DETERMINANTS AND CONSEQUENCES OF INTERNAL AUDIT FUNCTION QUALITY

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Abstract

I develop a new input-based measure of internal audit function (IAF) quality and investigate the factors that incentivize firms to establish a high-quality IAF as well as the economic consequences of a high-quality IAF. To operationalize my empirical analysis, I construct a unique, international archival IAF sample by matching a proprietary global internal auditor survey named CBOK 2010 with public data in the Worldscope database. Based on the International Standards for the Professional Practice of Internal Auditing proposed by the Institute of Internal Auditors, I measure IAF quality by desirable IAF attributes and practices which encompass the IAF's (1) competence, (2) independence, (3) planning and reporting practices, and (4) quality assurance and improvement practices.

Regarding the determinants of IAF quality, I find that the IAF quality is affected by firms' operating environments and features of other governance mechanisms including board monitoring incentives, audit committee diligence, and CEO power. Moreover, firms' incentives for a high-quality IAF are bolstered by strict and detailed IAF requirements in countries' corporate governance codes. Finally, I document that other governance mechanisms, especially the monitoring incentives of directors, play a greater role in influencing the IAF quality when the overall regulatory environment is weak.

Regarding the economic consequences of a high-quality IAF, I first address the role of IAF in providing assurance services in financial reporting and find that IAF quality is positively associated with earnings quality. Considering the increasing involvement of IAF in risk management and strategic initiatives, which leads to an expanded role of IAF in providing consulting services relevant to firms' operations, I further provide evidence supporting that a high-quality IAF matters for firms' operating performance. Specifically, I document that the speed of operating performance recovery after the recent financial crisis is significantly quicker for firms with a high-quality IAF than for firms with a low-quality IAF, and that the IAF quality is positively associated with firms' investment efficiency in the post-financial-crisis period. In addition, I find that the extent to which the IAF is involved in strategic consulting activities has an incremental positive effect on performance recovery, which suggests that providing consulting services is an important way for the IAF to deliver value to firms. However, the benefits from such an expansion of consulting activities comes at a cost in firms with a low-quality IAF, as I find that the IAF's involvement in strategic consulting can impair the IAF's role in providing assurance services and hence negatively affects earnings quality when the IAF quality is low but not when the IAF quality is high. Overall, the findings suggest that if the IAF is expected to deliver value to firms by providing both assurance and consulting services, maintaining an appropriate level of IAF quality is essential.

Keywords: internal audit function, internal audit quality, corporate governance, earnings quality, operating performance, financial crisis, international accounting

Résumé

Je développe ici une nouvelle évaluation de la qualité de la fonction d'audit interne (FAI) basée sur des données d'entrée et j'examine les facteurs qui poussent les entreprises à mettre en place une FAI de haute qualité ainsi que les conséquences économiques d'une FAI de haute qualité. Afin de rendre opérationnelle mon analyse empirique, je crée un échantillon d'archivage de FAI international unique en associant une enquête d'auditeur interne menée au niveau international intitulée CBOK 2010 à des données publiques présentes dans la base de données Worldscope. En me basant sur les Normes Internationales pour la Pratique Professionnelle d'Audit Interne proposées par l'Institut des Auditeurs Internes, je mesure la qualité de la FAI en fonction des attributs et des pratiques de FAI souhaitables qui prennent en compte la compétence (1), l'indépendance (2), les pratiques de reporting et de planification (3), et les pratiques d'amélioration et de vérification de la qualité (4) de la FAI.

En ce qui concerne les facteurs décisifs de la qualité de la FAI, je constate que la qualité de la FAI est affectée par les cadres opérationnels et les caractéristiques d'autres mécanismes de gouvernance des entreprises y compris les mesures incitatives de supervision du conseil d'administration, la diligence du comité d'audit et les pouvoirs du PDG. En outre, les mesures incitatives des entreprises destinées à une FAI de haute qualité sont renforcées par les exigences strictes et détaillées en matière de FAI présentes dans les codes de gouvernance d'entreprise des pays. Enfin, je documente le fait que d'autres mécanismes de gouvernance, en particulier les mesures incitatives de supervision des directeurs, jouent un plus grand rôle pour influencer la qualité de la FAI lorsque le cadre réglementaire dans son ensemble est fragile.

En ce qui concerne les conséquences économiques d'une FAI de haute qualité, j'aborde le rôle que joue la FAI pour fournir des services de vérification en matière de reporting financier et je constate que la qualité de la FAI est associée de manière positive à la qualité des revenus. En prenant en compte l'implication croissante de la FAI dans la gestion du risque et les initiatives stratégiques, qui a pour conséquence le fait que la FAI joue un rôle accru pour fournir des services de consulting appropriés aux opérations des entreprises, je fournis en outre les preuves qu'une FAI de haute qualité est importante pour la performance opérationnelle des entreprises. Je documente de manière spécifique le fait que la vitesse de reprise de la performance opérationnelle suite à la crise financière récente est considérablement plus rapide pour les entreprises qui bénéficient d'une FAI de haute qualité que pour les entreprises dont la FAI est de mauvaise qualité, et que la qualité de la FAI est associée de manière positive à la bonne capacité d'investissement des entreprises au cours de la période post-crise financière. De plus, je constate que le degré d'implication de la FAI dans les activités de consulting stratégique a un effet positif incrémentiel sur la reprise de la performance, ce qui suggère que fournir des services de consulting est une façon importante pour la FAI de procurer de la valeur aux entreprises. Les bénéfices d'une telle expansion des activités de consulting ont cependant un coût pour les entreprises dont la FAI est de mauvaise qualité, car je

constate que l'implication de la FAI dans le consulting stratégique peut nuire au rôle que joue la FAI pour fournir des services de vérification et par conséquent affecter de manière négative la qualité des revenus lorsque la qualité de la FAI est mauvaise mais non pas lorsque la qualité de la FAI est bonne. De manière générale, ces constatations suggèrent que si l'on s'attend à ce que la FAI procure de la valeur aux entreprises en fournissant à la fois des services de vérification et de consulting, il est alors essentiel de maintenir un niveau de qualité de FAI adéquat.

Mots-clés: la fonction d'audit interne, la qualité d'audit interne, la gouvernance d'entreprise, la qualité des revenus, la performance opérationnelle, la crise financière, comptabilité internationale

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List of Acronyms

CAE	Chief Audit Executive
CBOK	Common Body of Knowledge
CEO	Chief Executive Officer
CG	Corporate Governance
COSO	Committee of Sponsoring Organizations of the Treadway Commission
ECGI	European Corporate Governance Institute
FASB	Financial Accounting Standards Board
GAIN	The Global Audit Information Network
IAASB	International Auditing and Assurance Standards Board
IAF	Internal Audit Function
IASB	International Accounting Standards Board
IIA	The Institute of Internal Auditors
IIARF	The Institute of Internal Auditors Research Foundation
ICRMS	Internal Control and Risk Management System
IPPF	International Professional Practice Framework from IIA
ISA	International Standard on Auditing
NYSE	New York Stock Exchange
PCAOB	Public Company Accounting Oversight Board
PLS-PM	Partial Least Squares Path Modeling
SEC	U.S. Securities and Exchange Commission
SOX	Sarbanes-Oxley Act of 2002

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General Introduction

1. Introduction

More than one decade ago, high-profile financial scandals, such as Enron and WorldCom, shook the corporate governance to its core and stimulated serious criticisms of corporate governance practices worldwide. Those scandals led the passage of the Sarbanes-Oxley Act of 2002 (hereafter, SOX) in the U.S. and similar regulations in other countries, which in turn acted as an impetus for the rapid and significant development of internal audit function (IAF) in organizations. Consequently, enjoying a level of prominence and attention unlike ever before (Carcello et al., 2005b), the IAF has established its position within the corporate governance field (Gramling et al., 2004), especially in the area of internal control over financial reporting (Lin et al., 2011; Prawitt et al., 2009).

However, the role of IAF in corporate governance has never stopped evolving, since stakeholders continue to raise their expectations. New demands from directors and managers require IAF to refocus efforts beyond regulatory compliance issues so as to expand its historical role on value preservation to value creation (KPMG, 2009). In order to meet the rising expectations, internal auditors accordingly extend their involvement in performance-relevant activities, such as consultancy in operations and strategies (PricewaterhouseCoopers, 2009).

Recently, the financial crisis has again raised the doubts and criticisms about the value and relevance of IAF in corporate governance, as directors and managers were questioning what the IAF can bring to the companies. Facing the criticisms, some researchers suspect that the IAF is probably over-promising and under-delivering (Lenz and Sarens, 2012), and therefore propose that the IAF should refocus on providing assurance services rather than expanding its consulting activities.

However, even though the expectation of IAF to render both assurance and consulting services is challenging, given the potential tension between the board and management, is the IAF indeed over-promising and under-delivering? Answering this question is not straight forward. Regardless of the emerging criticisms, IAF has demonstrated its importance in various aspects of corporate activities in and after the financial crisis, through both assurance and consulting activities. For example, in 2014, the first whistleblower reward was made by the U.S. Securities and Exchange Commission (SEC) to a person with internal audit and compliance background (SEC, 2014). Recent surveys also support internal auditors' agility as a profession by realigning coverage to address organizations' operational needs, such as cost reduction after the crisis (KPMG, 2015).

So, what is missing in the debate with respect to the value and relevance of IAF in corporate governance? Surprisingly, although it is not new to mention that having an IAF is different from having a high-quality and value-delivering IAF (Gramling et al., 2004; Prawitt et al., 2009), IAF quality and its impact on the IAF's role in corporate governance have been largely neglected. Stakeholders value IAF more when it is perceived as a "trusted advisor" rather than a pure "assurance provider" (PricewaterhouseCoopers, 2014), but there is a lack of knowledge with respect to what constitute a "trusted advisor" and how companies benefit from having a "trusted advisor". My entire dissertation is developed to shed light on this critical issue by addressing the importance of IAF quality in enabling the IAF to fulfill its role as a "trusted advisor" in companies.

The remaining of the general introduction is organized as follows. I elaborate the research motivations in section 2, and provide background information about the role of IAF corporate governance in section 3. Then, I present main research

questions and the overall structure of dissertation in section 4, followed by a discussion about research methods, data, and IAF quality measure in section 5. Finally, I conclude the general introduction with main research findings in section 6.

2. Research Motivations

Although IAF has been identified as an important part of corporate governance, research on the IAF is still in its infancy (DeFond and Zhang, 2014). The imbalance between the significant development of IAF in companies and the lack of research in this area motivates me to study the IAF in my dissertation so as to advance the current knowledge with respect to the role of IAF in corporate governance. The reasons for choosing IAF quality in particular as the key subject matter in my dissertation are threefold. First, the increasing prevalence and the enhanced status of IAF in companies imply that research on the IAF needs to investigate the variation of IAF quality in a more holistic manner, rather than merely studying the existence or single characteristics of the IAF. Second, the recent criticisms and debate about the added value of IAF in companies entail a need for research that can help clarify the role of IAF in organizations. Third, although it is well recognized in the literature that maintaining an appropriate level of quality is essential for the IAF to realize its role as a value-adding corporate governance mechanism, IAF quality is largely neglected in the recent debate and empirical evidence in this regard is lacking. In the following subsections, I elaborate each of the three points with more details.

2.1 Increasing Prevalence and Enhanced Status of IAF

IAF is prevalent in today's business world. According to the website of the Institute of Internal Auditors (IIA) which is the world-leading professional

association of internal auditors, the IIA now has over 180,000 members from more than 190 countries. Compared to the perceived low status of internal auditors in the past, the Chief Audit Executive (CAE) is now a top position in companies who lead the internal audit team to provide assurance and consulting services in various corporate activities.

The increasing prevalence and enhanced status of IAF worldwide can be attributable to several reasons. The first important reason is the regulatory push for better corporate governance after the high-profile financial scandals in the early 2000s. For instance, although IAF still remains as a voluntary governance mechanism in most countries and stock exchanges, in the U.S. setting, the New York Stock Exchange (NYSE) has required all listed companies to establish an IAF since 2004.

In parallel to the regulatory push, the increasing global competition also contributes to the development of IAF. Managers and directors now have greater demand for timely, reliable, and relevant information for decision making. Such increased information demand makes them turn to the IAF for improvement of risk management, reengineering of internal control structures and processes, and greater accountability so that the corporation could stay competitive in the markets.

2.2 Recent Debate about the Added Value of IAF

Despite the increasing prevalence and enhanced status of IAF, there has been an emergence of doubts and criticisms about the IAF in and after the recent financial crisis. The criticisms mainly come from directors and top managers who began questioning the added value of IAF. For example, according to KPMG (2009), only 26 percent of the audit committee members in a sample of U.S. listed companies

were very satisfied with the internal audit services and many believed that their IAFs could be delivering greater value to the companies.

Such an emergence of doubts can be partly attributable to the lack of clear conveyance of the added value of IAF in companies. When the IAF is positioned as an agent providing assurance services to the directors and, at the same time, as a partner offering advisory services to the top management, it is very likely that directors and managers do not have a shared vision of the value expected to be delivered by the IAF. Because of such ambiguity, the internal audit profession is now facing the threat of being marginalized in the current governance debate, as the role of IAF is largely kept silent when governance stakeholders seek solutions after the recent financial crisis. For example, although Richard Chambers, President and CEO of the IIA, emphasized the importance of IAF in corporate governance in his response letter to SEC which solicited comments for "Enhanced disclosures about risk, compensation and corporate governance" (Chambers, 2009), the final version of the regulation did not mention the IAF at all. The risk of marginalizing IAF in the corporate governance also exists in the non-US setting. An example is the Walker Report (2009) in the U.K. which fails to reference the IAF in any of the 39 recommendations that are expected to improve corporate governance in the U.K. banks.

2.3 The Importance of IAF Quality

The co-occurrence of the significant development of IAF in companies and the recent debate about the added value of IAF signals that more research is needed to clarify the role of IAF in corporate governance. Although IAF is prevalent in companies nowadays, regulations seldom specify the nature of the IAF or address the effectiveness of IAF (Carcello et al., 2005a). In a similar vein, the IAF quality has

not been given much attention in the recent debate, although it is well recognized that having an IAF is not the same as having a high-quality and effective IAF (Davidson et al., 2005; Prawitt et al., 2009).

Notwithstanding, the quality of IAF is essential for the IAF to deliver value in companies. Gramling et al. (2004) argue that, although the IAF is an indispensable component of the corporate governance structure, it should possess an appropriate level of quality in order to realize its role as a valuable resource to other key governance parties. Empirical studies also support the importance of developing a high-quality IAF rather than merely putting an IAF in place. For instance, while Davidson et al. (2005) find no evidence that the presence (versus absence) of an IAF is related to less earnings management, Prawitt et al. (2009) and Ege (2014) document that a high-quality IAF (versus a low-quality IAF) can deter earnings manipulations and management misconduct.

Although IAF quality is important, the unobservable nature of IAF quality imposes challenges to researchers who want to define and measure this construct. Most previous papers thus focus less on the quality of IAFs and more on their existence, size, and budget (e.g., Wallace and Kreutzfeldt, 1991; Carcello et al., 2005a; Carcello et al., 2005b; Barua et al., 2010; Sarens and Abdolmohammadi, 2011; Anderson et al., 2012). Although a few recent studies (e.g., Prawitt et al., 2009; Lin et al., 2011; Ege, 2014) begin to tackle the issues related to the IAF quality, those studies mainly address the IAF's role in improving internal control over financial reporting.

To advance our current knowledge regarding the role of IAF in corporate governance, I therefore identify that research needs to investigate the variation of IAF quality in a holistic manner and to address the inter-relationships between IAF

and other corporate governance mechanisms closely related to the IAF. Furthermore, given the extensive involvement of IAF in various corporate activities beyond financial reporting in today's business world, research on the consequences of having a high quality IAF should not be constrained in financial reporting but extends to other corporate activities such as operations.

3. IAF's Role in Corporate Governance

3.1 Theoretical Background: Agency Conflicts and Corporate Governance

In modern corporations, agency conflicts arise because of the separation between ownership and control, the conflicting interests of owners and managers, and the information asymmetry between owners and managers (Coase, 1937; Jensen and Mechling, 1976; Fama and Jensen, 1983). Corporate governance mechanisms are put in place to mitigate the agency conflicts and the associated agency costs (Dey, 2008). Although there is no consensus of the definition of corporate governance, the most commonly recognized one is from Shleifer and Vishny (1997) who define corporate governance as the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment. More recently, Larcker et al. (2007: p964) posit that corporate governance "refers to the set of mechanisms that influence the decision made by managers when there is a separation of ownership and control".

Theoretically, the demand for monitoring and governance in companies comes from two aspects. On the one hand, suppliers of finance want to reduce the costs associated with moral hazard and can do so by (1) realigning manager's incentives through contracting (e.g., stock options in managers' compensation schemes), and (2) establishing third-party monitoring mechanisms (e.g., establishing an independent

board of directors and hiring high quality external auditors). On the other hand, since outside investors, when making investment decisions, will bid down the firm price as the assessed expropriation risk increases due to the lack of effective governance structure, managers and insiders also have incentives to establish better monitoring mechanisms to restrain their opportunistic behavior so that the costs of raising external capital can be reduced.

The agency conflicts, combined with the inability to costlesssly write perfect contracts to monitor the managers, spawned a voluminous body of research on corporate governance. Gillan (2006) classifies the corporate governance mechanisms that have been most extensively studied into internal governance mechanisms and external governance mechanisms. The internal governance mechanisms mainly include the board of directors, managerial incentives, capital structure, bylaws and charters, and internal control systems, whereas the external governance mechanisms encompass the external market for corporate control and the legal system.

Findings in the existing corporate governance literature are abundant but inconclusive. Collectively, prior studies document that the variation in corporate governance structures can be explained by firm, industry, and country factors (e.g., La Porta et al., 2000; Licht et al., 2005; Dey, 2008; Fan et al., 2011), that one particular governance mechanism can be affected by other governance mechanisms (e.g., Klein, 2002; Larcker and Richardson, 2004), and that firm performance and value are influenced by corporate governance (e.g., Gomper et al., 2003; Larcker et al., 2007). However, regarding the inter-relationships among different governance mechanisms, existing literature is inconsistent in that it is still not clear whether and under what circumstances different corporate governance mechanisms act as complements or substitutes (Armstrong et al., 2010).

3.2 IAF 's Role in Corporate Governance

IAF is one of the important internal corporate governance mechanisms. The IIA define 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). In practice, the IAF is indeed involved in diversified corporate activities which are summarized in Figure 1. In the figure, the activities commonly performed by the IAF are characterized into two dimensions. The vertical dimension indicates that the activities performed by the IAF can be assurance-oriented or advisory-oriented, and the horizontal dimension indicates that the activities can be more relevant to compliance or to operations.

The traditional role of IAF mainly focuses on providing assurance in compliance, such as tax compliance, audit of financial reporting, and fraud detection. In the early stage of development, the IAF was perceived as a closely related extension of the work of external auditors (Moeller and Witt, 1999). Nowadays, the IAF takes responsibilities over a wide range of activities including compliance audit, audits of transaction cycles, investigation of fraud and other irregularities, evaluation of operational efficiency, and analysis of operational- and organizational-wide risks (Ramamoorti, 2003). Although assurance services still compose a large portion of the IAF's mandate, the advisory services related to operations and strategies have become increasingly important in recent years. For example, PricewaterhouseCoopers (2009) indicates that strategic, business, and operational risk categories are the fastest-growing areas of the focus of IAFs in recent years. There has also been a move worldwide that internal auditors provide consulting

services for enterprise risk management (Sarens and De Beelde, 2006), especially after the Committee of Sponsoring Organizations of the Treadway Commission (COSO) issued its Integrated Framework of Enterprise Risk Management (COSO, 2004). According to COSO (2013), all activities within an organization are potentially within the scope of internal auditor's responsibility.

Along with the significant development of IAF, research on IAF and related areas is growing considerably. One stream of literature closely related to the IAF is internal control. Prior evidence generally supports that a better IAF increases the quality of internal control over financial reporting (Lin et al., 2011) which in turn matters for firms' financial reporting quality (e.g., Doyle et al., 2007; Ashbaugh-Skaife et al., 2008; Van de Poel and Vanstraelen, 2011). Moreover, a high-quality IAF itself is associated with less earnings management (Prawitt et al., 2009) and can prevent fraud from occurring (Ege, 2014). In addition, when investigating the relationship between internal audit and external audit, researchers find that the IAF can be a determinant of external audit fees (e.g., Felix et al., 2001; Hay et al., 2006; Messier et al. 2011) and that a high-quality IAF decreases external audit delay (Pizzini et al., 2014). Finally, studies examining the inter-relationships among different corporate governance mechanisms document that audit committees can play an important role in the development of IAF (e.g., Carcello et al., 2005a; Piot and Kermiche, 2009; Barua et al., 2010).

4. Research Questions and Structure of Dissertation

To address the role of a high-quality IAF in corporate governance, I attempt to answer three main research questions in the dissertation: (1) what is a high-quality IAF and how to measure it, (2) what are the factors that incentivize firms to establish

a high-quality IAF, and (3) what are the economic consequences of having a high-quality IAF.

Figure 2 depicts the overall structure of the dissertation. As shown in the figure, the entire dissertation consists of three chapters. In the first chapter, I endeavor to develop a new measurement model of IAF quality based on the IAF's characteristics and practices. Then, I explore firm- and country-level factors that influence the IAF quality.

In the second and third chapters, I investigate the economic consequences of having a high-quality IAF. I focus on the IAF's traditional role in providing assurance services in financial reporting in the second chapter, and accordingly test whether IAF quality is positively associated with firms' earnings quality. Moreover, I examine whether the nature of IAF activities (financial reporting focused or strategic consulting oriented) influences earnings quality in addition to the effect of IAF quality, and whether the nature of IAF activities moderates the association between IAF quality and earnings quality. I perform this extended analysis in order to address the recent public concern that expanding the IAF activities into strategic consulting could potentially negatively affect the IAF's role in providing assurance activities, because such expansion may distract the IAF's resources from assurance activities and impair internal auditors' objectivity.

Taking into account the increasingly important role of IAF in providing advisory services related to firms' operations and strategies, I further explore the potential relation between IAF quality and firms' operating performance in the third chapter. Specifically, I employ the recent post-financial-crisis period as the research setting and examine whether having a high-quality IAF positively influences firms' operating performance recovery after the recent financial crisis. In addition, I

investigate the potential channels through which a high-quality IAF can contribute to firms' performance recovery.

5. Research Method, Data, and IAF Quality Measure

5.1 Research Method

I use quantitative research methods to perform empirical analysis in the dissertation. Quantitative research is a means for "testing objective theories by examining the relationship among variables. Those variables, in turn, can be measured so that numbered data can be analyzed using statistical procedures" (Creswell, 2009: p4). I choose quantitative research methods because the goal of the dissertation is to investigate the relationships between my key variable of interest, i.e., IAF quality, and the other variables pertaining to either the factors that can affect the IAF quality or the economic consequences that are affected by the IAF quality.

In my dissertation, I seek to develop relevant statements that can serve to explain the role of IAF in corporate governance. To this end, I adopt the reductionistic approach, attempting to reduce the general idea, i.e., the role of high-quality IAF in corporate governance, into small, discrete set of ideas that can be tested, i.e., the factors influencing IAF quality and the corporate behaviors influenced by a high-quality IAF. I follow the standardized, conventional procedure in the quantitative research when developing and structuring each chapter of my dissertation. Specifically, for each research question investigated, I first derive a set of hypotheses from theories, prior studies, and real-world antecedents. I then collect data and construct samples which can be used for empirical analysis. Finally I use various statistical procedures, such as regression models, to analyze the data to see if the hypotheses are confirmed or rejected.

5.2 Data and Sample

The IAF data used in my dissertation comes from a global internal auditor survey named CBOK 2010. CBOK stands for Common Body of Knowledge which consists of several global internal auditor surveys conducted by the IIA. I use CBOK 2010 which is the most recent one. To operationalize my empirical analysis, I match the proprietary data in CBOK 2010 with public data in Worldscope database, constructing a unique international archival IAF sample. More specifically, I merge the survey responses with the public firms in Worldscope by matching firms' 2009 year-end total assets and total sales, country, industry, and the domain names of firms' websites with relevant information provided by the CBOK survey respondents. 329 uniquely matched firms are retained in the sample. I then download financial data of the matched firms from Worldscope. For data related to the characteristics of board of directors, audit committees, and CEOs, I manually collect it from firms' annual reports or proxy statements. Depending on the empirical models and the corresponding data requirements, the sample size varies slightly across the three chapters. Detailed information with respect to the sample selection procedure is presented respectively in each chapter.

5.3 IAF Quality Measure

In developing the IAF quality measurement model, I follow the International Standards for the Professional Practice of Internal Auditing (IIA, 2012; hereafter the "Standards") and synthesize prior studies (e.g., Prawitt et al., 2009; Lin et al., 2011; Lenz et al., 2013). I define that IAF quality is composed of four quality dimensions: competence, independence, structured and risk-based planning and reporting practices, and regular quality assurance and improvement practices. Corresponding

measurement items are selected from the survey questions. Appendix A presents the definition of each quality dimension, the measurement items of each quality dimension, and the data source (i.e., the survey question number) of each measurement item in the CBOK 2010.

In order to compute the scores for the quality dimensions as well as to form a composite score of the overall IAF quality, I use two methods to aggregate the measurement items. In the first method, I take the average of the measurement items of a quality dimension as the score for that quality dimension, and subsequently treat the mean of the four quality dimensions as the score for the overall IAF quality (i.e., equal-weighting approach). In the second method, I develop a hierarchical measurement model of IAF quality and use Partial Least Squares Path Modeling (PLS-PM) to estimate the model (i.e., PLS-PM approach). The structure of the hierarchical measurement model of IAF quality is depicted in Figure 3. In the model, the quality dimensions are treated as the first-order latent variables and the overall IAF quality is specified as the second-order latent variable. The outer part of the model indicates that each quality dimension is measured by its respective measurement items and the overall IAF quality is measured by all measurement items. The inner part of the model specifies the structural paths, which demonstrate that the overall IAF quality is equal to a linear combination of the four quality dimensions. PLS-PM estimation process generates the weights of the measurement items that maximize the sum of correlations between the overall IAF quality and the quality dimensions. Those estimated weights are then used to calculate the scores of the quality dimensions and the overall IAF quality. Since the PLS-PM approach avoids arbitrarily assigning equal weights to the measurement items and takes into account the potential correlations among quality dimensions, this approach is more

statistically sound than the equal-weighting approach. As a result, I use the IAF quality score obtained from the PLS-PM approach in the main analysis. Nevertheless, my results remain unchanged if I use the IAF quality score derived from the equal-weighting approach.

6. Key Research Findings

Based on the IAF quality scores obtained from the IAF quality measurement model, I find that IAF quality is positively affected by firms' operating complexity and growth opportunities. In addition, IAF quality is influenced by the features of other governance mechanisms, including the board of directors, audit committee, and top management which are identified as the other three corporate governance cornerstones besides the IAF in the corporate governance framework put forth by the IIA (IIA, 2005). Specifically, IAF quality is positively associated with board monitoring incentives and audit committee diligence, but negatively related to CEO power. Such result implies that the relationships between IAF quality and other governance mechanisms can be complementary or substitutive. Moreover, the monitoring incentives of directors actually play a greater role in improving the IAF quality when the overall regulatory environment is of low quality, suggesting that private incentives matter more in influencing the IAF quality when the institutional environment is relatively weak.

Besides the firm-level factors, I also document that firms' incentives for establishing a high-quality IAF are influenced by the institutional environment in which the firms operate. In particular, in addition to countries' financial market development and quality of regulatory environment, which have been documented in the prior literature to influence firms' corporate governance structure, I find that

firms' incentives for a high-quality IAF are reinforced if the country's corporate governance code outlines strict and detailed IAF requirements.

Having a high-quality IAF is associated with significant economic consequences. Pertaining to the traditional role of IAF in providing assurance services in financial reporting, I find that IAF quality is associated with various earnings quality attributes, including less smoothed earnings, more predictable earnings, earnings with better accruals quality, and a composite measure of earnings quality which aggregates individual earnings attributes. Such result confirms that a high-quality IAF is important for firms' financial reporting quality. Additional analysis shows that, among the four quality dimensions, the IAF's independence and quality assurance and improvement practices are relatively more important in maintaining high-quality earnings.

Regarding the nature of IAF activities, I find that, when the IAF quality is controlled for, the financial reporting focus of an IAF does not have an incremental positive impact on earnings quality. Similarly, the financial reporting focus of the IAF does not reinforce the positive association between IAF quality and earnings quality either. In contrast, the IAF's involvement in strategic advisory activities does have a negative impact on earnings quality when the IAF quality is low. However, such negative effect is alleviated by the IAF quality and disappears when the IAF quality is high. This result implies that when the IAF quality is low, IAF's involvement in strategic consulting can be problematic, because it can distract internal auditors' resources from assurance activities and impair internal auditors' objectivity when they work too closely with the management. Nevertheless, a high-quality IAF is less prone to such problems and hence its assurance service quality is not affected by its involvement in strategic consulting activities. Furthermore, I

document that the positive relation between IAF quality and earnings quality is more pronounced when the IAF undertakes strategic consulting activities, which articulates the importance of IAF quality in maintaining financial reporting quality when a high-quality IAF is most needed.

In addition to the importance of IAF quality in realizing the IAF's traditional role in providing assurance in financial reporting, I find that the IAF quality matters for firms' operational activities. Specifically, I document that firms with a high-quality IAF were more likely to recover and indeed recovered faster after the recent financial crisis than firms with a low-quality IAF, where performance recovery is defined as reaching a firm-specific performance benchmark calculated in the pre-financial-crisis period. In addition, when I decompose the overall IAF quality and test the relative importance of the four quality dimensions on performance recovery, I reveal that it is the process through which the internal audit is conducted, i.e., the IAF's planning and reporting activities as well as the quality assurance and improvement programs, that drives the results. Furthermore, I find that the IAF quality has a significant positive relation to firms' investment efficiency in the post-financial-crisis period, which could be one of the reasons why firms with a high-quality IAF recovered faster after the financial crisis.

The impact of IAF on firms' operating performance recovery may rely on both the IAF quality and the relevance of IAF activities to firms' operations. To shed light on this issue, I extend my analysis to include IAF activities, with the purpose to examine whether IAFs that are extensively involved in risk management or strategic consulting could have an incremental positive effect on firms' performance recovery. Empirical results confirm that, when the IAF quality is controlled for, the extent to

which the IAF is involved in risk management and strategic consulting activities has an incremental positive impact on performance recovery.

In sum, the findings with respect to the economic consequences of a high-quality IAF suggest that both assurance and consulting services are important for the IAF to deliver value to companies. However, only a high-quality IAF can resist capacity and objectivity issues when performing strategic consulting activities. As a result, if the IAF is expected to act as a "trusted advisor" that provides both assurance and consulting services, maintaining an appropriate level of IAF quality is crucial for the IAF to fulfill its role as a "trusted advisor" that delivers value to companies.

Chapter I

Determinants of Internal Audit Function Quality:
An International Study

Abstract: In this paper I explore firm- and country-level factors that influence the quality of IAF. Relying on a unique international archival IAF sample derived from matching a proprietary global internal auditor survey with public data in the Worldscope database, I first develop a new, input-based measure of IAF quality that incorporates desirable IAF attributes and practices. Based on this measure, I find that IAF quality is positively associated with a firm's operating complexity and growth opportunities. In addition, IAF quality is positively related to board monitoring incentives and audit committee diligence, but is negatively related to CEO power. Moreover, the monitoring incentives of directors actually play a greater role in improving the IAF quality when the overall regulatory environment is weak. Finally, with respect to the country-level factor, I find that the IAF quality is significantly higher for firms in countries with strict and detailed IAF requirements in the corporate governance codes.

Keywords: internal audit function; internal audit quality; corporate governance; international accounting.

1. Introduction

In this paper, I explore firm- and country-level factors that influence firms' incentives to establish a high-quality IAF. The study is motivated by the increased prevalence of internal audit and the enhanced status of IAF in companies in recent years, both of which were prompted, at least in part, by the worldwide regulatory push for better corporate governance in the wake of the major financial scandals in the early 2000s. For example, in the U.S. setting, companies listed on NYSE have been mandated to have an IAF since 2004, and the NASDAQ stock exchange is considering adopting a similar rule (SEC, 2013). In the non-US settings, although the IAF remains largely voluntary, the corporate governance codes of many countries recommend the establishment of an IAF as a best practice (e.g., Denmark, Switzerland, and Sweden) or even require that publicly listed companies have an IAF (e.g., Malaysia and Taiwan).

Despite the worldwide prevalence of internal auditing, previous research on the IAF has been mainly conducted in single country settings (e.g., Carey et al., 2000, Davison et al., 2005, and Goodwin and Kent, 2006 for Australia; Felix et al., 2001, Carcello et al., 2005a, Carcello et al., 2005b, Abbott et al., 2007, Prawitt et al., 2009, Barua et al., 2010, Lin et al., 2011, and Anderson et al. 2012 for the U.S.; Zain et al., 2006 for Malaysia; Sarens and Abdolmohammadi, 2011 for Belgium). Most of this literature focuses less on the quality of IAFs and more on their existence, size, and budget, which are found to be influenced by a variety of firm characteristics such as size, industry, and profitability (Wallace and Kreutzfeldt, 1991; Carcello et al., 2005a; Carcello et al., 2005b; Barua et al., 2010; Sarens and Abdolmohammadi, 2011; Anderson et al., 2012). I extend prior literature by exploring to what extent firms'

incentives for a high-quality IAF are influenced by both firm and institutional characteristics.

I measure IAF quality using proprietary global internal auditor survey data in the Common Body of Knowledge (CBOK) 2010, which is produced by the IIA. Guided by the Standards (IIA, 2012) as well as prior studies (e.g., Prawitt et al., 2009; Lin et al., 2011; Lenz et al., 2014), I define that the overall IAF quality is composed by four quality dimensions related to the IAF's (1) competence, (2) independence, (3) planning and reporting practices, and (4) quality assurance and improvement practices, and accordingly select measurement items from the CBOK 2010 survey questions. To compute a composite score of the overall IAF quality for each sample firm, I employ two methods to aggregate the measurement items. In the first method, I calculate the average value of the measurement items of each quality dimension and then 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 PLS-PM to estimate a hierarchical model of the IAF quality in which the quality dimensions are treated as the first-order latent variables and the overall IAF quality is treated as the second-order latent variable (i.e., the PLS-PM approach). Instead of arbitrarily assigning equal weights to the measurement items, the PLS-PM estimation process generates the weights of the measurement items that maximize the sum of correlations between the quality dimensions and the overall IAF quality. The estimated weights are then used to compute the scores of the quality dimensions as well as the overall IAF quality.

I match the CBOK survey data with public data from Worldscope in order to operationalize our empirical analysis. I explore both the firm-level and country-level factors that influence firms' incentives to establish a high-quality IAF. For firm-level

factors, I focus on two sets of variables pertaining to either the characteristics of firms' operating environments or the features of other governance mechanisms. For country-level factor, I self-construct an index which indicates the intensity of IAF requirements in countries' corporate governance codes and test whether such requirements have an impact on the IAF quality.

I find that IAF quality is positively associated with firms' operating complexity and growth opportunities, suggesting that a firm's IAF quality is developed as a response to the firm's operating environment. Regarding the features of other corporate governance mechanisms, I concentrate our analysis on the characteristics of board of directors, audit committee, and top management, because these governance mechanisms are positioned as the other three corporate governance cornerstones besides the IAF in the corporate governance framework proposed by the IIA (IIA, 2005). Gramling et al. (2004) claim that the four corporate governance cornerstones are likely to influence each other, and call for more research to examine the relationships between the IAF and the other three corporate governance cornerstones. As a response, I indeed document that IAF quality is positively related to board monitoring intensives and audit committee diligence, but negatively related to CEO power. Such results suggest that, on the one hand, IAF quality is reinforced by directors with high incentives to monitor, but on the other hand, IAF quality is affected by the bargaining between the board and top management (Hermalin and Weisbach, 1998). Taken together, I provide evidence that the other three corporate governance cornerstones indentified in the IIA's corporate governance framework do influence IAF quality, and their effects can be either complementary or substitutive. In an additional analysis, I further document that the monitoring incentives of directors matter more in improving the IAF quality when the overall regulatory

environment of the country is weak, implying that firm-level private incentives play a stronger role in affecting the IAF quality in a relatively weak institutional environment.

Regarding country-level factor, I find that firms in countries with stricter and more detailed IAF requirements in the corporate governance codes have higher quality IAFs than firms in countries without such requirements. This result is robust to the inclusion of other institutional factors such as countries' financial market development and overall quality of regulatory environments, providing evidence in support of the importance of corporate governance codes in directing the development of IAF.

I make several contributions to the literature in this study. First, I develop a new, input based measurement model of IAF quality which incorporates a comprehensive set of IAF attributes and practices. Although some prior studies (e.g., Prawitt et al., 2009) also measure the IAF quality based on a number of IAF characteristics, their measure mainly focus on measurement items relevant to financial reporting. In contrast, our IAF quality measure does not constrain the measurement items to be financial reporting relevant, and therefore is more applicable to the current status of IAFs which take responsibilities in various activities beyond financial reporting. Moreover, previous IAF quality measure does not incorporate the quality assurance and improvement practices of the IAF, even though such practices are found to be essential to the IAF's role in corporate governance in recent studies (e.g., Zipfel and Eulerich, 2013). As an improvement, I explicitly take this aspect into consideration when developing the measurement model of IAF quality. Finally, besides the commonly used equal-weighting approach to form the composite score of IAF

quality, I introduce an alternative approach based on PLS-PM which is more statistically sound.

Second, to our best knowledge, this is the first paper that systematically examines both the firm-level and country-level factors that affect IAF quality. Although prior literature has investigated the firm-level factors influencing some single characteristics of the IAF, such as presence, size, and investment (e.g., Carcello et al., 2005a; Barua et al., 2010), Prawitt et al. (2009) and Prawitt et al. (2011) argue and show that those single variables are poor proxies for the IAF quality. Hence, the previous studies do not provide much evidence on the factors that influence IAF quality. I extend prior literature by showing that IAF quality is affected by firms' operating environment and the features of other governance mechanisms. More importantly, I show that other governance mechanisms can have both complementary and substitutive effects on the IAF quality, and they play a greater role in affecting the IAF quality when the overall regulatory environment is weak. As such, this study is also a response to the call for more research on the relationships between different governance mechanisms (Armstrong et al., 2010).

Third, by showing that IAF quality is associated with the strictness and intensity of IAF requirements in countries' corporate governance codes, this paper depicts a more complete picture of the factors that affect the IAF quality in an international context. I address, for the first time, the importance of corporate governance codes in influencing the IAF quality, hence demonstrate how the IAF quality can be bolstered by the institutional environment in which a firm operates, a factor that is independent of a firms' own incentive. The findings have implications for regulators, standard setters, as well as the internal audit profession who are now recommending the IAF

as a best practice in corporate governance worldwide and promulgating new regulations and standards for internal audit practices.

The remainder of the paper is organized as follows. The following section presents the background information regarding the IAF's role in corporate governance and summarizes previous literature. Hypotheses with respect to firm- and country-level factors influencing the IAF quality are developed in section 3. Sample and data are discussed in section 4, followed by a presentation of the IAF quality measurement model in section 5. Empirical models and results are discussed in section 6. Section 7 concludes the paper.

2. Previous Literature

2.1 The Role of IAF in Corporate Governance

Being one of the corporate governance cornerstones (IIA, 2005), the IAF emerges and evolves as the organizational structures and transactions become more complex, which increases the need for monitoring and advising as well as enhances the importance of technical accounting expertise. As put by Walsh (1963), "the widening gap between management and action has made it necessary to develop a series of controls by means of which the business may be administrated efficiently […] the internal auditors provide on-the-scene appraisal of each form of control [and] there is no substitute for this activity". The IAF is generally considered to serve as a valuable resource to the other parties in charge of monitoring, maintaining, and enhancing the overall corporate governance (Gramling et al., 2004). Responding to competition from global markets and the demand for more timely and precise information, corporate stakeholders rely more on the IAF for risk management and

internal control, which in turn enlarges the role played by the IAF (Ramamoorti, 2003).

More recently, the importance and status of IAF has increased considerably due to the high-profile financial scandals at the beginning of the 2000s. As a response to corporate failures, the public and the regulators in particular are increasingly turning to the IAF as a means to increase the quality of corporate governance and thereby retain investors' faith in the financial market. For instance, in the U.S. setting, the impact of the Sarbanes-Oxley Act of 2002 on corporate governance expands the role of the IAF in monitoring, especially in the area of internal control (Gramling et al., 2004). A similar trend has taken place in other countries as well. For example, in the Netherlands and Sweden, corporate governance codes specify that the need for an IAF should be re-evaluated by the audit committee or the board of directors every year.

2.2 The Importance of IAF Quality

In order to fulfill its role as a monitoring and advising mechanism and to be a valuable resource to the other key governance parties, an IAF should possess an appropriate level of quality (Gramling et al., 2004). For example, early experimental studies demonstrate that external auditors consider various quality characteristics such as competence, objectivity, and work performance of a firm's IAF when deciding whether or to what extent to rely on the IAF (e.g., Gibbs and Schroeder, 1979; Clark et al., 1980; Messier and Schneider, 1988; DeZoort et al., 2001; Schneider, 2009; Desai et al., 2010; Bame-Aldred et al., 2012). Studies investigating the consequences of such reliance find that better quality IAFs result in more reliance by external auditor on IAFs, which in turn increases audit efficiency (e.g., Pizzini et

al., 2014) and reduces external audit costs (e.g., Felix et al., 2001; Messier et al., 2011; Abbott et al., 2012) .

Moreover, better quality IAFs can contribute to more effective internal control and better financial reporting quality. For example, Lin et al. (2011) reveal that firms with a more competent IAF are less prone to material weaknesses in internal control over financial reporting, and when such material weaknesses exist, firms with a high-quality IAF are more likely to disclose them. In addition, Schneider and Wilner (1990) find that the existence of an IAF is perceived by managers as a deterrent of aggressive financial reporting. Collaborating evidence is provided by Prawitt et al. (2009) and Ege (2014) who report that a high-quality IAF decreases earnings management and constrains management misconduct.

3. Hypothesis Development

3.1 Firm-Level Factors Influencing IAF Quality

In this subsection, I rely on prior corporate governance literature to develop the hypotheses regarding the firm-level factors that are expected to influence firms' incentives for developing a high-quality IAF. I focus on two sets of variables: (1) the operating environment of a firm and (2) the features of other corporate governance mechanisms that are closely related to the IAF, i.e., board of directors, audit committee, and top management which are identified as the other three corporate governance cornerstones besides the IAF in the corporate governance framework put forth by the IIA.

Firm complexity

Fama and Jensen (1983) posit that the organization of a firm is structured in a way that corresponds to the scope and complexity of the firm's production process. Complex firms have greater agency conflicts and hence more monitoring demand (Dey, 2008). Those firms also have greater advisory needs (Klein, 1998). The increased monitoring and advisory needs caused by firm complexity in turn drive the firm to establish mechanisms to meet such monitoring and advisory demand.

A high-quality IAF is one of the mechanisms that firms can develop to meet increased monitoring and advisory needs. This is because the IAF is a governance mechanism particularly designed to facilitate information gathering, verification, and transmission. The unique position of the IAF in corporations gives internal auditors plenty of opportunities to gather information from different departments of the company. The gathered information can then be either used by the managers to better evaluate the resource needs and risks and to make further business decisions accordingly, or used by the audit committee and the board of directors to oversee the managers' performance and to advise them in making strategic decisions. As a firm becomes more complex, this information role played by the IAF should gain in importance. As a result, I predict that:

H1: IAF quality is positively associated with firm complexity.

Firms can be complex along different dimensions. As a result, I use three variables to proxy for a firm's operating complexity, including firm size (LogAT) (Klein, 1998; Doyle et al., 2007; Dey, 2008), the number of business segments (SEGMENT) (Rose and Shepard, 1997; Hermalin and Weisbach, 1998), and the extent of foreign business (FORSALE) (Ashbaugh-Skaife et al., 2007). I predict that IAF quality is positively related to LogAT, SEGMENT, and FORSALE.

Growth opportunities

Firms with greater future prospects have more needs for external financing. In order to raise external capital at a lower cost to support future growth, firms with greater investment opportunities have more incentives to adopt stronger corporate governance, as they are the ones that benefit the most from good governance (Doidge et al., 2007). For example, Durnev and Kim (2005) report that corporate governance quality is positively related to a firm's investment opportunities. In a similar vein, I expect that firms with greater future prospects are more likely to invest in the IAF and hence have better quality IAFs.

H2: IAF quality is positively associated with growth opportunities.

I use market-to-book ratio (MTB) to proxy for a firm's growth opportunities (Linck et al., 2008) and predict that IAF quality is positively related to MTB.

Board monitoring incentives

The board of directors is one of the major stakeholders to which an IAF provides assurance services. As a result, the IAF quality should be developed in response to the service demand from the board of directors, which in turn depends on the directors' incentives for monitoring. On the one hand, a high-quality IAF is generally beneficial to the directors as it can provide them with relevant information for overseeing the managers' behaviors. Moreover, the high-quality information transferred by a high-quality IAF is also valuable for the directors who want to align their expertise with the firm's specific environment and to thereby optimize their ability to contribute to developing the firm's strategy. Accordingly, a board of directors characterized with a high incentive for monitoring will be more likely to increase the IAF quality.

On the other hand, a counter-argument is that directors who are "intensive monitors" may have less need for assurance services from the IAFs, because those directors are already extensively involved in the monitoring process and hence can obtain the first-hand information by themselves. Such substitutive effect can lead to a reduced incentive for the directors to increase the IAF quality.

Given the alternative arguments, the nature of the association between board monitoring incentives and IAF quality remains an open empirical question. Accordingly, I make the following hypothesis without specifying the direction:

H3: IAF quality is associated with board monitoring incentives.

I use several variables to proxy for the monitoring incentives of directors, including the percentage of independent directors (Hermalin, 2005) (BODINDE), the percentage of female directors (Adams and Ferreira, 2009) (BODFEMALE), the percentage of busy directors who serve at least three additional directorships in other companies (Fich and Shivdasani, 2006) (BODBUSY), and the number of board meetings (Adams et al., 2010) (BODMEET). I also form a composite variable for board monitoring incentives which aggregates the individual variables listed above. To do so, I dichotomize each individual variable by its respective sample median, and take the sum of the four dummy variables as the composite variable (BODMONI). As a robustness check, I also perform a principal component analysis and rely on the factor score of the four variables to form the proxy for board monitoring incentives (BODMONI_pca).[1] Using BODMONI or BODMONI_pca does not change the results.

[1] In both methods, I take the opposite order of Bodbusy when constructing the composite variable of board monitoring incentives, because Bodbusy is an inverse measure for board monitoring incentives (i.e., busy directors have a lower incentive to monitor).

Audit committee diligence

Audit committees have the most direct oversight responsibility over IAFs. Several studies have investigated the relationship between audit committee characteristics and the size and budget of the IAF (e.g., Barua et al., 2010; Anderson et al., 2012). Considering the direct oversight responsibility of the audit committee over the IAF, I posit that the IAF's attributes and practices and hence the IAF quality should be influenced by the audit committee characteristics, especially the diligence of the audit committee.

A diligent audit committee is likely to be associated with a high-quality IAF, and the reasons are threefold. First, a diligent audit committee, through more frequent interactions with the internal auditors, is more likely to develop a close relationship with the IAF. According to Cohen et al. (2010), a close relation between the audit committee and the IAF can improve the quality and governance capabilities of both parties. Second, more diligent audit committees review the IAF performance in a timelier manner, which in turn facilitates quicker discovery (Hoitash et al. 2009) and remediation of deficiencies in the IAF. Third, similar to the other board members, diligent audit committee members have stronger incentives to establish a high-quality IAF in order to get timely and high-quality information to fulfill their own monitoring responsibilities.

However, like the alternative argument for board monitoring incentives, it is also possible that a diligent audit committee demands less help from the IAF and hence has a lower incentive to develop a high-quality IAF. For instance, Barua et al. (2010) document that the auditing expertise of an audit committee is negatively associated to the IAF budget, implying that the relationship between audit committee monitoring and IAF may be substitutive in certain circumstances. Because of the

conflicting arguments, I make the following hypothesis without specifying the direction:

H4: IAF quality is associated with audit committee diligence.

Following prior literature (e.g., Hoitash et al., 2009; Barua et al., 2010; Anderson et al., 2012), I measure audit committee diligence by the number of audit committee meetings (ACMEET).[2]

CEO power

The support from top management is found to be very important for the development of IAF (Roussy, 2013). However, CEOs have conflicting incentives for establishing a high-quality IAF, due to the dual role played by the IAF. On the one hand, the CEO relies on the advisory role of the IAF in decision making, especially in the areas of internal control and risk management, which provides her with incentives to establish a high-quality IAF. On the other hand, the monitoring role of the IAF implies that a high-quality IAF constrains the CEO's ability to obtain personal gain, because the high-quality IAF is more likely to disclose the CEO's opportunistic behavior to the board. For instance, Prawitt et al. (2009) document that IAF quality is negatively associated to managers' earnings management activities. Consequently, the influence of CEO on IAF quality largely depends on the CEO's need for advisory services from the IAF and her incentive and ability to resist monitoring from the IAF.

Considering the two aspects, I predict that IAF quality decreases with CEO power. First, Hermalin and Weisbach (1998) argue that a firm's governance structure

[2] Some prior studies include audit committee financial expertise and audit committee tenure in the analysis. However, in our research setting, when I was manually collecting the corporate governance data from firms' annual reports or proxy statements, I recognized that there are (1) a lack of variance regarding the audit committee expertise, and (2) a lack of information regarding the audit committee members' tenure in the non-US firms. Due to these data constraints, I do not include audit committee financial expertise and audit committee tenure in the analysis.

is the consequence of a bargaining process among different corporate stakeholders, especially between the CEO and the board of directors, conditional on their incentives and power. As CEOs generally do not like monitoring, powerful CEOs are more likely to bargain with the board in order to reduce the potential monitoring. Since the IAF plays an important role in supporting board monitoring, bargaining to constrain the IAF capacity can be a way for powerful CEOs to resist or avoid monitoring from the board. Second, a CEO's power derives from her perceived superior ability (Hermalin and Weisbach, 1998). A powerful CEO is more likely to be a good decision maker, to therefore require less advising, and to, in turn, have fewer incentives to establish a high-quality IAF. In sum, I predict that as the CEO becomes more powerful, her incentive for a high-quality IAF diminishes.

H5: IAF quality is negatively associated with CEO power.

I measure CEO power by two CEO characteristics: CEO tenure (CEOTENURE) and whether the CEO is also the chairman of the board of directors, i.e. CEO duality (CEODUALITY). Like variables related to the board monitoring incentives, I also construct a composite variable of CEO power. To do so, I separate the sample into long- versus short-tenure subsamples by the sample median of CEOTENURE, and construct an indicator variable HCEOTENURE, which takes the value of 1 for long CEO tenure firms and 0 for short CEO tenure firms. I take the average of CEODUALITY and HCEOTENURE to form the aggregated variable of CEO power (CEOPOWER).[3] I expect IAF quality to be negatively associated to CEOpower.

[3] Because CEOduality is an indicator variable, it is not appropriate to use factor analysis to form the composite score for CEO power.

3.2 Country-Level Factor Influencing IAF Quality

In this subsection, I develop hypothesis related to a potential country-level factor affecting IAF quality. Country-level characteristics matter in determining IAF quality because firms' incentives and capabilities to raise their governance quality can be constrained by the institutional environment of their home country. For example, John and Kedia (2003) show theoretically that a country's level of financial development and quality of monitoring technologies affect firms' choices with regard to governance mechanisms. Doidge et al. (2007) document a strong role of country in determining firm-level governance ratings, which is consistent with Krishnamurti et al. (2005) who report that, after the Asian financial crisis, the country factor was found to exert a significant influence on firms' decisions concerning governance quality improvement. Overall, these studies suggest that a firm's flexibility in choosing its own corporate governance is limited by the institutional environment of its country (Klapper and Love, 2004).

As the IAF is a part of the corporate governance structure, the above findings imply that firms' incentives and capabilities to establish a high-quality IAF are also influenced by the institutional environments in which the firms are embedded. Since there has been a huge literature on how firm-level corporate governance can be influenced by countries' financial market development and investor protection regimes (e.g., La Porta et al., 1998; La Porta et al., 2000; Klapper and Love, 2004; Doidge et al., 2007; Aggarwal et al., 2009; Hugill and Siegel, 2012), I concentrate our analysis on the IAF requirements in countries' corporate governance codes which are less-researched but can be of particular importance for the IAF quality.

IAF requirements in corporate governance codes

Corporate governance codes (hereafter CG codes) are important in directing companies' corporate governance practices. Since the issuance of the United Kingdom's Cadbury Report in 1992, there has been an explosion of CG codes around the world.[4] Although most CG codes follow the "comply or explain" principle so that the compliance with the code provisions is not compulsory, listed companies are shown in country surveys to respond to CG code recommendations despite the voluntary nature (Gregory and Skimmelkjear, 2002), and they tend to adopt a higher percentage of the code recommendations in recent years (Aguilera and Cuervo-Cazurra, 2009). Aguilera and Cuervo-Cazurra (2004) suggest the observed tendency to follow CG codes be attributable to two reasons. First, listed companies are pressured by the market forces to "do the right thing" and to comply with the legitimate practices. Second, stock exchange listing rules in many countries mandate firms to justify the noncompliance with the CG codes in annual reports, and such "complain or explain" disclosure requirement eventually works as an encouragement for companies to comply with the CG codes.

The tendency for listed companies to follow the recommendations in CG codes implies that, depending on whether the IAF is recommended and how detailed the recommendations of IAF practices are in the CG codes, a country's CG code could potentially have a significant impact on the characteristics and practices of IAF and hence influences the IAF quality. Specifically, firms in countries with stricter and more detailed IAF requirements could feel more obliged to establish a high-quality IAF. Furthermore, because of the specific requirements and recommendations with respect to the IAF's responsibilities and practices in the CG codes, it is easier for

[4] According to Aguilera and Cuervo-Cazurra (2009), 64 countries had issued 196 distinct CG codes by mid-2008.

firms following the recommendations to develop a high-quality IAF. Accordingly, I conjecture IAF quality to be higher for firms in countries with stricter and more detailed IAF requirements in their CG codes.

H6: IAF quality is positively associated with IAF requirements in *countries'* CG codes.

To capture the intensity and specification of IAF requirements in the CG codes, I obtain the CG codes of sample countries from European Corporate Governance Institute (ECGI) which traces the CG codes released by different countries.[5] I then manually coded the CG codes based on how the establishment and practices of the IAF are stated in the codes. Five types of CG codes emerged from the coding process. Appendix C illustrates each type of the CG codes with examples. The first type of CG codes states that publicly listed companies are required to have an IAF. The second type of CG codes strongly recommends that an IAF be established (i.e., companies should have an IAF) and that, if a company does not have an IAF, the need for one should be reviewed by the audit committee or the board of directors on an annual basis. The third type of CG codes explicitly recommends an IAF. In addition, those CG codes provide guidance with respect to the IAF practices in the requirements and responsibilities of the audit committee, the board of directors, or the managers. The fourth type of CG codes does not explicitly recommend an IAF, although the IAF and its practices are mentioned in the requirements and responsibilities of the audit committee, the board of directors, or the managers. The fifth type of CG codes does not mention the IAF at all. I assign values from five to one to the five types of CG codes (CGCode), with higher values indicating stricter,

[5] Available at http://www.ecgi.org/codes/all_codes.php.

more specified, and more detailed IAF requirements. I predict IAF quality to increase in CGCode.[6]

4. Sample and Data

The IAF data used in this study comes from the CBOK 2010 survey.[7] I match the survey responses with firms from Worldscope to operationalize empirical analysis.[8] Table 1.1 outlines the sample selection and matching procedure. There are 5,906 responses from publicly listed companies, of which 2,977 have enough information for matching. As I will illustrate with more details later in the section of IAF quality measurement model, I retain only responses from the CAEs to keep the responses comparable across firms. Specifically, because the questions and corresponding answers in the CBOK 2010 pertaining to internal auditors' competence are personal information about the individual respondents, I have to keep only CAE responses in order to avoid comparing a CAE's competence in one company with an internal audit staff's competence in another company.

There are 721 CAE responses eligible for matching. I merged the survey responses with the firms from the same country in Worldscope by matching firms' 2009 year-end[9] total assets, total sales, industry, and the domain names of firms' websites with relevant information provided by the CBOK respondents.[10,11] This

[6] Because IAF is mandated in NYSE but remains voluntary in NASDAQ, I differentiate the requirements by coding the variable CGCode as 5 for U.S. firms listed in NYSE, but 4 for U.S. firms listed in NASDAQ.
[7] The CBOK 2010 global internal auditor survey was conducted by the IIA from March to May 2010. The survey questionnaire, which covers a wide range of questions, was sent to internal auditors working in a variety of organizations, including publicly listed companies, private companies, governments, and non-profit organizations.
[8] The matching process is permitted by the Institute of Internal Auditors Research Foundation (IIARF). Information regarding individual firms or respondents is kept strictly confidential.
[9] Because the CBOK survey was conducted in early 2010, I assume that the information provided by the respondents regarding assets, sales, and industry is more representative of the firms' financial data of the end of year 2009.
[10] I require an exact match between the domain names and the email address provided by the respondent. For example, if the email address is aaa@xyz.com, it is matched with the firm whose website also ends with xyz.com. I delete responses containing gmail, hotmail, yahoo, or "163" email addresses, as those email addresses are not useful for the identification of firms and confound the matched results.
[11] In the CBOK, the questions about total assets and total sales are asked in a way that the respondents only need

matching process produced 329 uniquely matched firms. Financial data of matched firms were then downloaded from Worldscope. Variables related to the characteristics of board of directors, audit committees, and CEOs were manually collected from firms' 2008 annual reports or proxy statements. A total of 64 firms had missing values of at least one of the main tested variables and were subsequently deleted from the sample. The final sample for the empirical analysis consists of 265 firms.

Table 1.2 presents the sample distribution by country. It shows that the U.S. firms take a large portion of the sample (111 out of 265). This is not surprising, given the large stock market in the United States and the fact that the IAF is a more prevalent and mature practice in the United States than in the other countries. To address the potential bias introduced by the U.S. firms, I explicitly control for the U.S. firms in the subsequent empirical analysis. In the additional tests, I also re-run the analysis without the U.S. firms.

In addition, Table 1.2 also presents the self-constructed index for the IAF requirements in countries' corporate governance codes, as well as the indices for countries' financial market development and overall quality of regulatory environments, which are used as control variables for countries' overall institutional environments in the subsequent empirical analysis. The indices show that our sample covers countries with diversified institutional characteristics, and that the IAF requirements in the corporate governance codes do vary significantly across countries.

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 indicated in the CBOK response.

5. Measuring IAF Quality

5.1 Defining Measurement Items

Based on the Standards and prior literature (e.g., Prawitt et al., 2009; Lin et al., 2011; Lenz et al., 2013), I define that IAF quality is composed of four quality dimensions representing the IAF's desirable attributes and activities. While the attributes include the IAF's competence (Competence) and independence (Independence), [12] the activities encompass the IAF's planning and reporting practices (Plan_report) as well as the IAF's quality assurance and improvement practices (Quality_assure). Measurement items for each quality dimension are selected from the survey questions in the CBOK 2010 and the overall IAF quality is supposed to be measured by all the measurement items. 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 the CBOK 2010.[13]

IAF competence is measured by seven survey items that relate to (1) whether the CAE has external/internal auditing experience (audexp), (2) whether the CAE has over 10 years experience in the position (yearexp), (3) the educational level of the CAE (education), (4) whether the CAE has accounting/auditing related diploma (major), (5) whether the CAE holds a CIA/CPA certificate (certificate), (6) whether there are at least 40 hours training every year (training), and (7) whether the CAE is a

[12] Prior literature usually uses objectivity instead of independence, and treats objectivity and independence in an interchangeable manner. 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, 2012). Survey items used in this study, such as reporting line and hiring practices, relate more to internal auditors' independence than to objectivity. Moreover, mental attitude is impossible to measure based on the survey data. As a result, I use independence as the second desirable attribute rather than objectivity.

[13] A recent study by Lenz et al. (2013) evaluates the characteristics of an IAF that can be used to distinguish high versus low IAF effectiveness in Germany. Several items identified in their study to have discriminatory power are also included in our IAF quality measurement model.

member of the IIA (IIAmemb). As already discussed, it is worth noting that competence is mainly measured as the CAE's competence because questions in the CBOK pertaining to internal auditors' competence are personal information about the individual respondents. Nevertheless, since prior research demonstrates that the CAE is an essential factor in determining the overall quality of the IAF (e.g., Sarens and De Beelde, 2006), it is not unreasonable to use the CAE competence to proxy for the competence of the IAF. Moreover, recent studies (e.g., Ellul and Yerramilli, 2013) also use the characteristics of the Chief Risk Officer (CRO) to measure the quality of risk management function.

IAF independence is measured on the basis of three survey questions asking (1) whether the IAF reports directly to the audit committee (reportline), (2) whether the audit committee has authority over the CAE employment (AC_employ), and (3) whether the audit committee has authority over the evaluation of the IAF performance (AC_evalu). The three items are chosen because prior research has found that an IAF reporting directly to the audit committee is perceived to be more independent and objective by external auditors (e.g., Messier and Schneider, 1988; Messier et al., 2011), and that the status and independence of the internal auditors are enhanced if the employment and evaluation authorities are rested with the audit committee rather than with the management (e.g., Abbott et al., 2007).

Besides the two important IAF attributes, how the IAF plans its audit activities, reports its audit results, and has its practices reviewed and assessed are also essential to the IAF quality (IIA, 2012). The quality of planning and reporting activities of the IAF is measured by the following five items: (1) the number of internal audit charters, plans, mission statements, and manuals that a firm has (document), (2) the existence of an internal control framework (IC_frame), (3) the adoption of a risk-

based auditing plan (risk_plan), (4) the audit technologies used by the IAF (technology), and (5) the practice to give an opinion or a rating in the internal audit reports (report).

The quality assurance and improvement practices of the IAF are measured by four items representing (1) whether the IAF has a quality assurance and improvement program in place (qa); (2) whether an external quality assessment has taken place during the last five years (qa_recent);[14] (3) the number of audit areas examined by the quality assurance and improvement program (coverage), as a higher coverage is expected to increase the fieldwork quality (Pizzini et al., 2014); and (4) whether the IAF is in full compliance with the Standards (compliance).

5.2 Forming a Composite Score of IAF Quality

In order to form the scores for the quality dimensions as well as to construct the composite score of the overall IAF quality, I use two methods to aggregate the measurement items. In the first method, I transfer the values of all measurement items to fall into the range from 0 to 1, and take the average of the measurement items for a quality dimension as the score for that quality dimension. The score of the overall IAF quality is computed as the mean of the four quality dimensions. I name this method as the equal-weighting approach, because in essence measurement items are equally weighted in this method. The IAF quality score obtained from this approach is named IAFQ_WA.

Although the equal-weighting approach has been adopted by most previous studies, there are drawbacks of this approach. First, it assumes that all measurement items are of equal importance in measuring the quality dimensions and the overall

[14] I use five-year period because the Standards No. 1310 requires an external quality assessment be taken at least every five years.

IAF quality. Second, the equal-weighting approach assumes that the quality dimensions are independent from each other, even though they are likely to be correlated.

To overcome the shortcomings of the equal-weighting approach and to mitigate the potential measurement errors, I adopt an alternative method in which I develop a hierarchical measurement model of IAF quality and use PLS-PM to estimate the model. I name this approach and the IAF quality score derived from this approach as the PLS-PM approach and IAFQ, respectively. The structure of the hierarchical measurement model of IAF quality is depicted in Figure 3. As shown in the figure, the quality dimensions are treated as the first-order latent variables and the overall IAF quality is specified as the second-order latent variable. The outer part of the model indicates that quality dimension are measured as a linear combination of their respective measurement items and the overall IAF quality is measured as a linear combination of all measurement items. The inner part of the model specifies the structural paths, which demonstrate that the overall IAF quality is equal to a linear combination of the four quality dimensions. The PLS-PM estimation process generates the weights of the measurement items necessary to the calculation of the scores for the quality dimensions and the overall IAF quality. Specifically, the estimation process starts with a random set of weights of the measurement items and iterates the estimation until the convergence of weights is achieved, which maximizes the sum of correlations among all the latent variables depending on the paths specified in the model. In our model, this means that the estimated weights of the measurement items maximize the sum of correlations between the overall IAF quality and the quality dimensions.

I use the whole CAE sample (matched and unmatched) for estimating the weights. There are 1,056 CAE responses from public firms with no missing value for the measurement items. Appendix B summarizes the descriptive statistics of the measurement items for the 1,056 CAE responses. Table 1.3 presents the estimation results of the PLS-PM approach. The overall model goodness of fit (GoF) is 0.55 and the relative GoF is 0.996. According to Vinzi et al. (2010), a relative GoF equal to or higher than 0.90 clearly speaks in favour of the model. In addition, because the quality dimension blocks in the model are supposed to be reflective, they should be homogeneous and unidimensional. Panel A of Table 1.3 shows the Cronbach's alpha and the Dillon-Goldstein's rho of each quality dimension block. Based on Chin (1998), all the quality dimension blocks are considered homogenous, because the Dillon-Goldstein's rho of each block is not below 0.70. Panel B of Table 1.3 shows the standardized path coefficients as well as the correlation and contribution of each quality dimension to the overall IAF quality. As shown in the table, Quality_assure contributes the most, whereas Independence contributes the least.

Given the advantages of the PLS-PM approach, I use the IAF quality score obtained from the PLS-PM approach (i.e., IAFQ) in the main analysis. In order to decide whether I can use the estimated IAFQ from the whole CAE sample in the following empirical analysis when only the matched 265 firms have available financial and governance data, I compare the mean and median IAFQ of the matched 265 responses with those of the unmatched responses. Mean comparison shows that the t-statistic is 0.43 (p=0.67) and median comparison results in a z-statistic of 0.67 (p=0.50). The comparisons suggest that there is no significant difference of IAFQ between the matched and unmatched CAE responses.

As a robustness check, I re-run all the tests using the IAF quality score derived from the equal-weighting approach. Our results are not affected when I use IAFQ_WA instead of IAFQ. In fact, the two scores of IAF quality are highly correlated, as shown in the correlation matrix in Table 5 (i.e., the correlation between IAFQ and IAFQ_WA is as high as 0.94).

6. Empirical Model and Empirical Results

6.1 Empirical Model

I estimate the following two models to test the hypotheses:

Model (1): $\mathrm{IAFQ}_i = \alpha + \beta' \mathrm{X}_i + \mathrm{FControl}_i + \varepsilon_i$

Model (2): $\mathrm{IAFQ}_i = \alpha + \beta' \mathrm{X}_i + \lambda' \mathrm{C}_i + \mathrm{FControl}_i + \mathrm{CControl}_i + \varepsilon_i$

where for each firm i, IAFQ is the IAF quality score, X is a set of firm-level tested variables, and C is the country-level tested variable, i.e., CGCode. FControl is a group of firm-level control variables that have been cited in prior research to influence firms' corporate governance ratings and audit efforts. Those control variables include leverage ratio (LEV), sales growth ratio (GOWTH), percentage of intangible assets to total assets (INTANGIBLE), percentage of inventory and receivables to total assets (INVREC), cash flow from operating (CFO), percentage of closely held shares by insiders (CLOSEHELD), whether a company is audited by Big4 audit firms (BIG4), and whether a company is crosslisted in main U.S. stock exchanges (CROSSLIST). Considering the relatively high percentage of U.S. firms in the sample, I also explicitly control for the U.S. firms (US). Furthermore, to control for the potential effect from larger boards and audit committees, I also include board size (BODSIZE) and audit committee size (ACSIZE) in the regression. In Model (2), I add additional country-level control variables (CControl), which

include countries' financial market development (FinDev) and overall quality of regulatory environments (RegQuality). Finally, I control for industry fixed effects and region fixed effects.[15] Details of variable definitions are summarized in Appendix D. The coefficients β and λ measure the sensitivity of IAFQ to the firm- and country-level factors.

It is worth noting that, because the CBOK 2010 survey was conducted in early 2010, the IAF quality score is supposed to measure the IAF quality at the end of 2009. The static nature of the IAF quality measure in this study may induce an endogeneity issue as I do not know when a firm integrates a particular attribute or practice into the IAF. Without any time-series data, the ability to deal with this endogeneity problem is limited. I try to address this concern by adding a comprehensive set of firm-level variables commonly used in prior corporate governance literature to control for the profitability, ownership, leverage, external audit quality, and crosslisting status of the firms (e.g., Durnev and Kim, 2005; Doidge et al., 2007). In addition, all firm- and country-level independent variables are lagged values by at least one year relative to the year when the IAF quality is supposed to be measured.

6.2 Main Empirical Results

Descriptive statistics of the firm-level variables are shown in Table 1.4. The correlation matrix of the firm-level variables used in the regressions is presented in Table 1.5. According to the table, when the significance level is set at 5% level, IAFQ and IAFQ_WA have significantly positive correlations with LogAT, SEGMENT, FORSALE, MTB, INTANGIBLE, BODMONI, BODMONI_pca,

[15] Sample countries are classified into seven different economic blocks based on MSCI's indexes: Asian-Developed, Europe-Developed, America-Developed, Asian-Emerging, Europe-Emerging, Middle-East-Emerging and Africa-Emerging, and America-Emerging.

ACMEET, LEVERAGE, and CFO, and significantly negative correlations with CEOPOWER and INVREC.

Table 1.6 presents the main regression results, with IAFQ being the dependent variable. Regression (1) is estimated using the aggregated variable for board monitoring incentives and CEO power and excluding country-level factors. As shown in Regression (1), IAFQ is significantly and positively associated with LogAT, SEGMENT, and MTB, confirming that the IAF quality increases in firms' operating complexity and growth opportunities. With respect to the other corporate governance mechanisms, the table shows that IAFQ is significantly and positively associated with BODMONI and ACMEET, suggesting that diligent directors with high incentives to monitor tend to establish a high-quality IAF. On the contrary, the significant negative relationship between IAFQ and CEOPOWER implies that powerful CEOs are less in need for the assistance from the IAF and are likely to bargain with the directors to maintain a low-quality IAF in order to decrease monitoring.

Regression (2) of Table 1.6 shows the results when country-level variables are included in the model. The results regarding the firm-level variables remain unchanged. For the country-level factor, consistent with our prediction, the coefficient of CGCode is significantly positive, even when countries' financial market development and overall quality of regulatory environment are controlled for, providing supporting evidence on the importance of CG codes in influencing the IAF quality.

In Regression (3) of Table 1.6, I replace the composite variables of board monitoring incentives and CEO power with individual variables related to the features of directors and CEOs. The results are in line with the findings when

aggregated variables are used. Specifically, Regression (3) shows that IAF quality is positively influenced by board independence, female board members, board diligence, and audit committee diligence, but negatively affected by busy board members and CEO duality.

Taken together, the results in Table 1.6 suggest that the IAF quality developed by a firm is a response to the firm's operating environment. Moreover, the IAF quality is affected by the features of other governance mechanisms which can have either complementary or substitutive effect on the IAF quality. Finally, a firm's incentive for a high-quality IAF is bolstered by the strict and detailed IAF requirements in the country's corporate governance codes.

6.3 Robustness Check: Results without U.S. Firms or without NYSE Firms

Since I have a large portion of U.S. firms in our sample, one concern is that the U.S. firms are driving the results. Although I explicitly control for the U.S. firms in our previous analysis, I nevertheless re-run the test without the U.S. firms. Furthermore, given the mandatory nature of IAF in firms listed (or crosslisted) in NYSE and the potential bias introduced by this strict mandatory requirement, I also re-run the analysis without the firms listed or crosslisted in NYSE. The results are presented in Table 1.7 which shows that our findings are unaffected by the U.S. firms or the firms listed in NYSE.

6.4 Additional Analysis: Do Other Corporate Governance Mechanisms Play a More or Less Important Role in a Weak Regulatory Environment?

Although in the main analysis, I document that other corporate governance mechanisms have a significant impact on the IAF quality, the magnitude of the

impact can vary, depending on the overall regulatory environment of the country. On the one hand, some researchers argue that the relationship between country-level regulatory environment and firm-level governance quality is complementary (e.g., La Porta et al., 2000), suggesting that the influence of other corporate governance mechanisms on the IAF quality should be stronger when the overall regulatory environment is stricter. On the other hand, a counter-argument is that the effect of other corporate governance mechanisms on the IAF quality should be more prominent when countries' regulatory environment is of low quality, because private incentives play a more important role in corporate governance when the overall regulations are weak (e.g., Durnev and Kim, 2005; Hugill and Siegel, 2012).

To shed light on the issue regarding the relative importance of other corporate governance mechanisms in affecting the IAF quality, I separate the sample countries into countries with high-quality regulatory environment and those with low-quality regulatory environment, on the basis of the median value of the regulatory environment variable, and accordingly create an indicator variable H_Reg which equals 1 if a firm is in the high-quality regulatory environment and 0 otherwise. I then interact H_Reg with the variables related to board monitoring intensives, audit committee diligence, and CEO power.

Table 1.8 shows the results. As before, in Regression (1) I use the composite score for board monitoring incentives and CEO power, whereas in Regression (2) I include all individual variables rather than aggregated variables. According to the table, the interaction terms between H_Reg and BODMONI (i.e., reg_BODMONI) is significantly negative, meaning that the positive effect of BODMONI on IAF quality decreases (increases) when the overall regulatory environment is relatively strict (weak). Similarly, in Regression (2), when individual variables are used, the

interaction terms between H_Reg and BODINDE, BODFEMALE, BODMEET, and ACMEET (i.e., reg_BODINDE, reg_BODFEMALE, reg_BODMEET, and reg_ACMEET) are significantly negative, confirming the findings in Regression (1). Overall, the results imply that diligent directors with high monitoring incentives play a greater role in developing a high-quality IAF when the country's overall regulatory environment is weak, which is consistent with the notion that private incentives for a high-quality IAF matter more in a weak regulatory environment.

7. Conclusion

Relying on a unique matched sample between the CBOK 2010 survey and the Worldscope dataset, I develop a new measurement model of IAF quality and explore firm- and country-level factors that influence firms' incentives to establish a high-quality IAF. I document that a firm's private incentive for a high-quality IAF is influenced by the firm's operating environment which determines the monitoring and advisory needs of the firm. Moreover, board monitoring incentives, audit committee diligence, and CEO power affect IAF quality. Such findings suggest that the IAF should be studied in a context where its relationships with other corporate stakeholders are considered, as different corporate governance mechanisms do influence each other. In addition to the firm-level factors, I do find that country-level institutional environment matters, especially the IAF requirements in countries' corporate governance codes, regardless of the voluntary nature of the codes. Finally, when I interact firm-level factors with country-level factors, I reveal that private incentives, especially the monitoring incentives of the directors, matter more for the IAF quality when the overall regulatory environment of a country is weak.

Some results in this paper may well have policy implications. First, our results suggest that a high-quality IAF is most likely to be beneficial to firms having greater monitoring and advisory demand. Second, our findings imply that regulations of other governance mechanisms, such as the mandate that the majority of board members be independent or that some board members be female, could have side effects on the IAF quality. Finally, I suggest that strengthening the IAF requirements in the corporate governance codes can provide firms with incentives and guidelines to establish a high-quality IAF.

This paper has some caveats. First, in our use of the survey responses to develop the IAF quality measure, I implicitly assume that the survey respondents provide accurate information regarding their IAF characteristics and practices. I also assume that any inaccurate information that may be given is likely to introduce noise rather than bias in the analysis. Nevertheless, readers need to be aware of this shortcoming related to the use of survey data. Second, our IAF quality measurement model does not specify whether the IAF is used as a management training ground, as the survey did not ask questions pertaining to this matter. However, as recent studies (e.g., Messier et al., 2011) found that being a management training ground may affect internal auditors' objectivity, future research would do well to take this aspect into consideration if more data is available. Third, because of the high proportion of sample firms audited by Big4 auditors, I do not specifically test the relationship between IAF quality and external auditor characteristics. Future research could therefore test how external auditor characteristics influence firms' incentives for establishing a high-quality IAF, since literature is inconclusive with respect to whether internal audit and external audit are complements or substitutes (DeFond and Zhang, 2014).

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Chapter II

Internal Audit Function Quality, Internal Audit Activities, and Earnings Quality

Abstract: Relying on a unique set of archival data of IAF, I find supporting evidence that IAF quality is positively related to various earnings quality attributes, including earnings smoothness, predictability, accruals quality, and a composite measure of earnings quality. Furthermore, considering the recent expansion of IAF activities into strategic consulting and the corresponding concerns that such an expansion may impair the IAF's objectivity and distract the IAF's resources from assurance tasks related to financial reporting, I test whether the nature of IAF activities influences earnings quality and moderates the relationship between IAF quality and earnings quality. I document that the financial reporting focus of the IAF does not affect earnings quality or reinforce the positive relationship between IAF quality and earnings quality. In contrast, I find that assuming a strategic consulting role by the IAF negatively affects earnings quality. However, such negative effect only exists when the IAF quality is low and disappears when the IAF quality is high. Moreover, the positive association between IAF quality and earnings quality is actually more pronounced when the IAF is involved in strategic consulting, consistent with the notion that IAF quality matters more in maintaining financial reporting quality when a high-quality IAF is most needed.

Keywords: internal audit function, internal audit quality, earnings quality, internal audit activity

1. Introduction

The relevance of IAF in financial reporting has long been acknowledged. For example, external auditing standards explicitly recognize that a high-quality IAF can reduce audit risk, and therefore recommend external auditors to rely upon the work done by internal auditors or to use internal auditors as direct assistance as long as certain indicators of IAF quality are present (PCAOB, 2010; IAASB, 2012). Some standard-setters posit that the IAF serves as a key resource to the board of directors for monitoring, which is expected to deter management opportunistic behaviors (COSO, 2013). Providing corroborating evidence, recent studies show that managers in firms with a high-quality IAF are less likely to manipulate earnings (Prawitt et al., 2009) or to commit misconduct (Ege, 2014).

This paper builds on and extends prior literature by (1) investigating the association between IAF quality and various earnings quality attributes, and (2) exploring whether the nature of IAF activities influences earnings quality and moderates the association between IAF quality and earnings quality. For the second question, I examine whether the influence of IAF quality on earnings quality depends on the extent to which the IAF is involved in financial reporting activities. Furthermore, because the recent expansion of IAF's activities into strategic consulting has raised some concerns that such expansion could impair internal auditors' objectivity and distract the IAF's time and resources from providing assurance services related to financial reporting, I test whether the IAF's involvement in strategic consulting affects earnings quality and the relationship between IAF quality and earnings quality.

I use a unique matched sample that combines public data in Worldscope and proprietary global internal auditor survey data from the IIA. Guided by the Standards

(IIA, 2012), I develop an input based IAF quality measurement model that incorporates the IAF's competence, independence, planning and reporting activities, and quality assurance and improvement practices. I measure earnings quality by earnings smoothness, predictability, conservatism, total accruals, and abnormal accruals, and also form a composite measure of earnings quality that aggregates the aforementioned five individual earnings quality attributes.

Among the five individual earnings quality attributes, I find that IAF quality is associated with less smoothed earnings, more predictable earnings, less total accruals, and less abnormal accruals. The composite measure of earnings quality is also significantly and positively related to the IAF quality. Further analysis indicates that among the four quality dimensions of IAF quality, the IAF's independence and quality assurance and improvement practices are of particular importance for maintaining high-quality earnings.

Regarding the nature of IAF activities, I find that the financial reporting focus of an IAF does not affect earnings quality or reinforce the positive relationship between IAF quality and earnings quality. In other words, IAF quality consistently has a significant positive association with earnings quality regardless of the extent to which the IAF is involved in financial reporting activities. On the contrary, I document that the strategic consulting role assumed by an IAF has a negative effect on earnings quality, but the IAF quality alleviates such negative impact. More specifically, the IAF's involvement in strategic consulting has a negative impact on earnings quality only when the IAF quality is low but not when the IAF quality is high. This result suggests that a high-quality IAF is more likely to cope with the potential capacity and objectivity issues resulted from performing strategic consulting activities, and thus the expansion of activities into strategic consulting is

less likely to affect the IAF's role in financial reporting quality when the IAF quality is high. Furthermore, I find that the positive effect of a high-quality IAF on earnings quality is actually more pronounced when the IAF is involved in strategic consulting activities, implying that the IAF quality matters more for financial reporting quality when a high-quality IAF is most needed.

I make several contributions to the literature in this paper. First, since IAF data is scarce, Prawitt et al. (2009) call for more research to re-test the relationship between IAF quality and financial reporting quality when more data becomes available. Since internal auditing is becoming an increasingly worldwide practice, I make a timely and important extension of previous studies by testing the relationship between IAF quality and various earnings quality attributes in an international setting. Second, I address the concern that the recent expansion of IAF's activities into strategic consulting could impair the IAF's role in providing quality assurance services in financial reporting. I show that the strategic consulting role assumed by an IAF negatively affects earnings quality only when the IAF quality is low. Findings in this paper imply that, rather than debating on whether the IAF should or should not be involved in strategic consulting, regulators as well as directors need focus on improving the quality of IAF, particularly the independent status and the quality assurance and improvement practices of the IAF.

The remainder of the paper is organized as follows. Section 2 discusses prior literature and develops hypotheses. Section 3 describes the sample and the measure of IAF quality, followed by section 4 which discusses the measures of earnings quality and presents the empirical models. Section 5 discusses main empirical results and section 6 complements the main analysis with additional analyses. Section 7 concludes the paper.

2. Previous Literature and Hypothesis Development

2.1 IAF Quality and Earnings Quality

IAF is extensively involved in the financial reporting process. In the early stage of its development, the IAF was designed for accounting and financial controls and was perceived as a closely related extension of the work of external auditors (Moeller and Witt, 1999). The relevance and importance of IAFs in financial reporting is also recognized by external auditing standards (e.g., PCAOB, 2010; IAASB, 2012) which recommend external auditors to rely on the work done by qualified IAFs or to use qualified internal auditors as direct assistance. Additionally, prior studies provide empirical evidence supporting the importance of IAF in financial reporting. For example, Beasley et al. (2000) reveal that firms having an IAF are less likely to conduct fraud, and Ege (2014) reports that a high-quality IAF is negatively associated with accounting- and non-accounting-related management misconduct. Prawitt et al. (2009) find that firms with a high-quality IAF are less likely to take a big-bath or to just meet or beat analyst forecasts. Apart from archival studies, research based on experiments also provides corroborating evidence showing that the IAF can deter managers' aggressive reporting behavior. For instance, while Schneider and Wilner (1990) document that internal auditing and external auditing play a similar role in constraining financial reporting irregularities, Asare et al. (2008) find that internal auditors increase the budgeted working hours when they sense that the management has a high incentive to misreport financial information. Taken together, those findings collectively suggest that managers in firms with a high-quality IAF are subject to higher transparency requirements, which decrease the managers' incentives to manipulate financial reporting because such opportunistic

behavior is more likely to be detected when the reporting process is equipped with stricter internal checks (Brown and Pinello, 2007).

The latest definition of internal auditing put forward by the IIA profiles IAF as a crucial component in the internal control and risk management system (hereafter, ICRMS), articulating that an IAF is expected to "evaluate and improve the effectiveness of risk management, control, and governance process" (IIA, 1999). According to the newly issued integrated framework for internal control from the Committee of Sponsoring Organizations of the Treadway Commission (COSO, 2013), one of the objectives of internal control is to maintain the reliability, timeliness, and transparency of financial reporting. A high-quality IAF can increase the effectiveness of internal control (Lin et al., 2011), which in turn leads to increased accrual quality (Ashbaugh-Skaife et al., 2008) and more timely loss recognition (Goh and Li, 2011).

Furthermore, in addition to its role in improving internal control over financial reporting, a high-quality IAF is expected to increase the effectiveness of risk management which can reduce false or misleading reporting resulted from unexpected deviation from operational and strategic plans. Although there is no direct empirical evidence on the relationship between IAF quality and risk management quality, several internal auditor surveys illustrate that the IAF is playing an increasingly important role in risk management (Sarens and De Beelde, 2006). A high-quality IAF is expected to perform disciplined and structured risk assessments, to provide objective assurance that the major business risks are being managed appropriately, and to report the assessment results to the management and board of directors on a timely basis (COSO, 2004). This can ultimately help firms avoid extreme financial events that could in turn affect the earnings quality.

In sum, a high-quality IAF can improve the transparency of a firm and increase the effectiveness of the ICRMS, preventing the intentional manipulation of information reported to outsiders, reducing the risk of random procedural and estimation errors in reporting, and mitigating the inherent risks of business strategies and operations that may affect the quality of reported financial information (Brown et al., 2014; COSO, 2013). As the enhanced quality of reported financial information should be manifested as better quality earnings, I make the following hypothesis:

H1: IAF quality is positively related to earnings quality.

2.2 Financial Reporting Focus of IAF and Earnings Quality

Some researchers argue that the influence of IAF on financial reporting depends on whether the IAF allocates its resources and time on the financial reporting activities. For instance, Prawitt et al. (2009) treat financial reporting focus, measured as the time that an IAF spends on performing financial audits, as one of the quality elements in their IAF quality measure. In this study, I follow the broad definition of internal audit from the IIA (1999). Hence, instead of treating the extent to which the IAF is performing activities relevant to financial reporting as one of the IAF quality elements, I consider financial reporting as one of the several types of activities that the IAF is expected to perform.

On the one hand, the impact of IAF on earnings quality may well depend on the extent to which the IAF is involved in financial reporting related activities. The underlying rationale is that, for the IAF to have an effect on earnings quality, internal auditors need to perform financial-reporting-relevant activities, as the effect is determined by whether the IAF's resources and efforts are allocated to the financial reporting activities. For example, external auditing standards (e.g., PCAOB, 2010;

IAASB, 2012) requires external auditors to evaluate the nature of the work performed by the IAF in terms of its relevance to financial reporting before relying upon the work done by the internal auditors.

On the other hand, the extent to which the IAF is involved in activities related to financial reporting does not necessarily directly affect earnings quality, especially when the IAF quality is low. This is because, even if the IAF only performs financial-reporting-relevant activities, it may not have any positive impact on the financial reporting quality if the IAF is not competent and independent and does not follow a disciplined procedure to conduct internal audits. For instance, if the IAF directly reports to the management rather than the audit committee members, the lack of independence will impose difficulties on the internal auditors to report and communicate their findings of managers' opportunistic behavior. In other words, the impact of IAF on earnings quality is more likely to depend on the IAF quality rather than whether the IAF focuses on activities related to financial reporting. The above conflicting arguments lead me to make the following hypothesis:

H2a: Financial reporting focus of IAF does not influence earnings quality when the IAF quality is controlled for.

Although the extent to which the IAF is involved in financial reporting is not necessarily associated with better earnings quality, more active involvement in financial reporting can nevertheless reinforce the impact of a high-quality IAF on earnings quality. This is because the influence of a high-quality IAF on earnings quality can be magnified if the IAF allocates more time and resources on the financial reporting activities. Accordingly, I develop the following hypothesis:

H2b: Financial reporting focus of IAF reinforces the positive relationship between IAF quality and earnings quality.

2.3 Strategic Consulting Role of IAF and Earnings Quality

Internal auditors can perform strategic or non-strategic roles in different activities. For example, in risk management, the IAF is expected to perform assurance-oriented tasks such as giving assurance on the risk management process, or to take more strategic-oriented tasks such as championing establishment of enterprise risk management. The survey done by Melville (2003) indicates that internal auditors are actively involved in the development of strategic objectives and make positive contributions to strategic management, and that internal auditors perceive themselves to increasingly pursue such a strategic consulting role.

However, the recent expansion of IAF activities into strategic consulting raises the question of whether conducting strategic consulting activities will negatively impact the IAF's role in financial reporting. The major concern is that providing services in strategic consulting may induce capacity and objectivity issues in the IAF. First, since providing strategic consulting requires certain skills that traditional internal auditors may not possess, being involved in those activities may force the internal auditors to spend more time and resources to develop the competence necessary for strategic consulting. As each IAF has limited capacity, the demand for developing competence in strategic consulting can, to some extent, distract the IAF's resources from assurance services such as maintaining the quality of financial reporting.

Second, some researchers argue that internal auditors are likely to assume the position which is in the best interests of their employer (Brody and Lowe, 2000). Internal auditors may, consciously or unconsciously, shape their mindset to become a "partner" with the management, which imposes treats to the internal auditors'

objectivity (Christopher et al., 2009). The potential erosion of objectivity can become severe when the IAF is expected to perform a strategy consulting role that requires intensive cooperation with the management, as unconscious erosion of objectivity and social pressure can occur when internal auditors work too closely with the management (Fern, 1985). For instance, Fraser and Henry (2007) view the strategic consulting services provided by the IAF in enterprise risk management as an "intrusion into strategic area" that gives dangers to maintaining the IAF's objectivity, because it may be difficult for the internal auditors to distinguish providing impartial advice from taking executive decisions when a strategic consulting role is assumed.

In short, assuming a strategic consulting role by the IAF can potentially cause capacity and objectivity issues, making internal auditors less able to detect and/or less willing to report managers' opportunistic behaviors including earnings manipulation. Based on the above argument, I hypothesize that:

H3a: Assuming a strategic consulting role by IAF is negatively related to earnings quality.

Although assuming a strategic consulting role by the IAF can negatively influence earnings quality due to the lack of capacity and objectivity, a high-quality IAF should be less prone to those problems, since a high-quality IAF is competent, independent, and have regular quality assurance and improvement program in place. For example, the regular training programs in the high-quality IAF can help internal auditors develop necessary competence in a more efficient and cost-effective way. The direct reporting line to the audit committee and the involvement of audit committee members in the evaluation of IAF performance can help maintain the independent status of the IAF, making the internal auditors less likely to surrender to the social pressure. In addition, a high-quality IAF is subject to formal external

quality assessment which can reveal any problem related to capacity or objectivity, making internal auditors aware of the potential problems and therefore facilitating remediation in a timely basis. According to Ahmad and Taylor (2009), as long as the internal auditors are aware of the issues related to independence and objectivity when performing strategic consulting, the role conflict associated with consultancy does not significantly affect internal auditors' commitment to objectivity.

Taken together, I posit that although assuming a strategic consulting role by the IAF could have a negative effect on earnings quality, a high-quality IAF is less likely to have such problems. Therefore, the negative impact of assuming a strategic consulting role on earnings quality is expected to be alleviated as the IAF quality increases. This leads me to make the following hypothesis:

H3b: IAF quality alleviates the negative association between strategic consulting role assumed by IAF and earnings quality.

3. Sample and IAF Quality Measure

I rely on a matched sample between CBOK 2010 and Worldscope to operationalize empirical analysis. In the survey, there are 5,906 responses from public listed companies with country identified. To maintain the responses comparable across firms, I only keep responses from CAEs. After removing the responses that have missing values for the matching variables, 721 responses are left eligible for matching. I then merge the survey responses with the firms from the same country in Worldscope by matching firms' 2009 year-end total assets, total sales, industry, and the domain names of firms' websites with relevant information provided by the CBOK respondents. Detailed matching procedure is discussed in the first chapter. The matching process ultimately produces 329 uniquely matched firms

of which financial data is obtained from Worldscope. After calculating the earnings quality attributes by rolling ten-year window and deleting observations having missing values for variables used in the regression models, the final sample consists of 1,234 observations (320 firms) covering period 2009 to 2012. Table 2.1 outlines the sample matching and selection procedure and Table 2.2 presents the sample distribution by country and by year.

Based on the Standards (IIA, 2012), I measure IAF quality by four quality dimensions including competence (Competence), independence (Independence), planning and reporting activities (Plan_report), and quality assurance practices (Quality_assure). Each quality dimension is measured by several items derived from the CBOK survey, and the overall IAF quality is measured by all measurement items. To form a composite score of the IAF quality, I use Partial Least Square Path Modeling (PLS-PM) to estimate the hierarchical measurement model which is depicted in Figure 3. The PLS-PM estimation procedure generates the weights of measure items which are subsequently used to compute the scores for the quality dimensions and the overall IAF quality. At the end of the estimation procedure, each matched firm is assigned a unique IAF quality score (IAFQ) that ranges from 0 to 1. Higher values of IAFQ indicate better IAF quality. Appendix A presents the details of the measurement items and their data sources.

4. Research Design

4.1 Measuring Earnings Quality

I measure earnings quality by several earnings quality attributes which are constructed based on prior literature. Those earnings quality attributes include earnings smoothness, earnings predictability, earnings conservatism, total accruals,

and abnormal accruals. All earnings quality attributes are measured on a firm-year specific basis. Total accruals for each firm-year are directly calculated based on the balance sheet approach used in Leuz et al. (2003) and Ahem et al. (2013). Following Francis et al. (2004), other earnings quality attributes are calculated by firm-specific time-series models using relevant accounting and market information for rolling ten-year window. By adopting firm-specific time-series models, I basically use the firm as its own benchmark to mitigate the concerns that differences among firms in different industries and countries give rise to noisy measures of the constructs. Moreover, due to the sample size constraint, it is very difficult to measure the earnings quality attributes based on cross-sectional models, because those models usually require partitioning the sample into country-industry-year subsamples that do not have enough observations in the current research context.

Earnings Smoothness

I define earnings smoothness as the correlation between the change of accruals (chgACC) and the change of operating cash flows (chgCFO), both of which are scaled by lagged total assets. The firm-year specific measure of smoothness is calculated by rolling ten-year window.

$$\text{Smoothness} = \text{corr}(\text{chgACC}, \text{chgCFO}) \tag{1}$$

Following Leuz et al. (2003) and Ahem et al. (2013), accruals (ACC) are calculated by balance sheet items. Operating cash flows (CFO) are directly obtained from the cash flow statement.

$$ACC_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} + \Delta TP_{it} - Dep_{it} \tag{2}$$

where for each firm i in year t, ΔCA_{it} is the change of current assets from year t-1 to year t; ΔCL_{it} is the change of current liabilities from year t-1 to year t; $\Delta Cash_{it}$ is the

change of cash and cash equivalents from year t-1 to year t; ΔSTD_{it} is the change of short-term debt and current component of long-term debt from year t-1 to year t; ΔTP_{it} is the change of income taxes payables from year t-1 to year t; Dep_t is the depreciation and amortization expenses in year t. Following Ahmed et al. (2013), ΔSTD and ΔTP are replaced by zero if their values are missing.

If a firm uses accounting accruals to buffer cash flows shocks, either accelerating the reporting of future revenues with the purpose to hide poor current performance or underreporting current strong performance to create reserves for future "rainy days", the correlation between the change of accruals and the change of cash flows will be negative. Although such a negative association is a natural consequence of accrual accounting (Dechow, 1994), a large magnitude of the negative correlation between the change of accruals and the change of cash flows indicates greater intentional income smoothing behavior which obfuscates the firm's underlying economic performance (Leuz et al. 2003). Accordingly, a positive influence of IAF quality on the variable Smoothness means that higher quality IAFs are related to less smoothed earnings.

Earnings Predictability

Following Francis et al. (2004) and Lipe (1990), I define earnings predictability as the ability of earnings to predict itself. To measure this construct, for each firm-year, I estimate the following autoregressive model using maximum likelihood estimation and rolling ten-year window.

$$NIBE_{it} = \lambda_{0i} + \lambda_{1i} NIBE_{it-1} + \upsilon_{it} \quad (3)$$

where NIBE is the net income before extraordinary items. Like Francis et al. (2004), I treat the standard deviation of the error terms from the above equation as the

measure for earnings predictability. Larger variances of the error terms imply less predictable earnings. To keep the same ordering of all earnings quality attributes, I multiply the estimated standard deviation by -1 so that larger (smaller) values correspond to more (less) predictable earnings.

$$\text{Predict} = -\text{Sd}(\upsilon_{it})$$

Earnings Conservatism

The measure for earnings conditional conservatism is based on Basu (1997) model which measures the differential ability of accounting earnings to reflect economic losses (bad news) versus economic gains (good news). Similar to the other earnings quality attributes, the following equation (4) is estimated on a firm-year specific basis over rolling ten-year window.

$$\text{EPS}_{it} = \beta_{0i} + \beta_{1i}\text{D}_{it} + \beta_{2i}\text{R}_{it} + \beta_{3i}\text{DR}_{it} + \varsigma_{it} \qquad (4)$$

where EPS is the year-end earnings per share; R is the annual stock return; D is an indicator variable equal to 1 if the stock return is negative and 0 otherwise; DR is the interaction term between D and R. Following Givoly and Hayn (2000) and Francis et al. (2004), the measure of conditional conservatism is the ratio of the coefficient on bad news to the coefficient on good news.

$$\text{Conservatism} = \frac{\beta_2 + \beta_3}{\beta_2}$$

A larger positive value of β_3 means a quicker reflection of economic losses by accounting earnings relative to economic gains. Accordingly, larger (smaller) values of Conservatism indicate more (less) conservative earnings.

Accrual Quality

I measure accrual quality by total accruals and abnormal accruals. Like the calculation of accruals specified in equation (2), total accruals are directly measured from the balance sheet items for each year from 2009 to 2012. To keep the same ordering for all earnings quality attributes (i.e., larger values mean higher earnings quality), I multiple total accruals by -1 to create TACC. Larger values of TACC mean less total accruals.

For the measurement of abnormal accruals, to allow variation across firms in the determinants of normal accruals, I use firm-specific time-series modified Jones (1991) model proposed by Dechow et al. (1995). Specifically, I measure abnormal accruals as the residual from the following firm-specific regression over rolling ten-year window.

$$TACC_{it} = \phi_0 + \phi_1(\Delta Sales_{it} - \Delta Rec_{it}) + \phi_2 PPE_{it} + \varsigma_{it} \quad (5)$$

where for each firm i, $\Delta Sales_{it}$ is the change of sales from year t-1 to year t; ΔRec_{it} is the change of total receivables from year t-1 to year t; PPE_{it} is the gross property, plants, and equipment in year t. Abnormal accruals are measure as the residuals from equation (5). As before, I multiply abnormal accruals by -1 to form ABACC in order to keep the same ordering of all earnings quality attributes.

$$ABACC = -\varsigma_{it}$$

Composite measure of earnings quality

To mitigate the potential measurement errors in each earnings quality attribute, I develop a composite measure of earnings quality. To do so, I first rank each individual earnings quality attribute into percentile, and then scale of the percentiles by 100 and take of the average of them to construct the composite measure of

earnings quality (EQ). EQ ranges from 0 to 1 and larger values of EQ indicate better overall earnings quality.

4.2 Measuring Financial Reporting Focus of IAF

The financial reporting focus of an IAF is measured by the extent to which the IAF is involved in the financial reporting activities and whether the IAF assumes an important role in financial reporting. In the CBOK 2010 survey, respondents were asked to indicate whether the following statement applies to their IAFs as of the time the survey took place: "the internal audit activity assumes an important role in the integrity of financial reporting". I consider IAFs whose CAEs answered "Applies" to the above question as the IAFs extensively involved in financial reporting activities. Accordingly, an indicator variable REPORT is constructed that takes the value of 1 if the respondents answered "Applies", and 0 if the respondents replied "Does not apply".

4.3 Measuring IAF 's Involvement in Strategic Consulting

In a similar vein, I measure the strategic consulting role assumed by an IAF by whether the IAF takes significant consulting responsibilities in the strategic development. In the CBOK 2010 survey, respondents were asked 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".

4.4 Regression Models

To test the relationship between IAF quality and earning quality, I estimate the following regression model which is adapted from Francis and Wang (2008) and Ahmed et al. (2013).

$$\begin{aligned} AQ_{it} = {} & \alpha_0 + \alpha_1 IAFQ_{it} + \alpha_2 BTM_{it} + \alpha_3 GROWTH_{it} + \alpha_4 EISSUE_{it} + \alpha_5 DISSUE_{it} \\ & + \alpha_6 LEV_{it} + \alpha_7 LogAT_{it} + \alpha_8 CFO_{it} + \alpha_9 BIG4_{it} + \alpha_{10} lag\_LOSS_{it} + \alpha_{11} ACMEET_{it} \\ & + \alpha_{12} BODMONI_{it} + \alpha_{13} CEOPOWER_{it} + IndustryFixed + CountryFixed + \varepsilon_{it} \end{aligned} \quad (6)$$

where for each firm i in year t, AQ is either one of the earnings quality attributes developed in section 4 or the composite earnings quality measure EQ; IAFQ is the IAF quality score, ranging from 0 to 1; BTM is the book-to-market ratio; GROWTH is sales growth from year t-1 to t; EISSUE is the percentage change in common equity from t-1 to t; DISSUE is the percentage change in total liabilities from t-1 to t; LEV is the leverage ratio calculated as total debts to total assets; LogAT is the natural logarithm of total assets in USD; CFO is the net cash flow from operating divided by average total assets; BIG4 is an indicator variable equal to 1 if a company is audited by a Big4 auditor, and 0 otherwise; lag_LOSS is an indicator variable equal to 1 if the lagged net income is negative, and 0 otherwise. Since IAF quality is influenced by other corporate governance mechanisms which can also affect firms' financial reporting, I further add three corporate governance variables into the regressions, including board monitoring intensives (BODMONI), audit committee diligence (ACMEET), and CEO power (CEOPOWER). BODMONI is an aggregated variable based on board independence, female board members, busy board members who take at least three other directorship in other companies, and board meetings; ACMEET is measured by the number of audit committee meetings; CEOPOWER is developed based on two CEO characteristics: CEO tenure and CEO duality i.e.,

whether the CEO is also the chairman of the board. Those corporate governance variables are manually collected from firms' annual reports or proxy statements. In addition to the firm-level control variables, I also include industry and country fixed effects into the regressions. Since for each and every earnings quality measure, larger values indicate better earnings quality, I expect that the coefficients of IAFQ are significantly positive in all regressions.

To test the effect of financial reporting focus of the IAF on earnings quality (H2a) as well as the impact of financial reporting focus of the IAF on the relationship between IAF quality and earnings quality (H2b), I estimate the following regression:

$$\begin{aligned} EQ_{it} = {} & \beta_0 + \beta_1 IAFQ_{it} + \beta_2 REPORT_{it} + \beta_3 REPORT\_IAFQ_{it} + \beta_4 BTM_{it} \\ & + \beta_5 GROWTH_{it} + \beta_6 EISSUE_{it} + \beta_7 DISSUE_{it} + \beta_8 LEV_{it} + \beta_9 LogAT_{it} + \beta_{10} CFO_{it} \\ & + \beta_{11} BIG4_{it} + \beta_{12} lag\_LOSS_{it} + \beta_{13} ACMEET_{it} + \beta_{14} BODMONI_{it} + \beta_{15} CEOPOWER_{it} \\ & + IndustryFixed + CountryFixed + \varepsilon_{it} \end{aligned} \quad (7)$$

where for each firm i in year t, REPORT is an indicator variable equal to 1 if the IAF is extensively involved in financial reporting activities, and 0 otherwise; REPORT_IAFQ is the interaction term between REPORT and IAFQ. All other variables are defined the same as before. In the above equation, β_1 captures the effect of IAF quality on earnings quality when the IAFs are not financial reporting focused. β_2 is the impact of financial reporting focus of the IAF on earnings quality. β_3 represents whether the influence of IAF quality on earnings quality is moderated by the IAF's financial reporting focus. A significant positive β_3 indicates that the financial reporting focus of the IAF reinforces the relationship between IAF quality and earnings quality. To contrast high-quality IAFs with low-quality IAFs, I replace IAFQ with HIAFQ which is an indicator variable for high-quality IAFs. HIAFQ

takes the value of 1 if a firm's IAFQ is larger than the sample median, and 0 otherwise.

A similar equation is adopted to test the influence of assuming a strategic role by the IAF on earnings quality (H3a) as well as to investigate whether the IAF quality can mitigate the potential negative impact of a strategic consulting role on earnings quality, if such negative effect exists (H3b):

$$\begin{aligned} EQ_{it} = {} & \gamma_0 + \gamma_1 IAFQ_{it} + \gamma_2 STRATEGY_{it} + \gamma_3 STRATEGY\_IAFQ_{it} + \gamma_4 BTM_{it} \\ & + \gamma_5 GROWTH_{it} + \gamma_6 EISSUE_{it} + \gamma_7 DISSUE_{it} + \gamma_8 LEV_{it} + \gamma_9 LogAT_{it} + \gamma_{10} CFO_{it} \\ & + \gamma_{11} BIG4_{it} + \gamma_{12} lag\_LOSS_{it} + + \gamma_{13} ACMEET_{it} + \gamma_{14} BODMONI_{it} + \gamma_{15} CEOPOWER_{it} \\ & + IndustryFixed + CountryFixed + \varepsilon_{it} \end{aligned} \tag{8}$$

where for each firm i in year t, STRATEGY is an indicator variable equal to 1 if the IAF assumes a strategic consulting role, and 0 otherwise. STRATEGY_IAFQ is the interaction term between STRATEGY and IAFQ. All other variables are defined the same as before. In the above equation, γ_1 shows the impact of IAF quality on earnings quality when the IAF does not take a strategic consulting role. γ_2 demonstrates the impact of assuming a strategic role by the IAF on earnings quality. A significant negative γ_2 indicates that assuming a strategic consulting role has a negative impact on earnings quality. If such negative impact is alleviated by the IAF quality, I expect γ_3 to be significantly positive. Like before, I replace IAFQ with HIAFQ to compare high-quality IAFs with low-quality IAFs.

It is worth noting that the coefficient γ_3 also identifies whether the effect of IAF quality on earnings quality differs between the IAFs that assume a strategic consulting role and those which do not. A significant positive (negative) γ_3 suggests that the effect of IAF quality on earnings quality is more (less) pronounced when the IAF undertakes strategic consulting activities.

5. Empirical Results

5.1 Descriptive Statistics

Table 2.3 shows the descriptive statistics of the earnings quality attributes and the variables used in the regressions. Variable correlations are tabulated in Table 2.4. According to the table, the correlation between IAFQ and EQ are significantly positive. However, the correlations between EQ, REPORT, and STRATEGY are not significant at 5% level, although the signs of the correlations indicate that EQ is positively related to REPORT and negatively related to STRATEGY.

5.2 Regression Results

The regression results regarding the relationship between IAF quality and earnings quality are tabulated in Table 2.5. Model (1) to Model (5) present the results for individual earnings quality attributes, respectively. The results illustrate that IAF quality has a significant positive relationship with Smoothness, Predict, TACC, and ABACC, suggesting that IAF quality is associated with less smoothed earnings, more predictable earnings, and earnings with better accrual quality. The coefficient of IAFQ in the regression of earnings conservatism does not appear significant, although the positive sign is consistent with the prediction. Model (6) in Table 2.5 tabulates the result for the composite measure of earnings quality EQ. In this regression, the coefficient of IAFQ remains significant and positive, implying that high-quality IAFs are associated with better overall earnings quality.

Table 2.6 presents the results regarding the impact of financial reporting focus of the IAF. In the table, the coefficient of IAFQ is significant and positive, whereas the coefficients of REPORT and the interaction term between IAFQ and REPORT are not significant. The joint test suggests that the combination between IAFQ and

IAFQ_REPORT is positive and statistically significant. In Model (2) where IAFQ is replaced by HIAFQ, results remain the same. Together, findings in Table 2.6 imply that IAF quality is positively associated with earnings quality regardless of the extent to which the IAF is involved in financial reporting, and that the financial reporting focus of the IAF neither influences earnings quality nor reinforces the positive relation between IAF quality and earnings quality.

Table 2.7 exhibits the results with respect to the IAF assuming a strategic consulting role. In Model (1), the significantly positive coefficient of IAFQ indicates that IAF quality has a positive impact on earnings quality when the IAF does not assume a strategic consulting role. The joint test of the combination between IAFQ and IAFQ_STRATEGY is positive and significant, meaning that IAF quality remains a positive impact on earnings quality even when the IAF is involved in strategic consulting activities. The significantly negative coefficient of STRATEGY suggests that the strategic consulting role assumed by the IAF has a negative impact on earnings quality. However, the significantly positive coefficient of the interaction term between IAFQ and STRATEGY implies that the negative influence resulted from strategic consulting is alleviated by the IAF quality. Model (2) of Table 2.7 provides a more intuitive interpretation of the results when IAFQ is replaced by HIAFQ. According to the table, the negative coefficient of STRATEGY indicates that when the IAF quality is low, assuming a strategic consulting role has a negative impact on earnings quality. However, such negative impact is alleviated by high-quality IAFs as the coefficient of the interaction term between HIAFQ and STRATEGY is significantly positive. The joint test of the combination between STRATEGY and HIAFQ_STRATEGY is not statistically significant, implying that

the negative effect of strategic consulting on earnings quality disappears when the IAF quality is high.

Furthermore, the significantly positive coefficients of the interaction terms in both Model (1) and Model (2) of Table 2.7 imply that the impact of a high-quality IAF on earnings quality is more pronounced when the IAF assumes a strategic consulting role. Considering the potential issues related to the IAF's capacity and objectivity when the IAF is involved in strategic consulting, this result is consistent with the notion that IAF quality matters more for financial reporting when a high-quality IAF is most needed.

6. Additional Analysis

6.1 Quality Dimensions and Earnings Quality

In the main analysis, I use the composite measure of IAF quality. Nevertheless, the relative effect of each IAF quality dimension on earnings quality can be different. To shed light on this issue, I regress EQ on each quality dimension separately. Table 2.8 presents the regression results. While Model (1) to (4) show the results for each quality dimension respectively, Model (5) reports the result when the four quality dimensions are added into the regression together. Based on the table, Independence and Quality_assure have significantly positive relationships with EQ, regardless of whether they are added into the model alone or with other quality dimensions together. On the contrary, the coefficients of Competence and Plan_report are insignificant. The results in Table 2.8 imply that the independent status of IAF and the quality assurance and improvement practices of IAF are relatively more important in improving earnings quality than the IAF's competence and planning and reporting activities. Such finding is consistent with the public opinion that internal

auditors' independence and objectivity are essential for the IAF to fulfill its responsibilities in monitoring and that internal auditing should always remain as an independent and objective activity (IIA, 2012).

Nevertheless, the above result is somehow different from the findings in Prawitt et al., (2009) and Ege (2014) who document that the IAF's competence is more important in deterring earnings management and fraud. However, Ege (2014) cautions readers that the lack of significance of objectivity[16] in his paper may be caused by small variations in his measure of the IAF's objectivity. The international sample based on the CBOK 2010 in this study offers a setting with sufficient variance of the IAF's independence and the results indeed confirm that the independent status of IAF is important for maintaining high-quality financial reporting. As such, the significant result of independence in this paper complements the findings in previous studies.

6.2 U.S. firms vs. Non-US firms

Consider the large stake of U.S. firms in the sample as well as the strict regulatory environment for internal control over financial reporting in the U.S., I re-regress IAFQ on EQ using only U.S. firms or only non-US firms separately to address the concern that the findings are driven by the U.S. firms. The regression results are tabulated in Table 2.9. The table shows that IAFQ remains positive and significant in both U.S. sample and non-US sample, suggesting that the positive relationship between IAF quality and earnings quality is not simply driven by the U.S. firms.

[16] The measure of objectivity in Ege (2014) is similar to the measure of independence in the current study. Footnote 12 provides a detailed discussion of this issue.

7. Conclusion

In this paper, I investigate the relationship between IAF quality, IAF activities, and earnings quality. Using a unique archival IAF sample, I find that IAF quality is positively associated with various earnings quality attributes. As a response to the call in Prawitt et al. (2009) that the relationship between IAF quality and financial reporting quality needs be re-tested when new data is available, I provide corroborating evidence in this paper supporting the importance of IAF quality in maintaining financial reporting quality. However, unlike the previous studies relying on the GAIN database[17] (e.g., Prawitt et al., 2009; Ege, 2014) which find that the competence of IAF is a relatively more important factor in improving financial reporting quality, I document that the independence of IAF and the quality assurance and improvement practices of IAF are crucial aspects for the IAF to have a positive influence on earnings quality.

More importantly, considering the recent expansion of IAF activities into strategic consulting and the corresponding public concerns that assuming a strategic role by the IAF could negatively affect the IAF's role in financial reporting, I reveal that assuming a strategic consulting role by the IAF could indeed have a negative influence on earnings quality. However, such negative influence only occurs when the IAF quality is low and disappears when the IAF quality is high. In fact, high-quality IAFs consistently have a positive influence on earnings quality, and such positive effect is more pronounced when the IAF assumes a strategic consulting role. Since issues related to capacity and objectivity are more likely to happen when the IAF is involved in strategic consulting activities, this finding implies that IAF quality

[17] GAIN database, which also belongs to the IIA, is an online voluntary survey in which firms participate to benchmark their IAFs to the ones of comparable firms.

matters more in maintaining high-quality financial reporting when a high-quality IAF is most needed.

The findings of this study should prove interesting to several parties, especially those involved in the debates of whether expanding IAF activities could impair the IAF's role in assurance type activities. Findings in this paper suggest that attention need be placed on improving the IAF quality rather than debating whether the IAF should or should not consult the management in strategic development. The IAF is expected to add value to companies and such expectation will make the IAF's involvement in strategic consulting inevitable. In order to mitigate the potential issues related to the lack of capacity and the erosion of objectivity when the IAF performs strategic consulting, regulators, standard setters, as well as other governance bodies should consider ways to improve the IAF quality.

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Chapter III

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

Abstract: Standard-setters and internal audit practitioners have claimed for years that a high-quality 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 a high-quality IAF is 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 a high-quality IAF than for firms with a low-quality IAF. Furthermore, I document that firms with a high-quality IAF 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 IAF, and its effect on firm performance. The IIA defines internal auditing as "an independent, objective assurance and consulting activity designed to add value and improve an organization's operation" (IIA, 1999). 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 the IAF 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) 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: p1). 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 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. As there is no consensus with respect to the definition of IAF quality, I self-construct an IAF quality measurement model based on the Standards (IIA, 2012) 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 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 quality. The estimated weights are then used

to compute the scores for the quality dimensions and the overall IAF quality (PLS-PM approach).

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 efficiency, regardless of whether investment efficiency is measured by the investment expenditure sensitivity to investment opportunities (Chen et al., 2011; Bushman et al., 2011; 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, 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 IAF 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 IAF quality. 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 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 for enterprise risk management that incorporates both internal control and risk management[18] (Sarens and De Beelde, 2006). The global internal

[18] 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

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 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

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

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.

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

[19] 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 Standards. All these aspects are incorporated in my IAF quality measurement model.

First, firms with a high-quality IAF 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.[20] 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 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

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

with several experienced internal auditors[21] 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 capital was limited.

[21] 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.

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 a high-quality IAF in improving the efficiency of resource allocation can also be demonstrated by the fact that a high-quality IAF 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 3.1 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. The global internal auditor survey was conducted in early 2010 by the IIA and was a part of the Common Body of Knowledge (CBOK). 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. After removing responses that have 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 total assets, total sales, industry, and the domain names of firms' websites with relevant information provided by the survey respondents. Detailed matching procedure is outlined in the first chapter. 329 unique firms were ultimately 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 3.2 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 3.3) 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 bias would be most likely to work against finding any result supporting my expectations. Nevertheless, to somehow address the concern that firms with a good IAF 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[22] of firms providing early responses does not statistically differ from that of firms having late responses.[23]

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 the first chapter. Specifically, relying on the Standards (IIA, 2012), 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 competence and independence,[24] the desirable practices encompass the IAF's planning and reporting practices (Plan_report) as well

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

[23] 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).

[24] Please refer to the first chapter for a detailed discussion about the reasons why independence rather than objectivity is selected as the second quality dimension.

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 PLS-PM[25] to estimate the hierarchical measurement model of IAF quality which is depicted in Figure 3 (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 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

[25] Please refer to the first chapter for a detailed discussion about the advantages of using PLS-PM.

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 approach 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)[26] which is computed as net income scaled by total assets.[27] 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 median 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 quarters each firm took to reach the reference ROA for the first time during the recovery

[26] 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 a low-quality IAF 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.

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

period. Recovery duration for non-survivals is assigned the value of 12. Figure 4 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:

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

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.[28] 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 a better IAF 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.[29] In the above equation (1), FirmControls are lagged firm-level control variables measured at the 2009 year-end. According to the findings in the first chapter, larger and more complex firms are more likely to have a better IAF. 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 opportunities.

[28] 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.

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

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 their 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 a high-quality IAF 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 in the first chapter I 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 incentives (BODMONI), audit committee diligence (ACMEET), and CEO power (CEOPOWER). [30] In addition to firm-level control variables, I also control for industry fixed effects (IndustryFixed)[31] and country fixed effects (CountryFixed). [32] Considering the possible recovery

[30] BODMONI is a composite variable aggregating board independence, female board members, busy board members who serve at least three other directorship in other companies, and board diligence. CEO power is a composite variable aggregating CEO tenure and CEO duality. In a robustness test, individual variables regarding the board and CEO characteristics are used instead of composite variables. Results remain unchanged. In addition, I also add the aggregated variable for earnings quality (EQ) derived from the second chapter to control for the financial reporting quality of the firms. The inclusion of EQ into the model does not alter the results.

[31] The results remain unchanged if financial institutions are excluded from the analysis. In addition, in a robustness check, I subtract country-industry median ROA from firm-specific ROA to measure performance. Results remain unchanged if industry-subtracted ROA is used in the performance recovery analysis.

[32] 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

dependence across firms in the same economic regions/markets, standard errors are adjusted by clustering region-economic blocks.[33] 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 D 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., 2011; Stein, 2003; Lang et al., 1996). The following regression model is adopted:

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

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

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.

[33] 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 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.

(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 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.

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

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:

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

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 3.3. 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 a high-quality IAF and 0.028 for firms with a low-quality IAF, 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, 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 a high-quality IAF and firms with a low-quality IAF is somehow similar. However, in the post-financial-crisis period 2010-

2012, the mean ROA for firms with a high-quality IAF is about 0.030 whereas the mean ROA for firms with a low-quality IAF 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 a high-quality IAF and 5.78 quarters for firms with a low-quality IAF. The difference in recovery duration between high-quality and low-quality IAFs is statistically significant (t=2.98, p<0.01).

Regarding the multivariate analysis, the results of Cox duration analysis are tabulated in Table 3.4 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 a high- quality IAF are more likely to recover and recover faster than firms with a low-quality IAF 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-US firms not crosslisted, non-US firms crosslisted in major U.S. stock exchanges experienced slower recovery.

Table 3.5 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 a high-quality IAF have more efficient investment than firms with a low-quality IAF.

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[34] 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

[34] Operating ROA is computed as net operating profits divided by net assets.

duration model with time-varying control variables consists of 1,164 firm-quarter observations.

Results of the sensitivity analyses are summarized in Table 3.6. 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.

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 3.7. As expected, Model (1) of Table 3.7 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 a high-quality IAF is about 77% (exp(-0.26) = 0.77) of the recovery duration of firms with a low-quality IAF, while holding all other variables in the model constant.

In Model (2) of Table 3.7, 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 the first chapter. 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 the first chapter, 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 a high-quality IAF recover faster than firms having a low-quality IAF 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

the first chapter where I 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 the first chapter to construct the first instrumental variable of IAFQ. The last column of Table 3.2 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 3.8. 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.[35] Overall, results in the diagnosing analyses confirm the appropriateness of the two instrumental variables.

[35] 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.

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 3.8, both TQ and the interaction term between TQ and HIAFQ remain significantly positive.

6.4 Additional Analysis: IAF Activities, IAF Quality, and 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 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 IAF 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.

Results regarding the 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: IAF Quality Dimension and 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 3.10. 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 a high-quality IAF are indeed more likely to recover and recover faster after the financial crisis than firms with a low-quality IAF. 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 IAF in corporations and the expanded involvement of IAF 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 their 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 IAF 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 IAF 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 IAF after the financial crisis. Taken together, the findings suggest that for the IAF to add value, the IAF quality 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.

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Conclusion

1. Summary

In my dissertation, I empirically investigate the determinants and economic consequences of IAF quality, using a unique set of international archival IAF data. Based on the new, input based measure of IAF quality developed in the dissertation, I demonstrate that the IAF quality is influenced by both (1) firm-level factors, including operating complexity, growth opportunities, board monitoring incentives, audit committee diligence, and CEO power, and (2) country-level factors, especially the IAF requirements in the corporate governance codes. In addition, firm-level factors, in particular the board monitoring incentives, matter more in affecting the IAF quality when the overall regulatory environment is weak.

Furthermore, I show that having a high-quality IAF can have significant economic consequences. Addressing the traditional role of IAF in providing assurance services, I find that a high-quality IAF is associated with better earnings quality. Pertaining to the IAF's role in providing consulting activities that has gained increasing importance in recent years, I document that a high-quality IAF is associated with quicker operating performance recovery and more efficient investments after the recent financial crisis. Moreover, the extent to which the IAF is involved in risk management or strategic consulting activities has an incremental positive impact on firms' performance recovery even when the IAF quality is controlled for. However, the IAF's extensive involvement in strategic consulting activities can be a double-edged sword when the IAF quality is low, as I find that such involvement can induce potential capacity and objectivity issues in the a low-quality IAF which in turn adversely affect the earnings quality. In contrast, a high-

quality IAF is not prone to those problems, and hence the involvement in strategic consulting by a high-quality IAF does not have a negative impact on earnings quality.

Finally, I show that the process through which internal audit is conducted and evaluated can be of particular importance for the IAF to provide quality assurance and consulting services. Specifically, I find that, among the four quality dimensions, the IAF's independence and quality assurance practices are relatively more important for financial reporting, whereas the IAF's planning and reporting practices as well as well the quality assurance practices are relatively more important for firms' operations. Taken together, findings in my dissertation suggest that maintaining an appropriate level of quality, especially by improving the internal audit process, can be critical for the IAF to act as a "trusted advisor" which meets the rising expectations from directors and managers.

2. Contributions

My dissertation makes several important contributions to the accounting, auditing, and corporate governance literature. The first major contribution is the new, input-based measurement model of IAF quality that incorporates a comprehensive set of IAF attributes and practices. Compared to previous IAF quality measures (e.g., Prawitt et al., 2009; Ege, 2014), I make three improvements in my IAF quality measure. First, given the fact that nowadays IAFs assume responsibilities in various corporate activities beyond financial reporting, I do not constrain the measurement items to be financial reporting relevant. In this sense, the IAF quality measure in my dissertation is more applicable to the current status of IAFs. Second, I explicitly take into account the quality assurance and improvement practices of the IAF which have been found essential to the IAF's role in corporate governance in recent studies

(Zipfel and Eulerich, 2013). Third, to form the composite IAF quality score, I rely on a more statistically sound method, i.e., PLS-PM, to estimate a hierarchical model of IAF quality instead of merely equal-weighting the measurement items.

Second, although prior studies already investigate firm-level factors influencing some single characteristics of the IAF, such as presence, size, budget (e.g., Carcello et al., 2005a; Barua et al., 2010), those single IAF features are poor proxies for IAF quality (Prawitt et al., 2009; Prawitt et al., 2011). In contrast, I explore both firm- and country-level factors that affect the overall IAF quality. I show that the IAF quality is affected by firms' operating environment and the features of other governance mechanisms whose influence on the IAF quality can be either complementary or substitutive. In addition to the firm-level factors, I document that firms' incentives for a high-quality IAF are bolstered by stronger institutional environment, especially the strictness and intensity of the IAF requirements in countries' corporate governance codes. As such, I depict a more complete picture of the factors that affect the IAF quality in an international context. More interestingly, I find that the other corporate governance mechanisms matter more for IAF quality when a country's regulatory environment is of low quality, suggesting that firm-level private incentives play a stronger role in influencing the IAF quality in a relatively weak institutional environment.

Third, contrary to the previous literature which mainly investigates the IAF's role in providing assurance services in financial reporting, I address both the assurance and advisory roles of IAF in my dissertation. With respect to the role of providing assurance services, I show that IAF quality has a positive impact on earnings quality. More importantly, I find that the IAF's involvement in strategic consulting has a negative impact on earnings quality only when the IAF quality is

low, demonstrating that having a high-quality IAF can counter-balance the potential capacity and objectivity issues arising from expanding the IAF activities into strategic consulting.

With respect to the potential benefits from the IAF's advisory role, I find that having a high-quality IAF is associated with quicker operating performance recovery after the recent financial crisis. To my best knowledge, this is the first piece of empirical evidence supporting the positive influence of a high-quality IAF on firms' operational activities. Given the increasing involvement of IAFs in advisory activities relevant to firms' operations and strategic initiatives, this finding is an important extension of prior studies and should have implications for the current debate about the added value of IAF. This finding, combined with the finding regarding the importance of IAF quality in providing assurance services in financial reporting, suggests that if the IAF is expected to provide both assurance and advisory services, as defined by the IIA (1999), keeping a high-quality IAF is essential.

Fourth, by testing the four quality dimensions separately, I illustrate, for the first time in the literature, that the process through which internal audit is conducted, evaluated, and improved is of particular importance for the IAF to fulfill both assurance and advisory roles. Until now, much attention is given to the characteristics of the IAF, such as competence and objectivity. Findings in my dissertation imply that the process of conducting internal audit is at least as important as the characteristics of IAF.

3. Limitations

Despite the important findings and implications discussed above, my dissertation has some caveats. First, as a common drawback when survey data is used

in empirical studies, I implicitly assume that survey respondents provide accurate information regarding their IAFs' characteristics and practices. Although inaccurate information is somehow inevitable in surveys, it is more likely to introduce noise rather than systematic bias in my analysis. Nevertheless, readers should be aware of this caveat when interpreting the results.

Second, another common pitfall of using survey data is the selection bias. Although I do not find significant differences in the IAF quality between early and late responses, it is still possible that companies responding to the CBOK 2010 survey, and subsequently included in my analysis, are those having particular incentives and therefore do not represent the overall population of listed firms. Addressing this selection bias is difficult in my research setting, as information related to the IAF is very limited for the firms which did not participate in the survey. As a result, the generalizability of findings in my dissertation is reduced due to this caveat.

Third, my dissertation shares the common endogeneity issue in corporate governance research. Corporate governance is complex and encompasses many pieces which intertwine with each other. Consequently, the impact of a high-quality IAF on firms' financial reporting and operating performance can be a complicated process. Although I attempt to control for as many factors as I can and use lagged values to address the endogenous problem, it is not viable to control for everything. Moreover, because the CBOK 2010 survey was conducted at a particular point of time, the static nature of the IAF quality measure constrains my ability to perform change-level analysis. Nevertheless, although change-level analysis is not feasible in my research setting, I attempt to address this issue by conducting analysis with panel data in which the IAF quality is kept constant across years, with the assumption that

corporate governance structures, including IAF characteristics and practices, are likely to be sticky. Nevertheless, readers should be aware that I mainly document associations rather than causality in my dissertation.

Fourth, because the CBOK 2010 survey did not ask questions pertaining to whether the IAF is used as a management training ground, there is a potential important missing indicator in my measurement model of IAF quality, because using IAF as a management training ground can negatively affect internal auditors' objectivity (e.g., Messier et al., 2011). Although in my IAF quality measurement model, I focus on the IAF's independence rather than objectivity, as objectivity is a mental status that is hard to observe and measure, independence and objectivity are nevertheless closely related. Researchers would do well to take this aspect into consideration if more data is available.

4. Future Research

As research on IAF is still in its early stage and the role of IAF in corporate governance is still evolving, there are a plenty of research opportunities in this area. To conclude my dissertation, I indentify four streams of literature in the internal audit research that, in my view, are promising for future studies.

First, as pointed out by DeFond and Zhang (2014), the relationship between internal audit and external audit is a potential fruitful area for both internal audit research and audit research in general. Although external auditor's decision to rely on the IAF is one of the most researched areas in the IAF studies, evidence regarding the consequences of such reliance is not consistent in the existing literature. For example, while Felix et al. (2001) and Messier et al. (2011) find a negative relationship between external auditor's reliance on IAF and external audit fees,

Goodwin-Steward and Kent (2006) and Singh et al. (2014) find a positive relationship. In addition, Bame-Aldred et al. (2014) reveal that very few studies have examined the effect of external auditor's reliance decision on audit efficiency and the findings are contradictory. For instance, while Abbott et al. (2012) document that the positive effect of IAF quality on external audit efficiency is derived from external auditors using IAF as assistants, Prawitt et al. (2011) find that audit delay is reduced when the IAF performs work on which the external auditors can rely, rather than directly assisting the external auditors. In sum, according to the current literature, it is not clear whether internal audit and external audit are complements or substitutes. Therefore, more studies are needed to clarify the relationship between external audit and internal audit.

Second, even though the volume of research on the IAF's role in financial reporting and internal control is growing fast recently, this stream of literature will continue to be a promising field for future research, given the recent changes in accounting standards and the correspondingly increased demand for assurance services from senior managers and directors. For example, the recently announced changes to rules regarding revenue recognition – "Revenue from Contracts with Customers" – are going to replace more than 200 pronouncements from both the U.S. Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB), causing sweeping changes in accounting practices in a number of industries (Chamber, 2014). As revenue recognition ranks the most common causes of restatements in financial reporting, companies' financial reporting quality can be significantly influenced, depending on whether the IAF can assist the managers and directors in applying the new rules and provide assurance that the new rules are being implemented appropriately. It will be interesting to examine the

factors that make the IAF more effective in providing assurance in implementing new accounting standards and the consequences from such assurance services.

Third, besides the assurance services, the consulting services provided by the IAF and the subsequent economic consequences resulted from such consulting services should be given more attention. The third chapter of my dissertation makes an initial move in this area, and future research can continue to explore this field. For instance, given the extensively involvement of IAFs in risk management and the enhanced public awareness of the importance to manage risks, the IAF's influence on the overall enterprise risk management quality will be an very interesting and timely research question.

Fourth, although I do not test whether the recruiting and staffing practices of the IAF influence IAF quality, those practices should be an important factor because internal auditing is eventually a human behavior. Bartlett et al. (2014) find that IAFs face challenges in finding sufficient numbers of high quality job applicants to fill their ranks and that experienced external auditors hold negative stereotypes of internal auditing as a career. According to the Pulse of the Profession (IIA, 2015) from the IIA's Audit Executive Center, 42 percent of CAEs in North America held a position outside of internal audit immediately before becoming the CAE. Those phenomena suggest that it is a timely issue to understand how the staffing problem of the IAFs and the recruiting practices developed by the companies influence the IAF practices and IAF quality. Research on this issue can have strong implications for the development of the internal audit profession.

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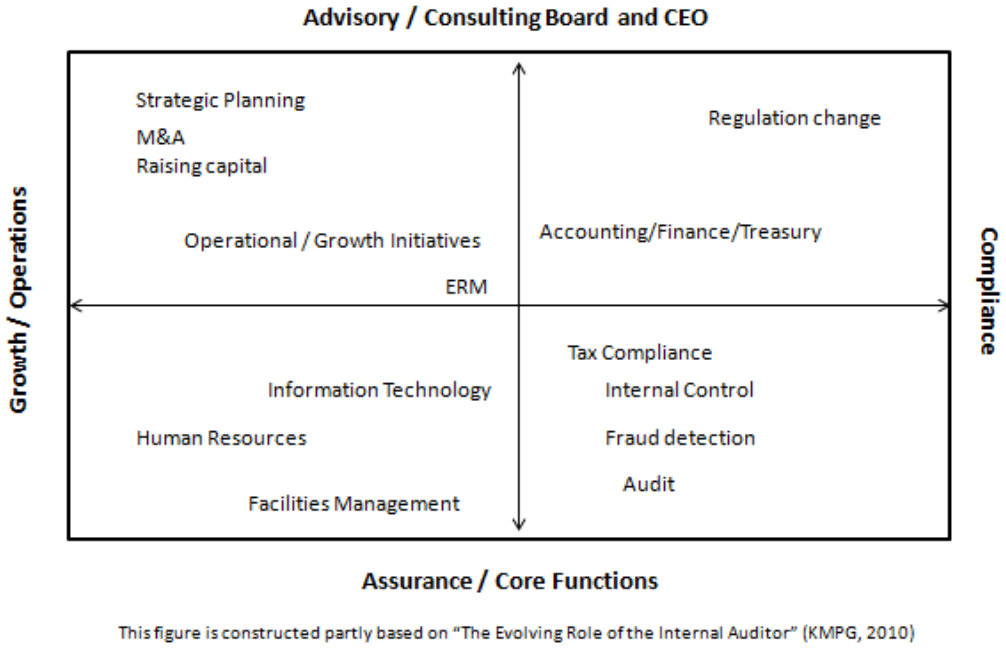
Figures

Figure 1: Activities Commonly Performed by an IAF



This figure is constructed partly based on "The Evolving Role of the Internal Auditor" (KMPG, 2010)

Figure 2: Overall Structure of Dissertation

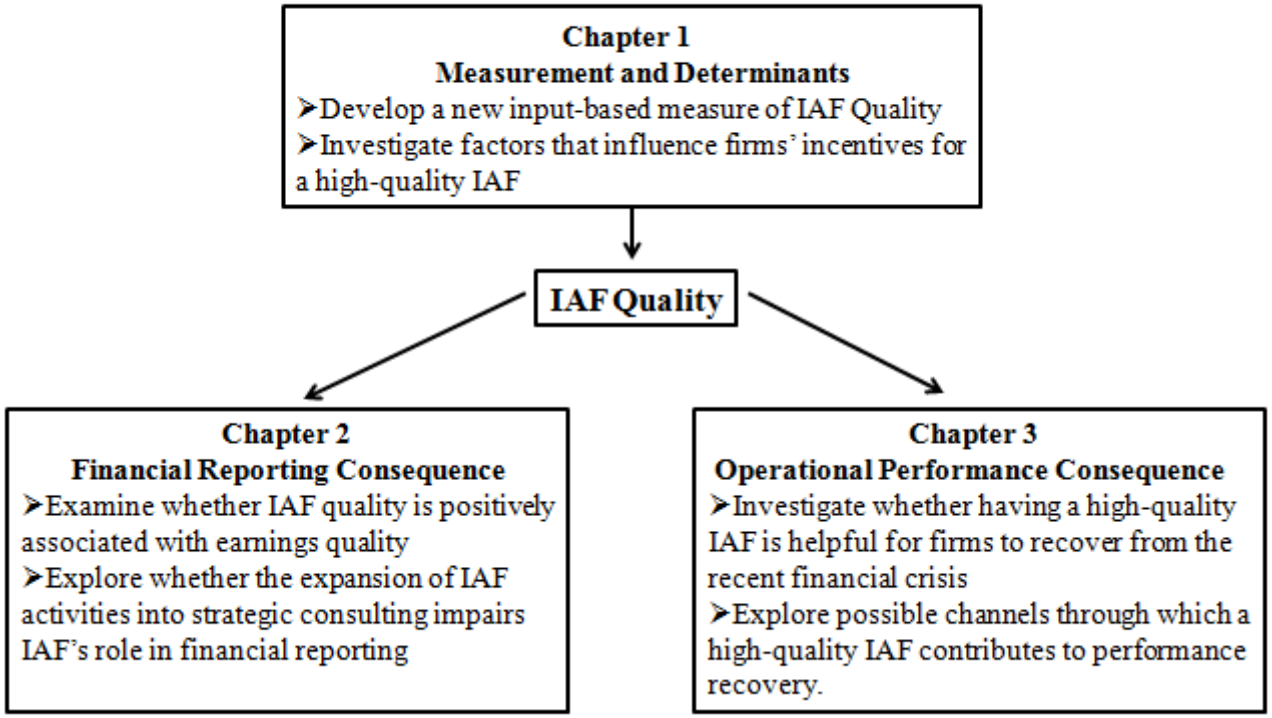


Figure 3: Hierarchical Measurement Model of IAF Quality

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. In the outer part of the model, each quality dimension 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 measurement items and is computed as a linear combination of all measurement items. The inner part of the model specifies four paths linking the four quality dimensions to the overall IAF quality, as the overall IAF quality is composed by the four quality dimensions. 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 between 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.

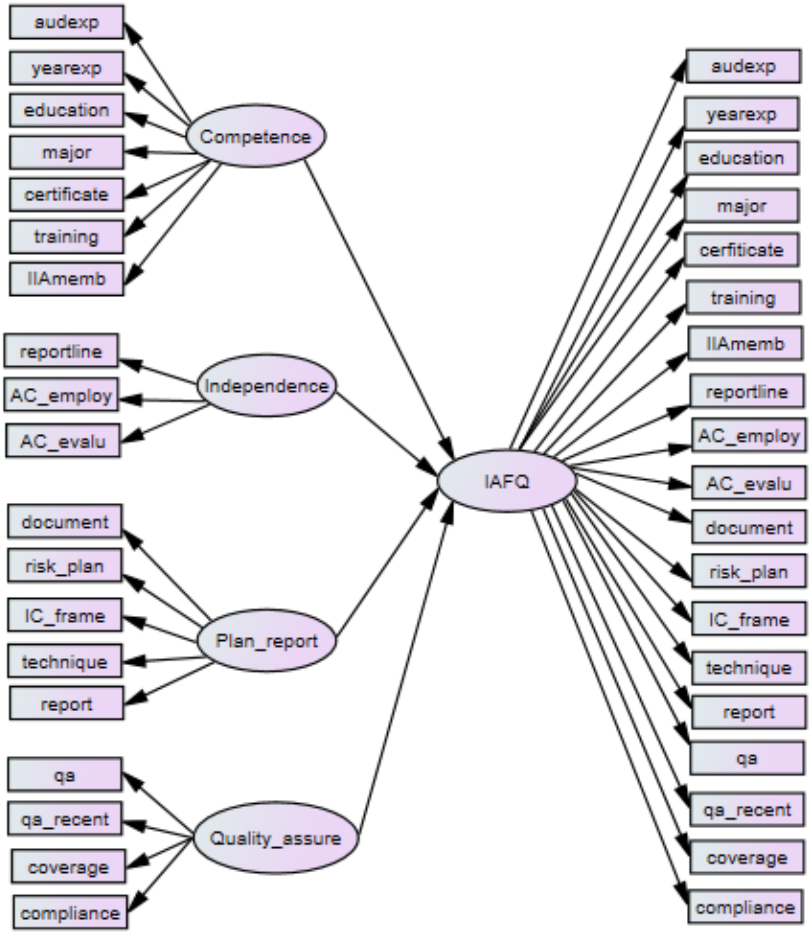
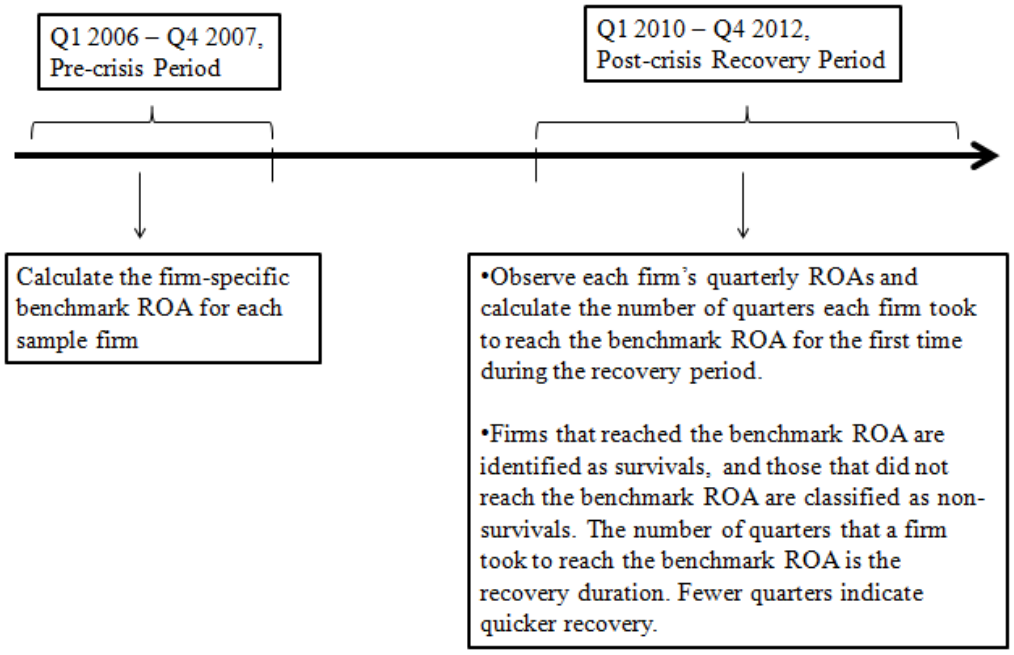


Figure 4: Research Design for Analyzing Performance Recovery

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



Tables

Table 1.1: Sample Matching and Selection Procedure in Chapter I

This table shows the sample matching and selection process in Chapter I. The sample is constructed by merging the CBOK 2010 survey responses with public firms in Worldscope. CBOK refers to Common Body of Knowledge that consists of several global internal auditor surveys conducted by the Institute of Internal Auditors (IIA).

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
Firms with missing values of firm-level variables in empirical models	64
Final sample for empirical analysis	**265**

Table 1.2: Sample Distribution and Country-level Variables in Chapter I

This table shows the sample distribution by country in Chapter I. It also shows the values of country-level variables used in the regressions. CGCode is a self-constructed index that captures the intensity of IAF requirements in countries' corporate governance codes. It is an ordinal variable taking values from 1 to 5 with higher values indicating stricter and more detailed IAF requirements. Details regarding the coding of the corporate governance codes can be found in Appendix C. FinDev is an index measuring the financial market development of a country. RegQuality is an index measuring the overall quality of a country's regulatory environment. FinDev and RegQuality are standardized values. All variable definitions are summarized in Appendix D.

Country	Freq.	CGCode	FinDev	RegQuality
Australia	2	3	1.38	0.90
Austria	3	4	-0.83	0.86
Belgium	4	4	-0.09	0.41
.Canada	8	2	1.38	0.76
Denmark	1	4	0.47	1.21
Finland	4	3	0.47	0.77
France	9	2	-0.09	0.23
Germany	1	1	-0.89	0.68
Greece	1	1	-0.21	-0.41
India	1	2	-0.49	-2.20
Ireland	2	1	-0.66	1.21
Italy	10	3	-1.28	-0.33
Japan	25	2	0.30	0.07
Malaysia	6	5	1.21	-0.97
Mexico	1	4	-1.79	-1.16
Netherlands	3	4	-0.09	1.01
New Zealand	2	2	-0.60	0.98
Norway	1	2	0.36	0.37
Portugal	3	1	-1.34	-0.07
Singapore	2	4	1.66	1.15
South Africa	6	4	0.53	-0.86
Sweden	2	4	0.76	0.74
Switzerland	9	4	1.27	0.75
Taiwan	35	5	0.98	-0.23
Thailand	1	1	-0.83	-1.43
Turkey	5	2	-1.57	-1.29
U.K.	7	4	1.21	1.14
U.S. NYSE	64	5	0.64	0.70
U.S. NASDAQ	47	4	0.64	0.70
Total	265			

Table 1.3: Estimation Results of PLS-PM Approach

The tables show the estimation results of the IAF quality measurement model depicted in Figure 3. The estimation process is based on Partial Least Squares Path Modeling (PLS-PM). CBOK survey responses from the Chief Audit Executives (CAEs) who answered all the survey questions related to the measurement items are used in the estimation process. Detailed descriptions of the measurement items are presented in Appendix A and descriptive statistics of the measurement items are tabulated in Appendix B.

Panel A: Test of Homogeneity of Quality Dimension Blocks

This table presents the results for testing whether each quality dimension block is homogenous and unidimensional.

Latent variable	Number of Items	Cronbach's alpha	D.G. rho
Competence	7	0.54	0.71
Independence	3	0.64	0.81
Plan_report	5	0.49	0.70
Quality_assure	4	0.77	0.85

Panel B: Impact and Contribution of Quality Dimensions on Overall IAF Quality (IAFQ)

This table shows the correlations between quality dimensions and the overall IAF quality (IAFQ), the standardized path coefficients of the quality dimensions, and the contribution of each quality dimension to the variance of IAFQ.

	Quality_assure	Plan_report	Competence	Independence
Correlation	0.774	0.741	0.643	0.547
Path coefficient	0.453	0.358	0.349	0.292
Contribution %	35.051	26.538	22.423	15.987
Cumulative %	35.051	61.590	84.013	100.000

Table 1.4: Descriptive Statistics of Firm-Level Variables in Chapter I

This table presents the descriptive statistics of the firm-level variables used in the regressions in Chapter I. Continuous variables are winsorized at both top and bottom 1% level. All variable definitions are summarized in Appendix D.

Variable	N	Mean	Median	SD	Min	Max
IAFQ	265	0.597	0.597	0.188	0.057	0.989
IAFQ_WA	265	0.642	0.654	0.142	0.248	0.953
LOGAT	265	7.210	7.186	1.844	1.798	12.524
SEGMENT	265	3.215	3.000	2.003	1.000	10.000
FORSALE	265	0.214	0.056	0.272	0.000	0.955
MTB	265	1.610	1.175	1.770	0.009	13.577
BODSIZE	265	9.155	9.000	3.231	3.000	34.000
BODINDE	265	0.516	0.556	0.293	0.000	1.000
BODFEMALE	265	0.098	0.091	0.115	0.000	0.500
BODBUSY	265	0.453	0.400	0.357	0.000	1.000
BODMEET	265	8.396	8.000	3.536	1.000	20.000
BODMONI	265	1.842	2.000	1.010	0.000	4.000
BODMONI_PCA	265	0.000	0.104	1.110	-2.383	3.147
ACSIZE	265	3.442	3.000	1.160	1.000	12.000
ACMEET	265	4.623	4.000	2.524	1.000	10.000
CEOTENURE	265	8.015	5.000	8.056	1.000	44.000
CEODUALITY	265	0.423	0.000	0.495	0.000	1.000
CEOPOWER	265	0.453	0.500	0.380	0.000	1.000
INTANGIBLE	265	0.197	0.074	0.357	0.000	3.008
GROWTH	265	0.063	0.039	0.149	-0.252	0.900
LEVERAGE	265	0.166	0.127	0.170	0.000	0.865
CLOSEHELD	265	0.258	0.191	0.237	0.000	0.931
BIG4	265	0.842	1.000	0.366	0.000	1.000
CROSSLIST	265	0.053	0.000	0.224	0.000	1.000
INVREC	265	0.302	0.294	0.174	0.016	0.760
CFO	265	0.082	0.068	0.076	-0.088	0.313

Table 1.5: Variable Correlations in Chapter I

This table shows the Pearson correlations among the firm-level variables used in the regressions in Chapter I. Correlations significant at 5% level are in boldface. All variable definitions are summarized in Appendix D.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	IAFQ	1.00																			
2	IAFQ_WA	**0.94**	1.00																		
3	LogAT	**0.40**	**0.34**	1.00																	
4	SEGEMENT	**0.21**	**0.17**	**0.41**	1.00																
5	FORSALE	**0.16**	0.11	**0.33**	**0.25**	1.00															
6	MTB	**0.14**	**0.13**	0.07	0.09	**0.13**	1.00														
7	INTANGIBLE	**0.21**	**0.18**	**0.24**	0.09	0.08	0.07	1.00													
8	BODMONI	**0.42**	**0.41**	**0.32**	**0.15**	0.09	0.07	0.06	1.00												
9	BODMONI_PCA	**0.48**	**0.44**	**0.23**	0.06	**0.15**	0.06	0.09	**0.73**	1.00											
10	CEOPOWER	**-0.13**	**-0.15**	-0.01	**-0.14**	**-0.11**	-0.07	0.02	-0.02	-0.04	1.00										
11	BODSIZE	0.06	0.03	**0.39**	**0.21**	**0.12**	0.00	**0.26**	0.06	0.04	-0.02	1.00									
12	ACSIZE	0.09	0.03	**0.17**	**0.15**	0.00	-0.03	0.07	**0.18**	**0.12**	0.00	**0.38**	1.00								
13	ACMEET	**0.46**	**0.44**	**0.31**	0.08	0.17	0.12	**0.27**	**0.28**	**0.32**	0.01	**0.26**	**0.19**	1.00							
14	GROWTH	-0.05	-0.03	**-0.13**	-0.05	-0.08	**0.20**	0.12	-0.06	-0.04	**-0.15**	-0.03	-0.11	-0.05	1.00						
15	LEV	**0.16**	**0.13**	**0.20**	0.05	0.00	0.03	**0.25**	0.08	**0.13**	-0.02	0.10	0.02	**0.21**	0.06	1.00					
16	CLOSEHELD	-0.06	-0.07	0.02	-0.02	-0.03	0.09	-0.09	-0.08	-0.04	**-0.13**	-0.06	**-0.13**	0.03	0.04	0.11	1.00				
17	BIG4	0.02	0.02	**0.13**	0.11	**0.17**	0.08	0.01	0.02	0.06	-0.03	-0.02	0.05	-0.04	0.02	0.02	**-0.12**	1.00			
18	CROSSLIST	0.04	0.00	0.08	-0.03	**0.16**	0.06	0.03	0.07	0.11	-0.10	0.08	-0.05	0.05	-0.08	0.04	-0.01	-0.04	1.00		
19	INVREC	**-0.20**	**-0.23**	**-0.20**	0.03	0.03	-0.02	**-0.30**	**-0.13**	-0.11	0.01	**-0.12**	0.07	**-0.25**	-0.09	**-0.45**	0.08	0.02	0.05	1.00	
20	CFO	**0.13**	**0.12**	-0.01	-0.04	**0.20**	**0.27**	0.01	0.04	0.10	0.09	-0.09	-0.07	0.10	0.06	0.10	0.03	**0.21**	-0.02	-0.11	1.00

Table 1.6: Regression Results: Factors Influencing IAF Quality

This table presents the regression results regarding the factors that affect IAF quality. Regression (1) includes only firm-level factors, whereas Regression (2) includes both firm- and country-level factors. In both Regression (1) and (2), composite variables for board monitoring incentives (BODMONI) and CEO power (CEOPOWER) are used. In contrast, in Regression (3), individual variables related to board monitoring incentives (BODBUSY, BODINDE, BODFEMALE, and BODMEET) and CEO power (CEOTENURE and CEODUALITY) are used. The dependent variable in all regressions is IAFQ, the IAF quality score derived from the PLS-PM approach. All variable definitions are summarized in Appendix D. Standard errors are in parentheses and are corrected for heteroskedasticity. P-value is calculated based on a two-tailed test. *p<0.1 **p<0.05 ***p<0.01

	(1)	(2)	(3)
Variables	IAFQ	IAFQ	IAFQ
Tested Variables			
LogAT	0.0277***	0.0269***	0.0233***
	(0.0069)	(0.0067)	(0.0062)
SEGMENT	0.0088*	0.0131**	0.0125**
	(0.0053)	(0.0052)	(0.0053)
FORSALE	-0.0526	-0.0482	0.0171
	(0.0403)	(0.0425)	(0.0387)
MTB	0.0071*	0.0077*	0.0075*
	(0.0051)	(0.0044)	(0.0045)
BODMONI	0.0325***	0.0268**	
	(0.0106)	(0.0109)	
CEOPOWER	-0.0900***	-0.0412*	
	(0.0255)	(0.0241)	
ACMEET	0.0213***	0.0228***	0.0186***
	(0.0049)	(0.0050)	(0.0047)
BODBUSY			-0.0721***
			(0.0257)
BODINDE			0.1252***
			(0.0476)
BODFEMALE			0.1612**
			(0.0786)
BODMEET			0.0017
			(0.0024)
CEOTENURE			0.0006
			(0.0011)
CEODUALITY			-0.0568***
			(0.0192)

Table 1.6 (continued)

Control Variables			
BODSIZE	-0.0105***	-0.0073*	-0.0062*
	(0.0035)	(0.0038)	(0.0035)
ACSIZE	-0.0072	-0.0074	-0.0105
	(0.0116)	(0.0111)	(0.0110)
INTANGIBLE	0.0419*	0.0403*	0.0486*
	(0.0265)	(0.0306)	(0.0281)
GROWTH	-0.0518	-0.0422	-0.0736
	(0.0503)	(0.0519)	(0.0478)
LEV	-0.0080	0.0063	0.0038
	(0.0553)	(0.0530)	(0.0521)
CLOSEHELD	-0.0626	-0.0122	-0.0174
	(0.0503)	(0.0504)	(0.0470)
BIG4	-0.0099	-0.0183	-0.0150
	(0.0319)	(0.0307)	(0.0291)
CROSSLIST	0.0065	0.0501	0.0236
	(0.0440)	(0.0468)	(0.0475)
INVREC	0.0189	0.0415	0.0489
	(0.0762)	(0.0683)	(0.0663)
CFO	0.2740**	0.1871*	0.1233
	(0.1178)	(0.1149)	(0.1205)
US	0.0516	0.0025	0.0211
	(0.0388)	(0.0459)	(0.0454)
CGCode		0.0283**	0.0225*
		(0.0119)	(0.0116)
FinDev		0.0545**	0.0454*
		(0.0268)	(0.0264)
RegQuality		0.0102	0.0086
		(0.0400)	(0.0385)
Constant	0.4516***	0.2119**	0.2854***
	(0.0759)	(0.1049)	(0.1023)
IndustryFixed	Yes	Yes	Yes
RegionFixed	Yes	Yes	Yes
Observations	265	265	265
F-test	8.48***	8.63***	9.33***
Adjusted R-squared	0.3987	0.4285	0.4643

Table 1.7: Regression Results without U.S. Firms or without NYSE Firms

This table shows the regression results when only non-US firms or non-NYSE firms are included. The dependent variable in both Regression (1) and Regression (2) is IAFQ, the IAF quality score derived from the PLS-PM approach. All variable definitions are summarized in Appendix D. Standard errors are in parentheses and are corrected for heteroskedasticity. P-value is calculated based on a two-tailed test. *p<0.1 **p<0.05 ***p<0.01

	(1)	(2)
	Non-US	Non-NYSE
Variables	IAFQ	IAFQ
Tested Variables		
LogAT	0.0309***	0.0290***
	(0.0080)	(0.0081)
SEGMENT	0.0060	0.0146**
	(0.0073)	(0.0063)
FORSALE	-0.0263	-0.0510
	(0.0600)	(0.0533)
MTB	0.0084	0.0070
	(0.0066)	(0.0054)
BODMONI	0.0282*	0.0231*
	(0.0148)	(0.0126)
CEOPOWER	-0.0862**	-0.0678**
	(0.0416)	(0.0332)
ACMEET	0.0270***	0.0235***
	(0.0072)	(0.0061)
Control Variables		
BODSIZE	-0.0096*	-0.0079**
	(0.0049)	(0.0040)
ACSIZE	0.0142	-0.0069
	(0.0131)	(0.0142)
INTANGIBLE	0.1077*	0.0823*
	(0.0635)	(0.0456)
GROWTH	-0.0140	-0.0644
	(0.0655)	(0.0611)
LEVERAGE	-0.0084	0.0540
	(0.0942)	(0.0784)
CLOSEHELD	-0.0500	-0.0132
	(0.0647)	(0.0564)
BIG4	0.0009	-0.0066
	(0.0405)	(0.0335)
CROSSLIST	0.0383	0.0508
	(0.0504)	(0.0477)

Table 1.7 (continued)

INVREC	-0.0974	0.0275
	(0.0980)	(0.0922)
CFO	0.0754	0.1801
	(0.1885)	(0.1601)
US		0.0274
		(0.0497)
CGCode	0.0400***	0.0426***
	(0.0144)	(0.0146)
FinDev	0.0339	0.0428
	(0.0300)	(0.0292)
RegQuality	-0.0140	-0.0041
	(0.0409)	(0.0429)
Constant	0.1610	0.1499
	(0.1522)	(0.1388)
IndustryFixed	Yes	Yes
RegionFixed	Yes	Yes
Observations	154	199
Adjusted R-squared	0.4088	0.4311

Table 1.8: Relative Importance of Other Corporate Governance Mechanisms: Weak vs. Strong Regulatory Environment

This table presents the regression results regarding the relative importance of other corporate governance mechanisms in affecting the IAF quality when the quality of overall regulatory environments varies (weak vs. strong). H_reg is an indicator variable equal to 1 if the overall regulatory environment is strong, and 0 otherwise. Regression (1) shows the results when composite variables related to board monitoring incentives (BODMONI) and CEO power (CEOPOWER) are used, whereas Regression (2) tabulates the results when individual variables related board monitoring incentives (BODBUSY, BODINDE, BODFEMALE, and BODMEET) and CEO power (CEOTENURE and CEODUALITY) are used. The dependent variable in both regressions is IAFQ, the IAF quality score derived from the PLS-PM approach. All variable definitions are summarized in Appendix D. Standard errors are in parentheses and are corrected for heteroskedasticity. P-value is calculated based on a two-tailed test. *p<0.1 **p<0.05 ***p<0.01

	(1)	(2)
Variables	IAFQ	IAFQ
Tested Variables		
LogAT	0.0308***	0.0263***
	(0.0068)	(0.0067)
SEGMENT	0.0110**	0.0123**
	(0.0053)	(0.0055)
FORSALE	-0.0632	-0.0686
	(0.0431)	(0.0429)
MTB	0.0073*	0.0086*
	(0.0043)	(0.0046)
BODMONI	0.0590***	
	(0.0119)	
CEOPOWER	0.0244***	
	(0.0067)	
ACMEET	-0.0749*	0.0169**
	(0.0405)	(0.0065)
BODBUSY		-0.0398
		(0.0448)
BODINDE		0.2789***
		(0.0759)
BODFEMALE		0.3590***
		(0.0957)
BODMEET		0.0072*
		(0.0039)
CEOTENURE		0.0024
		(0.0016)
CEODUALITY		-0.0619*
		(0.0319)
reg_BODMONI	-0.0406**	
	(0.0169)	

Table 1.8 (continued)

reg_CEOPOWER	-0.0062	
	(0.0089)	
Reg_ACMEET	0.0134	-0.0085*
	(0.0506)	(0.0048)
Reg_BODBUSY		-0.0272
		(0.0591)
Reg_BODINDE		-0.2306**
		(0.0991)
Reg_BODFEMALE		-0.3620**
		(0.1445)
Reg_BODMEET		-0.0085*
		(0.0048)
Reg_CEOTENURE		-0.0031
		(0.0022)
Reg_CEODUALITY		0.0207
		(0.0431)
Control Variables		
BODSIZE	-0.0063*	-0.0068*
	(0.0036)	(0.0036)
ACSIZE	-0.0084	-0.0089
	(0.0110)	(0.0101)
INTANGIBLE	0.0374	0.0539*
	(0.0281)	(0.0303)
GROWTH	-0.0722	-0.0887*
	(0.0481)	(0.0501)
LEVERAGE	-0.0015	-0.0187
	(0.0527)	(0.0535)
CLOSEHELD	-0.0335	-0.0203
	(0.0460)	(0.0448)
BIG4	-0.0250	-0.0156
	(0.0287)	(0.0278)
CROSSLIST	0.0366	0.0316
	(0.0424)	(0.0461)
INVREC	0.0444	0.0559
	(0.0657)	(0.0620)
CFO	0.1837	0.1100
	(0.1116)	(0.1193)
US	0.0318	0.0276
	(0.0445)	(0.0472)

Table 1.8 (continued)

CGCode	0.0183*	0.0162*
	(0.0123)	(0.0118)
FinDev	0.0525**	0.0436
	(0.0258)	(0.0266)
H_Reg	0.0288	0.2468**
	(0.0631)	(0.0977)
Constant	0.3042***	0.1268
	(0.1022)	(0.1042)
IndustryFixed	Yes	Yes
RegionFixed	Yes	Yes
Observations	265	265
F-test	9.73***	8.74***
Adjusted R-squared	0.4750	0.4868

Table 2.1: Sample Matching and Selection Procedure in Chapter II

This table illustrates the sample matching and selection procedure in Chapter II. The matched firms are obtained from merging survey responses in a global internal auditor survey named CBOK 2010 with public firms in Worldscope. CBOK stands for Common Body of Knowledge and it belongs to the Institute of Internal Auditors (IIA). The panel sample from year 2009 to year 2012 is constructed based on the matched firms.

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)
Number of matched firms	**329**
Firm-year observations 2009-2012	1316
Less:	
Observations with missing values in regressions	(82)
Final sample for empirical analysis	**1,234**

Table 2.2: Sample Distribution by Country and by Year in Chapter II

Panel A: Sample Distribution by Country

Country	Obs.	Country	Obs.
Australia	8	Netherlands	16
Austria	9	New Zealand	8
Belgium	12	Norway	8
Brazil	12	Peru	11
Canada	36	Portugal	16
Colombia	5	Singapore	8
Denmark	8	South Africa	31
Finland	16	South Korea	11
France	43	Spain	15
Germany	26	Sweden	8
Greece	7	Switzerland	36
India	12	Taiwan	140
Ireland	8	Thailand	8
Italy	55	Turkey	24
Japan	128	U.K.	27
Malaysia	23	U.S.	443
Mexico	16	Total	1,234

Panel B: Sample Distribution by Year

Year	Obs.
2009	303
2010	315
2011	313
2012	303
Total	1,234

Table 2.3: Descriptive Statistics in Chapter II

This table presents the descriptive statistics of the firm-level variables used in the regressions in Chapter II. Continuous variables are winsorized at both top and bottom 1% level. All variable definitions are summarized in Appendix D.

Variable	N	Mean	Median	SD	p10	p90
IAF Quality and Earnings Quality Measure						
IAFQ	1234	0.592	0.597	0.194	0.321	0.845
Smoothness	1234	-0.263	-0.320	0.449	-0.793	0.331
Predict	1234	-0.048	-0.034	0.048	-0.103	-0.007
Conservatism	1234	-1.118	0.337	21.112	-4.763	5.319
TACC	1234	0.027	0.032	0.113	-0.086	0.141
ABACC	1234	0.004	-0.001	0.088	-0.083	0.092
EQ	1234	0.503	0.512	0.137	0.316	0.676
Moderators: IAF Activities						
REPORT	1234	0.733	1.000	0.442	0.000	1.000
STRATEGY	1234	0.301	0.000	0.459	0.000	1.000
Firm-level Control Variables						
BTM	1234	0.860	0.686	0.696	0.268	1.702
GROWTH	1234	0.033	0.017	0.217	-0.195	0.251
EISSUE	1234	0.057	0.049	0.257	-0.149	0.297
DISSUE	1234	0.061	0.022	0.276	-0.186	0.321
LEV	1234	0.234	0.203	0.183	0.012	0.476
LogAT	1234	7.371	7.292	1.916	4.969	9.833
CFO	1234	0.075	0.069	0.078	-0.003	0.173
BIG4	1234	0.846	1.000	0.361	0.000	1.000
lag_LOSS	1234	0.143	0.000	0.350	0.000	1.000
ACMEET	1234	4.655	4.000	2.610	1.000	8.000
BODMONI	1234	0.027	0.000	1.081	-1.689	1.426
CEOPOWER	1234	0.378	0.500	0.387	0.000	1.000

Table 2.4: Variables Correlations in Chapter II

This table shows the Pearson correlations among the firm-level variables used in the regressions in Chapter II. Correlations significant at 5% level are in boldface. All variable definitions are summarized in Appendix D.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	EQ															
2	IAFQ	**0.13**														
3	REPORT	0.03	**0.19**													
4	STRATEGY	-0.02	-0.02	**0.11**												
5	BTM	**0.09**	**-0.21**	0.00	0.01											
6	GROWTH	**-0.10**	0.03	-0.03	**0.06**	-0.14										
7	EISSUE	-0.02	0.03	-0.01	0.02	**-0.11**	**0.29**									
8	DISSUE	-0.06	**0.06**	-0.01	0.01	**-0.16**	**0.39**	**0.19**								
9	LEV	0.05	0.04	0.01	-0.04	**-0.08**	-0.04	**-0.13**	0.05							
10	LogAT	**0.17**	**0.34**	-0.03	**-0.18**	**-0.10**	0.03	0.06	0.03	**0.20**						
11	CFO	0.02	0.04	**0.07**	**-0.06**	**-0.31**	0.05	**0.16**	-0.04	**-0.13**	-0.04					
12	BIG4	-0.04	0.02	0.03	-0.05	**-0.17**	0.03	0.04	0.03	-0.04	**0.20**	**0.19**				
13	lag_LOSS	-0.03	-0.06	-0.02	-0.04	**0.14**	-0.03	**-0.11**	**-0.10**	**0.12**	**-0.10**	**-0.13**	-0.04			
14	ACMEET	0.02	**0.37**	**0.06**	**-0.18**	**-0.07**	-0.02	0.02	0.01	0.03	**0.30**	0.02	0.03	0.01		
15	BODMONI	0.00	**0.39**	0.05	**-0.14**	**-0.15**	0.03	0.03	**0.06**	0.02	**0.22**	**0.08**	0.05	-0.02	**0.34**	
16	CEOPOWER	-0.01	-0.03	**0.14**	**-0.07**	-0.03	-0.03	0.04	-0.01	-0.01	0.01	**0.08**	0.04	**-0.06**	**0.09**	-0.01

Table 2.5: Relationship between IAF Quality and Earnings Quality

This table presents the regression results regarding the relationship between IAF quality and earnings quality. IAFQ is IAF quality score derived from the PLS-PM approach. Smoothness is earnings smoothness, Predict is earnings predictability, Conservatism is earnings conservatism, TACC is the inverse value of total accruals, and ABACC is the inverse value abnormal accruals. EQ is the composite measure of earnings quality, measured as the average of the respective percentiles of Smoothness, Predict, Conservatism, TACC, and ABACC, divided by 100. All variable definitions are summarized in Appendix D. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering at both firm and year levels. P-value is calculated based on a two-tailed test. * p<0.1 ** p<0.05 *** p<0.01

VARIABLES	(1) Smoothness	(2) Predict	(3) Conservatism	(4) TACC	(5) ABACC	(6) EQ
IAFQ	0.2244*	0.0250*	3.9442	0.0311**	0.0118*	0.1136***
	(0.1340)	(0.0148)	(3.4306)	(0.0157)	(0.0068)	(0.0287)
BTM	-0.0373	0.0112***	1.8001	0.0089**	-0.0001	0.0225***
	(0.0235)	(0.0031)	(1.7515)	(0.0040)	(0.0001)	(0.0070)
GROWTH	-0.0804***	-0.0024	-1.4811	-0.0313	0.0026	-0.0479*
	(0.0210)	(0.0103)	(2.0937)	(0.0250)	(0.0120)	(0.0261)
EISSUE	0.0599	0.0143*	-0.6272	-0.0600***	-0.0358***	-0.0166
	(0.0452)	(0.0082)	(2.4659)	(0.0176)	(0.0124)	(0.0227)
DISSUE	-0.0724	0.0137	1.9721	-0.0316**	0.0116	-0.0036
	(0.0641)	(0.0095)	(1.7813)	(0.0131)	(0.0086)	(0.0175)
LEV	0.0297	-0.0086	8.3961*	0.0074	-0.0066	0.0205
	(0.1102)	(0.0145)	(4.6964)	(0.0139)	(0.0202)	(0.0211)
LogAT	0.0262*	0.0053***	0.8501	-0.0024	-0.0002	0.0111***
	(0.0137)	(0.0013)	(0.5457)	(0.0025)	(0.0021)	(0.0036)
CFO	-0.1413	-0.0076	15.0157	0.3818***	0.2773***	0.2872***
	(0.2896)	(0.0392)	(11.1235)	(0.0595)	(0.0498)	(0.0482)
BIG4	0.0147	-0.0002	-4.7550	-0.0033	-0.0089	-0.0090
	(0.0672)	(0.0074)	(3.1663)	(0.0073)	(0.0078)	(0.0143)
lag_LOSS	0.0676***	-0.0252***	0.3049	0.0451***	0.0131	-0.0015
	(0.0195)	(0.0043)	(1.0622)	(0.0144)	(0.0113)	(0.0084)
ACMEET	-0.0131	-0.0011	0.3138	-0.0023	-0.0005	-0.0042**
	(0.0087)	(0.0009)	(0.2181)	(0.0015)	(0.0013)	(0.0019)
BODMONI	0.0145	-0.0013	-0.0155	0.0010	-0.0061*	-0.0051
	(0.0238)	(0.0033)	(1.1173)	(0.0055)	(0.0033)	(0.0043)

Table 2.5 (continued)

CEOPOWER	-0.0022	0.0050	1.4879	-0.0031	-0.0203**	-0.0059
	(0.0509)	(0.0058)	(2.8730)	(0.0058)	(0.0081)	(0.0133)
Constant	-0.8656***	-0.0770***	-15.7752***	0.0465	-0.0130	0.3759***
	(0.2216)	(0.0230)	(4.9300)	(0.0447)	(0.0421)	(0.0630)
IndustryFixed	Yes	Yes	Yes	Yes	Yes	Yes
CountryFixed	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,234	1,235	1,234	1,234	1,234	1,234
F-test	5.82***	13.34***	2.56***	2.90***	2.85***	5.63***
R-squared	0.1815	0.2233	0.0439	0.1543	0.0878	0.1806

Table 2.6: IAF Quality, Financial Reporting Focus, and Earnings Quality

This table presents the regression results regarding the impact of financial reporting focus of an IAF on earnings quality. IAFQ is IAF quality score derived from the PLS-PM approach, and HIAFQ is an indicator variable equal to 1 for high-quality IAFs and 0 otherwise, based on the sample median IAFQ. REPORT is an indicator variable equal to 1 if survey respondents agreed that their IAF takes an important role in the integrity of financial reporting, and 0 otherwise. IAFQ_REPORT and HIAFQ_REPORT are interaction terms. All variable definitions are summarized in Appendix D. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering at both firm and year levels. P-value is calculated based on a two-tailed test. * p<0.1 ** p<0.05 *** p<0.01

	(1)	(2)
VARIABLES	EQ	EQ
IAFQ	0.1323***	
	(0.0343)	
HIAFQ		0.0308*
		(0.0181)
REPORT	0.0129	0.0078
	(0.0441)	(0.0147)
IAFQ_REPORT	-0.0256	
	(0.0634)	
HIAFQ_REPORT		-0.0085
		(0.0257)
BTM	0.0224***	0.0220***
	(0.0070)	(0.0070)
GROWTH	-0.0477*	-0.0496*
	(0.0261)	(0.0276)
EISSUE	-0.0166	-0.0176
	(0.0230)	(0.0229)
DISSUE	-0.0035	-0.0051
	(0.0174)	(0.0169)
LEV	0.0212	0.0199
	(0.0202)	(0.0197)
LogAT	0.0111***	0.0128***
	(0.0034)	(0.0035)
CFO	0.2890***	0.2800***
	(0.0477)	(0.0476)
BIG4	-0.0102	-0.0102
	(0.0134)	(0.0142)
lag_LOSS	-0.0020	-0.0005
	(0.0086)	(0.0086)
ACMEET	-0.0047**	-0.0038*
	(0.0021)	(0.0022)
BODMONI	-0.0051	-0.0039
	(0.0043)	(0.0046)
CEOPOWER	-0.0058	-0.0061
	(0.0127)	(0.0130)
Constant	0.3702***	0.4213***
	(0.0723)	(0.0722)
IndustryFixed	Yes	Yes
CountryFixed	Yes	Yes

Table 2.6 (continued)

F-test of Joint Significance		
IAFQ+IAFQ_REPORT	5.30**	
HIAFQ+HIAFQ_REPORT		3.75*
Observations	1,234	1,234
F-test	5.41***	5.19***
R-squared	0.1810	0.1743

Table 2.7: IAF Quality, Strategic Consulting Role, and Earnings Quality

This table presents the regression results regarding the impact of strategic consulting role assumed by an IAF on earnings quality. IAFQ is IAF quality score derived from the PLS-PM approach, and HIAFQ is an indicator variable equal to 1 for high-quality IAFs and 0 otherwise, based on the sample median IAFQ. STRATEGY is an indicator variable equal to 1 if survey respondents agreed that their IAF takes an important role in the strategic development, and 0 otherwise. IAFQ_STRATEGY and HIAFQ_STRATEGY are interaction terms. All variable definitions are summarized in Appendix D. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering at both firm and year levels. P-value is calculated based on a two-tailed test. * p<0.1 ** p<0.05 *** p<0.01

	(1)	(2)
VARIABLES	EQ	EQ
IAFQ	0.0937***	
	(0.0284)	
HIAFQ		0.0293**
		(0.0116)
STRATEGY	-0.0484**	-0.0275**
	(0.0227)	(0.0129)
IAFQ_STRATEGY	0.0711*	
	(0.0373)	
HIAFQ_STRATEGY		0.0347*
		(0.0197)
BTM	0.0224***	0.0005***
	(0.0070)	(0.0001)
GROWTH	-0.0469*	-0.0078
	(0.0256)	(0.0282)
EISSUE	-0.0169	-0.0346
	(0.0231)	(0.0277)
DISSUE	-0.0031	-0.0209
	(0.0168)	(0.0229)
LEV	0.0178	0.0307
	(0.0206)	(0.0307)
LogAT	0.0110***	0.0112***
	(0.0036)	(0.0033)
CFO	0.2895***	0.2570***
	(0.0483)	(0.0494)
BIG4	-0.0100	-0.0031
	(0.0142)	(0.0168)
lag_LOSS	-0.0019	-0.0022
	(0.0088)	(0.0087)
ACMEET	-0.0046**	-0.0045
	(0.0020)	(0.0030)
BODMONI	-0.0050	0.0067
	(0.0043)	(0.0044)
CEOPOWER	-0.0052	0.0062
	(0.0132)	(0.0123)
Constant	0.3929***	0.3903***
	(0.0626)	(0.0868)
IndustryFixed	Yes	Yes
CountryFixed	Yes	Yes

Table 2.7 (continued)

F-test of Joint Significance		
IAFQ+IAFQ_STRATEGY	14.99***	
STRATEGY+IAFQ_STRATEGY	1.65	
HIAFQ+HIAFQ_STRATEGY		7.75***
STRATEGY+HIAFQ_STRATEGY		0.22
Observations	1,234	1,234
F-test	5.52***	6.08***
R-squared	0.1830	0.1981

Table 2.8: IAF Quality Dimensions and Earnings Quality

This table presents the regression results regarding the relationship between each IAF quality dimension and earnings quality. Competence measures the competence of the IAF; Independence measures the independent status of the IAF; Plan_report measures the planning and reporting practices of the IAF; Quality_assure measures of the quality assurance and improvement practices of the IAF. Detailed descriptions of the quality dimensions and their respective measurement items are presented in Appendix A. All variable definitions are summarized in Appendix D. Standard errors are in parentheses and are adjusted by clustering at both firm and year levels. P-value is calculated based on a two-tailed test.
* p<0.1 ** p<0.05 *** p<0.01

VARIABLES	(1) EQ	(2) EQ	(3) EQ	(4) EQ	(5) EQ
Competence	0.0316				0.0275
	(0.0339)				(0.0342)
Independence		0.0597***			0.0609***
		(0.0177)			(0.0175)
Plan_report			0.0422		0.0158
			(0.0305)		(0.0291)
Quality_assure				0.0376**	0.0358***
				(0.0154)	(0.0131)
MTB	0.0222***	0.0220***	0.0226***	0.0212***	0.0221***
	(0.0071)	(0.0064)	(0.0072)	(0.0067)	(0.0068)
GROWTH	-0.0490*	-0.0512*	-0.0492*	-0.0492*	-0.0493*
	(0.0275)	(0.0278)	(0.0270)	(0.0282)	(0.0263)
EISSUE	-0.0185	-0.0186	-0.0182	-0.0183	-0.0170
	(0.0223)	(0.0221)	(0.0236)	(0.0232)	(0.0216)
DISSUE	-0.0034	-0.0028	-0.0027	-0.0051	-0.0036
	(0.0180)	(0.0173)	(0.0175)	(0.0186)	(0.0177)
LEV	0.0171	0.0166	0.0231	0.0236	0.0176
	(0.0222)	(0.0214)	(0.0217)	(0.0218)	(0.0212)
LogSA	0.0133***	0.0145***	0.0126***	0.0121***	0.0123***
	(0.0037)	(0.0035)	(0.0034)	(0.0033)	(0.0034)
CFO	0.2788***	0.2908***	0.2838***	0.2855***	0.2936***
	(0.0456)	(0.0444)	(0.0476)	(0.0463)	(0.0437)
BIG4	-0.0114	-0.0142	-0.0095	-0.0059	-0.0115
	(0.0150)	(0.0140)	(0.0143)	(0.0145)	(0.0152)

Table 2.8 (continued)

lag_LOSS	-0.0016	0.0011	-0.0030	-0.0004	0.0013
	(0.0091)	(0.0085)	(0.0092)	(0.0090)	(0.0078)
ACMEET	-0.0038*	-0.0043*	-0.0037*	-0.0038*	-0.0049**
	(0.0022)	(0.0023)	(0.0021)	(0.0021)	(0.0022)
BODMONI	-0.0037	-0.0033	-0.0039	-0.0044	-0.0047
	(0.0046)	(0.0046)	(0.0045)	(0.0045)	(0.0043)
CEOPOWER	-0.0081	-0.0050	-0.0063	-0.0064	-0.0046
	(0.0147)	(0.0137)	(0.0136)	(0.0136)	(0.0139)
Constant	0.4122***	0.3756***	0.4038***	0.4240***	0.3477***
	(0.0537)	(0.0685)	(0.0708)	(0.0667)	(0.0571)
IndustryFixed	Yes	Yes	Yes	Yes	Yes
CountryFixed	Yes	Yes	Yes	Yes	Yes
Observations	1,234	1,234	1,234	1,234	1,234
F-test	5.17***	5.53***	5.24***	5.41***	5.52***
R-squared	0.1600	0.1673	0.1616	0.1654	0.1772

Table 2.9: IAF Quality and Earnings Quality: U.S. firms vs. Non-US firms

This table presents the regression results when the sample is divided into U.S. firms and non-US firms. Model (1) presents the results for U.S. firms, whereas model (2) shows the results for non-US firms. All variable definitions are summarized in Appendix D. Standard errors are in parentheses and are adjusted by clustering both at firm and year levels. P-value is calculated based a two-tailed test. * p<0.1 ** p<0.05 *** P<0.01

	(1) US	(2) Non-US
VARIABLES	EQ	EQ
IAFQ	0.0945**	0.1171***
	(0.0430)	(0.0282)
BTM	0.0062	0.0232***
	(0.0106)	(0.0066)
GROWTH	-0.0211	-0.0609***
	(0.0472)	(0.0231)
EISSUE	-0.0454*	0.0021
	(0.0265)	(0.0355)
DISSUE	0.0082	-0.0143
	(0.0310)	(0.0122)
LEV	0.0501	0.0221
	(0.0337)	(0.0347)
LogAT	0.0174***	0.0116**
	(0.0056)	(0.0050)
CFO	0.1825**	0.3694***
	(0.0882)	(0.0516)
BIG4	-0.0597**	0.0121
	(0.0259)	(0.0130)
lag_LOSS	0.0007	0.0013
	(0.0217)	(0.0043)
ACMEET	-0.0072***	-0.0032
	(0.0028)	(0.0024)
BODMONI	-0.0039	-0.0015
	(0.0090)	(0.0048)
CEOPOWER	-0.0107	0.0106***
	(0.0259)	(0.0037)
Constant	0.2709***	0.3407***
	(0.0887)	(0.0558)
IndustryFixed	Yes	Yes
CountryFixed	Yes	Yes
Observations	443	791
F-test	5.51***	4.63***
R-squared	0.1933	0.2094

Table 3.1: Sample Matching and Selection Procedure in Chapter III

This table illustrates the sample matching and selection procedure in Chapter III. 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 3.2: Sample Distribution and Country-level Variables in Chapter III

This table presents the sample distribution by country in chapter III. The table also shows the country-level variables used in the study. Recovery indicates that the sample is for the analysis of performance recovery. 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 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 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 corporate governance codes index derived from chapter I, which measures the intensity of IAF requirements in countries' 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

Table 3.2 (continued)

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 3.3: Descriptive Statistics in Chapter III

This table presents the descriptive statistics of the variables used in the analyses in Chapter III. Performance recovery indicates that 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

Table 3.3 (continued)

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 3.4: Duration Analysis of Operating Performance Recovery

This table presents the results of the Cox duration analysis of performance recovery, where performance is measured by ROA. 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 D. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering regional-economic block. 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 3.5: Regression Analysis of Investment Efficiency

This table presents the regression results of investment efficiency analysis. 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 by 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 D. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering at both firm and year levels. 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)
Variables	Expected Sign	INV	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 3.6: Robustness Tests for Duration 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, 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 D. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering regional-economic block. P-value is calculated based on a two-tailed test.*p<0.1 **p<0.05 ***p<0.01

Variable	(1) Alternative Recovery Period	(2) Alternative Period for Benchmark ROA Calculation	(3) ROE as Performance Measure	(4) Operating ROA as Performance Measure	(5) 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 3.7: 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 where it is regressed on a set of IAF quality determinants. IAF quality determinants are lagged firm and country-level variables derived from Chapter I, 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 D. 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 of Recovery Duration	
			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)

Table 3.7 (continued)

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 3.8: Robustness Tests for Investment Efficiency Analysis

This table presents the results of the sensitivity analysis of 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 D. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering at both firm and year levels. 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) IV Regression of CFSI		(2) 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)

Table 3.8 (continued)

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 3.9: IAF Activities, IAF Quality, and Performance Recovery

This table presents the results regarding 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 D. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering regional-economic block. 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)	

Table 3.9 (continued)

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 3.10: Performance Recovery Analysis with Each IAF Quality Dimension

This table shows the duration analysis regarding the relationship between performance recovery and each IAF quality dimensions. 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 a detailed description of each quality dimension and its measurement items. All variable definitions are summarized in Appendix D. Continuous variables are winsorized at both top and bottom 1% level. Standard errors are in parentheses and are adjusted by clustering regional-economic block. 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)

Table 3.10 (continued)

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

Appendices

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 3. It also provides the data source, i.e., the survey question number, of each measurement item in the CBOK 2010 survey 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 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

Appendix A (continued)

	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, 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: Descriptive Statistics of Measurement Items of IAF Quality

This appendix presents the descriptive statistics of the measurement items in the IAF quality measurement model depicted in Figure 3. The definitions of the measurement items are presented in Appendix A. All responses from Chief Audit Executive (matched and unmatched) with no missing values of the measurement items in the survey are included. All measurement items are categorical: they are either indicator variables or ordinal variables. In the PLS-PM approach, in order to operationalize the estimation, indicator and ordinal variables are transformed into continuous variables using Optimal Scaling method.

Variable	N	Mean	Median	SD	Min	Max
Quality dimension: Competence						
audexp	1056	2.368	2	0.533	1	3
yearexp	1056	0.214	0	0.41	0	1
education	1056	3.427	4	0.767	1	5
major	1056	0.597	1	0.491	0	1
certificate	1056	0.569	1	0.495	0	1
training	1056	0.764	1	0.425	0	1
IIAmemb	1056	3.657	4	1.14	1	5
Quality dimension: Independence						
reportline	1056	0.389	0	0.488	0	1
AC_appoint	1056	0.827	1	0.379	0	1
AC_evalu	1056	0.716	1	0.451	0	1
Quality dimension: Plan_report						
document	1056	4.172	4	0.825	2	5
risk_plan	1056	0.876	1	0.33	0	1
IC_frame	1056	0.869	1	0.337	0	1
technique	1056	3.135	3	0.951	1	5
report	1056	0.895	1	0.307	0	1
Quality dimension: Quality_assure						
qa	1056	0.311	0	0.463	0	1
qa_recent	1056	0.348	0	0.476	0	1
coverage	1056	2.895	3	1.111	1	5
compliance	1056	2.208	2	0.786	1	3

Appendix C: Types of IAF Requirements in Corporate Governance Codes

CG Code Type	Example	Value Assigned
IAF is required for listed companies.	The amendments spell out …[that] the internal audit functions are now required in all PLCs and the reporting line for internal auditors is clarified. (Malaysia Code on Corporate Governance, 2007)	5
IAF is strongly recommended. If an IAF is not established, the audit committee should review the need for one every year.	An independent internal audit function should be established, with resources and skills adapted to the company's nature, size and complexity. If the company does not have an internal audit function, the need for one should be reviewed at least annually (The 2009 Belgian Code on Corporate Governance, 2009).	4
IAF is explicitly recommended. Some detailed information regarding the IAF can be found in the requirements for audit committee / board of directors / managers.	The company shall describe the manner in which the internal audit function of the company is organized (Finnish Corporate Governance Code, 2008).	3
IAF is not explicitly recommended, but some information regarding the IAF can be found in the requirements for audit committee / board of directors / managers.	The number and structure of the committees are determined by each Board. However, it is recommended that…the monitoring the internal audit…should be subject to preparatory work by specialized committees of the Board of directors (French Corporate Governance Code of Listed Corporations, 2008)	2
IAF is not mentioned in the code.	N/A	1

Appendix D: Variable Definitions

Variable	Definition
Firm-level Variables	
IAFQ	IAF quality score derived from the PLS-PM approach
IAFQ_WA	IAF quality score derived from the equal-weighting approach
HIAFQ	An indicator variable for high-quality IAFs based on the sample median of IAFQ
LogAT	Natural logarithm of total assets in USD
BTM	Book-to-market ratio, calculated as book value of equity divided by year-end market value of equity
SEGMENT	Number of business segments in which a firm operates
FORSALE	Foreign sales, calculated as the percentage of foreign sales to total sales
MTB	Market to book ratio, calculated as year-end market value of equity divided by book value of equity
INTANGIBLE	Intangible assets, calculated as intangible assets to total sales
LEV	Leverage ratio, calculated as total debt to total assets
CLOSEHELD	Closely held shares, calculated as the percentage of shares owned by insiders to total shares
BIG4	Big4 auditor, equal to 1 if a firm is audited by a Big4 audit firm, and 0 otherwise
CROSSLIST	Crosslisting status, equal to 1 if a firm is crosslisted in one of the U.S. stock exchanges (NASDAQ and NYSE), and 0 otherwise
INVREC	Inventories and receivables, calculated as the percentage of the sum of inventories and account receivables to total assets
CFO	Cash flow from operating, calculated as operating cash flow to total assets
US	U.S. firm, equal to 1 if a firm is a U.S. firm, and 0 otherwise
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
INV	Investment expenditure, calculated 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	Dividend payout, equal to 1 if a firm pays dividends, 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
GROWTH	Sales growth ratio, calculated as current year sales minus previous year sales deflated by previous year sales
EISSUE	Issue of new equity, calculated as the percentage change in common equity
DISSUE	Issue of new debt, calculated as the percentage change in total liabilities
Lag_LOSS	An indicator variable equal to 1 if the lagged net income is negative, and 0 otherwise.
BODSIZE	Board size, measured as the number of board members
BODINDE	Board independence, measured as the percentage of independent board members
BODFEMALE	Presence of female board members, measured as the percentage of female board members
BODMEET	Board meeting, measured as the number of board meetings in a year
BODBUSY	Busy board members, measured as the percentage of board members who hold at least three additional directorships in other companies
BODMONI	A composite variable of board monitoring intensitives, calculated as the mean of BODINDE, BODFEMALE, BODMEET, and BODBUSY which are all dichotomized by their respective sample medians.
BODMONI_pca	A composite variable of board monitoring intensives, calculated as the first principal component of BODINDE, BODFEMALE, BODMEET, and BODBUSY in a factor analysis

Appendix D (continued)

ACSIZE	Audit committee size, measured as the number of audit committee members
ACMEET	Audit committee meeting, measured as the number of audit committee meetings in a year
CEOTENURE	CEO tenure, measured as the number of years when the CEO has been in the position
CEODUALITY	CEO duality, equals to 1 if the CEO is also the chairman of the board of directors, and 0 otherwise
CEOPOWER	A composite variable for CEO power, calculated as the mean of CEO tenure and CEO duality, where CEO tenure is dichotomized by the sample median
Smoothness	Earnings smoothness, measured as the correlation between change of accruals and change of operating cash flows
Predict	Earnings predictability, measured as the residual from an autoregressive model of earnings
Conservatism	Earnings conservatism based on Basu (1997) model
TACC	Total accruals, computed by balance sheet items following Leuz et al. (2003) and Ahem et al. (2013)
ABACC	Abnormal accruals, computed as the residual from modified Jones (1991) model proposed by Dechow et al. (1995)
EQ	A composite variable of earnings quality, calculated as the average of the percentile ranks of the individual earnings quality attributes divided by 100
REPORT	An indicator variable equal to 1 if an IAF takes an important role in the integrity of financial reporting, and 0 otherwise
RISK	An indicator variable equal to 1 if an IAF is extensively involved in risk-management-relevant activities, and 0 otherwise.
STRATEGY	An indicator variable equal to 1 if an IAF assumes an important role in strategic development, and 0 otherwise
Country-level Variable	
CGCode	A self-structured index measuring the intensity of IAF requirements in corporate governance codes. The values of this variable range from 1 to 5 with higher value indicating stricter IAF requirements. See Appendix C for details of the coding.
FinDev	Financial market development of a country, calculated as the standardized mean rank of two variables: the number of domestic listed companies to the total population from year 2006 to 2008, and the market capitalization to total GDP from year 2006 to 2008.
RegQuality	Overall regulatory environment of a country, calculated as the standardized average of the Regulatory Quality Index from the Worldwide Governance Indicators from year 2006 to 2008
H_Reg	An indicator variable for high-quality regulatory environment, equal to 1 if a country's score of regulatory environment is larger than the sample median, an 0 otherwise

Présentation Générale

1. Introduction

Cela fait plus d'une décennie que les grands scandales financiers dont ont beaucoup parlé les médias tels que ceux d'Enron et de Worldcom ont secoué la gouvernance d'entreprise en son sein et suscité de sérieuses critiques quant aux pratiques de gouvernance d'entreprise dans le monde entier. Ces scandales ont eut pour conséquence l'adoption de la loi Sarbanes-Oxley de 2002 (ci-après, SOX) aux États-Unis et de réglementations similaires dans d'autres pays, ce qui a à son tour donné un élan au développement rapide et considérable de la fonction d'audit interne (FAI) dans les organisations. La FAI, jouissant désormais d'un niveau de notoriété sans précédents (Carcello et al., 2005b), a par conséquent affirmé sa position dans le domaine de la gouvernance d'entreprise (Gramling et al., 2004), en particulier dans le domaine du contrôle interne du reporting financier (Lin et al., 2011; Prawitt et al., 2009).

Le rôle joué par la FAI dans la gouvernance d'entreprise n'a cependant jamais cessé d'évoluer, étant donné que les parties intéressées sont de plus en plus exigeantes. De nouvelles demandes de la part des directeurs et managers font que la FAI doit reconcentrer ses efforts au-delà des problèmes de conformité réglementaire afin d'étendre son rôle historique de la préservation de valeur à la création de valeur (KPMG, 2009). Pour répondre à des attentes accrues, les auditeurs internes augmentent par conséquent leur implication dans des activités liées à la performance telles que le consulting en opérations et en stratégies (PricewaterhouseCoopers, 2009).

La crise financière a de nouveau récemment soulevé des doutes et des critiques quant à la valeur et la pertinence de la FAI en matière de gouvernance d'entreprise,

les directeurs et managers remettant en question ce que le FAI peut vraiment apporter aux entreprises. Face aux critiques, certains chercheurs soupçonnent que la FAI est probablement surestimée et sous-performante (Lenz and Sarens, 2012), et suggère par conséquent que la FAI doit se reconcentrer sur les services de vérification plutôt que d'étendre ses activités de consulting.

Cependant, bien que l'espoir que la FAI puisse rendre à la fois des services de vérification et de consulting représente un défi, étant donné la tension possible entre le conseil d'administration et le management, la FAI est-elle pour autant surestimée et sous-performante ? Il n'est pas évident de répondre à cette question. Quels que soient les nouvelles critiques, la FAI a prouvé son importance dans divers aspects des activités d'entreprise pendant et après la crise financière, par le biais d'activités de vérification et de consulting. En 2014 par exemple le premier dénonciateur à être récompensé l'a été par la Commission Boursière des États-Unis (SEC, U.S. Securities and Exchange Commission), et il s'agissait d'une personne travaillant dans le domaine de l'audit interne de la conformité (SEC, 2014). De récentes enquêtes confirment également l'agilité des auditeurs internes en temps que profession en redéfinissant la portée de celle-ci à son juste niveau afin de répondre aux besoins opérationnels des organisations, comme par exemple la réduction des coûts après la crise (KPMG, 2015).

Que manque-t-il donc dans le débat sur la valeur et la pertinence de la FAI en matière de gouvernance d'entreprise ? Étonnamment, bien qu'il ne soit pas nouveau que mentionner le fait d'avoir une FAI est différent du fait d'avoir une FAI de haute qualité et génératrice de valeur (Gramling et al., 2004; Prawitt et al., 2009), la qualité de la FAI et son impact sur le rôle de la FAI dans la gouvernance d'entreprise ont été largement négligés. Les parties intéressées accordent plus d'importance à la FAI

lorsque le rôle de celle-ci est perçue comme celui d'un « conseiller de confiance » plutôt que celui d'un simple « vérificateur » (PricewaterhouseCoopers, 2014), mais il existe un manque de connaissances en ce qui concerne la définition de « conseiller de confiance » et la manière dont les entreprises bénéficient des services d'un « conseiller de confiance ». Ma dissertation dans son ensemble est élaborée de façon à bien faire la lumière sur ce problème crucial en traitant de l'importance de la qualité de la FAI pour permettre à la FAI de remplir son rôle de « conseiller de confiance » dans les entreprises.

Le reste de la présentation générale s'articule de la manière suivante : je détaille les motivations de ma recherche dans la section 2, et je fournis des informations contextuelles quant au rôle de la FAI dans la gouvernance d'entreprise dans la section 3. Je présente ensuite les principales questions de recherche et la structure d'ensemble de la dissertation dans la section 4, suivis par une discussion sur les méthodes de recherche, les données et l'évaluation de la qualité de la FAI dans la section 5. Je conclus finalement la présentation générale par les principaux résultats de recherche dans la section 6.

2. Motivations de Recherche

Bien que la FAI ait été identifiée comme constituant une partie importante de la gouvernance d'entreprise, la recherche sur la FAI en est encore à ses balbutiements (DeFond and Zhang, 2014). Le déséquilibre entre le développement considérable de la FAI dans les entreprises et le manque de recherche dans ce domaine m'a motivé pour étudier la FAI dans ma dissertation dans le but de faire progresser les connaissances actuelles relatives au rôle de la FAI dans la gouvernance d'entreprise. Les raisons pour lesquelles j'ai choisi la qualité de la FAI en particulier comme

thème principal dans ma dissertation sont au nombre de trois. Premièrement, la prévalence accrue et le statut de plus en plus important de la FAI dans les entreprises impliquent que la recherche sur la FAI nécessite l'étude des variations en termes de qualité de la FAI d'un façon plus générale, plutôt que de simplement étudier l'existence ou les caractéristiques uniques de la FAI. Deuxièmement, les critiques et le débat récents suscités par la valeur ajoutée de la FAI dans les entreprises impliquent un besoin de recherche qui peut aider à clarifier le rôle de la FAI dans les organisations. Troisièmement, bien qu'il soit admis dans la littérature académique que le fait de maintenir un niveau adéquat de qualité est essentiel pour que la FAI puisse jouer son rôle de mécanisme de gouvernance d'entreprise générateur de valeur, la qualité de la FAI a été largement négligée dans le récent débat et il manque de preuves empiriques en la matière. Dans les sous-sections suivantes, j'explore chacun de ces trois points plus en détail.

2.1 Prévalence Accrue et Statut de plus en plus Important de la FAI

La FAI est très présente dans le monde des affaires d'aujourd'hui. Selon le site internet de l'Institut des Auditeurs Internes (IIA, Institute of Internal Auditors), la plus importante association professionnelle d'auditeurs internes au monde, l'IIA possède maintenant plus de 180 000 membres venus de plus de 190 pays. Par rapport à la perception d'un statut inférieur dont souffraient les auditeurs internes par le passé, le poste de Directeur de l'Audit Interne (DAI) est maintenant un poste de choix dans les entreprises qui poussent leur équipe d'audit interne à fournir des services de vérification et de consulting pour diverses activités d'entreprises.

La prévalence accrue et le statut de plus en plus important de la FAI à travers le monde peuvent être attribués à plusieurs raisons. La raison la plus importante est la

poussée réglementaire vers une meilleure gouvernance d'entreprise après les gros scandales médiatiques du début des années 2000. Par exemple, bien que la FAI demeure toujours un mécanisme volontaire de gouvernance dans la plupart des pays et des bourses, dans le contexte des États-Unis, la bourse de New-York (NYSE, New York Stock Exchange) a exigé depuis 2004 que toutes les sociétés cotées effectuent un audit interne.

Parallèlement à cette poussée réglementaire, une compétitivité mondiale en augmentation a également contribué au développement de la FAI. Les managers et directeurs doivent faire désormais face à plus de demandes d'informations pertinentes, fiables et disponibles dans des temps impartis pour pouvoir prendre leurs décisions. Une telle augmentation de la demande d'informations les pousse à se tourner vers la FAI pour faciliter la gestion du risque, reconcevoir les structures et processus de contrôle interne et inciter à plus de responsabilisation afin que l'entreprise puisse demeurer compétitive sur les marchés.

2.2 Le Débat Récent sur la Valeur Ajoutée de la FAI

Malgré la prévalence accrue et le statut de plus en plus important de la FAI, de nombreux doutes et critiques sont apparus en ce qui concerne la FAI pendant et après la crise financière. Ces critiques proviennent principalement de directeurs et de cadres supérieurs qui ont commencé à remettre en question la valeur ajoutée de la FAI. Par exemple, selon KPMG (2009), seul 26 % des membres de comité d'audit dans un échantillon de sociétés américains cotées étaient très satisfaits des services d'audit interne et beaucoup ont exprimé l'opinion que la FAI pouvait apporter bien plus de valeur ajoutée à leur entreprise.

Une telle émergence de doutes peut être en partie attribuable au fait que la valeur ajoutée de la FAI n'est pas assez clairement communiquée dans les entreprises. Lorsque la FAI se positionne comme agent fournisseur de services de vérification aux directeurs et en même temps comme partenaire fournisseur de services de conseil aux cadres supérieurs, il est fort probable que ces directeurs et managers ne partagent pas la même vision de la valeur qu'ils espèrent obtenir de la part de la FAI. C'est à cause d'une telle ambigüité que la profession des auditeurs internes doit maintenant faire face à une menace de marginalisation dans le cadre du débat actuel sur la gouvernance, au même moment où le rôle de la FAI est largement passé sous silence lorsque les parties intéressées recherchent des solutions suite à la récente crise financière. Par exemple, bien que Richard Chambers, Président et PDG de l'IIA, ait insisté sur l'importance du rôle de la FAI dans la gouvernance d'entreprise dans sa lettre de réponse à la SEC, qui a sollicité des commentaires en rapport aux « révélations accrues relatives au risque, à l'indemnisation et la gouvernance d'entreprise » (Chambers, 2009), la version finale de la réglementation ne mentionnait pas du tout la FAI. Le risque de marginaliser la FAI dans le cadre de la gouvernance d'entreprise existe également dans un contexte hors États-Unis. Prenons par exemple le cas du Walker Report (2009) au Royaume-Uni, qui ne fait référence à la FAI dans aucune de ses 39 recommandations censées améliorer la gouvernance d'entreprise dans les banques américaines.

2.3 L'importance de la Qualité de la FAI

La concomitance d'un développement considérable de la FAI dans les entreprises et le débat récent sur la valeur ajoutée de la FAI indique le besoin de plus de recherche afin de clarifier le rôle de la FAI dans le cadre de la gouvernance d'entreprise. Bien que la FAI soit aujourd'hui très répandue dans les entreprises, les

réglementations spécifient rarement la nature de la FAI ou aborde le sujet de l'efficacité de la FAI (Carcello et al., 2005a). De la même manière, peu d'importance a été accordée à la qualité de la FAI lors du débat récent, bien qu'il soit admis que la seule présence d'une FAI ne soit pas du tout la même chose qu'une FAI de haute qualité et efficace (Davidson et al., 2005; Prawitt et al., 2009).

Néanmoins, la qualité de la FAI est essentielle pour que la FAI puisse apporter de la valeur aux entreprises. Gramling et al. (2004) estiment que, bien que la FAI soit une composante indispensable de la structure de la gouvernance d'entreprise, celle-ci doit jouir d'un niveau adéquat de qualité afin de bien remplir son rôle en tant que ressource de valeur apportée aux autres parties clés de la gouvernance. Des études empiriques soulignent également l'importance de développer une FAI de haute qualité plutôt que de tout simplement mettre en place une FAI. Par exemple, tandis que Davidson et al. (2005) ne trouvent aucune preuve que la présence (contrairement à l'absence) d'une FAI soit liée à une diminution de la gestion des revenus, Prawitt et al. (2009) et Ege (2014) fournissent les preuves qu'une FAI de haute qualité (contrairement à une FAI de mauvaise qualité) peut faire frein à des manipulations de revenus et à un mauvaise conduite de la part du management.

Bien que la qualité de la FAI soit importante, la nature inobservable de la qualité de la FAI lance des défis aux chercheurs qui souhaitent définir et évaluer ce concept. La plupart des documents de recherche précédents se concentrent ainsi moins sur la qualité de la FAI que sur son existence, sa taille et son budget (par ex. Wallace et Kreutzfeldt, 1991; Carcello et al., 2005a; Carcello et al., 2005b; Barua et al., 2010; Sarens et Abdolmohammadi, 2011; Anderson et al., 2012). Bien que quelques études récentes (par ex. Prawitt et al., 2009; Lin et al., 2011; Ege, 2014) se soient mises à aborder les problèmes liés à la qualité de la FAI, ces études traitent

principalement du rôle que joue la FAI pour améliorer le contrôle interne du reporting financier.

Afin de faire progresser nos connaissances actuelles quant au rôle que joue la FAI dans la gouvernance d'entreprise, je stipule donc que la recherche a besoin d'étudier les variations en termes de qualité de FAI d'une manière globale et de traiter des interrelations qui existent entre la FAI et les autres mécanismes de gouvernance d'entreprise étroitement liés à la FAI. De plus, étant donné la forte implication de la FAI dans diverses activités d'entreprise au-delà du reporting financier dans le monde des affaires d'aujourd'hui, la recherche en ce qui concerne les conséquences d'une FAI de haute qualité ne devrait pas être limitée au reporting financier mais devrait être étendue à d'autres activités d'entreprises telles que les opérations.

3. Questions de Recherche et Structure de la Dissertation

Afin de traiter du rôle que joue une FAI de haute qualité dans la gouvernance d'entreprise, je tente de répondre à trois principales questions de recherche dans cette dissertation : (1) qu'est-ce qu'une FAI de haute qualité et comment l'évalue-t-on ? (2) quels sont les facteurs qui incitent les entreprises à mettre en place une FAI de haute qualité ? et (3) quelles sont les conséquences économiques d'une FAI de haute qualité ?

Le graphique 2 illustre la structure d'ensemble de cette dissertation. Comme le montre ce graphique, cette dissertation est composée de trois chapitres. Dans le premier chapitre, je m'efforce de développer un nouveau modèle d'évaluation de la qualité de la FAI basé sur les caractéristiques et les pratiques de la FAI. J'explore ensuite les facteurs liés à l'entreprise et au pays qui influent sur la qualité de la FAI.

Dans les deuxième et troisième chapitres, j'examine les conséquences économiques d'une FAI de haute qualité. Je me concentre dans le deuxième chapitre sur le rôle traditionnel que joue le FAI dans la prestation de services de vérification et de reporting financier, et par conséquent je vérifie aussi si la qualité de la FAI est associée de manière positive à la qualité des revenus des entreprises. De plus, j'examine si la nature des activités de FAO (reporting financier axé ou consulting stratégique orienté) influe sur la qualité des revenus, outre l'effet de la qualité de la FAI, et si la natures des activités de FAI modère le rapport entre la qualité de la FAI et la qualité des revenus. J'effectue une analyse poussée afin de répondre aux préoccupations récentes du public quant à l'expansion des activités de FAI vers le domaine du consulting stratégique qui pourrait potentiellement avoir un effet négatif sur le rôle que joue la FAI dans le cadre d'activités de vérification, car une telle expansion pourrait détourner les ressources du FAI mobilisées vers des activités de vérification et affecter l'objectivité des auditeurs internes.

En prenant en compte le rôle de plus en plus important que joue la FAI dans la prestation de services de conseil liés aux opérations et stratégies de l'entreprise, j'explore enfin dans le troisième chapitre la relation possible entre la qualité de la FAI et la performance opérationnelle des entreprises. J'utilise de manière spécifique la période post-crise financière récente comme contexte de recherche et j'examine si une FAI de haute qualité a une influence positive sur la reprise de la performance opérationnelle des entreprises après la crise financière récente. J'examine en outre les canaux possibles à travers lesquels une FAI de haute qualité peut contribuer à une reprise de la performance des entreprises.

4. Données et Evaluation de la Qualité de la FAI

4.1 Données et Echantillon

Les données de FAI utilisées dans ma dissertation proviennent d'une enquête d'auditeur interne internationale intitulée CBOK 2010. CBOK est l'acronyme de Common Body of Knowledge, qui est constitué de plusieurs enquêtes d'auditeur interne internationales menées par l'IIA. J'utilise CBOK 2010, l'enquête la plus récente à ce jour. Afin de rendre opérationnel mon analyse empirique, je fait correspondre les données propres à CBOK 2010 aux données publiques présente dans la base de données Worldscope, construisant ainsi un échantillon d'archivage unique et international de FAI. Je combine plus spécifiquement les réponses à l'enquête avec les entreprises présente dans Worldscope en faisant correspondre l'actif total et les ventes totales à la fin de l'exercice financier, le pays, le domaine d'activité et les noms de domaine des sites internet des entreprises et les informations correspondantes fournies par les personnes interrogées ayant participé à l'enquête CBOK. Je garde 329 entreprises uniques ainsi associées et je télécharge ensuite les données financières des entreprises associées tirées de Worldscope. Pour les données relatives aux caractéristiques du conseil d'administration, des comités d'audit et des PDG, je les recueille manuellement dans des rapports annuels et des déclarations de procuration. En fonction des modèles empiriques et des exigences relatives aux données correspondantes, la taille d'échantillonnage varie légèrement entre les trois chapitres. Des informations détaillées relatives au processus de sélection d'échantillon sont présentées de façon séparée dans chaque chapitre.

4.2 Évaluation de la Qualité de la FAI

En développant un modèle d'évaluation de la qualité de la FAI, je respecte les Normes Internationales pour la Pratique Professionnelle de l'Audit Interne (IIA, 2012; ci-après les « Normes ») et je synthétise des études précédentes (e.g., Prawitt et al., 2009; Lin et al., 2011; Lenz et al., 2013). Je stipule que la qualité de la FAI est composée de quatre dimensions qualitatives : le niveau de compétence, le niveau d'indépendance, la planification structurée basée sur le risque et les pratiques de reporting, et enfin les pratiques habituelles de vérification et d'amélioration de la qualité. Les critères d'évaluation correspondants sont tirés des questions de l'enquête. L'Appendice A donne la définition de chaque dimension qualitative, les critères d'évaluation de chaque dimension qualitative, et la source des données (c'est à dire le nombre correspondant à la question d'enquête) de chaque critère d'évaluation présent dans CBOK 2010.

Afin de calculer les notes des dimensions qualitatives et d'avoir une note composite de la qualité de la FAI dans son ensemble, j'utilise deux méthodes pour agréger les critères d'évaluation. Pour la première méthode, je me sers de la moyenne des critères d'évaluation d'une dimension qualitative donnée pour noter la dimension qualitative et par la suite prendre la moyenne des quatre dimensions qualitatives comme note d'ensemble de la qualité de la FAI (c'est-à-dire une approche de pondération). Pour la seconde méthode, je développe un modèle d'évaluation hiérarchique de la qualité de la FAI et j'utilise l'équation des moindres carrés (PLS-PM, Partial Least Squares Path Modeling) afin d'estimer le modèle (c'est-à-dire une approche PLS-PM). La structure du modèle d'évaluation hiérarchique de la qualité de la FAI et décrite dans le graphique 3. Dans ce modèle, les dimensions qualitatives sont traitées comme des variables latentes de premier ordre et la qualité d'ensemble

de la FAI est spécifiée comme variable latente de second ordre. La partie externe de la qualité d'ensemble de la FAI indique que chaque dimension qualitative est évaluée en fonction de son critère d'évaluation correspondant et la qualité d'ensemble de la FAI est mesurée en fonction de tous les critères d'évaluation. La partie interne du modèle spécifie les chemins structuraux, qui prouvent que la qualité d'ensemble de la FAI est égale à une combinaison linéaire des quatre dimensions qualitatives. Le processus d'estimation PLS-PM génère les pondérations des critères d'évaluation qui maximisent la somme des corrélations entre la qualité d'ensemble de la FAI et les dimensions qualitatives. Ces pondérations estimées sont ensuite utilisées afin de calculer les notes des dimensions qualitatives et de la qualité d'ensemble de la FAI. Étant donné que l'approche PLS-PM évite d'assigner de manière arbitraire des pondérations égales aux critères d'évaluation et qu'elle prend en compte les corrélations possibles entre les dimensions qualitatives, elle est statistiquement plus sensée que l'approche par pondération égale. J'utilise donc la note de la qualité de la FAI ainsi obtenue en me servant de l'approche PLS-PM dans l'analyse principale. Mes résultats demeurent cependant inchangés si je me sers de la note de la qualité de la FAI issue de l'approche par pondération égale.

5. Résultats de Recherche Clés

En me basant que les notes de la qualité de la FAI obtenues à partir du modèle d'évaluation de la qualité du FAI, je constate que la qualité de la FAI est affectée de manière positive par la complexité opérationnelle et les opportunités de croissance des entreprises. De plus, la qualité de la FAI est influencée par les caractéristiques des autres mécanismes de gouvernance, y compris le conseil d'administration, le comité d'audit et les cadres supérieurs qui sont identifiés comme les trois autres

constituants clés de la gouvernance d'entreprise en dehors de la FAI dans le cadre de la gouvernance d'entreprise mis en avant par l'IIA (IIA, 2005). La qualité de la FAI est plus spécifiquement associée aux mesures incitatives de supervision du conseil d'administration et à la diligence du comité d'entreprise, mais liée de manière négative aux pouvoirs du PDG. De tels résultats impliquent que les rapports entre la qualité de la FAI et d'autres mécanismes de gouvernance peuvent être complémentaires ou substitutifs. De plus, les mesures incitatives de supervision des directeurs jouent en réalité un plus grand rôle dans l'amélioration de la qualité de la FAI lorsque l'environnement réglementaire dans son ensemble est de mauvaise qualité, ce qui suggère que les mesures incitatives privées ont davantage d'influence sur la qualité de la FAI lorsque l'environnement institutionnel est relativement faible.

À part les facteurs existants au niveau de l'entreprise, je documente également le fait que les mesures incitatives pour mettre en place une FAI de haute qualité sont influencées par l'environnement institutionnel dans lequel les entreprise opèrent. En particulier, outre le développement du marché financier et la qualité de l'environnement réglementaire des entreprises, dont il a été démontré dans la littérature académique précédente que ceux-ci avait une influence sur la structure de la gouvernance d'entreprises des entreprises, je constate que les mesures incitatives des entreprises pour une qualité de FAI de haut niveau sont renforcées si le code de gouvernance d'entreprise du pays en question décrit des critères stricts et détaillés en matière de FAI.

Une FAI de haute qualité est associée à des conséquences économiques considérables. En ce qui concerne le rôle traditionnel que joue la FAI pour fournir des services de vérification et de reporting financier, je constate que la qualité de la FAI est associée à divers attributs de qualité des revenus, y compris moins de

revenus lissés, plus de revenus prévisibles, des revenus avec des charges à payer de meilleure qualité et une évaluation composite de la qualité des revenus qui regroupe les attributs de revenus individuels. Un tel résultat confirme le fait qu'une FAI de haute qualité est importante pour la qualité du reporting financier des entreprises. Une analyse supplémentaire démontre que parmi les quatre dimensions qualitatives, le niveau d'indépendance de la FAI et les pratiques d'amélioration et de vérification de la qualité sont relativement plus importantes afin de maintenir des revenus de haute qualité.

En ce qui concerne la natures des activités de FAI, je constate que lorsque la qualité de la FAI est bien contrôlée, l'objectif du reporting financier n'a pas un impact positif incrémentiel sur la qualité des revenus. De la même manière, l'objectif du reporting financier ne renforce pas non plus le rapport positif entre la qualité de la FAI et la qualité des revenus. En revanche l'implication de la FAI dans les activités de conseil stratégique a un impact négatif sur la qualité des revenus lorsque la qualité de la FAI est mauvaise. Un tel effet négatif est cependant atténué par la qualité de la FAI et disparaît lorsque la qualité de la FAI est haute. Ce résultat implique que lorsque la qualité de la FAI est mauvaise, l'implication de la FAI dans le consulting stratégique peut être problématique, car celle-ci peut détourner les ressources des auditeurs internes des activités de vérification et affecter l'objectivité des auditeurs internes lorsque ceux-ci travaillent beaucoup trop étroitement avec le management. Une FAI de haute qualité est néanmoins moins exposée à de tels problèmes et son service de vérification n'est par conséquent pas affecté par son implication dans les activités de consulting stratégique. Je démontre en outre que le rapports positif entre qualité de FAI et qualité des revenus est plus prononcé lorsque la FAI mène des activités de consulting stratégique, ce qui souligne l'importance du rôle de la qualité

de la FAI dans le maintien de la qualité du reporting financier lorsqu'on a le plus besoin d'une FAI de haute qualité.

Outre l'importance du rôle de la qualité de la FAI dans la mise en place du rôle traditionnel que joue la FAI pour fournir des activités de vérification dans le cadre d'un reporting financier, je constate que la qualité de la FAI est importante dans le cadre des activités opérationnelles de l'entreprise. Je constate plus spécifiquement que les entreprises bénéficiant d'une FAI de haute qualité sont plus susceptibles de bien récupérer et ont en effet récupéré bien plus vite à la suite de la crise financière récente que les entreprises dont la FAI était de mauvaise qualité, lorsque la reprise de la performance est définie comme l'atteinte d'un indice de référence spécifique à chaque entreprise et calculée durant la période post-crise financière. En outre, lorsque je décompose la qualité d'ensemble de la FAI et que je teste l'importance relative des quatre dimensions qualitatives de la reprise de la performance, je révèle que c'est le processus par l'intermédiaire duquel l'audit interne est mené, c'est-à-dire la planification et les activités de reporting de la FAI, ainsi que les programmes d'amélioration et de vérification de la qualité, qui ont un impact sur les résultats. Je constate également que la qualité de la FAI a un rapport positif considérable avec l'efficacité d'investissement des entreprises durant la période post-crise financière, ce qui pourrait être une des raisons pour lesquelles les entreprises bénéficiant d'une FAI de haute qualité on récupéré plus vite après la crise financière.

L'impact de la FAI sur la reprise de la performance opérationnelle des entreprises peut dépendre à la fois de la qualité de la FAI et de la pertinence des activités de FAI dans le cadre des opérations des entreprises. Afin de mettre en lumière cet aspect, j'étends mon analyse pour y inclure les activités de FAI, dans le but de savoir si les FAI qui sont largement impliquées dans la gestion du risque ou

dans le consulting stratégique pourraient avoir un effet positif incrémentiel sur la reprise de la performance des entreprises. Des résultats empiriques confirment que lorsque la qualité de la FAI est bien contrôlée, la mesure dans laquelle la FAI est impliquée dans la gestion du risque et les activités de consulting stratégique a un impact positif incrémentiel sur la reprise de la performance.

En résumé, les résultats relatifs aux conséquences économiques d'une FAI de haute qualité suggèrent que les services de vérification et de consulting sont tous les deux importants pour que la FAI puisse fournir de la valeur aux entreprises. Seule une FAI de haute qualité peut néanmoins faire obstacle aux problèmes de capacité et d'objectivité lorsque des activités de consulting stratégiques sont menées. Par conséquent, si l'on s'attend à ce que la FAI joue un rôle de « conseiller de confiance » qui fournit à la fois des services de vérification et de consulting, le maintien d'un niveau de qualité de FAI est crucial pour que la FAI puisse remplir son rôle de « conseiller de confiance » apportant de la valeur aux entreprises.