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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 developing countries 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. 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. 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.

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).

Microfinance institutions (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 (external) audit quality. 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 listed corporations that are typically investigated in audit research but is far less obvious within the microfinance industry.

Auditing is one type of governance mechanism, as auditors perform the gatekeeper role of certifying information from companies (Coffee, 2002). 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 (other) governance mechanisms relate to our measures of external and internal audit quality. 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 diffusion 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 we should not be surprised to find that other determinants of audit quality are more important in MFIs.

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 demanding 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 supports the complementarity perspective of corporate governance. We show that our two measures of audit quality are strongly related to each other. However, whereas internal audit quality appears to be positively associated with several other governance indicators, 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 the 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 presents and discusses prior research on audit quality relevant for this study. 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), more than 500 million poor families have a savings account (Christen et al., 2004), and 135 million poor families have some kind of micro insurance policy (Lloyd's, 2012). The growth in the microfinance market is remarkable and soon the microfinance sector will become the World's largest banking market in terms of the number of customers. Microfinance is increasingly an important asset class for investors, particularly investors who are pursuing both financial and social returns (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, and it is likely that the ownership structures of MFIs may 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. 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 (cf. Hartarska, 2009).

2.2. The Importance of Audit Quality

One of the most important objectives of external financial reporting is to reduce information asymmetries and 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). DeAngelo (1981) defines audit quality as the joint probability that an auditor will detect and report a material misstatement. 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 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). Empirically, 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 (Broye & Weill, 2008; Lin et al., 2009; Pittman & Fortin, 2004). 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).

Because MFIs are frequently involved in raising funds from external investors, concerns over audit quality is as important in the microfinance industry as it is in other industries addressed in prior research. Additionally, the presence of donors may affect the demand for audit quality. 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).

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 Jiambalvo, 1993; Krishnan and Schauer, 2000; Dechow et al., 2010). Hope et al. (2008) summarize 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 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. 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. 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. 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.

Empirical evidence regarding the three diversity measures confirms their importance. In a comprehensive meta-analysis, Hay et al. (2006)[1] 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 audit research (cf. Krishnan & Schauer, 2000). 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

[1] 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).

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.

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. In keeping with Hay et al. (2006), 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.

Our third complexity variable is voluntary savings. This is a particularly interesting complexity variable in the microfinance industry since the 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. However, this variable is also a proxy variable for capital needs, and it captures important aspects of governance. 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 reduce the 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.

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[2]) 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 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):

[2] 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.

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). 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. Thus, relationships could exist between auditing 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).

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.

In their meta-analysis, Hay et al. (2006) 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. They confirm a positive association between these two traits in the few prior studies that deal with the relationship between governance and audit quality (proxied by audit fees). 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 and the mix of mechanisms. 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 separately. We split these mechanisms into the two categories of internal and external structures. Incentives and monitoring are the two primary mechanisms of internal governance (Tirole, 2006). The dual

objectives of most MFIs (social impact and financial sustainability; see Morduch (1999)), 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. As for the external metrics, these 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.

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.

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). 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).

In accordance with Mersland and Strøm (2009), we consider ownership type to be an internal governance mechanism. Prior research from other industries has revealed that ownership may affect audit quality (Hay et al., 2006; Hay et al., 2008). 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. Thus, 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 (for more details, see Arun, 2005; Hardy et al., 2003; McGuire, 1999). 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 awareness 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.

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 (cf. Doidge et al., 2009; Leuz et al, 2009); 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. 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. 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).[3]

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 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

[3] 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

in (other) governance mechanisms. The expectation of a positive association between internal and external auditing is in accordance with Hay et al. (2008), who 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 evince higher audit quality than other MFIs,
c) the external governance indicators of regulation, international initiation, and market competition are all associated with higher audit quality, and
d) external audit quality is positively associated with internal audit quality.

Moreover, note that we use the Human Development Index (HDI) as a country control variable. 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.[4] Additionally, we control for the MFIs' age.

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

In the empirical analysis, we estimate the following multivariate relationship with a probit model (cf., e.g., Hope et al., 2008).

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

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

[4] 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).

as dependent variables. The Zellner seemingly unrelated regression (SUR) model is the estimation approach for this exploration (Greene, 2012). 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.

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. 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*. 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).

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 of 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. 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, and many of the countries that are represented in the sample have been subjected to very little international accounting research. 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. 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 overall message from table 4 is that variables are satisfactorily independent; therefore, the regression

analyses of this study may proceed without concerns about multicollinearity (cf. Kennedy, 2008). Moreover, it is notable that 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 examines the relationships between audit quality and the variables of the size, complexity and risk of MFIs. Governance variables are introduced in sub-section 4.2. In sub-section 4.3, we perform system estimations using the SUR framework to analyze the relationship between our two metrics of audit quality.[5]

4.1. 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 5.

Table 5

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.

[5] As a robustness test, we have performed a simple analysis (t-tests) of the bivariate relationships between each of the proposed explanatory variables and the two audit quality metrics (not tabulated). 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. Collectively, the t-tests confirm the conclusions of the multivariate analysis.

Table 5 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. The results of Table 5 support the hypothesis of 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 suggests that voluntary saving is not a good complexity proxy for an analysis of audit quality. Instead, 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 this 'signaling role' of deposits that was discussed in the hypothesis development section. The signaling effect of deposits is important and should prove to be interesting to stakeholders in the microfinance industry.

The hypothesis development section suggested a positive relationship between risk and external audit quality. Still, Table 5 suggests that risk is 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" 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 (Michaeley and Shaw, 1995).

Table 5 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 5 are unaltered if debt-to-assets is used to replace PAR30 as the proxy for

risk (these results are not tabulated). Thus, we are unable to document the hypothesized positive relationship between audit quality and risk.

Collectively, the results of Table 5 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.

4.2. Audit Quality and Governance Control Structures

In this section, we include governance variables in the regression analysis. The results from regressions that use the audit quality metrics of the use of a Big Four auditor and the presence of internal auditors are displayed in Table 6. Table 6 demonstrates the same patterns as Table 5 with respect to overall goodness-of-fit statistics. Furthermore, we notice that the coefficients of variables from Table 5 remain largely unchanged in Table 6. 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 5 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 5, in Table 6, 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 6

With respect to the use of a Big Four auditor, Table 6 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 MFIs) 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 6 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 6 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 between audit quality, as measured by the presence of board-reporting internal auditors, and governance mechanisms. Table 6 indicates that governance mechanisms 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 both ownership type and competition are strongly significant explanatory variables for the presence of 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 6, 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 MFEs' 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.

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 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.[6]

4.3. 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

[6] 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 robustness analyses of this study (not tabulated).

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 lower in developing and emerging countries (cf. Francis & Wang, 2008), 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 7.

Table 7

Table 7 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. 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.

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. 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 have 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 institutions 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.

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Table 1: Variable definitions

Variable	Definition
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

	No. of observations			No. of observations	
Country	**BigFour**	**Internal Audit**	**Country**	**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
Guatemela	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. 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: 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 5 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 5, ***, **, and * indicate significance levels of 10%, 5%, and 1%, respectively.

Table 6: 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 6 tests the relationships between audit quality and both internal and external governance indicators through the following probit regression: $AuditQuality = \beta_0 + \beta_1 * InternalGovernance + \beta_2 * ExternalGoverance + \beta_3 * Size + \beta_4 * Complexity + \beta_5 * Risk + \beta_6 * Age + \beta_7 * HDI + \varepsilon$. All of the variables in this table are defined in Table 1. In Table 6, ***, **, and * indicate significance levels of 10%, 5%, and 1%, respectively.

Table 7: 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 7 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 7, ***, **, and * indicate significance levels of 10%, 5%, and 1%, respectively.