

# **Audit Quality and Corporate Governance: Evidence from the Microfinance Industry**

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# ***Audit Quality and Corporate Governance: Evidence from the Microfinance Industry***

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## **Abstract**

This study uses a unique, hand-collected sample of microfinance institutions from 73 countries that typically are not investigated in accounting research to analyze the relationships between audit quality and governance mechanisms. We examine two measures of audit quality, namely, the use of Big Four auditors and the presence of internal auditors who report to the boards of these institutions. The empirical analysis of this study reveals that these two quality metrics are highly related, although we also demonstrate that these metrics capture distinctive aspects of audit quality. In particular, the presence of internal auditors is related to other indicators of stricter governance, whereas the use of Big Four auditors is generally unrelated to other control mechanisms. This study illustrates that there is no single association between audit quality and governance; instead, the relationships between these two characteristics are dependent on the specific mechanism that is investigated. However, for situations in which a significant relationship between audit quality and governance does exist, the sign of this relationship is always positive. Thus, our data support the complementarity view of these two traits that is espoused by prior research. We find no support for the contention that these control mechanisms function as substitutes.

## ***1. Introduction***

High-quality auditing services improve the confidence of investors in financial reporting and increase fundraising possibilities (Lin and Liu, 2009); moreover, prior research suggests that high audit quality is associated with lower costs of capital (Pittman and Fortin, 2004; Hartarska, 2009; Knechel et al., 2008). Thus, high-quality auditing is particularly important for companies that are frequently involved in raising funds, such as financial institutions; accordingly, several studies have found that a firm's demand for high-quality audit services is related to its financing needs (Knechel et al., 2008) and its leverage (Broye and Weill, 2008). Moreover, prior studies indicate that audit quality is related to both corporate governance (Hay et al., 2006; Lin and Liu, 2009) and firm complexity (Hay et al., 2006; Knechel et al., 2008). Based on these general findings from prior research, we examine audit quality in the microfinance industry.

Microfinance institutions (MFIs) offer banking services, particularly credit, to microenterprises and poor families in developing countries. MFIs are frequently involved in fundraising activities, represent an industry with both challenging and highly diverse governance structures (Mersland and Strøm, 2009), and participate in an industry in which correct performance measurements are unusually complex to obtain (Christen et al., 1995; Manos & Yaron, 2009). Thus, audit quality could be expected to be a particularly important issue in the microfinance industry. However, no published studies have analyzed audit quality in this industry. Moreover, there is a relative dearth of research that addresses either audit quality in developing countries (Lin and Liu, 2009; cf. Dechow et al., 2010) or audit quality in nonprofit organizations (Tate, 2007; Krishnan and Schauer, 2000); many MFIs are organizations of this type. Thus, this study contributes to filling these gaps.

Consistent with prior research (cf. Hay et al., 2006), we regard the use of a Big Four auditor as a summary variable of audit quality. This variable serves as our external (binary) measure of audit quality. Financial institutions, including MFIs, access external capital markets to fund their operations. To alleviate asymmetric information issues, an MFI hires external auditors as a signal of its audit quality. MFIs that have greater needs for external funding are more likely to choose a Big Four auditor. By contrast, relative to MFIs that require external funding, MFIs that rely on deposit funding obtain less benefits from the use of a Big Four auditor. In this study, we are able to further characterize this aspect of auditor choices by MFIs.

Moreover, we broaden the traditional concept of audit quality by considering an internal measure of audit quality. We believe that high audit quality should be not only measured through an external ‘product’, namely, the auditor’s report, but also regarded as a ‘process’ that can be assessed by examining the quality of internal audit procedures. In particular, we use the presence of internal auditors that report to the corporate board as a second (binary) measure of audit quality. The microfinance industry is especially suited for an analysis of internal auditors because the presence of these internal auditors that report to the board is clearly evident in the exchange-listed corporations that are typically investigated in audit research but is far less obvious within the microfinance industry.

Prior research has illustrated the ways in which various segments of the market for audit services are sensitive to different aspects and benefits of the audit process (Knechel et al., 2008; Guedhami et al., 2009). However, in general, firm diversity is often regarded as the most important factor that is associated with audit quality. The concept of firm diversity encompasses a firm’s size, the complexity of its operations, and its risk. An MFI’s operational complexity can vary depending on the number of markets that it serves and the services that it

provides to these markets. For instance, we should expect that MFIs with more branches will be associated with better audit quality.

Fama and Jensen (1983) and Demsetz (1983) recognize that corporate governance should be established in a manner that fits the business conditions of a firm. Due to the scarce and inconclusive nature of the extant investigations that address audit quality and governance (Hay et al., 2006) and the published studies that examine the diverging governance structures of the microfinance industry (Mersland and Strøm, 2009), this paper primarily focuses on how governance mechanisms relate to our measures of external and internal audit quality. Auditing is one type of governance mechanism, as auditors perform the gatekeeper role of certifying information from companies (Coffee, 2002). Hay et al. (2006) discuss two views in the literature regarding the relationship between corporate governance and audit quality. One of these perspectives is that better control will reduce the need for high-quality auditing, whereas the other perspective claims that governance mechanisms are complements; thus, improved control mechanisms will lead to more auditing and higher audit quality.

In addition to addressing to the need for more research on audit quality and governance (Hay et al., 2006), this study contributes to the existing research in several ways. First, most prior research on audits has been conducted in the context of for-profit, publicly traded organizations (Krishnan and Schauer, 2000; Hartarska, 2009). By contrast, MFIs generally feature a dual bottom line that includes not only a focus on profitability but also concerns about an organization's outreach efforts and social performance. MFIs are often incorporated as non-governmental organizations (NGOs), and none of the MFIs in our sample are publicly traded. From a purely business-centered perspective, the non-profit characteristics of many MFIs may cause MFIs to be regarded as less professional and more immature than other types

of corporations. Moreover, the microfinance industry involves donors that are interested in supporting the outspread of financial services to the poor; these donors constitute a large group of stakeholders in MFI firms but are absent from traditional businesses. Donors' preferences for audit quality may contrast with the preferences of traditional stakeholders, such as debt holders and investors (Tate, 2007; cf. Broye and Weill, 2008; Ashbaugh and Warfield, 2003). Thus, MFIs differ considerably from traditional corporations; as a result of these differences, MFIs and traditional corporations may evince clear distinctions with respect to their determinants of audit quality.

Moreover, our study contributes to existing audit research by illustrating that the explanatory variables for external audit quality may differ from the explanatory variables for internal audit quality. Finally, because little empirical research on audit quality has been conducted in developing and emerging economies (Lin and Liu, 2009), there is a need for additional audit research in the context of non-Western countries. We use a unique data sample of microfinance institutions in 73 countries from Latin America, Eastern Europe, Asia and Africa. The need for credible financial reporting may be regarded as particularly exigent in third-world countries and emerging markets because information asymmetries can be particularly large in financial markets that are less developed (cf. Lin and Liu, 2009) and because in these environments, there may be considerable distances between entities and their providers of capital.

The empirical analysis of this study reveals that for both audit quality metrics that are utilized in this investigation, audit quality is positively related to the MFI size. We find no association between audit quality and risk. The relationship between audit quality and complexity of operations is typically positive. By utilizing the two audit quality metrics of this study as

explanatory variables for each other, we also demonstrate strong support for the complementarity perspective regarding corporate governance. However, internal audit quality appears to be positively associated with several other governance indicators, whereas the use of a Big Four auditor is frequently only related to the control mechanism of the use of internal auditors. Collectively, we find no support for the hypothesis that a negative relationship exists between audit quality and governance mechanisms; thus, we conclude that our data do not support the notion that these two types of controls are substitutes. Moreover, we conclude that although our two audit quality metrics may be related, these metrics capture different aspects of audit quality.

The remainder of this paper is organized as follows. Section 2 presents the microfinance industry and discusses general research on audit quality. Section 2 also describes the hypotheses that are tested in an empirical examination of MFIs, whereas Section 3 presents the data sample and the research design of this study. Section 4 outlines the empirical findings from this investigation, and Section 5 concludes the paper.

## ***2. Theoretical Background***

This section begins with sub-section 2.1, which provides an overview of the microfinance industry and a brief discussion of the need for high-quality auditing in this industry. Sub-section 2.2 of this paper defines audit quality, presents prior research on the consequences of high-quality auditing, and outlines how audit quality can be measured. Sub-section 2.3 of this manuscript is devoted to hypothesis development.

### **2.1. The Microfinance Industry**

The microfinance industry has become large; at the present time, this industry provides microcredit to a total of more than 200 million individuals (Maes and Reed, 2012) and has enormous potential to continue expanding in the future. For instance, Demirguc-Kunt and Klapper (2012) find that in Sub-Saharan Africa, only 2% of examined adults report having formal financial institutions as their sole source of credit. Moreover, only 41% of adults in developing countries have an account at a formal financial institution (compared with 89% of adults in high-income economies). Foreign investments in microfinance, which are contributed by more than 100 international funds, have quadrupled over the last four years; these investments totaled 13 billion US dollars at the end of 2010 (Reille et al., 2011). Microfinance has become an important asset class for investors, particularly investors who are pursuing both financial and social returns ([www.mixmarket.org](http://www.mixmarket.org)). The importance of conducting a close examination of the mechanisms of control in the microfinance industry has greatly increased as more investors and creditors have become involved in microfinance (cf. Hartarska, 2009).

The funding for MFIs is supplied by sources that range from donations to commercial investments. Microfinance is thus an arena in which donors and professional investors may meet. MFIs are typically incorporated as shareholder firms that are frequently registered as either commercial banks or non-bank financial institutions; non-profit organizations that are often referred to as non-governmental organizations (NGOs); or formally registered, member-based organizations, such as savings and credit cooperatives (SACCOs) (Mersland, 2009). These differences in ownership structures are an interesting aspect of the microfinance industry. Prior research suggests that there is no difference in performance between different types of MFIs (Mersland and Strøm, 2009); however, it is likely that the ownership structures of MFIs influence their governance structures and audit quality.



Similarly to other financial intermediaries, MFIs are inherently opaque because it is difficult for outsiders to judge either the quality of projects that are financed by an MFI or the soundness of the MFI's funding (Rochet, 2008). For opaque firms, governance mechanisms, particularly auditing, are important. In a study of the impact of external control on microfinance performance, Hartarska (2009) states that the ability of various stakeholders, such as donors, creditors and investors, to effectively monitor managers is critically dependent on the completeness and accuracy of the information that these stakeholders possess. Thus, one can expect that financial reporting information will be as important in microfinance as it is in other industries. Because the purpose of high-quality audits is to improve the quality of financial reporting, these audits should be expected to reduce information asymmetries between a firm and its stakeholders. The microfinance industry has been criticized for weak corporate governance (Mersland and Strøm, 2009) and functions in a sector in which correct performance measurements can be unusually complex to obtain (Christen et al., 1995; Manos & Yaron, 2009). Thus, information asymmetries between managers and capital providers may be more serious in the microfinance industry than in other industries.

## 2.2. What is Audit Quality? A Review of Prior Research

### *2.2.1. Audit Quality Defined*

DeAngelo (1981) defines audit quality as the joint probability that an auditor will detect and report a material misstatement. Thus, the definition of audit quality consists of two components: the *ability* to detect misstatements and the *willingness* to report the misstatements that are uncovered during the course of an audit. Consistent with this definition of audit quality, there is extensive empirical evidence that various proxy variables for audit

quality are correlated with the increased trustworthiness of financial reports (Maijoor and Vanstraelen, 2006; DeFond and Jiambalvo, 1993; Lin and Hwang, 2010; Francis et al., 1999). For instance, high-quality audits are associated with fewer errors and irregularities (cf. DeFond and Jiambalvo, 1991). Moreover, Lin and Hwang (2010) document that a high-quality audit is expected to both constrain opportunistic earnings management and reduce the risk that material misstatements or omissions will be present in financial reports.<sup>1</sup>

### *2.2.2. The Importance of Audit Quality*

One of the most important objectives of external financial reporting is to reduce agency conflicts between the firm and its various stakeholders (Healy and Palepu, 2001; Hope et al., 2008). The degree to which information asymmetries are reduced by financial reports is crucially dependent on the quality of these financial reports; the purpose of an audit is to improve financial reporting quality (Boone et al., 2010). However, in addition to the direct effects of audit quality on accounting trustworthiness, indirect effects of audit quality are also observed; these effects are mediated by the associations between audit quality and other mechanisms of corporate governance (O'Sullivan, 2000; Carcello et al., 2002; Abbott et al., 2003; Knechel and Willekens, 2006).

It is generally assumed that firms choose their own levels of audit quality through their selection of an auditor. However, as Lin and Liu (2009) state: "... effective auditing will be adopted only when the benefits of imposing the monitoring device (reduced agency costs or lowered capital raising costs) outweigh the costs of using the device (forfeited benefits

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<sup>1</sup> Schipper (1989) defines earnings management as purposeful intervention in the external financial reporting process with the intent of obtaining private gain. Lin and Wang (2010) perform a meta-analysis of a large number of studies of audit quality and reveal a significant negative relationship between levels of earnings management and several proxies for audit quality (cf. Maijoor and Vanstraelen, 2006).

stemmed from governance constraints)” (Lin and Liu, 2009, p. 47). The main benefit of high-quality auditing is often considered to be the increased potential to raise funds that results from auditing-related reductions in information asymmetries (Hartarska, 2009; Dechow et al., 2010; Desender, 2010).

With respect to empirical studies, Broye and Weill (2008) examine the influence of audit quality on financial debt holders and document the existence of a positive association between audit quality and leverage. Pittman and Fortin (2004) find that the impact of audit quality on debt pricing is particularly large during the early public years of firms because firms are not well known at this time. Furthermore, consistent with a published finding that foreign owners require more credible financial statements to reduce agency costs (Guedhami et al., 2009), Leuz et al. (2009) find that foreigners avoid investments in poorly governed firms (cf. Doidge et al., 2009). Moreover, several studies have reported that audit quality is generally relevant to the investment decisions that are made by investors and other participants in capital markets (see discussion in Lin et al., 2009).

Because MFIs are frequently involved in raising funds from external investors, there is no reason to assume that audit quality should possess less importance in the microfinance industry than in other industries that have been addressed by prior research. For instance, the use of a Big Four auditor would send a signal to investors that the MFI conducts its business in a responsible manner. Thus, we expect to observe that MFIs that are largely reliant on investor funding should employ a Big Four auditor more frequently than other MFIs. By contrast, MFIs that have lower levels of dependence on investor funding will have little need to provide a signal to their investors through the use of a Big Four auditor and should therefore engage the services of a Big Four auditor less frequently than other MFIs.

Moreover, donors form a stakeholder group in the microfinance industry that is typically absent from ‘ordinary’ listed companies. Tate (2007) claims that “[s]ince donors receive no direct benefit from the charitable contributions they provide to a nonprofit and, therefore, cannot directly see how the funds were used, they rely more heavily on monitoring to ensure their funds were used consistently with their intent” (Tate, 2007, pp. 50-51). Thus, we may also expect to observe a relationship between audit quality and contributions from donors (cf. Steinwand, 2000; Hartarska, 2009).

### *2.2.3. The Measurement of Audit Quality*

Prior research in auditing suggests that the two primary drivers of quality in the auditing business are litigation costs and reputation loss (Boone et al., 2010). For the auditors, litigation costs are the immediate and direct consequences of poor audit quality, whereas reputation losses are the long-term costs of insufficient quality. Audit fees (Knechel et al., 2008; Lin and Hwang, 2010), auditor size (Francis and Krishnan, 1999; Boone et al., 2010), and auditor reputation (Broye and Weill, 2008; Hope et al., 2008) are the most commonly listed indicators of audit quality. These indicators are all readily applicable to the Big Four (or Five or Six) auditors. These Big Four auditors are not only the largest auditors in the world but are also typically the auditors with the best reputations and highest prices. In fact, according to Hay et al. (2006), a Big Four binary variable is the most commonly used indicator of audit quality. The proposition that the use of a Big Four auditor is related to high-quality auditing is supported by a number of empirical studies (Knechel et al., 2008; Francis, 2004; Barnes, 2008; DeFond and Jambalvo, 1993; Krishnan and Schauer, 2000; Dechow et al., 2010). Hope et al. (2008) summarizes the use of Big Four auditors as an indication of high quality in the following manner: “...the ability to detect material error in the financial

statement is a function of auditor competence, while the propensity to correct or reveal the material error is a function of auditor independence from the client... big four auditors are perceived to be competent given their heavy spending on auditor training facilities and programs and to be independent by virtue of their size and large portfolio of clients..." (Hope et al., 2008, p. 360).

Based on the overwhelming evidence that the use of Big Four auditors is strongly related to audit quality measures, this study uses Big Four auditing as a proxy variable for audit quality. However, we also employ a second indicator of audit quality. High-quality auditing is a trait that extends beyond the presentation of a trustworthy auditors' report. Audit quality is also a reflection of high-quality internal processes (cf. Hay et al., 2008). Thus, we choose to include a binary variable for internal audits in our analysis. In particular, this variable measures whether an MFI has internal auditors in its organization that report to its corporate board. The microfinance industry represents an excellent context for an analysis of internal audits. In particular, the existence of internal audits is not obvious in this industry (cf. Steinwand, 2000); thus, this industry gives us the opportunity to assess the factors that explain the presence or absence of internal audit systems in institutions that are similar in other respects.

In general, the auditing quality is a multi-dimensional characteristic (Lin and Wang, 2010); thus, although we expect the metrics of the use of Big Four auditors and the presence of board-reporting internal auditors to capture many of the same quality dimensions (see the hypothesis development section of this paper), we also expect these two quality indicators to measure certain non-overlapping dimensions of audit quality. For instance, Steinwand (2000) states that external audits may compensate for weak internal audits in the microfinance

industry. Thus, we believe that the inclusion of internal audits in this study will produce a broader analysis of audit quality than a mere analysis of the use of a Big Four auditor.

### 2.3. What explains audit quality? Hypothesis development

A firm's selection of an auditor serves as a signal of this firm's choice of audit quality. It is expected that effective auditing will be adopted only if the imposition of this monitoring device provides benefits that outweigh its costs. Prior research suggests that the demand for financial reporting transparency and audit quality is related to a large number of client characteristics. This section develops the hypotheses that will be tested with respect to the relationships between various MFI characteristics and audit quality.

An MFI must tailor its governance mechanisms to the business conditions that it faces (Fama and Jensen, 1983; Demsetz, 1983). We capture this consideration within the concept of firm diversity, which encompasses an MFI's size, its complexity of operations, and its risk. However, the MFI's choice of audit quality also depends on its choice of other governance mechanisms. For instance, the keen oversight of an MFI by its board may serve as a substitute for auditing. We first briefly discuss how audit quality relates to firm diversity and subsequently return to a more comprehensive discussion of the relationships between audit quality and other governance mechanisms.

An MFI's size is one aspect of its diversity. For instance, a larger size implies more employees and more organizational levels, which may create specialization and coordination issues (Milgrom and Roberts, 1992). The top management and the board of an MFI will experience greater difficulty in monitoring all aspects of the organization as the MFI becomes larger. The growth of an MFI causes the number of hierarchical levels in this organization to

increase and thereby renders the MFI more susceptible to agency problems, such as the occurrence of collusions between managers at different layers in the organization that are designed to evade oversight (Tirole, 1986). Moreover, an organization's diversity increases as its complexity of operations expands. For instance, if an MFI extends its lending from urban areas to rural regions, its management and board will have new tasks to oversee. Finally, if an MFI increases in scope, additional business-related risks arise among customers and funders; these risks contribute to the aggregate complexity of the MFI in question. The three aspects of increased MFI diversity, namely, size, complexity and risk, create the need for more formal corporate governance mechanisms; in particular, these considerations generate a demand for high-quality external and internal auditing procedures.

Empirical evidence regarding the three aforementioned diversity measures confirms the importance of these factors. In a comprehensive meta-analysis, Hay et al. (2006)<sup>2</sup> find that company size is the most dominant determinant of audit fees, which are one of the more frequently utilized indicators of quality in the extant research that addresses audits. Krishnan and Schauer (2000) demonstrate that company size is significantly related to audit quality in the non-profit sector as well. Thus, we expect audit quality to increase with MFI size. Our MFI size proxy is total assets, which is the most frequently applied indicator of firm size (Hay et al. 2006). Because we have a sample that incorporates a large number of countries, assets are PPP-adjusted; consistent with the approaches of prior research, we then utilize the log of the (PPP-adjusted) assets in the multivariate analysis to minimize the scale-related and non-linearity effects of this variable.

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<sup>2</sup> Hay et al. (2006) conduct a meta-analysis of audit research over the course of the previous 25 years. However, 134 out of their 147 investigated studies focus on countries with an Anglo-Saxon legislative tradition (cf. Desender, 2010).

Hay et al. (2006) state that there is little doubt that the relationship between audit fees and firm complexity is positive and significant; these researchers rank complexity as the second most important determinant of audit quality. Hay et al. (2006) find that a firm's number of subsidiaries is a much more commonly used proxy for complexity than any other complexity metric; therefore, we use the number of branch offices of each examined MFI as our first proxy for complexity. However, because complexity is difficult to measure, we also assess two alternative metrics. The second complexity metric is a variable that indicates each MFI's primary market; this variable is set equal to 1 if this market is strictly urban, takes a value of 2 if this market is strictly rural, and assumes a value of 3 if this market is a mix of the two different types of settings. Thus, higher values of this variable indicate increased complexity.

A particularly interesting complexity variable to study in the microfinance industry is the degree to which the MFIs accept savings. A majority of MFIs only provide credit but not savings; relative to these MFIs, MFIs that also accept savings are generally regarded as more complex organizations. Thus, a variable that represents the amount of voluntary saving accepted by an MFI relative to the MFI's loan portfolio is a possible complexity indicator. From the general arguments regarding audit quality and complexity, it could be reasonable to hypothesize that a positive relationship between audit quality and the proportion of voluntary savings may exist. However, this variable is also a proxy variable for capital needs, and it captures important aspects of governance. A bank that accepts deposits is intrinsically fragile because depositors may simultaneously decide to withdraw their money at any time (Calomiris and Kahn, 1991; Rochet, 2008). The depositors wish to keep their MFI viable and therefore have an interest in monitoring the actions of the bank. We refer to this consideration as the *monitoring role* of deposits; from this perspective, deposits are expected to be positively related to internal auditing. There is also a *signaling role* of deposits. For an MFI,



higher levels of deposits equate to a lesser need for investor funding. This effect implies that the benefits of having a Big Four auditor diminish as the extent of an MFI's deposits increases because the use of a Big Four auditor as a seriousness signal to outside investors is less important to an MFI with high deposits than to other MFIs. Thus, from this perspective, we would expect to observe a negative relationship between deposits and the use of a Big Four auditor. Overall, we acknowledge that the proportion of voluntary savings may be a less clear-cut measure of complexity than the other complexity proxies that are considered in this experiment; however, for the reasons that are discussed above, we consider this metric to be an especially important variable to include in the empirical analysis. In general, the fact that savings can have a powerful influence on firm behavior has been demonstrated in a study by Ivashina and Scharfstein (2010) that examined the 2008 financial crisis. During this crisis, banks that were primarily funded through deposits were able to continue lending, whereas banks that were funded through the short-term borrowing of funds curtailed their lending.

Risk is another aspect of firm diversity; this factor is considered to be the third of the dominant explanatory variables for audit quality by Hay et al. (2006). Firms with higher inherent risks will require more specialized audit procedures (cf. Michaely and Shaw, 1995). Thus, we expect to observe a positive relation between audit quality and risk. The riskiness of an MFI is typically measured through the metric of portfolio at risk (Gutierrez-Nieto and Serrano-Cinka, 2007). Thus, we use portfolio at risk > 30 (PAR30<sup>3</sup>) as our risk proxy in this study.

The theoretical reasoning underlying the relation between audit quality and size, complexity, and risk is straightforward and has been documented in research that uses auditor type as a

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<sup>3</sup> Portfolio at risk > 30 refers to the outstanding balance of loans that are more than 30 days past due divided by the average outstanding gross loan portfolio.

measure of audit quality (Knechel et al., 2008; Lin and Liu). However, the microfinance industry has several characteristics that distinguish firms in this industry from exchange listed corporations; for instance, in the microfinance industry, many non-profit organizations exist, there is frequently a large distance between organizations and their capital providers, and an additional stakeholder group (donors) exists that is absent from the industries that have been examined in prior audit research. Therefore, we test whether the relationships that have been established in previously published audit research remain valid for our sample. Thus, our first hypothesis may be expressed as follows (stated as the alternative to its null):

**Hypothesis 1:** Audit quality is positively associated with MFI size, complexity, and risk.

The next hypothesis relates to corporate governance. We define corporate governance as a set of mechanisms by which organizations are directed and controlled (OECD, 2004). These mechanisms may be defined either internally by the firm itself (through CEO incentives and board composition, among other factors) or externally (through market competition, public regulation, and various other considerations). Auditing reflects a corporate governance choice that establishes the quality of the gatekeeper role and the information certification function for a firm (Coffee, 2002). However, effective governance may be achieved through other means, such as through the use of a more expert board of directors. Demsetz and Lehn (1985) provide a rationale for considering the complete combination of various governance mechanisms; in particular, these researchers posit that a firm's choice of governance mechanisms represents an equilibrium solution to its governance issues. An implication of this reasoning is that there should be no relationship between governance mechanisms and firm performance. However, this reasoning also suggests that a relationship should exist between the various governance mechanisms that are utilized by a company. Thus, relationships could exist between audit

choice and other governance mechanisms. We explore this potential connection in this study, particularly given that the prior empirical evidence in the accounting literature with respect to these relationships is scarce and contradictory (Hay et al., 2006). The microfinance industry is particularly suited for a study of governance because firms in this industry vary greatly in terms of their quality of governance mechanisms and their degrees of professionalism (Mersland and Strøm, 2009).

In general, two competing views of the relationship between governance and audit quality are frequently discussed in the literature (see, e.g., Hay et al., 2008). According to the ‘complementarity view’, control mechanisms are complementary in the sense that the quality of one control mechanism is expected to be positively associated with the quality of another control mechanism. The notion underlying this viewpoint is that companies that need greater control would simultaneously utilize several different control dimensions (Hay et al., 2008). From this perspective, high audit quality should be positively associated with (other) high-quality governance structures. By contrast, under the ‘substitution view’, the existence of one control mechanism reduces the need for other controls, thus causing a negative association between audit quality and other governance mechanisms. The substitution perspective reflects the Demsetz and Lehn (1985) theory that firms will choose an optimal mix of governance mechanisms to address the entirety of their particular situation. For instance, a high ownership concentration may substitute for other strong governance mechanisms. It has sometimes been claimed that the complementarity view best describes the relationships between internal control mechanisms, whereas the substitution view provides a more accurate description of the relationships between external control mechanisms, including the relationships between external audit quality and corporate governance mechanisms (Hay et al., 2008; cf. Knechel and Willekens, 2006).

Knechel and Willekens (2006) attribute the existence of potentially complementary relationships among governance mechanisms to diverging preferences of the multiple stakeholders of a firm and the externalities of the costs and benefits of these stakeholders' individual decisions. Consistent with this complementarity perspective, Lin and Liu (2009) document a positive relation between governance and auditor choice in their study of Chinese firms. These researchers argue that for situations in which opaqueness is important for managers or owners to protect private benefits, weak governance mechanisms are preferred, and a low audit quality will be chosen (and vice versa).

In their meta-analysis, Hay et al. (2006) also argue in favor of the complementarity view and contend that improved corporate governance implies that the control environment is more effective. Thus, these researchers expect audit quality to be positively associated with other corporate governance mechanisms. In accordance with this expectation, Hay et al. (2006) find that among the few prior studies that document a statistically significant relationship between governance and audit quality (which is proxied by audit fees), a positive association between these two traits is found. In general, the predominant hypothesis in accounting research is that a positive association exists between governance mechanisms and audit quality; this hypothesis has also been supported by more recent investigations (Desender, 2010; Hay et al., 2008; Knechel and Willekens, 2006). The contention that improved corporate governance leads to a more effective control environment is typically applied to external audit quality, but this argument appears to be highly relevant for our measure of internal audit quality as well (cf. Hay et al., 2008). Thus, in this study, we hypothesize that positive associations exist between governance mechanisms and both of our measures of audit quality.

It is difficult to identify metrics of ‘good’ governance (Dechow et al., 2010), given that ideal governance involves optimizing both the total amount of governance in a firm and the mix of governance mechanisms that are used by a firm. For instance, Adams and Ferreira (2009) find that the presence of women on the board of a firm results in more board meetings (which is most likely a good phenomenon in general) but that this female representation on the board of the firm does not result in improved firm performance. These researchers ascribe this phenomenon to monitoring levels that are greater than the optimal monitoring level. Moreover, governance can be measured along several dimensions that can be difficult to consolidate into a single composite measure. Therefore, we analyze several indicators of the quality of corporate governance mechanisms. In accordance with the aforementioned definitions, we split these mechanisms into the two categories of internal and external structures. The external metrics should not be regarded as *direct* measures of control but instead represent characteristics that have been identified by prior research as traits that contribute to a more favorable control environment.

As mentioned above, audit quality should be regarded as a governance mechanism. This interpretation is common for external auditing (Lin and Hwang, 2010; DeFond et al., 2002) but is even more relevant for internal audit quality. In general, the causality of relationships between the different types of governance mechanisms that are examined is not obvious. In contrast to studies that imply that audit quality is a function of corporate governance mechanisms (Knechel et al., 2008; Lin and Liu, 2009), in this study, we simply observe statistical associations between governance structures and audit quality without drawing

strong inferences about the causality of these relationships. Notably, one unique feature of our study is that it uses highly reliable data for a variety of diverse internal and external governance variables.

Incentives and monitoring are the two primary mechanisms of internal governance (Tirole, 2006). MFI owners typically use incentives to attempt to align the interests of an MFI's CEO with their own objectives. However, an MFI has the dual objective of not only reaching out to poor customers (its social mission) but also ensuring that this outreach occurs in a financially sustainable manner (its financial performance mission) (Morduch, 1999). These dual objectives, as well as differences in ownership structures among MFIs, can render incentive structures difficult to construct; thus, in this study, our assessment of internal governance mechanisms focuses on monitoring structures.

Following the approach of Lin and Liu (2009), the first internal governance variable we apply is the number of board members of an MFI. Larger boards are regarded as an indicator of stronger internal governance, and the board size is also strongly related to the number of outside directors, which is another frequently applied governance metric (Hay et al., 2006; Desender, 2010). However, one recurring result in studies of corporate boards is that smaller boards are associated with improved firm performance (Yermack, 1996; Eisenberg et al., 1998).

Hay et al. (2006) state that there is limited research that examines the relationship between corporate governance and audit quality; however, these researchers find that in the scarce literature that does exist with respect to this topic, the separation of the duties of the chair and the CEO is used as a measure of governance. Thus, CEO/chair duality is our second measure

of governance (see, for instance, Lin and Liu, 2009). We note that the binary CEO/chair variable implies that the board is less independent if the CEO and chairperson roles are combined.

In accordance with Mersland and Strøm (2009), we consider ownership type to be an internal governance mechanism. Mersland and Strøm (2008) are unable to find a relationship between ownership type and the performance of an MFI. However, an unexplored and interesting channel for the possible influence of ownership characteristics on MFI performance is through the governance mechanisms of the MFI. Prior research from other industries has revealed that ownership may affect audit quality (Hay et al., 2006; Hay et al., 2008). For instance, Chan et al. (1993) identify a negative relationship between ownership concentration and audit fees (cf. Ashbaugh and Warfield, 2003). However, in contrast to previous research on audit quality, which has examined listed companies, the microfinance industry includes a variety of legal incorporations. Thus, the additional explanatory variable of legal incorporation becomes relevant in examinations of MFI audit quality. Based on prior research indicating that ownership concentration is negatively related to governance structures in listed companies (e.g., Desender, 2010), it can be expected that shareholder companies will have stronger governance mechanisms than companies with other legal incorporations. The MFI categories in our data sample are bank and non-bank financial institutions that are owned by shareholders, cooperatives that are owned by members, NGOs and state owned MFIs. We examine the simple dichotomy between shareholder-owned MFIs and other MFIs.

Importantly, this binary variable also captures the for-profit vs. non-profit dimension of the microfinance industry. Shareholder corporations generally have profit as an objective,

whereas other MFIs do not possess this objective. Thus, the legal incorporation variable is expected to reveal whether the existence of the for-profit objective affects audit quality.

MFI regulation is the first external governance mechanism. Microfinance is an industry in which certain players are regulated by local banking authorities whereas other entities do not experience this regulation. The appropriate regulation of MFIs depends on country-specific characteristics, such as a nation's level of development and institutional capacities (Arun, 2005; Hardy et al., 2003); thus, there is no uniform regulation of MFIs across countries (McGuire, 1999). Relevant regulations for MFIs can include rules that govern MFI formation and operations, consumer protection, fraud prevention, the establishment of credit information services, secured transactions, interest rate limits, the ability to mobilize deposits, minimum levels of provisions for future losses, foreign ownership limits, and tax issues (Cull et al., 2011). In general, regulations could be imposed in a manner that favors higher audit quality. Moreover, regulations may produce the indirect effect of raising firms' levels of consciousness regarding the importance of high-quality reporting and reducing information asymmetries in regulated entities. Thus, we suggest that an MFI that is regulated by a local banking supervisor is associated with higher audit quality. Regulation is measured through a binary variable that takes a value of 1 if the MFI is regulated by a local banking authority and takes a value of 0 otherwise.

The second external governance metric is a binary variable that indicates whether an MFI originated from abroad. International origins may directly provide favorable governance implications for MFIs; moreover, this variable may also act as a proxy for other variables with international connotations, such as the number of board members who are elected by donors and the number of international board members. In empirical studies, Ashbaug and Warfield



(2003) find a positive association between audit quality and foreign stakeholders, and Leuz et al. (2009) reveal a positive relationship between governance mechanisms and foreign investment. Thus, we expect to observe a positive association between international initiation and audit quality.

A third external governance measure is competition. We propose that fiercer competition reduces managerial slack and increases a firm's need for control (cf. Giroud and Mueller, 2011). Thus, strong product market competition may place more emphasis on corporate governance, and we therefore expect to observe a positive association between audit quality and an MFI's level of competition. It is also notable that stronger competition may be associated with a higher degree of complexity. This phenomenon further strengthens the expectation that a positive association will exist between a firm's level of competition and its audit quality. However, as noted by Knechel et al. (2008), incentives to disguise true levels of performance in competitive markets may cause companies to choose low quality auditors if they face fierce competition. Thus, we cannot rule out the possibility that the relation between audit quality and competition may conflict with our expectations. It is difficult to measure a firm's level of competition; in this study, this measurement uses a self-constructed variable that is based on the local market information that is presented in the reports of MIF raters (see below).<sup>4</sup>

We conclude this hypothesis development section with a discussion of the possible relationships between our two audit quality metrics. These two metrics are assumed to capture different components of overall audit quality, but they may also reasonably serve as explanatory variables for each other. In accordance with the previous discussion, we maintain

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<sup>4</sup> Among MFIs, ownership types, regulation statuses, international origins, and the levels of competition that are faced vary considerably. Ownership type and the other background features may be regarded as exogenous factors for the purposes of this study

that control mechanisms are complements; because managers often choose to protect their reputations by increasing their investments in both internal and external auditing, more external auditing is expected to be associated with more internal auditing and improvements in (other) governance mechanisms. The notion of a positive association between internal and external auditing is in accordance with Hay et al. (2008), who “...present arguments that controls, governance and auditing are complements, not substitutes, and that an increase in one will lead to an increase in the others” (Hay et al., 2008, p. 9). The findings of these researchers not only support the notion of generally positive associations between governance mechanisms and audit quality but also specifically suggest that *our two measures* of audit quality are positively related. This expectation is supported by Hay et al. (2006), who reveal that the majority of previous studies that find a significant relation between internal audits and external audit fees conclude that this association is positive. However, Hay et al. (2006) note that few researchers have access to data about internal controls and that the limited research that does exist often presents mixed results.

Our expectations regarding governance are summarized in hypothesis 2:

### **Hypothesis 2:**

Governance mechanisms are complements; therefore, the following relationships should hold:

- a) board size is positively related to audit quality, whereas CEO-chair duality is negatively related to audit quality,
- b) shareholder-owned MFIs should evince higher audit quality than other MFIs,
- c) the external governance indicators of regulation, international initiation, and market competition should all be associated with higher audit quality, and
- d) external audit quality should be positively associated with internal audit quality.

Moreover, note that we test the relationship between MFI age and audit quality. Knechel et al. (2008) find a positive relationship between financing needs and audit quality. It may be argued that newly established MFIs have the greatest need for financing and therefore should have the highest audit quality. However, MFI complexity is increasing in its age, suggesting that a positive relationship between age and audit quality may exist. Because it is possible to expect either sign for the association between these two traits, we refrain from formulating a hypothesis. Finally, we use the Human Development Index (HDI) as a country control variable. However, this variable also measures whether audit quality is related to the level of economic development of the countries in which the examined MFIs are located.<sup>5</sup>

#### **Table 1**

All of the variables that are discussed in this section and used in the empirical analyses are defined in Table 1.

### ***3. Research Design and Data Sample***

#### **3.1. Research Design**

Based on the above discussion, we begin the empirical analysis with a simple analysis of the bivariate relationships between each of the proposed explanatory variables and the two audit quality metrics (which are assessed through t-tests). This simple test allows us to use a larger number of observations for the different variables of the study than we can employ in the multivariate analysis of this study. In the multivariate analysis, we estimate the following relationship with a probit model (cf., e.g., Hope et al., 2008).

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<sup>5</sup> Financial performance is sometimes applied as an explanatory variable in audit research; however, the theoretical foundation for the possible relationship between financial performance and audit quality is somewhat weak and unclear, and we therefore refrain from discussing this variable in our study. Consistent with the mixed and often inconclusive empirical results regarding the relationship between audit quality and profitability (Hay et al., 2006), robustness tests demonstrate that return on assets (ROA) is not a significant consideration in our regressions (these results are not tabulated).

$$AuditQuality = \beta_0 + \beta_1*Size + \beta_2*Complexity + \beta_3*Risk + \beta_4*Governance + \beta_5*Age + \beta_6*HDI + \varepsilon$$

In the above equation, the subscripts *i* and *t* are dropped for simplicity. *AuditQuality* is a binary variable for either the use of a Big Four auditor or for the presence of board-reporting internal auditors. We first focus the analysis on the firm diversity variables and subsequently include all of the explanatory variables of this study in the full model.

The relationship above does not account for the potential interdependence between the use of a Big Four auditor and an MFI's use of an internal auditor. We explore this aspect through system estimations that include the use of a Big Four auditor and the use of an internal auditor as dependent variables. The Zellner seemingly unrelated regression (SUR) model is the estimation approach for this exploration (Greene, 2012); this estimation is implemented through the generalized least squares (GLS) method. The SUR method assumes that the dependent variable is continuous. This assumption implies that we can achieve estimates of the direction but not the strength of a relationship through the SUR estimations. Thus, we cannot compare coefficient estimates from the probit regressions with the results of the SUR regressions. However, tests of significance have the same interpretation in both approaches.

### 3.2. Data Sample

The dataset is hand-collected and contains information from *risk assessment reports* that were written by five of the leading rating agencies in the microfinance industry. The rating reports that compose the dataset were financially subsidized by Ratingfund 1 and downloaded from [www.ratingfund2.org](http://www.ratingfund2.org). The dataset contains information from 379 MFIs in 73 countries. Mitra

et al. (2008) report that there are approximately 16 rating agencies that are active in microfinance. Our agencies have been chosen because they are the agencies that provide the most information and involve the largest players in the microfinance industry. In particular, the agencies that were selected for this study include the American *MicroRate* agency, the Italian *Microfinanza* agency, the French *Planet Rating* agency and the two Indian agencies of *Crisil* and *M-Cril*. Although each of these agencies may argue that its rating methodology differs from the methodology that is used by other rating agencies (Mitra et al. 2008), the core information that is used in this study consists of standard indicators that are calculated similarly across the entire microfinance industry (Beisland and Mersland, 2012). All of the aforementioned agencies consider the whole world to be their market. However, the Indian agencies are more active in Asia than in other regions of the world, whereas the other selected agencies of this study are more active in Africa, Latin America and Eastern Europe than in Asia.

In total, the sample of this study is composed of 1616 firm-year observations from the 2001 to 2009 time period. To measure bank-critical data, such as the size of an MFI's loan portfolio, the selected rating agencies obtain data for not only the rating year but also approximately three years prior to this rating year,. However, certain variables are only recorded for the rating year; in particular, these variables include measures of internal and external auditing and most governance-related factors. We use rating year observations only; for our two proxy variables for audit quality, this restriction produces a sample of 255 firm-year observations of external auditors and 421 firm-year observations of the presence of a board-reporting internal auditor. Table 2 lists the geographical distribution of the sample. Many of the countries that are represented in the sample have been subjected to very little international accounting research. In general, access to machine-readable firm-level financial data is restricted in

countries other than the US (Dechow et al. 2010), particularly in developing and emerging economies. Thus, few to no comprehensive studies of audit quality in the third world have been published in the accounting literature. Table 3 presents descriptive statistics for the variables that are used in this study.

### **Tables 2 and 3**

Table 3 reveals that 30% of the MFIs for which we have auditor choice data utilize a Big Four auditor. In addition, 45% of the examined MFIs have board-reporting internal auditors. This table also illustrates that the spread of the sample with respect to firm size, as measured by PPP-adjusted assets, is large. A large spread is also observed with respect to the age of the examined MFIs; the average firm age for these MFIs is slightly over 10 years. An average of 2.15 for the complexity proxy variable of “Main market” suggests that most MFIs operate in both urban and rural areas. Moreover, on average, voluntary savings are equal to 20% of an MFI’s total loan portfolio. With respect to our governance variables, we note that the average board size equals 7, whereas the chair and the CEO of an MFI is the same person for 12% of the sample. In total, 34% of the examined MFIs are shareholder corporations, 29% of the examined MFIs are regulated by local banking authorities, and 39% of the examined MFIs originate from abroad. The average of our 7-scale competition index is 4.4, indicating that competition in the microfinance market is beginning to increase.

### **Table 4**

The correlation matrix for the explanatory variables is provided in table 4. The simple bivariate correlations can be used as a first check of multicollinearity. If two explanatory variables are highly correlated, then their regression estimates will be imprecise. Kennedy (2008) notes the bivariate correlation level of approximately 0.80 may produce these problems. Table 4 reveals that none of the observed correlations approach this level. However, we note a relatively high correlation between an MFI’s size, measured by its assets,

and the MFI's number of branch offices; in particular, the correlation coefficient for this relationship is calculated to be 0.474. We also note that the correlation between the variables that measure voluntary saving and bank regulation is only 0.268. A much higher correlation might be expected because it could be anticipated that governments could pass regulations to protect savers. The overall message from table 4 is that variables are satisfactorily independent; therefore, the regression analyses of this study may proceed without concerns about multicollinearity.

Table 4 indicates that there are generally low levels of correlations between the governance indicators that are examined in this study. We note that a negative correlation exists between the binary variables for shareholder firm and CEO/chair duality, suggesting that the CEO and the chair are typically two different persons in MFIs that are incorporated as shareholder firms. Moreover, we note that compared with other MFIs, shareholder firms are more frequently regulated. The relatively low correlation coefficients between the examined governance variables suggest that one cannot generally talk about *the* (single) relationship between governance and audit quality.

#### **4. Econometric evidence**

Sub-section 4.1 discusses the bivariate relationships between each of the explanatory variables and the two audit quality metrics. We then proceed to a multivariate setting that includes single-equation probit estimations. In sub-section 4.2, we examine the relationships between audit quality and the variables of the size, complexity and risk of MFIs. Governance variables are introduced in sub-section 4.3. In sub-section 4.4, we perform system estimations using the SUR framework to analyze the relationship between our two metrics of audit quality.

#### 4.1. Bivariate Analysis

The results from t-tests for differences in means are presented in Table 5. Panel A displays the differences if the use of a Big Four auditor is used as the audit quality metric. As expected, the MFIs that use a Big Four auditor are larger than the other examined MFIs. We also note significant differences in the use of a Big Four auditor for two out of the three examined complexity proxies. As hypothesized, users of Big Four auditors have more branch offices than firms that employ different auditors. However, we also find that audit quality, as measured by the Big Four variable, is negatively related to an MFI's proportion of savings; this result may suggest that the savings proportion is not a good complexity indicator. A possible interpretation of this finding is that relative to the general population of examined MFIs, MFIs that mobilize local deposits are most likely better integrated into local capital markets and therefore have less need to obtain external financing from abroad. Thus, these MFIs do not need verification from a Big Four auditor to obtain access to capital. This first empirical test supports the signaling role of deposits that was discussed in the hypothesis development section.

With respect to risk, the t-test reveals results that contrast with our expectations. Table 5 suggests that the use of Big Four auditors is negatively related to risk, which is measured by PAR30 values. The measurement of risk is not necessarily straightforward, an issue which we discuss later in the manuscript; however, one possible explanation for the negative association between the use of Big Four auditors and PAR30 values is that MFIs with higher risk are less professionalized and are therefore less willing to pay the costs that would be required to hire a Big Four auditor.

#### **Table 5**



The bivariate results for the relationship between governance variables and the use of Big Four auditors are generally insignificant. Only the competition index demonstrates significant differences with respect to this measure of audit quality; as expected, higher levels of competition are associated with higher audit quality. The relationship between the use of a Big Four auditor and international origin is weakly significant; thus, a degree of evidence exists to indicate that international origin is associated with the use of a Big Four auditor. This result is consistent with the hypotheses of this study.

We note that the use of a Big Four auditor is not significantly related to either MFI regulation or ownership type. The correlation matrix suggests that these two indicators of governance share a great deal of common information. We hypothesized that both of these governance indicators should be positively related to audit quality. However, because relative to unregulated MFIs, regulated MFIs are generally more integrated into local capital markets and possess better abilities to mobilize savings, it could be argued that compared with unregulated MFIs, these regulated MFIs should evince less need to tap into international sources of funds. In accordance with this reasoning, regulated MFIs may have stakeholders with low levels of demand for high-quality external audits.

In panel B of Table 5, the use of board-reporting internal auditors replaces the use of a Big Four auditor as the metric for audit quality. The expected results are obtained for firm size. In particular, size appears to be positively related to the use of internal auditors. One of the complexity proxies is significant; in particular, the MFIs that use internal auditors generally have higher scores on the main market variable, suggesting that these MFIs operate more frequently in both urban and rural areas. This result is consistent with the hypotheses of this study. We find no relationship between internal auditors and risk, a result that contrasts with

the hypothesis. However, we do find a statistically significant relationship between MFI age and the use of internal auditors; in particular, board-reporting internal auditors are more frequently used by older MFIs than by younger MFIs.

We find more statistically significant relationships between governance variables and audit quality if the use of internal auditors is regarded as the metric of audit quality than if the use of a Big Four auditor is considered to be the metric of audit quality. Relative to MFIs that do not use internal auditors, MFIs that use internal auditors are more frequently regulated, they are more often shareholder firms, and they operate in markets that involve fiercer competition. All of these results are consistent with the hypotheses of this study. With respect to regulation, it is notable that the presence of internal auditors may be a formal requirement for some bank regulators. In addition, in considerations of firm type, it must be recalled that shareholder firms are typically for-profit organizations, thus, it appears that the internal monitoring that is provided by board-reporting internal auditors is less important in non-profit organizations than in for-profit firms.

On the whole, the bivariate analyses reveal strong support for the hypothesis that a positive relationship exists between audit quality and MFI size. The results regarding complexity are less clear-cut, but point towards the possibility of a positive relationship between complexity and audit quality. The results on risk are either insignificant or contrast with the proposed hypothesis of a positive association between risk and audit quality. The governance variables are frequently insignificant, but the statistically significant relationships involving governance variables are always in accordance with the proposed hypothesis that a positive relationship exists between audit quality and corporate governance mechanisms. The results of this

investigation are strongest if the presence of board reporting internal auditors is used as the metric of audit quality.

#### 4.2. Audit Quality and MFI Size, Complexity and Risk

We begin the multivariate analysis with an examination of the relationships between audit quality and the conventional explanatory variables of firm size, complexity and risk. The results from this examination are reported in Table 6.

##### **Table 6**

The explanatory variables are introduced sequentially to assess the stability of the aforementioned relationships. The overall goodness-of-fit statistics for each regression are satisfactory; in particular, each of these regressions demonstrates relatively high  $R^2$  values and significance levels of nearly zero for the LR exclusion test that states that all of the examined variables are irrelevant. The models appear to be well specified; the significance levels of the explanatory variables are generally similar across the different specifications that are examined. Thus, we focus the analysis of this study on the most complete models.

Table 6 indicates that the use of a Big Four auditor is strongly related to MFI size. This positive association is consistent with the hypotheses of the current study. Size can also be regarded as a proxy variable for complexity (see discussion in Hope et al., 2008). However, according to Hay et al. (2006), the most commonly used metric for complexity is the number of subsidiaries; accordingly, we have included the number of branch offices for each MFI as a complexity variable in this study. In accordance with the hypotheses of this investigation, we find a positive association between the number of branch offices that an MFI possesses and the MFI's use of a Big Four auditor. The negative relationship between the use of a Big Four auditor and an MFI's proportion of voluntary savings again suggests that voluntary saving is

not a good complexity proxy for an analysis of audit quality. Instead, the findings of this study are in accordance with the expectation that high levels of voluntary savings indicate an MFI with a low need for capital market funding; therefore, relative to other MFIs, this MFI will obtain less benefit from using a Big Four auditor. This signaling effect of deposits is important and should prove to be extremely interesting to stakeholders in the microfinance industry.

The significant and unexpectedly negative relationship between risk and the use of a Big Four auditor that was identified in the bivariate analysis vanishes in a multivariate setting. However, the association between these two factors is not the positive relationship that was hypothesized; instead, risk appears to be unrelated to the use of a Big Four auditor. However, one caveat to these results must be noted with respect to the analysis of risk; in particular, many of the studies that find a relationship between audit quality and risk use audit fees as their proxy for audit quality (Hay et al., 2006). It may be argued that it is reasonable to expect a positive relationship between audit fees and risk because auditors may require more time to issue “clean” (unqualified) audit opinions for risky clients. Lin and Liu (2009) conduct a study that is comparable to ours in which they use auditor type as a measure of audit quality. These researchers also do not find any statistically significant relationship between risk and audit quality. It must also be noted that the effect of risk can be ambiguous; a *negative* relationship between risk and audit quality may be reasonable if one assumes that Big Four auditors avoid providing services to risky clients that could potentially damage the reputation of the auditing firm (Michaelley and Shaw, 1995).

In addition to the aforementioned findings, Table 6 also displays the results from regressions in which the presence of board-reporting auditors replaces the use of Big Four auditors as the

metric of audit quality. Once again, we find that a highly significant and positive association exists between audit quality and MFI size. The relationship between audit quality and the proportion of voluntary savings that is possessed by an MFI remains negative; however, in this case, this relationship is not significant. This finding provides a degree of support to the notion that the monitoring role of deposits contrasts with the signaling role of these deposits. We document the existence of a positive and significant relation between audit quality and the main market variable. This result suggests that greater firm complexity is associated with the more frequent use of internal auditors; this finding is in accordance with our hypotheses. The negative relationship between an MFI's number of branch offices and its use of board-reporting internal auditors is unexpected; however, this association is only weakly significant.

The results regarding risk, as measured by PAR30, remain insignificant. An alternative risk measure that is sometimes applied in audit research is leverage (Hay et al., 2006). However, the results of Table 6 are unaltered if debt-to-assets is used to replace PAR30 as the proxy for risk (although these results are not tabulated in this study). Thus, we are unable to document the hypothesized positive relationship between audit quality and risk.

Collectively, the results of Table 6 are consistent with hypotheses for MFI size. However, the null hypothesis that no relationship exists between risk and audit quality cannot be rejected. With respect to complexity, we find support for the hypothesis that a positive relationship exists between complexity and audit quality. In particular, this hypothesis is supported if complexity is measured by an MFI's number of branch offices and the use of a Big Four auditor is employed as a metric for audit quality or if complexity is measured by the main market variable and the use of internal auditors is employed as a metric for audit quality. The number of complexity proxies that has been used in prior research is vast; in fact, Hay et al.

(2006) identify 33 different measures of complexity in their meta-analysis. Our study illustrates the importance of using several proxy variables to assess this ambiguous phenomenon; the results of this investigation are highly sensitive to the proxies that are selected.

#### 4.3. Audit Quality and Governance Control Structures

In this section, we include governance variables in the regression analysis. The results from regressions that use the auditing quality metrics of the use of a Big Four auditor and the presence of internal auditors are displayed in Table 7. Table 7 demonstrates the same patterns as Table 6 with respect to overall goodness-of-fit statistics. Furthermore, we notice that the coefficients of variables from Table 6 remain largely unchanged in Table 7. None of the results regarding size, complexity and risk are altered by the introduction of governance mechanisms into the analysis. This finding implies that our main results from Table 6 are unperturbed by different regression specifications; therefore, there is no need to once again comment on these results.

Similarly to the approach that was adopted in Table 6, in Table 7, the governance variables have been successively included in the presented regressions. In particular, as a robustness assessment, only the internal governance measures were included in the first regressions; subsequently, the external governance measures were considered, and finally, all of these measures were simultaneously incorporated. The results are similar from all of these analyses, and we therefore only present the results that are obtained from the complete model.

#### **Table 7**

With respect to the use of a Big Four auditor, Table 7 reveals that the only governance variable with statistical significance is CEO/chair-duality. As hypothesized, the sign of this

variable is negative; however, this negative association with audit quality is only weakly significant, and we therefore refrain from drawing strong conclusions from this finding. Thus, we conclude that audit quality, as measured by the use of a Big Four auditor, appears to be unrelated to other control mechanisms, including both internal measures and external indicators.

This result is surprising. According to the complementarity perspective, which forms the basis for the hypotheses of this study, we should have observed significantly positive coefficients (except for the CEO/chair-duality variable, which is a measure of ‘bad’ governance) for the relationships between the examined governance variables and audit quality. Under the alternative perspective that is provided by the substitution viewpoint, one would expect to observe significantly negative coefficients for these relationships because one control mechanism should reduce the need for another. Our results support neither of these perspectives; instead, auditor choice appears to be completely unrelated to other control mechanisms. We propose several explanations for this finding. First, microfinance is a relatively new industry, and this industry’s lack of maturity might be a reason that different governance measures appear to be unrelated. This explanation is in accordance with prior research that suggests that weak and random governance mechanisms generally exist in the microfinance industry (Mersland and Strøm, 2009). Second, equity market mechanisms that typically respond to poor governance structures, such as stock price reductions and hostile takeovers, are lacking in the microfinance industry (cf. Ashbaugh and Warfield, 2003), thus allowing weak governance to prevail. A third explanation is that all governance mechanisms are driven by the MFI’s size because more formal governance mechanisms become necessary as an MFI grows. Fourth, based on the fact that prior audit research has provided inconclusive evidence of a relationship between audit quality and governance, organizations in general (not

merely microfinance organizations) may not have conscious and consistent positions regarding the ways in which audit quality is related to other governance mechanisms.

In general, the results of this study are consistent with the perspective that the MFI aligns its auditor choice with fundamental economic forces; in particular, this alignment occurs in accordance with increases in the size and complexity of MFIs. Under this interpretation, an MFI's auditor choice appears to be random and unrelated to its general need for control mechanisms. However, the opposite interpretation is also possible; MFIs may believe that their choice of auditor is far more important than their choice of other control mechanisms. For instance, MFIs may believe that high audit quality alone is a sufficient signal of the existence of strong corporate governance mechanisms. If MFIs focus on auditor choice and not on other governance structures, the results that are displayed in Table 7 could readily be obtained. Unfortunately, the data of this study cannot address which of these interpretations is more likely to be valid. Therefore, this issue must be addressed in future research, possibly through the use of a survey-based study.

The results of Table 7 may explain why previous studies on determinants of audit quality, including studies that use audit fees as a metric of audit quality, often report inconclusive results with respect to governance mechanisms (Hay et al., 2006). These results may also explain why relatively few published studies empirically analyze the relation between audit quality and governance; this dearth of studies may reflect the fact that "...editors do not like 'no results' papers" (Hay et al., p. 157). Because governance mechanisms in general are often uncorrelated (cf. the correlation matrix of Table 4) it may not be surprising that a control mechanism, such as audit quality, appears to be statistically unrelated to other control mechanisms.



We now examine the relationships in Table 7 between audit quality, as measured by the presence of board-reporting internal auditors, and governance mechanisms. Once again, we note that the change in regression specifications between Table 6 and Table 7 does not alter any of the previously discussed findings from Table 6.

Table 7 indicates that governance mechanisms other than audit quality are more frequently related to the presence of board-reporting internal auditors than to the use of a Big Four auditor. As hypothesized, board size is positively related to audit quality (as measured by the existence of internal auditors), but this relationship is only weakly significant. However, we do find that as shown in Table 7, both ownership type and competition are strongly significant explanatory variables for the presence of board-reporting internal auditors. As expected, the signs of the coefficients for both of these metrics are positive.

With respect to an MFI's ownership type, the regressions indicate that shareholders are willing to embrace the use of internal auditors but not to hire Big Four auditors. Thus, an MFI's shareholders appear to require reassurance that internal oversight functions are upheld in a manner that minimizes moral hazard problems within the organization. By contrast, the stakeholders in non-profit organizations do not appear to exhibit a similar level of concern regarding the control structure that is provided by internal auditors. On the whole, given that the extant research on audit quality in non-profit organizations is extremely scarce, it is interesting to note that the degree of profit maximization in these organizations only appears to affect internal audit quality rather than a firm's choice of external auditors.

With respect to competition, MFIs in more competitive markets more frequently employ board-reporting internal auditors than other MFIs. Fiercer competition increases the need for internal control; however, according to Table 7, this competition does not create a need for high-quality external auditors. Thus, the results on competition are sensitive to the audit quality metric that is employed. The finding that the demand for Big Four auditors does not appear to increase with increased levels of competition could potentially be attributed to the MFIs' desires to disguise their true profitability in a competitive market (cf. Knechel et al., 2008). However, this explanation appears to be less plausible in the microfinance industry than in industries that incorporate a more explicit profit-maximizing objective.

Hay et al. (2008) argue that a substitution view is often applied in analyses of internal controls and governance but that the complementarity view is more commonly employed if the relationship between external auditing and corporate governance is investigated (see discussion in Hay et al., 2008, and the references therein). Although the substitution view is not supported by our data, we do find clear evidence that the explanatory variables for internal and external audit quality can vary. In general, our data suggest that the choice of external auditors appears to be unrelated to other control mechanisms, whereas the presence of internal auditors is frequently positively associated with other indicators of control.

A bit surprisingly, we never find either international origin or the presence of banking regulations to be associated with the examined audit quality metrics. The former finding contrasts with previous empirical evidence suggesting that international stakeholders require higher audit quality (see, e.g., Ashbaug and Warfield, 2003). With respect to the latter finding, the recent critical focus on microfinance (Bateman, 2010) has advanced the discussion about the need for the greater regulation of this industry. Our data do not support

the notion that higher reporting trustworthiness and reduced information asymmetries, as measured by audit quality, are demonstrated by regulated entities than by non-regulated entities.

We conclude this sub-section by noting that the explanatory power of the coefficients in the regressions is higher if the use of a Big Four auditor is employed as the audit quality metric than if the presence of internal auditors is utilized as this metric. Thus, although more explanatory variables are significant in the internal audit regressions, it is easier to explain the choice of external auditor than the existence of board-reporting internal auditors.<sup>6</sup>

#### 4.4. The Relationship between External and Internal Audit Quality

The aforementioned empirical analyses suggest that the two examined proxies for audit quality, namely, the use of a Big Four auditor and the presence of board-reporting internal auditors, capture different aspects of audit quality. Non-tabulated statistics reveal that 32% of the MFIs that do not use a Big Four auditor have board-reporting internal auditors. Moreover, 36% of the MFIs that use a Big Four auditor do *not* have board-reporting internal auditors. This finding further illustrates the fact that these two proxies for audit quality appear to measure different facets of audit quality. More MFIs use board-reporting internal auditors than Big Four auditors (cf. Table 3); thus, high-quality internal auditing appears to be a more preferred control mechanism than high-quality external auditors in the microfinance industry. A possible interpretation of this finding is that the status of the Big Four auditors might be

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<sup>6</sup> We have also tested the number of board meetings as an internal governance mechanism. However, due to a low number of observations for this variable, board meetings are excluded from the main analysis. If this consideration is included in the multivariate analysis, the variable that represents board meetings supports our findings that there is little or no association between audit quality and internal governance measures. The number of board meetings is significant for neither of the examined audit quality metrics. Furthermore, gender research reveals that female CEOs are often associated with stronger governance mechanisms in firms (Adams and Ferreira, 2009). However, we have many missing observations for this variable, and this variable is insignificant in all of the multivariate analyses of this study.

lower in developing and emerging countries, many of which are rather small nations, than in developed Western countries.

However, thus far, we have not conducted a multivariate exploration of whether the use of a Big Four auditor and the use of internal auditors are substitutes, complements, or totally independent considerations. This issue is investigated in Table 8.

### **Table 8**

Table 8 reveals that the two audit quality metrics that are examined in this study are highly significant explanatory variables for each other. The sign of the relationship between these metrics is positive; this result is in accordance with the complementarity perspective regarding corporate governance and implies that better governance in terms of higher quality external auditors is positively associated with the presence of board-reporting internal auditors. This finding illustrates that an MFI's choice of external auditors is not completely independent of other control mechanisms. Consistent with the finding that internal and external auditing are complementary, Steinwand (2000) contends that internal auditing helps ensure that a firm's management not only adheres to policies and procedures but also issues reports that provide the most accurate information that is available.

In the audit literature, it is generally assumed that the use of a Big Four auditor increases the trustworthiness of financial reports and reduces information asymmetries. Our study suggests that there is a 'double effect' that exists in the microfinance industry; in particular, information asymmetries are further reduced by the increased likelihood that an MFI that uses a Big Four auditor will also employ board-reporting internal auditors. The exploration of whether high external audit quality precedes or follows high internal audit quality is left for future research. Another interesting issue for future research would be to examine direct

measures of financial reporting quality (e.g., predictability, persistence, and earnings management; see Dechow et al., 2010) and investigate if differences exist with respect to these reporting quality metrics among the following four sub-categories of firms: MFIs that neither use a Big Four auditor nor employ board-reporting internal auditors, MFIs that use a Big Four auditor but not board-reporting internal auditors, MFIs that use board-reporting internal auditors but not a Big Four auditor, and MFIs that use both types of auditors.

Finally, the reader should note that the HDI variable is not associated with audit quality in any of our tests. Although this variable is only a control variable in our analyses, we find it interesting that audit quality appears to be unrelated to the level of development of the countries in which the examined MFIs are located. Many researchers and accounting professionals may have expected to observe a positive relationship between audit quality and the level of development in an MFI's location. Although caution should be employed in drawing strong conclusions from these results, our study does not find that the trustworthiness of financial reports, as measured by a proxy for audit quality, is higher in (relatively) more advanced economies than in less developed contexts.

## ***5. Conclusion***

This study investigates explanatory variables for audit quality in the microfinance industry. Consistent with prior research, the use of a Big Four auditor is employed as a proxy variable for high (external) audit quality. However, we broaden the perspectives of prior research by acknowledging that audit quality is more than simply a 'product' that is delivered by an external supplier; instead, audit quality also refers to the quality of the internal auditing processes that exist within an organization. Thus, we apply the presence of a board-reporting internal auditor as a proxy variable for the quality of an MFI's financial reporting process and

the MFI's economic control. The microfinance industry is particularly suited for this type of approach; certain MFIs use board-reporting internal auditors, whereas other, similar MFIs that operate in similar markets do not employ these auditors.

Another interesting aspect of the microfinance industry is the fact that the industry consists of both for-profit and non-profit organizations. The empirical findings of this study suggest that the for-profit objective affects internal audit quality but not external audit quality. In particular, board-reporting internal auditors are more likely to be present in for-profit MFIs than in their non-profit counterparts.

Our study has a particular focus on governance indicators because prior research has generated inconclusive results regarding the relationship between audit quality and corporate governance and because the microfinance industry is particularly suitable for a study of control mechanisms. We adopt a complementarity perspective and hypothesize that a positive association exists between different governance mechanisms. In accordance with this hypothesis, the empirical analysis of this study illustrates that the use of a Big Four auditor is associated with the presence of board-reporting internal auditors. Nevertheless, many MFIs use a Big Four auditor but lack internal auditors, whereas other MFIs employ internal auditors but refrain from using a Big Four auditor. Consistent with the complementarity perspective, our internal audit quality metric, namely, the presence of board-reporting internal auditors, is positively associated with several other control indicators. However, except for the positive association between the use of a Big Four auditor and the presence of internal auditors, the analysis of this study indicates that the external audit quality metric of the use of a Big Four auditor appears to be independent of other governance mechanisms.

The empirical analysis of this investigation illustrates that control mechanisms are often unrelated. There is no straightforward and direct relationship between audit quality and governance (particularly if a conventional measure of external audit quality is utilized), and this lack of a consistent relationship may explain why prior research has frequently produced mixed and inconclusive results with respect to this relationship. Although several researchers, including Hay et al. (2006), maintain that a positive relationship between governance and audit quality is expected, the results of this study indicate the need for a more detailed analysis in which specific governance mechanisms are separately investigated. However, for situations in which we actually identify significant relationships between two different control mechanisms, these associations are always positive. Thus, this study provides no support for the perspective that control mechanisms function as substitutes.

Because prior research that has examined exchange-listed companies in advanced and developed countries has reported only weak relationships between different control mechanisms (Hay et al., 2006), it may be unsurprising that our sample of unlisted and small (relatively speaking) organizations from emerging and relatively undeveloped economies does not consistently display clear statistical associations between the investigated metrics for governance. In general, audit research may be interpreted to suggest that companies evince a relatively low degree of focus on the topic of how an optimal portfolio of control mechanisms might be designed. In our sample of relatively rudimentary organizations, the results, particularly for the external measure of audit quality, are consistent with the notion that MFIs with weak audit quality do not devote much attention to corporate governance in general. By contrast, institutions with high audit quality may not devote much attention to *other* corporate governance mechanisms because audit quality itself may be regarded as a sufficient signal of strong governance structures. This study contributes to increasing the existing understanding

of the relationships between different governance mechanisms; however, more research on this topic is required. One challenge for this type of research is the construction of large data samples; a great deal of information about governance variables is often not readily accessible and must therefore be collected by hand.

In general, high-quality auditing is expensive and will only be chosen if its benefits exceed its costs. The main benefit from high-quality auditing is increased access to capital, which can produce a lower cost of capital. An interesting extension of this study would involve examining if MFIs with high audit quality, as measured by both the external and internal audit quality metrics, actually achieve lower costs of capital than other MFIs. Because the microfinance industry is characterized by large-scale donations and subsidies, the relationship between audit quality and the cost of capital may be less strong in the microfinance industry than in other, more conventional, industries.



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**Table 1: Variable definitions**

<b>Variable</b>	<b>Definition</b>
Big Four auditors	An audit quality proxy. This binary variable takes a value of 1 if an MFI is audited by one of the Big Four auditors (PWC, Ernst & Young, Deloitte & Touche or KPMG).
Internal auditor	An audit quality proxy. This binary variable takes a value of 1 if an MFI has board-reporting internal auditors.
Assets (million US dollars)	A size proxy. An MFI's PPP-adjusted end-of-period assets
Main market	A complexity proxy. This variable takes a value of 1 if a firm's main market is strictly urban, a value of 2 if a firm's main market is strictly rural, and a value of 3 if the firm's main market is a mix of urban and rural settings.
Branch offices	A complexity proxy. The number of branch offices that are maintained by an MFI.
Relative voluntary saving	A complexity proxy. An MFI's quantity of voluntary savings divided by its gross loan portfolio (see also the discussion of possible governance effects of this variable)
Portfolio at Risk (30 days)	A risk proxy. The outstanding balance of an MFI's loans that are more than 30 days past due divided by its average outstanding gross loan portfolio
Board size	An internal governance indicator. An MFI's number of board members
CEO/Chair duality	An internal governance indicator. A binary variable that takes a value of 1 if these two roles are shared by the same person
Ownership type	An internal governance indicator. A binary variable that takes a value of 1 if an MFI is owned by shareholders
Bank regulated	An external governance indicator. A binary variable that takes a value of 1 if an MFI is regulated by a local bank authority
Internationally initiated	An external governance indicator. A binary variable that takes a value of 1 if an MFI is founded by an international organization.
Competition	An external governance indicator. A self-constructed variable that takes a value from 1 to 7. This variable reflects an MFI rater's judgment of an MFIs competitive position; a higher value indicates higher levels of competition
MFI age	A control variable. The number of years that an MFI has been in the microfinance industry
Human Development Index	A control variable. A country index that summarizes a country's levels of GDP per capita, life expectancy, and education.

Table 1 provides the definitions of the variables that are used in the empirical analyses. Our two proxies for audit quality, namely, the use of a Big Four auditor and the presence of internal auditors, constitute the dependent variables of the study; the remaining variables that are listed in this table are explanatory variables.

**Table 2: Data sample – observations by country**

Country	No. of observations		Country	No. of observations	
	BigFour	Internal Audit		BigFour	Internal Audit
Albania	3	4	Kenya	5	8
Argentina	0	1	Kosovo	3	5
Armenia	3	3	Kyrgyzstan	4	5
Azerbaijan	5	5	Madagascar	2	1
Bangladesh	0	2	Malawi	1	1
Benin	7	10	Mali	2	3
Bolivia	18	23	Mexico	8	17
Bosnia Hercegovina	14	15	Moldova	1	3
Brazil	14	16	Mongolia	3	3
Bulgaria	2	3	Montenegro	2	3
Burkina Faso	2	2	Morocco	6	9
Burundi	0	1	Mozambique	2	2
Cambodia	8	15	Nepal	0	4
Cameroun	3	6	Nicaragua	4	15
Chad	1	1	Niger	2	3
Chile	2	2	Nigeria	1	2
China	0	0	Pakistan	0	1
Colombia	1	7	Paraguay	1	2
Croatia	0	1	Peru	13	32
Dem Republic of Congo	0	1	Philippines	2	7
Dominican Republic	1	5	Rep of CongoBrazz	0	1
East Timor	0	0	Romania	1	1
Ecuador	13	18	Russian Federation	12	16
Egypt	4	5	Rwanda	4	3
El Salvador	3	8	Senegal	4	9
Ethiopia	7	10	Serbia	1	1
Gambia	1	1	South Africa	1	3
Georgia	4	9	Sri Lanka	0	1
Ghana	4	4	Tajikistan	7	7
Guatemala	5	6	Tanzania	2	6
Guinee	1	1	Togo	5	4
Haiti	2	4	Trinidad and Tobago	0	0
Honduras	6	10	Tunisia	1	1
India	10	20	Uganda	3	11
Indonesia	0	1	Vietnam	0	1
Jordan	4	4	Zambia	2	2
Kazakhstan	2	4	Total sample	255	421

Table 2 lists the geographical distribution of the sample that is used in this study. The dataset was collected by hand and contains information from *risk assessment reports* from the *MicroRate*, *Microfinanza*, *Planet Rating*, *Crisil*, and *M-Cril* rating agencies. The rating reports that form the dataset were subsidized by Ratingfund 1 and downloaded from [www.ratingfund2.org](http://www.ratingfund2.org). The sample of this study consists of 255 firm-year observations of external auditor use and 421 firm-year observations of the presence of board-reporting internal auditors; these two metrics serve as our proxy variables for audit quality. The sample is obtained from the year that the examined microfinance firms were rated.

**Table 3: Descriptive statistics**

Variable	Mean	Std	Min	Max	Obs
Big 4 auditors	0.302	0.460	0.000	1.000	255
Internal auditor	0.447	0.498	0.000	1.000	421
Assets (million)	8.607	16.752	0.120	248.115	492
Relative voluntary saving	0.203	0.616	0.000	6.726	484
Main market	2.145	0.843	1.000	3.000	482
Branch offices	12.416	17.849	1.000	175.000	483
Portfolio at risk (30 days)	0.061	0.096	0.000	0.973	480
MFI age	10.594	7.073	0.000	79.000	493
Board size	7.007	3.357	1.000	23.000	458
CEO/chair duality	0.118	0.322	0.000	1.000	451
Ownership type	0.339	0.474	0.000	1.000	496
Bank regulated	0.290	0.454	0.000	1.000	489
Internationally initiated	0.391	0.489	0.000	1.000	493
Competition	4.411	1.527	1.000	7.000	467
Human Development Index	0.612	0.129	0.296	0.807	496

Table 3 lists the mean, standard deviation, minimum value, maximum value, and number of observations for the variables that are used in the empirical analyses of this study; see Table 1 for variable definitions. The data are obtained from the years that the examined MFIs were rated.

**Table 4: Correlation matrix**

		1	2	3	4	5	6	7	8	9	10	11	12
ln(Assets)PPP	1												
Rel volun sav	2	0.122											
Main mkt	2	0.120	0.061										
Branch off	4	0.474	0.083	0.114									
PAR30	5	-0.086	0.125	0.041	-0.033								
MFI age	6	0.200	0.122	0.063	0.143	0.221							
Board size	7	0.048	0.129	-0.146	0.239	0.012	0.054						
Duality	8	0.077	-0.010	0.032	0.010	-0.033	-0.006	-0.085					
Ownership	9	0.153	0.036	0.049	-0.048	-0.054	-0.128	-0.203	-0.047				
Regulated	10	0.185	0.268	0.085	0.055	0.065	0.017	-0.016	-0.045	0.478			
Int. initiated	11	0.033	-0.127	0.030	0.005	-0.223	-0.210	0.001	-0.079	0.067	-0.001		
Compet	12	0.168	-0.025	0.124	0.145	0.016	0.058	-0.155	0.001	-0.009	-0.023	-0.088	
HDI	13	-0.071	-0.171	-0.018	-0.197	-0.113	-0.012	-0.104	0.061	-0.207	-0.292	-0.071	-0.055

Table 4 lists the bivariate correlations of the explanatory variables of the analyses in this study; see Table 1 for variable definitions.



**Table 5: Mean comparisons and t-tests of explanatory variables**

PANEL A	Big 4 Auditor			No Big 4 Auditor			t-test
	Mean	Std	Obs	Mean	Std	Obs	
ln(Assets) PPP adjusted	16.843	1.069	77	15.822	1.111	177	6.813***
Main market	2.329	0.839	76	2.144	0.872	174	1.564
Branch offices	19.149	22.815	74	8.886	12.797	176	4.518***
Relative voluntary saving	0.052	0.186	77	0.208	0.607	177	-2.208**
Portfolio at risk (30 days)	0.035	0.066	77	0.060	0.071	173	-2.578***
MFI age	9.727	5.977	77	10.831	7.209	177	-1.178
Board size	6.908	2.763	76	6.703	3.197	172	0.483
CEO/chair duality	0.054	0.228	74	0.120	0.327	166	-1.586
Ownership type	0.325	0.471	77	0.287	0.453	178	0.610
Regulated	0.250	0.436	76	0.288	0.454	177	-0.620
Internationally initiated	0.532	0.502	77	0.404	0.492	178	1.895*
Competition	4.784	1.590	74	4.122	1.448	172	3.191***
Human Development Index	0.634	0.103	77	0.614	0.140	178	1.116

  

PANEL B	Internal auditor			No internal auditor			t-test
	Mean	Std	Obs	Mean	Std	Obs	
ln(Assets) PPP adjusted	16.707	1.044	187	15.720	1.202	232	8.854***
Main market	2.279	0.828	183	2.048	0.863	230	2.750***
Branch offices	14.457	18.567	184	11.300	18.443	230	1.725*
Relative voluntary savings	0.169	0.401	233	0.190	0.647	233	-0.399
Portfolio at risk (30 days)	0.051	0.063	186	0.065	0.110	224	-1.470
MFI age	11.750	8.575	188	9.844	5.987	231	2.672***
Board size	7.063	3.486	174	7.160	3.400	219	-0.277
CEO/chair duality	0.119	0.325	176	0.110	0.313	210	0.301
Ownership type	0.426	0.496	188	0.253	0.436	233	3.792***
Regulated	0.346	0.477	188	0.240	0.428	229	2.380**
Internationally initiated	0.396	0.490	187	0.392	0.489	232	0.072
Competition	4.766	1.584	184	4.108	1.448	222	4.369***
Human Development Index	0.628	0.114	188	0.605	0.142	233	1.808*

Table 5 employs standard t-tests to study the differences in the means of the explanatory variables that are defined in Table 1. Panel A lists differences between the MFIs that use a Big Four auditor and MFIs that do not use a Big Four auditor, whereas Panel B lists differences between the MFIs that use board-reporting internal auditors and MFIs that do not use board-reporting internal auditors. In Table 5, \*\*\*, \*\*, and \* indicate significance levels of 10%, 5%, and 1%, respectively.

**Table 6: The relationships between audit quality and MFI size, risk, and complexity**

	Big 4			Internal auditor		
ln(Assets) PPP adjusted	0.422**	0.545***	0.448***	0.513***	0.452***	0.505***
Relative voluntary saving	-2.289***	-1.425***	-2.260***	-0.204	-0.271	-0.288
Main market	0.143		0.181	0.213***		0.188**
Branch offices	0.021***		0.024***	-0.007*		-0.007*
Portfolio at risk (30 days)		-1.489	-0.916		-0.442	-0.597
MFI age		-0.022	-0.040**		0.015	0.011
HDI	0.581	-0.169	0.223	0.784	0.679	0.778
Constant	-8.153***	-8.847***	-8.012***	-9.273***	-7.954***	-9.153***
Pseudo Rsqrd	0.266	0.238	0.289	0.201	0.174	0.201
LR Test of Coefficients(4)	65.573	59.628	69.799	82.180	71.189	79.340
Significance Level of LR	0.000	0.000	0.000	0.000	0.000	0.000
Observations	240	244	226	396	398	384

Table 6 tests the relationships between audit quality and MFI size, complexity and risk through the following probit regression:  $AuditQuality = \beta_0 + \beta_1*Size + \beta_2*Complexity + \beta_3*Risk + \beta_4*Age + \beta_5*HDI + \varepsilon$ . All of the variables in this table are defined in Table 1. The explanatory variables are introduced successively to test the stability of the regression results. In Table 6, \*\*\*, \*\*, and \* indicate significance levels of 10%, 5%, and 1%, respectively.

**Table 7: Audit quality and internal and external governance mechanisms**

	Big 4	Internal auditor
Board size	-0.056	0.047*
CEO/chair duality	-0.764*	0.043
Ownership type	0.071	0.521***
Regulated	-0.033	0.053
Internationally initiated	-0.102	-0.081
Competition	0.035	0.156***
ln(Assets) PPP adjusted	0.472***	0.478***
Relative voluntary saving	-2.141***	-0.301
Main market	0.199	0.199***
Branch offices	0.030***	-0.011*
Portfolio at risk (30 days)	-2.077	-1.002
MFI age	-0.030	0.021
Human Development Index	0.422	0.865
Constant	-8.393***	-10.014***
Pseudo Rsqrd	0.357	0.257
LR Test of Coefficients(5)	76.531	85.523
Significance Level of LR	0.000	0.000
Observations	206	320

Table 7 tests the relationships between audit quality and both internal and external governance indicators through the following probit regression:  $AuditQuality = \beta_0 + \beta_1 * InternalGovernance + \beta_2 * ExternalGoverance + \beta_3 * Size + \beta_4 * Complexity + \beta_5 * Risk + \beta_6 * Age + \beta_7 * HDI + \epsilon$ . All of the variables in this table are defined in Table 1. In Table 7, \*\*\*, \*\*, and \* indicate significance levels of 10%, 5%, and 1%, respectively.

**Table 8: Simultaneous equation estimation**

	Big 4	Internal auditor	Big 4	Internal auditor
Big 4		0.343***		
Internal auditor	0.294***			
Assets (million)	0.075**	0.106***	0.118***	0.147***
Relative voluntary saving	-0.082	0.010	-0.089	-0.021
Main market	0.002	0.119***	0.041	0.134***
Branch offices	0.008***	-0.007***	0.007***	-0.005*
Portfolio at risk (30 days)	-0.800	0.305	-0.790	0.034
Board size	-0.016	0.018	-0.012	0.014
CEO/chair duality	-0.202**	0.085	-0.197**	0.017
Ownership type	-0.038	0.178**	0.016	0.184**
Regulated	-0.009	-0.076	-0.035	-0.088
Internationally initiated	0.012	-0.011	0.010	-0.007
Competition	0.009	0.043**	0.024	0.051**
MFI age	-0.009*	0.009*	-0.007	0.006
Human Development Index	-0.020	0.384	0.104	0.419
Constant	-0.856	-2.279***	-1.697***	-2.861***
R-sqrd	0.283		0.250	
Prob value from F test	0.000		0.000	
Correlation of residuals	-0.457		0.163	

Table 8 tests the relationship between our two metrics of audit quality through the use of the seemingly unrelated regression (SUR) methodology (195 observations). All of the variables in this table are defined in Table 1. In Table 8, \*\*\*, \*\*, and \* indicate significance levels of 10%, 5%, and 1%, respectively.