because their performance was less adversely affected during the crisis,[25] I compare the chgROA of high-quality IAFs with that of low-quality IAFs (recall that chgROA is calculated as the difference between the reference ROA and the lowest quarterly ROA during 2008-2009). Untabulated result shows that the chgROA of high-quality IAFs is not significantly different from that of low-quality IAFs, implying that the performance decline between firms with high-quality IAFs and firms with low-quality IAFs is somehow similar. However, in the post-financial-crisis period 2010-2012, the mean ROA for firms with high-quality IAFs is about 0.030 whereas the mean ROA for firms with low-quality IAFs is about 0.019, and the difference is statistically significant ($t=1.96$, $p=0.05$). In addition, the mean recovery duration is 4.24 quarters for firms with high-quality IAFs and 5.78 quarters for firms with low-quality IAFs. The difference in recovery duration between high-quality and low-quality IAFs is statistically significant ($t=2.98$, $p<0.01$).

[25] The decline of ROA during the crisis period (i.e., chgROA) is also controlled for in the multivariate analyses.

Regarding the multivariate analysis, the results of Cox duration analysis are tabulated in Table 4 in which Model (1) and Model (2) display the results for IAFQ and the dummy variable HIAFQ, respectively. According to the table, both the coefficients of IAFQ and HIAFQ are positive and significant, suggesting that recovery hazard increases in IAF quality and hence recovery duration decreases in IAF quality. Given that a firm does not recover at time t-1, the likelihood that the firm will recover in time t is significantly higher if the firm has a better quality IAF. In other words, in terms of reaching the firm-specific benchmark of operating performance, firms with high- quality IAFs are more likely to recover and recover faster than firms with low-quality IAFs in the post-financial-crisis period, after controlling for several firm characteristics. The hazard ratios tabulated next to the coefficients give a more intuitive interpretation of the results. Specifically, while a hazard ratio of 1 means no effect, a hazard ratios greater (less) than 1 means that an increase in the independent variable increases (decreases) the likelihood of observing the event (i.e. recovery). Accordingly, the hazard ratio in Model (2) indicates that the estimated recovery hazard in the high-quality IAF group is 1.27 of that of the low-quality IAF group. That is, moving from the low-quality IAF group to the high-quality IAF group is associated with a 27% (1.27-1=0.27) increase in the likelihood of experiencing recovery in the post-financial-crisis period, after adjustment for the other explanatory variables in the model. Such an increase in the recovery hazard is statistically significant.

The coefficients of the control variables show some interesting results. The coefficient of LogAT is significantly negative, meaning that larger firms have slower operating performance recovery. CFO has a significant negative coefficient, suggesting that having too much cash without investing it in profit-generating projects is harmful for firms operating performance recovery. As expected, chgROA is significantly negative, confirming that firms suffering a large decrease in ROA in the crisis period have more difficulties to recover after the crisis. The coefficient of SEGMENT is significantly positive, indicating diversification is somehow beneficial for firms' operating performance recovery. The significant and negative coefficient of CROSSLIST implies that, compared to U.S. firms and non-U.S. firms not crosslisted, non-U.S. firms crosslisted in major U.S. stock exchanges experienced slower recovery.

Table 5 presents the results with respect to the association between IAF quality and investment efficiency. Model (1) shows the results when the sensitivity of investment expenditure to investment opportunities is used as the measure for investment efficiency. As predicted, the coefficient of TQ is positive, confirming the positive relation between investment expenditure and investment opportunities. The coefficient of the interaction term between HIAFQ and TQ (i.e., HIAFQ_TQ) is significantly positive, meaning that the positive relationship between TQ and INV is reinforced by high-quality IAFs. Model (2) of Table 5 presents the results when CFSI is used as the investment efficiency measure. The coefficient of IAFQ is significantly negative, indicating that CFSI decreases in IAF quality and hence investment efficiency increases in IAF quality (recall that larger values of CFSI mean lower investment efficiency). Taken together, results in Table 5 provide supporting evidence that firms with high-quality IAFs have more efficient investment than firms with low-quality IAFs.

6. Robustness Tests and Additional Analysis

6.1 Robustness tests for Cox duration analysis of performance recovery

I conduct five sensitivity analyses to test whether the main finding regarding the positive association between IAF quality and performance recovery in the duration analysis is robust. In the first sensitivity analysis, I re-define the recovery period to start from the third quarter of 2009 and end at the fourth quarter of 2012 (14 periods in total). In the second robustness check, I try to use another definition of pre-crisis period to calculate the benchmark performance. Specifically, I add year 2005 and the first two quarters in 2008 into the pre-crisis period, and re-calculate the reference ROA. In the third and the fourth sensitivity tests, I replace ROA with return on equity (ROE) and operating ROA[26] as the measure for operating performance, respectively. The fifth sensitivity analysis aims at counting for the time-varying nature of some firm-level control variables (e.g., total assets, cash flows, and book-to-market ratio). To this end, I re-structure the sample as follows. I treat each firm-quarter as an observation and observe each sample firm in each quarter from the first quarter of 2010 to the quarter when the ROA reached the reference ROA. Firm-quarters before recovery are included into the sample whereas firm-quarters after the recovery are dropped subsequently. Time-varying control variables are updated quarterly or annually if quarterly data is not available. The sample for the Cox duration model with time-varying control variables consists of 1,164 firm-quarter observations.

Results of the sensitivity analyses are summarized in Table 6. According to the table, IAFQ remains consistently positive and significant across the five sensitivity analyses, supporting the main finding that IAF quality has a significant positive influence on firms' performance recovery after the crisis. In addition, Model (5) with time-varying control variables illustrates some interesting patterns not observed in other model specifications. Besides the effects of firm size, business segment, CFO, ROA decline, and crosslisting status that are already documented in the prior analysis, the results in Model (5) show that recovery is quicker for firms with a higher leverage ratio, a higher level of closely held shares, and a more powerful CEO.

[26] Operating ROA is computed as net operating profits divided by net assets (Palepu et al. 2013).

6.2 Poisson regression of recovery duration

To provide further evidence on the effect of IAF quality on decreasing recovery duration, I conduct a Poisson regression in which the dependent variable is the number of quarters that each firm took to recover (i.e., variable T in the Cox duration model). The results are presented in Table 7. As expected, Model (1) of Table 7 shows that the coefficient of IAFQ is significantly negative, suggesting that a firm's recovery duration reduces in IAF quality. When IAFQ is replaced by HIAFQ, the coefficient of HIAFQ in the Poisson regression is about -0.26. This implies that the recovery duration of firms with high-quality IAFs is about 77% (exp(-0.26) = 0.77) of the recovery duration of firms with low-quality IAFs, while holding all other variables in the model constant.

In Model (2) of Table 7, I conduct a two-stage Poisson regression in order to address the concern that the classification of high- versus low-quality IAFs is not randomized, so that unobservable factors could influence both the likelihood of being a high-quality IAF and the recovery duration. In the first-stage, I regress HIAFQ on a set of IAF quality determinants derived from Jiang et al. (2014). Since HIAFQ is supposed to indicate firms' IAF quality at the end of year 2009, I use lagged values for the determinants which are calculated at the 2008 year-end. Those determinants include natural logarithm of total assets (LogAT08), book-to-market ratio (BTM08), percentage of independent directors (Bodinde08), percentage of female directors (Bodfemale08), CEO duality (CEOduality08), the number of audit committee meetings (ACmeet08), and the IAF requirements in countries' corporate governance codes (CGCode). The results of the first-stage regression are consistent with the findings in Jiang et al. (2014), showing that the likelihood of being a high-quality IAF is influenced by firm size, growth prospects, features of other corporate governance mechanisms, and the IAF requirements in countries' corporate governance codes. The second-stage results show that HIAFQ remains significantly negative, confirming that firms having high-quality IAFs recover faster than firms with low-quality IAFs even after controlling for the treatment effect of being a high-quality IAF.

6.3 Robustness tests of investment efficiency analysis

To check the robustness of the positive relationship between IAF quality and firms' investment efficiency, I perform two sets of sensitivity analysis. For investment efficiency measured by CFSI, I use two instrumental variables for IAFQ and perform the 2SLS regression. The first instrumental variable is chosen based on Jiang et al. (2014) who document that the IAF quality is strongly influenced by the IAF requirements in countries' corporate governance codes. However, it is hard to believe that the strictness of IAF requirements in corporate governance codes could strongly affect firm-level investment efficiency measured as the investment sensitivity to cash flows. Accordingly, I rely on the index of corporate governance codes with respect to the IAF requirements (CGcode) in Jiang et al. (2014) to construct the first instrumental variable of IAFQ. The last column of Table 2 shows the assigned value of CGcode for each sample country. The second instrumental variable is the age of IAF obtained from the CBOK survey. IAFs with longer history are found to be more mature and generally have higher quality, but the relationship between the age of IAF and the sensitivity of investment to cash flow is not expected to be strong.

Results regarding the 2SLS estimates are summarized in the first two columns of Table 8. The first column displays the first-stage results, and the second column reports the second-stage results. Following the recommendations in Larker and Rusticus (2010), I perform several diagnosing analyses to test the appropriateness of the instrumental variables, and the results are summarized at the bottom of the table. First, the partial F-statistic of the first-stage model is

17.57, passing the critical F-values for two instrumental variables developed in Stock et al. (2002). Next, the null hypotheses of underidentification and weak identification are rejected. Finally, since I use two instrumental variables, I also check the overidentification restriction test in which the null hypothesis is not rejected at 5% level.[27] Overall, results in the diagnosing analyses confirm the appropriateness of the two instrumental variables. Given the appropriateness of the instrumental variables, the second-stage results illustrate that IAFQ remains negative and significant, providing corroborating evidence for the positive association between IAF quality and investment efficiency.

Concerning the other measure of investment efficiency which is the sensitivity of investment expenditure to investment opportunity, the same instrumental variables do not pass the diagnosing analysis and therefore are not appropriate. Nevertheless, following the extant literature, I try another measure of investment expenditure which is the change of gross property, plants, and equipment (chgPPE) as an alternative approach for the robustness test. The variable chgPPE is measured as the difference between the ending and beginning value of gross property, plants, and equipment, scaled by the beginning value. According to the results shown in the last column of Table 8, both TQ and the interaction term between TQ and HIAFQ remain significantly positive.

6.4 Additional Analysis: IAF activities, IAF quality, and performance recovery

In the hypothesis development, I argue that the increasing involvement of IAFs in risk management and strategic consulting can put the IAFs in a crucial position to assist managers

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[27] Note that in the overidentification test, the null hypothesis is that the instruments are valid instruments, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation. As a result, it is rejection rather than acceptance of the null hypothesis that casts doubt on the appropriateness of the instrumental variables. In my analysis, the Hansen J-statistic is 3.354 (p=0.067), indicating that the null hypothesis of overidentification test cannot be rejected at 5% level.

and board of directors in decision making in the post-financial-crisis period where risk is a significant concern. High-quality IAFs are more likely to provide managers and board of directors with relevant, timely, and reliable information so as to help them make right and timely decisions, which can be one of the reasons for the high-quality IAFs to contribute to the performance recovery. Although my focus is on IAF quality, the above argument nevertheless implies that the role of IAFs in improving performance can also rely on whether the activities performed by the IAF are relevant to risk management and/or strategic development. To shed light on this issue, I test the influence of IAF's involvement in strategic consulting and risk management on performance recovery while controlling for the IAF quality.

To measure an IAF's involvement in strategic consulting, I rely on the survey question asking whether "internal auditors in the organization have an advisory role in strategy development". I consider the IAFs whose CAEs answered "Applies" to the above question as the IAFs assuming a strategic consulting role in the companies. Accordingly, an indicator variable STRATEGY is constructed which equals 1 if the respondents answered "Applies", and 0 if the respondents replied "Does not apply". To measure the extent to which an IAF is involved in risk-management-relevant activities, I rely on the survey question asking the respondents to tick the activities performed by their IAFs. Based on Chen and Lin (2011), among the twenty-five activities listed in the survey, five activities are identified as risk management relevant. I consider IAFs performing at least three risk-management-relevant activities as those extensively involved in risk management. Accordingly, I construct a variable RISK which equals 1 if the CAE ticked at least three risk management activities in the survey, and 0 otherwise.

Duration analysis of performance recovery with the inclusion of STRATEGY and RISK are tabulated in Table 9. The table shows that IAFQ remains significant and positive, suggesting that the positive impact of IAF quality on performance recovery does not depend on the nature of the IAF activities. Nevertheless, both STRATEGY and RISK also appear significantly positive, implying that IAF's involvement in strategic consulting and risk management indeed has an incremental positive impact on performance recovery after the IAF quality is controlled for. Taken together, the above findings suggest that, while IAF quality is important for firm performance, the expansion of IAF activities into risk management and the enhanced role of IAFs into strategic consulting can have a positive effect on firms' performance recovery.

6.5 Additional analysis: each quality dimension and performance recovery

In the main analysis of performance recovery, I use the composite measure of IAF quality which aggregates four IAF quality dimensions including competence, independence, planning and reporting activities, and quality assurance and improvement practices. To further shed light on which quality dimensions are relatively more important in facilitating operating performance recovery, I add each quality dimension into the Cox duration model separately. Results are tabulated in Table 10. Based on the table, Plan_report and Quality_assure turn out to be significantly positive, whereas Competence and Independence are not significant. This result suggests that, in terms of the IAF's role in improving firms' operating performance, the process of how internal audit is planned, conducted, and evaluated is relatively more important than the attributes of the IAF.

7. Conclusion and Limitations

In this paper, I investigate the relationship between IAF quality and firm performance recovery in the post-financial-crisis period. I find that IAF quality is positively associated with investment efficiency, and firms with high-quality IAFs are indeed more likely to recover and recover faster after the financial crisis than firms with low-quality IAFs. Such findings are robust to several sensitivity tests.

This study contributes to the literature in several ways. As the first empirical paper (to my best knowledge) investigating the relationship between IAF quality and firm performance recovery, the current study follows a line of research examining whether a specific corporate governance mechanism achieve its goals. In addition to advancing knowledge relevant to the research question in general, research on IAF and IAF quality is important by itself because of the enhanced status of IAFs in corporations and the expanded involvement of IAFs in various corporate activities. Furthermore, findings in the current paper are important due to the increasing regulatory pressure for firms to invest more resources in IAFs. Although standard-setters as well as internal auditing practitioners claim the importance of IAF for firm performance, this study provides the initial supporting empirical evidence on this issue, demonstrating that high-quality IAFs could help firms recover faster from an exogenous negative shock on performance such as the recent global financial crisis. In addition, notwithstanding the emphasis put on the attributes of IAFs such as competence and independence, findings in the additional analysis suggests that the quality of the field work process and a disciplined and regular quality assurance and improvement program can be essential for the IAFs to add value to companies. Such results can have implications for the future development of the IAF, as some managers and board of directors began questioning the added value of IAFs after the financial crisis. Taken together, the findings suggest that for an IAF to add value, the quality of the IAF is of particular importance.

Despite the important findings and implications revealed, this paper has some limitations. First, like all other studies using survey data, this paper relies on the assumption that survey respondents have provided correct information about the characteristics and practices of their IAFs. Second, as the survey was conducted in early 2010, the measure of IAF quality is static, which constrains my ability to perform change level analysis. Nevertheless, in addition to including a set of control variables into each of the analyses to address the potential correlated omitted variable problems, I perform several sensitivity analyses to test the robustness of the results. Future research may re-investigate the role of IAF on firm performance by examining whether changes of IAF quality can lead to improvement of performance when more data is available.

References:

Arena, M., Arnaboldi, M., Azzone, G., 2010. The organizational dynamics of Enterprise Risk Management. Accounting, Organizations and Society 35, 659–675.

Armstrong, C.S., Guay, W.R., Weber, J.P., 2010. The role of information and financial reporting in corporate governance and debt contracting. Journal of Accounting & Economics 50, 179–234.

Ashbaugh-Skaife, H., Collins, D.W., Kinney, J., LaFond, R., 2008. The Effect of SOX Internal Control Deficiencies and Their Remediation on Accrual Quality. Accounting Review 83, 217–250.

Baxter, R., Bedard, J.C., Hoitash, R., Yezegel, A., 2013. Enterprise Risk Management Program Quality: Determinants, Value Relevance, and the Financial Crisis. Contemporary Accounting Research 30, 1264–1295.

Beasley, M. S., Clune, R. and Hermanson, D. R. , 2005, Enterprise risk management: An Empirical Analysis of Factors Associated with the Extent of Implementation. Journal of Accounting and Public Policy 24, 521-531.

Biddle, G.C., Hilary, G., 2006. Accounting Quality and Firm-Level Capital Investment. Accounting Review 81, 963–982.

Biddle, G.C., Hilary, G., Verdi, R.S., 2009. How does financial reporting quality relate to investment efficiency? Journal of Accounting and Economics 48, 112–131.

Bushman, R.M., Piotroski, J.D., Smith, A.J., 2011. Capital Allocation and Timely Accounting Recognition of Economic Losses. Journal of Business Finance & Accounting 38, 1–33.

Chambers, R., 2013. How Internal Audit Can Help You Sleep Better. Internal Audit, 71.

Chen, J., Lin, W., 2011. Measuring Internal Auditing's Value. The IIA's Global Internal Audit Survey: A Component of the CBOK Study, Report III.

Chen, S., Sun, Z., Tang, S., Wu, D., 2011. Government intervention and investment efficiency: Evidence from China. Journal of Corporate Finance 17, 259–271.

Cheng, M., Dhaliwal, D., Zhang, Y., 2013. Does investment efficiency improve after the disclosure of material weaknesses in internal control over financial reporting? Journal of Accounting and Economics 56, 1–18.

Committee of Sponsoring Organizations of the Treadway Commission (COSO), 2004. Enterprise Risk Management - Integrated Framework. New York: American Institute of Certified Public Accountants.

Committee of Sponsoring Organizations of the Treadway Commission (COSO), 2013. Internal Control- Integrated Framework. New York: American Institute of Certified Public Accountants.

Cox, D.R., 1972. Regression Models and Life-Tables. Journal of the Royal Statistical Society 34, 187-200.

DeFond, M., Zhang, J., 2014. A Review of Archival Auditing Research. Working Paper, University of Southern California.

Doyle, J.T., Weili Ge, McVay, S., 2007. Accruals Quality and Internal Control over Financial Reporting. Accounting Review 82, 1141–1170.

Ege, M., 2014. Does Internal Audit Function Quality Deter Management Misconduct? Working Paper, University of Florida.

Ernst & Young, 2008. Escalating the role of internal audit: EY's 2008 Global Internal Audit Survey.

Frank, K.A., 2000. Impact of a Confounding Variable on a Regression Coefficient. Sociological Methods & Research 29, 147-194.

Gompers, P., Ishii, J., Metrick, A., 2003. Corporate Governance and Equity Prices. Quarterly Journal of Economics 118, 107.

Gordon, L.A., Loeb, M.P., Tseng, C.-Y., 2009. Enterprise risk management and firm performance: A contingency perspective. Journal of Accounting and Public Policy 28, 301–327.

Hayashi, F., 1982. Tobin's marginal q and average q: a neoclassical interpretation. Econometrica 50, 213-224.

Hooren, F. van, Kaasch, A., Starke, P., 2014. The shock routine: economic crisis and the nature of social policy responses. Journal of European Public Policy 21, 605–623.

Hovakimian, A., Hovakimian, G., 2009. Cash Flow Sensitivity of Investment. European Financial Management 15, 47–65.

Hoyt, R.E., Liebenberg, A.P., 2011. The Value of Enterprise Risk Management. Journal of Risk and Insurance 78, 795–822.

Institute of Internal Auditor Research Foundation, 2009. International Professional Practice Framework (IPPF).

Institute of Internal Auditor, 1999. Definition of Internal Auditing. Available at: https://na.theiia.org/standards-guidance/mandatory-guidance/Pages/Definition-of-Internal-Auditing

Institute of Internal Auditor, 2010. Imperatives for Change: The IIA's Global Internal Audit Survey in Action.

Institute of Internal Auditor, 2013. International Standards for the Professional Practice of Internal Auditing. Available at: https://na.theiia.org/standards-guidance/Pages/Standards-and-Guidance-IPPF.aspx

Jiang, L., Andre, P., Richard, C., 2014. Determinants of Internal Audit Function Quality: An International Study. Working Paper, ESSEC Business School.

Jiang, L., 2014a. Internal Audit Function Quality, Internal Audit Function Activities, and Earnings Quality. Working paper, ESSEC Business School.

Kelly, S., 2012. Internal Audit Broadens Its Horizon. Treasury & Risk.

Lang, L., Ofek, E., Stulz, R., 1996. Leverage, investment and firm growth. Journal of Financial Economics. 40, 3–29

Larcker, D.F., Richardson, S.A., Tuna, İ., 2007. Corporate Governance, Accounting Outcomes, and Organizational Performance. Accounting Review 82, 963–1008.

Larcker, D.F., Rusticus, T.O., 2010. On the Use of Instrumental Variables in Accounting Research. Journal of Accounting and Economics 49, 286-205.

Lenz, R., Sarens, G., 2012. Reflections on the internal auditing as a profession: what might have gone wrong. Managerial Auditing Journal 27: 532-549.

Lin, S., Pizzini, M., Vargus, M., Bardhan, I.R., 2011. The Role of the Internal Audit Function in the Disclosure of Material Weaknesses. Accounting Review 86, 287–323.

Lins, K.V., Volpin, P., Wagner, H.F., 2013. Does Family Control Matter? International Evidence from the 2008–2009 Financial Crisis. Review of Financial Studies.

Malhotra, N. K., Birks, D., and Peter, W., 2012. Marketing Research: an Applied approach. Harlow: Pearson Education.

Malul, M., Rosenboim, M., Shavit, T., Tarba, S.Y., 2011. The Role of Employment Protection during an Exogenous Shock to an Economy. Global Economy Journal 11, 1–12.

Pagach, D.P., Warr, R.S., 2010. The Effects of Enterprise Risk Management on Firm Performance. Working Paper, North Carolina State University.

Palepu, K.G., Healy, P.M., Bernard, V.L., Peek, E., 2013. Business Analysis and Valuation (IFRS Edition). Thomson Learning.

Prawitt, D.F., Smith, J.L., Wood, D.A., 2009. Internal Audit Quality and Earnings Management. Accounting Review 84, 1255–1280.

PricewaterhouseCoopers, 2009. Business upheaval: Internal audit weighs its role amid the recession and evolving enterprise risks.

Sarens, G., De Beelde, I., 2006. The Relationship between Internal Audit and Senior Management: A Qualitative Analysis of Expectations and Perceptions. International Journal of Auditing 10, 219–241.

Sarens, G., 2014. Editorial: internal audit research at the crossroads: time to turn a page? International Journal of Auditing 18: 103-104.

Securities and Exchange Commission (SEC). 2013. Notice of filing of proposed rule change to require that listed companies have an internal audit function. Release No. 34-69030.

Smithson, C. and B. J. Simkins., 2005. Does Risk Management Add Value? A Survey of the Evidence. Journal of Applied Corporate Finance 17: 8-17.

Stein, J., 2003. Agency, information and corporate investment. In: Constantinides, G.M., Harris, M., Stulz, R. (Eds.), Handbook of the Economics of Finance. North-Holland, Amsterdam, The Netherlands.

Stock, J. H., Wright, J.H., Yogo, M., 2002. A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments. Journal of Business & Economics Statistics 20, 518-529.

Tobin, J., 1969. A general equilibrium approach monetary theory. Journal of Money, Credit and Banking 1, 15-29.

Appendix A: Definition of Measurement Items of IAF Quality

This appendix presents the definitions of the measurement items used in the IAF quality measurement model depicted in Figure 1. It also provides the data resource, i.e., the survey question number, for each measurement item in the Common Body of Knowledge (CBOK) 2010 database.

Quality Dimension	Measurement Item	Definition	CBOK
Competence	audexp	This variable takes value of 1 if CAE has no auditing experience, 2 if CAE has either internal or external experience, and 3 if CAE has both internal and external auditing experience	Q7
	yearexp	This variable takes value of 1 if a CAE has 10 years or more experience in the position, and 0 otherwise.	Q8
	education	The number of years of undergraduate and graduate education of the CAE, based on the highest degree received. This variable takes value of 1 if a CAE's highest degree is secondary or high school, 2 if associate degree, 3 if bachelor's degree, 4 if master's degree, and 5 if Ph.D.	Q3
	major	This variable takes value of 1 if a CAE has auditing/accounting academic background, and 0 otherwise.	Q4
	certificate	This variable takes value of 1 if a CAE has CIA or CPA certificate, and 0 otherwise.	Q6
	training	This variable takes value of 1 if at least 40 hours of training is provided per year, and 0 otherwise.	Q10
	IIAmemb	The number of years that a CAE has been an IIA member. This variable takes value of 1 if a CAE is not a member of the IIA, 2 if a CAE has 1 year or less membership, 3 if 2-5 years, 4 if 6-9 years , and 5 if not less than 10 years.	Q1
Independence	reportline	This variable takes value of 1 if a CAE reports directly to the audit committee, and 0 otherwise.	Q9
	AC_employ	This variable takes value of 1 if the audit committee is involved in making the employment decision of the CAE, and 0 otherwise.	Q17
	AC_evalu	This variable takes value of 1 if the audit committee is involved in the evaluation of IAF's performance, and 0 otherwise.	Q18

Plan_report	document	This variable is the number of the charters, plans, manuals existing in a firm. The variable equals 1 if no document is used, 2 if 1-3 documents are used, 3 if 4-6 documents are used, 4 if 7-9 documents are used, and 5 if 10-12 documents are used.	Q16
	risk_plan	This variable takes value of 1 if an IAF has a risk-based audit plan, and 0 otherwise.	Q43
	IC_frame	This variable takes value of 1 if an IAF has implemented an internal control framework (e.g., COSO), and 0 otherwise.	Q48
	technique	This variable is the number of audit tools or techniques that an IAF uses. The variable equals 1 if no technique is used, 2 if 1-4 techniques are used, 3 if 5-8 techniques are used, 4 if 9-12 techniques are used, and 5 if 13-16 techniques are used.	Q43
	report	This variable takes value of 1 if an IAF provides an opinion or a rating in audit reports, and 0 otherwise.	Q40
Quality_assure	qa	This variable takes value of 1 if a quality assurance and improvement program is in place in a firm, and 0 otherwise.	Q36
	qa_recent	This variable takes value of 1 if internal audit activities have been subject to a formal external quality assessment in the last five years, and 0 otherwise.	Q37
	coverage	This variable is the number of internal audit activities subject to the quality assessment and improvement program. The variable equals 1 if none activity is covered by quality assurance, 2 if 1-3 activities are covered, 3 if 4-7 are covered, 4 if 7-9 are covered, and 5 if all 10 activities are covered.	Q38
	compliance	This variable takes value of 1 if an IAF is not in compliance with the Standards, 2 if partial compliance, and 3 if full compliance.	Q35

Appendix B: Variable Definitions

Variable	Definition
IAFQ	IAF quality score, ranging from 0 to 100 with larger values indicating higher quality IAFs
HIAFQ	An indicator variable for high-quality IAFs, which is equal to 1 for high-quality IAFs, and 0 otherwise
LogAT	Logarithm of total assets in USD
BTM	Book-to-market ratio, calculated as book value of equity divided by market value of equity
LEV	Leverage ratio, calculated as total long-term debts to total assets
CFO	Cash flows from operating to total assets
chgROA	ROA decline in the crisis-period, calculated as the reference ROA in the pre-crisis period minus the minimum quarterly ROA in the crisis period
FORSALE	Percentage of international sales relative to total sales
SEGMENT	Logarithm of number of business segments
CLOSEHELD	Percentage of closely held shares
CROSSLIST	An indicator variable equal to 1 if a firm is cross-listed in one of the major U.S. stock exchanges, and 0 otherwise
INV	Investment expenditure, measured as the sum of capital expenditure, research and development expenses, and asset acquisition, minus sales of property, plants, and equipment.
TQ	Tobin's Q, measured as the sum of the market value of equity and book value of total liabilities, divided by book value of total assets
DIV	An indicator variable equal to 1 if a firm pays dividends, and 0 otherwise
sd_CFO	Standard deviation of cash flows from operating
Big4	An indicator variable equal to 1 if a firm is audited by Big4 auditors, and 0 otherwise
CFSI	Cash flow sensitivity to investment, calculated as the difference between the cash-flow-weighted time-series average investment and the un-weighted arithmetic time-series average investment
ACMEET	Audit committee diligence, computed as the number of audit committee meetings per year
BODMONI	Board monitoring intensity, derived from a factor analysis of the percentage of independent directors and the percentage of female directors
CEOPOWER	CEO power, derived from a combination of CEO tenure and CEO duality
CGcode	An index derived from Jiang et al. (2014), showing the strictness of IAF requirements in corporate governance codes
IAage	The age of IAF derived from CBOK survey
STRATEGY	An indicator variable equal to 1 if survey respondents replied that their IAF is involved in strategic consulting activities, and 0 otherwise.
RISK	An indicator variable equal to 1 if an IAF is extensively involved in risk-management-relevant activities, and 0 otherwise. IAFs are extensively involved in risk management if survey respondents indicated that, among the five risk-management-relevant activities listed in the survey, their IAFs perform at least three activities.

Figure 1: Structure of IAF Quality Measurement Model Based on PLS-PM

This figure presents the structure of the hierarchical measurement model of IAF quality. In the model, the four quality dimensions, i.e. Competence, Independence, Plan_report, and Quality_assure, are treated as the first-order latent variables, and the overall IAF quality, i.e., IAFQ, is treated as the second-order latent variable. Each of the quality dimensions is measured by its respective measurement items and is computed as a linear combination of its respective measurement items. The overall IAF quality is measured by all the measurement items and is computed as a linear combination of all measurement items. As the overall IAF quality is composed by the four quality dimensions, the model also specify four paths linking the four quality dimensions to the overall IAF quality. The model is estimated by Partial Least Squares Path Modeling (PLS-PM) which generates the weights of the measurement items that maximize the sum of correlations among the overall IAF quality and the four quality dimensions. The estimated weights are used to compute the scores for the quality dimensions and the overall IAF quality.

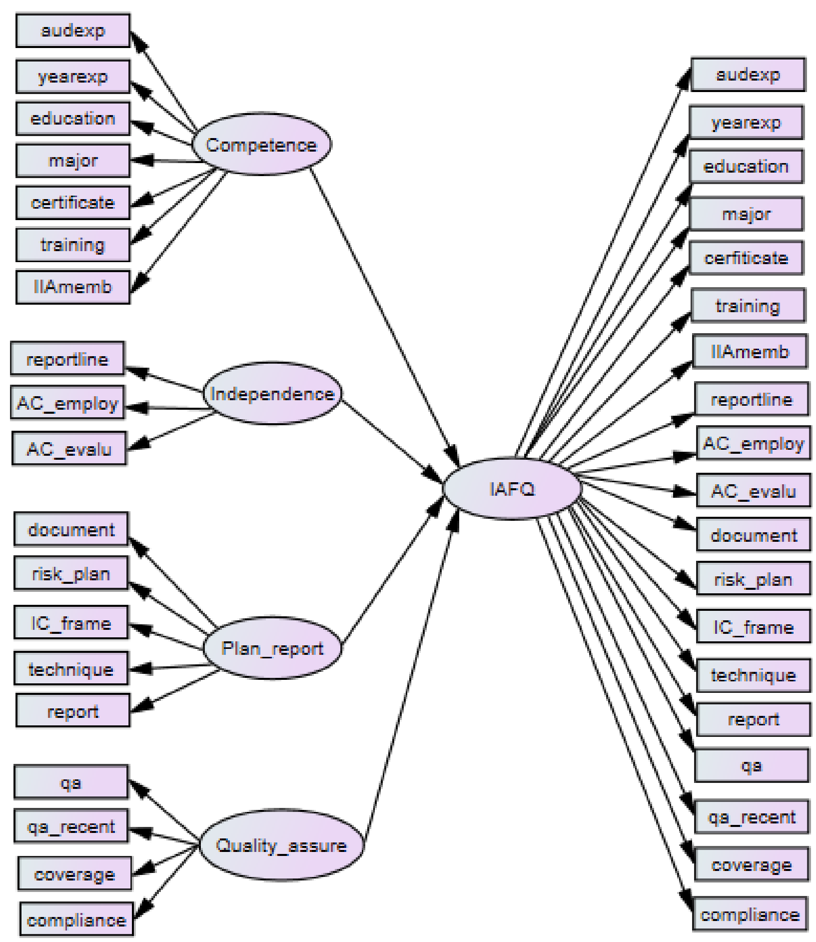

Figure 3: Research Design for Analyzing Performance Recovery

This figure presents the research design for the main analysis of performance recovery. Performance is measured by ROA and the analysis is based on quarterly ROAs. Q1 2006 – Q4 2007 means the pre-crisis period covers quarter 1 of 2006 to quarter 4 of 2007. Q1 2010 – Q4 2012 means the post-crisis recovery period covers quarter 1 of 2010 to quarter 4 of 2012. In the robustness checks, alternative specifications regarding the pre-crisis period, post-crisis recovery period, and measures of performance are used.

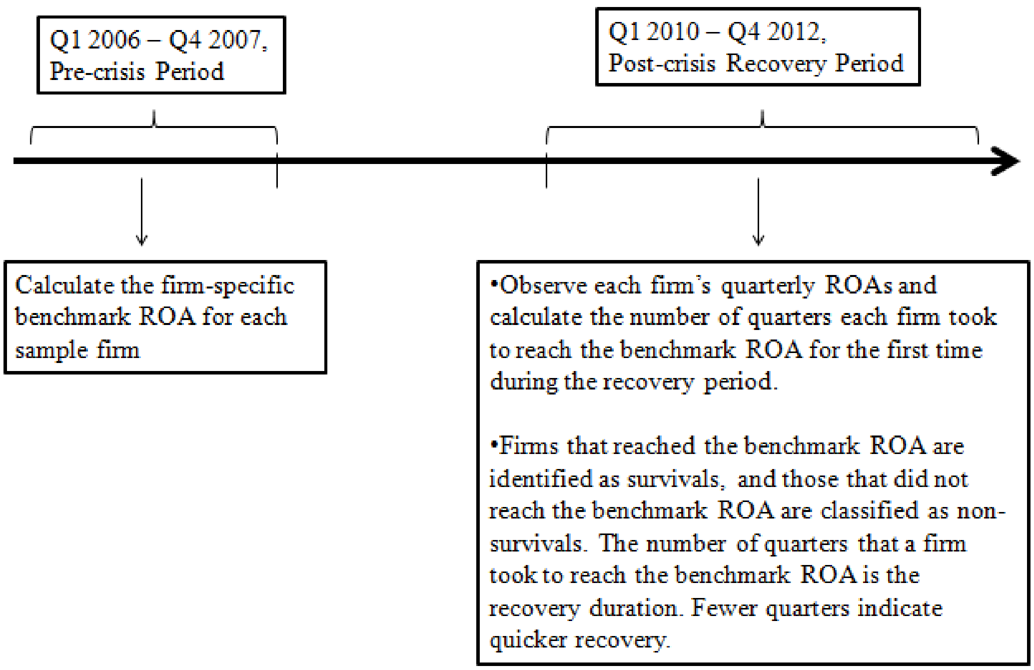

Table 1: Sample Matching and Selection Procedure

This table illustrates the sample matching and selection procedure. DV=INV means that the sample is for the analysis of investment efficiency measured by the sensitivity of investment expenditure to investment opportunity. DV=CFSI means that the sample is for the analysis of investment efficiency measured as the sensitivity of investment to cash flows.

Original survey responses from public listed companies with country identified	5906
Less:	
Responses have missing matching variables	(2929)
Non-CAE responses	(2256)
CBOK CAE responses eligible for matching	**721**
Less:	
Responses not matched with Worldscope firms	(392)
Initial matched sample	**329**
Less:	
Missing values in Cox duration analysis	(22)
Sample for analysis of performance recovery	**307**

Panel Data (2010-2012)	**DV = INV**	**DV=CFSI**
CBOK matched sample	987	987
Less:		
Missing values in investment efficiency analysis	(71)	(78)
Sample for analysis of investment efficiency	**916**	**909**

Table 2: Sample Distribution by Country and Country-level Variable

This table presents the sample distribution by country for the main tests in the paper. The table also shows the country-level variables used in the study. Recovery indicates the sample is for the analysis of performance recovery. DV=INV means the sample is for the analysis of investment efficiency measured by the sensitivity of investment expenditure to investment opportunity. DV=CFSI means that the sample is for the analysis of investment efficiency measured by the sensitivity of investment to cash flows. Note that for recovery analysis cross-sectional data is used, whereas for the analysis of investment efficiency (DV=INV or CFSI), panel data is used, with IAF quality measure being a static measure. The variable Block identifies the regional-economic block that each sample country belongs to. Based on MSCI's indices, sample countries are classified into seven different regional-economic blocks: SD is Asian-Developed, ED is Europe-Developed, AD is America-Developed, SE is Asian-Emerging, EE is Europe-Emerging, ME is Middle-East-Emerging and Africa-Emerging, and AE is America-Emerging. CGcode is a self-constructed index derived from Jiang et al. (2014), which illustrates how strict and detailed the IAF requirements are in countries' corporate governance codes. Values in the CGcode index range from 1 to 5, with higher values indicating stricter and more detailed IAF requirements in the corporate governance codes.

	Sample Distribution			Institutional Variable	
Country	Recovery	DV=INV	DV=CFSI	Block	CGcode
Australia	2	6	6	SD	3
Austria	3	8	7	ED	4
Belgium	3	9	9	ED	4
Brazil	3	9	9	AE	3
Canada	9	27	27	AD	2
Colombia	1	3	3	AE	NA
Denmark	2	6	6	ED	4
Finland	4	12	12	ED	3
France	10	30	30	ED	2
Germany	7	20	19	ED	1
Greece	2	6	6	EE	1
India	2	6	6	SE	2
Ireland	2	6	6	ED	1
Italy	14	42	42	ED	3
Japan	32	96	96	SD	2
Malaysia	7	19	19	SE	5
Mexico	4	12	12	AE	4
Netherlands	4	12	12	ED	4
New Zealand	2	6	6	SD	2
Norway	2	6	6	ED	2
Peru	3	8	8	AE	4
Portugal	4	12	12	ED	1
Singapore	2	6	6	SD	5
South Africa	7	21	21	ME	5
Spain	4	12	12	ED	4
Sweden	2	6	6	ED	4
Switzerland	9	27	27	ED	4

Taiwan	35	105	105	SE	5
Thailand	2	6	6	SE	1
Turkey	4	12	12	ME	2
United Kingdom	7	21	20	ED	4
United States	113	339	335	AD	5
Total	307	916	909		

Table 3: Descriptive Statistics

This table presents the descriptive statistics of the variables used in the analyses. Performance recovery indicates the variables are used for the analysis of performance recovery. DV=INV means that the variables are used for the analysis of investment efficiency measured by the sensitivity of investment expenditure to investment opportunity. DV=CFSI means that the variables are used in the analysis of investment efficiency measured as the sensitivity of investment to cash flows. All continuous variables are winsorized at both top and bottom 1% level.

Variable	N	Mean	Median	SD	Min	Max
Panel A: Performance recovery analysis						
IAFQ	307	59.20	59.60	19.19	5.73	98.95
HIAFQ	307	0.50	0.00	0.50	0.00	1.00
LogAT	307	7.27	7.16	1.91	1.97	13.70
BTM	307	0.86	0.67	0.72	-0.22	4.24
LEV	307	0.17	0.13	0.17	0.00	0.75
CFO	307	0.09	0.08	0.08	-0.20	0.31
chgROA	307	0.06	0.03	0.18	-0.11	2.64
FORSALE	307	0.24	0.04	0.30	0.00	0.98
SEGMENT	307	0.92	1.10	0.71	0.00	2.30
CLOSEHELD	307	0.29	0.24	0.26	0.00	0.93
CROSSLIST	307	0.07	0.00	0.25	0.00	1.00
ACMEET	307	4.47	4.00	2.88	0.00	10.00
BODMONI	307	-0.05	0.00	1.06	-2.05	3.14
CEOPOWER	307	0.38	0.50	0.38	0.00	1.00
Panel B: Investment efficiency analysis DV=INV						
INV	916	0.07	0.04	0.11	-0.53	1.84
HIAFQ	916	0.50	0.00	0.50	0.00	1.00
TQ	916	1.40	1.16	1.21	0.53	30.97
LogAT	916	7.33	7.23	1.92	0.18	13.70
LEV	916	0.23	0.20	0.18	0.00	0.78
CFO	916	0.08	0.07	0.08	-0.20	0.34
DIV	916	0.72	1.00	0.45	0.00	1.00
CLOSEHELD	916	0.28	0.21	0.26	0.00	0.94
sd_CFO	916	0.04	0.03	0.06	0.00	0.79
CROSSLIST	916	0.07	0.00	0.25	0.00	1.00
Big4	916	0.86	1.00	0.35	0.00	1.00
ACMEET	916	4.47	4.00	2.89	0.00	10.00
BODMONI	916	0.00	0.00	1.09	-2.05	3.56
CEOPOWER	916	0.38	0.50	0.39	0.00	1.00
Panel C: Investment efficiency analysis DV=CFSI						
CFSI	909	0.03	0.01	0.17	-1.07	2.36
IAFQ2	909	0.59	0.60	0.19	0.06	0.99
BTM	909	0.84	0.67	0.68	-0.22	4.32
LogAT	909	7.39	7.31	1.92	0.18	13.68
LEV	909	0.16	0.12	0.16	0.00	0.74
CFO	909	0.07	0.07	0.07	-0.20	0.32
DIV	909	0.74	1.00	0.44	0.00	1.00
CLOSEHELD	909	0.27	0.20	0.27	0.00	0.94
sd_CFO	909	0.04	0.03	0.05	0.00	0.52
CROSSLIST	909	0.07	0.00	0.25	0.00	1.00

Big4	909	0.86	1.00	0.35	0.00	1.00
ACMEET	909	4.46	4.00	2.89	0.00	10.00
BODMONI	909	0.00	0.00	1.08	-2.05	3.56
CEOPOWER	909	0.38	0.50	0.39	0.00	1.00

Table 4: Analysis of Performance Recovery

This table presents the results of the Cox duration analysis of performance recovery. Model (1) and (2) show the results for IAFQ and HIAFQ respectively. IAFQ is a continuous IAF quality score ranging from 0 to 100, with higher values indicating better quality IAFs. HIAFQ is an indicator variable for high quality IAFs. All variable definitions are summarized in Appendix B. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering regional-economic blocks. P-value is calculated based on a two-tailed test.*p<0.1 **p<0.05 ***p<0.01

	(1)		(2)	
Variable	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio
Tested Variable				
IAFQ	0.0126***	1.0126		
	(0.0024)			
HIAFQ			0.2366***	1.2669
			(0.0593)	
Control Variable				
LogAT	-0.1179***		-0.0942*	
	(0.0434)		(0.0482)	
BTM	-0.0023		-0.0052	
	(0.0710)		(0.0727)	
LEV	0.1352		0.1483	
	(0.3915)		(0.3334)	
CFO	-1.4111**		-1.4603*	
	(0.7035)		(0.7712)	
chgROA	-0.6586***		-0.6585***	
	(0.1954)		(0.1622)	
FORSALE	0.1474		0.1998	
	(0.1660)		(0.1748)	
SEGMENT	0.2492***		0.2079***	
	(0.0456)		(0.0497)	
CLOSEHELD	0.0289		0.0646	
	(0.3874)		(0.4230)	
CROSSLIST	-0.5000*		-0.5606**	
	(0.2812)		(0.2434)	
ACMEET	0.0026		0.0148	
	(0.0099)		(0.0101)	
BODMONI	0.0036		0.0336	
	(0.0842)		(0.0858)	
CEOPOWER	0.1813		0.1825	
	(0.2249)		(0.2260)	
IndustryFixed	Yes		Yes	
CountryFixed	Yes		Yes	
Chi-squared	1245.19***		1975.03***	
Observations	307		307	

Table 5: Analysis of Investment Efficiency

This table presents the regression results of investment efficiency. Analyses are based on a panel sample from 2010 to 2012. In Model (1), investment efficiency is measured as the sensitivity of investment expenditure (INV) to investment opportunities measured as lagged Tobin's Q (TQ). In Model (2), investment efficiency is measured by the sensitivity of investment to cash flows (CFSI). CFIS is computed as the difference between cash-flow-weighted time-series average investment and un-weighted arithmetic time-series average investment. All variable definitions are summarized in Appendix B. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering firm and year. P-value is calculated based on a one-tailed test for variables with directional predictions.*p<0.1 **p<0.05 ***p<0.01

Variables	Expected Sign	(1) INV	(2) CFSI
Tested Variables			
HIAFQ	?	-0.0114	
		(0.0112)	
TQ	+	0.0061*	
		(0.0039)	
HIAFQ_TQ	+	0.0129**	
		(0.0066)	
IAFQ	-		-0.0988**
			(0.0537)
Control Variables			
LogAT		-0.0008	-0.0005
		(0.0028)	(0.0033)
LEV		-0.0043	0.2723*
		(0.0244)	(0.1460)
CFO		0.2306***	0.0081
		(0.0305)	(0.0846)
DIV		-0.0078	-0.0334**
		(0.0157)	(0.0139)
CLOSEHELD		-0.0003***	-0.0001
		(0.0001)	(0.0003)
sd_CFO		-0.1065*	-0.0375
		(0.0580)	(0.0883)
CROSSLIST		-0.0070	-0.0337
		(0.0075)	(0.0277)
Big4		0.0122	0.0006
		(0.0137)	(0.0154)
ACMEET		0.0006	0.0032
		(0.0015)	(0.0030)
BODMONI		-0.0005	-0.0157
		(0.0053)	(0.0106)
CEOPOWER		0.0037	-0.0344*
		(0.0140)	(0.0189)
BTM			-0.0113
			(0.0090)
Constant		0.0375	0.0983
		(0.0427)	(0.0731)
IndustryFixed		Yes	Yes

CountryFixed	Yes	Yes
F	8.04***	3.34***
Observations	916	909
R-squared	0.1944	0.1531

Table 6: Robustness Tests for Analysis of Performance Recovery

This table presents the results of the sensitivity analysis for the duration analysis of performance recovery. In Model (1), the recovery period is defined to start from the third quarter of 2007 and end at the fourth quarter of 2012. In Model (2), benchmark ROA is calculated on the basis of quarterly ROAs from the first quarter of 2005 to the second quarter of 2008. In Model (3) and (4), performance is measured by ROE and operating ROA instead of ROA, respectively. In Model (5), each firm-quarter is treated as an observation and is included in the sample as long as the ROA of previous firm-quarter has not reached the reference ROA. With this data structure, control variables in Model (5) are updated quarterly or annually if quarterly data is not available. All variable definitions are summarized in Appendix B. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering regional-economic blocks. P-value is calculated based on a two-tailed test.*p<0.1 **p<0.05 ***p<0.01

	(1)	(2)	(3)	(4)	(5)
Variable	Alternative Recovery Period	Alternative Period for Benchmark ROA Calculation	ROE as Performance Measure	Operating ROA as Performance Measure	Panel Data with Time-varying Controls
IAFQ	0.0135***	0.0069**	0.0066**	0.0127**	0.0170***
	(0.0041)	(0.0031)	(0.0033)	(0.0051)	(0.0035)
LogAT	-0.1332***	-0.0771*	-0.0800**	-0.1290***	-0.2015***
	(0.0379)	(0.0466)	(0.0348)	(0.0288)	(0.0412)
BTM	0.0346	-0.0383	0.0231	0.1196	0.0910
	(0.0719)	(0.0613)	(0.0469)	(0.1449)	(0.1930)
LEV	0.1217	-0.0483	0.0548	0.2906	2.2454***
	(0.1819)	(0.4026)	(0.2664)	(0.6035)	(0.2850)
CFO	-0.3556	-0.8959	-0.5110	-0.3138	4.7938***
	(0.7783)	(0.7122)	(0.9438)	(0.9643)	(1.0246)
chgROA	-0.7079***	-0.7098**	-0.5318***	-0.5773*	-0.8114***
	(0.1061)	(0.2914)	(0.1795)	(0.3489)	(0.1940)
FORSALE	0.0528	0.1007	-0.1296	0.2345	-0.0476
	(0.1404)	(0.1502)	(0.1991)	(0.1533)	(0.3514)
SEGMENT	0.1982**	0.1734**	0.2011***	0.3082***	0.4728***
	(0.0969)	(0.0713)	(0.0582)	(0.1070)	(0.1104)
CLOSEHELD	-0.0792	0.0442	0.0189	0.2083	0.8404***
	(0.3777)	(0.3701)	(0.2638)	(0.3531)	(0.1886)
CROSSLIST	-0.4465	-0.1922	-0.3253	0.0654	-1.0813
	(0.3254)	(0.2384)	(0.1995)	(0.1486)	(1.8097)
ACMEET	-0.0264	-0.0075	0.0161	0.0131	0.0194
	(0.0161)	(0.0135)	(0.0112)	(0.0183)	(0.0240)
BODMONI	0.0344	0.0213	-0.0080	-0.1166	0.0708
	(0.0607)	(0.0869)	(0.0763)	(0.1337)	(0.1423)
CEOPOWER	0.2411	0.0621	0.1532	0.0636	0.4965***
	(0.2059)	(0.2113)	(0.2733)	(0.0705)	(0.1030)
IndustryFixed	Yes	Yes	Yes	Yes	Yes
CountryFixed	Yes	Yes	Yes	Yes	Yes
Chi-squared	275.45***	1034.01***	885.87***	10850.52***	4852.78***
Observations	307	307	307	307	1,164

Table 7: Poisson Regression of Recovery Duration

This table presents the results for Poisson regressions of recovery duration. Model (1) presents the results when either IAFQ or HIAFQ is used as the independent variable. Model (2) presents the two-stage Poisson regression, with HIAFQ being the dependent variable in the first-stage regression which is regressed on a set of IAF quality determinants. IAF quality determinants are lagged firm and country-level variables derived from Jiang et al. (2014), which are calculated at the 2008 year-end. Those variables include natural logarithm of total assets (LogAT08), book-to-market ratio (BTM08), percentage of independent directors (Bodinde08), percentage of female directors (Bodfemale08), CEO duality (CEOduality08), the number of audit committee meetings (ACmeet08), and the IAF requirements in countries' corporate governance codes (CGCode). All other variable definitions are summarized in Appendix B. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses. P-value is calculated based on a two-tailed test.*p<0.1 **p<0.05 ***p<0.01

Variable	(1) Poisson Regression of Recovery Duration		(2) Two-stage Poisson Regression	
			First-stage	Second-stage
IAFQ	-0.0146***			
	(0.0020)			
HIAFQ		-0.2646***		-0.7446***
		(0.0666)		(0.2101)
LogAT08			0.1991***	
			(0.0485)	
BTM08			-0.2012*	
			(0.1119)	
Bodinde08			0.1658	
			(0.2900)	
Bodfemale08			0.7765*	
			(0.6528)	
CEOduality08			-0.1121	
			(0.1500)	
ACmeet08			0.0825**	
			(0.0361)	
CGCode			0.2616***	
			(0.0632)	
LogAT	0.1273***	0.0978***		0.1965***
	(0.0208)	(0.0199)		(0.0433)
BTM	-0.0031	-0.0055		-0.0090
	(0.0171)	(0.0170)		(0.0352)
LEV	0.0591	0.0919		0.1388
	(0.1556)	(0.1548)		(0.2957)
CFO	0.8677**	0.9961***		1.2297*
	(0.3423)	(0.3454)		(0.7035)
chgROA	0.3522***	0.3447***		0.3915**
	(0.1134)	(0.1130)		(0.1905)
FORSALE	-0.2652**	-0.2899**		-0.4108*
	(0.1338)	(0.1330)		(0.2336)
SEGMENT	-0.2419***	-0.2107***		-0.2288**

	(0.0499)	(0.0493)		(0.0907)
CLOSEHELD	-0.0840	-0.1482		-0.0844
	(0.1319)	(0.1325)		(0.2549)
CROSSLIST	0.3851**	0.4198**		0.5445
	(0.1688)	(0.1662)		(0.3545)
ACMEET	-0.0041	-0.0119		0.0152
	(0.0124)	(0.0122)		(0.0330)
BODMONI	0.0425	0.0147		0.0661
	(0.0361)	(0.0357)		(0.0796)
CEOPOWER	-0.2603***	-0.2633***		-0.2179
	(0.0765)	(0.0762)		(0.1542)
Constant	-0.0608	-0.6408	-2.8277***	-0.9918
	(0.7533)	(0.7480)	(0.4656)	(0.9516)
IndustryFixed	Yes	Yes		Yes
CountryFixed	Yes	Yes		Yes
Chi-squared	411.80***	373.25***		211.86***
Observations	307	307	307	307

Table 8: Robustness Tests for Investment Efficiency Analysis

This table presents the results of the sensitivity analysis regarding investment efficiency. Model (1) shows the results of the IV regression when the dependent variable is CFSI. CFIS is the sensitivity of investment to cash flows, computed as the difference between cash-flow-weighted time-series average investment and un-weighted arithmetic time-series average investment. The two columns in Model (1) report the first-stage and the second stage results of the IV regression, respectively. Model (2) reports the sensitivity analysis when investment efficiency is measured by the sensitivity of investment expenditure to investment opportunity and investment expenditure is measure by the change of PPE. All variable definitions are summarized in Appendix B. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering firm and year. P-value is calculated based on a one-tailed test for variables with directional predictions.*p<0.1 **p<0.05 ***p<0.01

		(1)		(2)
		IV Regression of CFSI		Alternative Definition of Investment
	Expected	First-stage	Second-stage	
Variable	Sign	IAFQ	CFSI2	ChgPPE
CGcode	+	0.0415***		
		(0.0085)		
IAFage	+	0.0202***		
		(0.0065)		
IAFQ	-		-0.2107**	
			(0.1094)	
HIAFQ	?			-0.0343**
				(0.0225)
TQ	+			0.0110*
				(0.0071)
HIAFQ_TQ	+			0.0224*
				(0.0149)
Control Variables				
BTM		-0.0283*	-0.0268*	
		(0.1524)	(0.0141)	
LogAT		0.0225***	0.0020	-0.0003
		(0.0057)	(0.0043)	(0.0050)
LEV		-0.0042	0.2493*	-0.0495
		(0.0507)	(0.1357)	(0.0538)
CFO		0.0506	0.0298	0.0716
		(0.1030)	(0.0777)	(0.0873)
DIV		-0.02134	-0.0388**	0.0183*
		(0.0193)	(0.0182)	(0.0110)
CLOSEHELD		0.0003	-0.0002	-0.0004**
		(0.0003)	(0.0002)	(0.0002)
sd_CFO		-0.0191	-0.0595	0.2899
		(0.1385)	(0.1314)	(0.2246)
CROSSLIST		0.0009	-0.0256	-0.0330
		(0.0383)	(0.0187)	(0.0366)
Big4		-0.0241	-0.0055	0.0156
		(0.0284)	(0.0216)	(0.0365)
ACMEET		0.0125***	0.0026	-0.0001

	(0.0036)	(0.0027)	(0.0017)
BODMONI	0.0314***	-0.0042	0.0067
	(0.0092)	(0.0099)	(0.0087)
CEOPOWER	-0.0386*	-0.0340**	0.0077
	(0.0198)	(0.0169)	(0.0145)
Constant	0.1892	0.2140**	-0.0258
	(0.0744)	(0.0874)	(0.0646)
IndustryFixed	Yes	Yes	Yes
CountryFixed	No	No	Yes
Observations	903	903	812
R-squared	0.4152	0.0797	0.0921

Diagnosing appropriateness of IV	
F-statistic of excluded instruments:	18.26***
Underidentification test Chi-squared	31.078***
Weak identification test F-statistic	61.923***

Table 9: IAF Activities, IAF Quality, and Performance Recovery

This table presents the results regarding the duration analysis of the relationship between IAF activities, IAF quality, and performance recovery. STRATEGY is an indicator variable equal to 1 if an IAF is involved in strategic consulting activities, and 0 otherwise. RISK is an indicator variable equal to 1 if an IAF is extensively involved in risk-management-relevant activities, and 0 otherwise. Both STRATEGY and RISK are constructed based on the survey questions in CBOK 2010. All variable definitions are summarized in Appendix B. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering regional-economic blocks. P-value is calculated based on a two-tailed test.*p<0.1 **p<0.05 ***p<0.01

	(1)		(2)		(3)	
Variables	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio
IAFQ	0.0114***	1.0114	0.0117***	1.0118	0.0106***	1.1011
	(0.0025)		(0.0026)		(0.0026)	
STRATEGY	0.2337**	1.2632			0.2324**	1.2627
	(0.0951)				(0.0975)	
RISK			0.2016**	1.2243	0.2003**	1.2217
			(0.0875)		(0.0872)	
LogAT	-0.1165***		-0.1251***		-0.1240***	
	(0.0391)		(0.0404)		(0.0361)	
BTM	0.0161		0.0177		0.0359	
	(0.0778)		(0.0731)		(0.0806)	
LEV	0.1172		0.1257		0.1094	
	(0.3664)		(0.4069)		(0.3787)	
CFO	-1.2720*		-1.3534*		-1.2177*	
	(0.7111)		(0.7279)		(0.7319)	
chgROA	-0.6543***		-0.6366***		-0.6275***	
	(0.1876)		(0.2128)		(0.2025)	
FORSALE	0.1879		0.1492		0.1927	
	(0.1387)		(0.1689)		(0.1373)	
SEGMENT	0.2395***		0.2515***		0.2434***	
	(0.0457)		(0.0348)		(0.0403)	
CLOSEHELD	0.0276		0.0387		0.0361	
	(0.3625)		(0.4007)		(0.3779)	
CROSSLIST	-0.4993*		-0.4700*		-0.4669*	
	(0.2723)		(0.2661)		(0.2549)	
ACMEET	0.0023		-0.0001		-0.0007	
	(0.0094)		(0.0100)		(0.0101)	
BODMONI	-0.0017		-0.0014		-0.0063	
	(0.0873)		(0.0840)		(0.0873)	
CEOPOWER	0.1857		0.1435		0.1448	
	(0.2150)		(0.2332)		(0.2211)	
IndustryFixed	Yes		Yes		Yes	
CountryFixed	Yes		Yes		Yes	
Chi-squared	1848.72***		1678.19***		1375.54***	
Observations	307		307		307	

Table 10: Performance Recovery Analysis with Each Quality Dimension

This table shows the Cox duration analysis of performance recovery for each quality dimensions that collectively construct the overall IAF quality. Competence measures the competence of the IAF; Independence measures the independence of the IAF; Plan_report measures the planning and reporting activities of the IAF; Quality_assure measures of the quality assurance and improvement practices of the IAF. Please refer to Appendix A for the measurement of each quality dimension. All variable definitions are summarized in Appendix B. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering regional-economic blocks. P-value is calculated based on a two-tailed test. *p<0.1 **p<0.05 ***p<0.01

Variable	(1)	(2)	(3)	(4)	(5)
Competence	0.0036				0.0026
	(0.0029)				(0.0028)
Independence		0.0047			0.0049
		(0.0038)			(0.0043)
Plan_report			0.0074***		0.0055**
			(0.0028)		(0.0028)
Quality_assure				0.0039***	0.0029**
				(0.0012)	(0.0014)
LogAT	-0.0903**	-0.0839**	-0.1096**	-0.0985*	-0.1160***
	(0.0443)	(0.0397)	(0.0509)	(0.0569)	(0.0398)
BTM	-0.0073	-0.0173	-0.0130	-0.0139	-0.0073
	(0.0789)	(0.0718)	(0.0790)	(0.0762)	(0.0699)
LEV	0.1046	0.1162	0.1486	0.1500	0.1384
	(0.3879)	(0.3427)	(0.3726)	(0.3968)	(0.3862)
CFO	-1.4815*	-1.3998*	-1.4985**	-1.4246**	-1.3816*
	(0.8312)	(0.8506)	(0.7569)	(0.7087)	(0.7095)
chgROA	-0.6860***	-0.5964***	-0.6917***	-0.6113***	-0.6162***
	(0.2067)	(0.1483)	(0.2144)	(0.1819)	(0.2086)
FORSALE	0.1627	0.1853	0.1712	0.2101	0.1509
	(0.2017)	(0.1704)	(0.1752)	(0.1734)	(0.1718)
SEGMENT	0.2133***	0.2067***	0.2311***	0.2119***	0.2492***
	(0.0398)	(0.0448)	(0.0454)	(0.0586)	(0.0393)
CLOSEHELD	0.0757	0.0390	-0.0349	0.0884	-0.0057
	(0.4171)	(0.3653)	(0.4209)	(0.4117)	(0.3490)
CROSSLIST	-0.5521***	-0.6404***	-0.5122**	-0.5343**	-0.5424*
	(0.1943)	(0.2056)	(0.2496)	(0.2464)	(0.3033)
ACMEET	0.0126	0.0120	0.0147	0.0135	0.0016
	(0.0104)	(0.0119)	(0.0106)	(0.0111)	(0.0127)
BODMONI	0.0342	0.0330	0.0078	0.0227	0.0026
	(0.0804)	(0.0936)	(0.0904)	(0.0726)	(0.0941)
CEOPOWER	0.1614	0.1966	0.1745	0.1766	0.1964
	(0.2213)	(0.2146)	(0.2380)	(0.2299)	(0.2147)
IndustryFixed	Yes	Yes	Yes	Yes	Yes
CountryFixed	Yes	Yes	Yes	Yes	Yes
Chi-squared	1048.41***	1194.49***	1458.66***	954.47***	1151.90***
Observations	307	307	307	307	307