Use of Big Four auditors and fund raising: Evidence from developing and emerging markets

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Abstract

Purpose – The traditional view in audit research has been that high-quality auditors are associated with improved access to funding. This study is motivated by recent research suggesting that the funding benefits of using Big Four auditors may not be as uniform as was previously assumed. To further examine the contention that the implications of audit quality are context dependent, we turn to the microfinance industry. Specifically, we apply data from microfinance institutions in developing and emerging countries, a population typically not investigated in accounting research, to analyze the relationship between use of Big Four auditors and access to debt capital.

Design/methodology/approach – We apply a unique hand-collected dataset from 59 developing and emerging markets and empirically investigate whether access to various sorts of debt is related to the use of Big Four auditors.

Findings – Controlling for firm characteristics found in prior research to affect access to capital, we are unable to document a significant relation between use of Big Four auditors and access to debt capital. Thus, we conclude that one of the main benefits of using Big Four auditors seems not to extend to the poor countries of the world.

Originality/value – Big Four auditors are expensive. Our findings potentially have implications for auditor choice in poor countries; why should an organization pay extra for auditing if no benefits from the higher price can be documented?

Keywords Audit quality; Cost of debt; Fund raising; Microfinance; Big Four; Emerging markets.

Paper type Research paper

1. Introduction

Improved audit quality is associated with lower information asymmetries between an organization and its stakeholders (Chen et al., 2011). Prior research suggests that audit quality has real consequences for an organization; the reduced risk caused by lower agency costs improves fund-

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raising possibilities and reduces costs of capital (Kitching, 2009; Gul et al., 2013; Pratoomsuwan, 2012). An indicator variable for use of Big Four auditors is the most commonly used proxy variable for audit quality (Hay et al., 2006), and several studies specifically suggest that use of Big Four auditors is associated with improved fund raising opportunities and lower costs of capital (Boone et al., 2010; Pittman and Fortin, 2004).

However, recent reviews of audit quality research find that empirical results from this line of research are mixed and highly country-specific (Gul et al., 2013; Eilifsen and Willekens, 2008; Tsipouridou and Spathis, 2012). For instance, Francis and Wang (2008) document that the association between use of Big Four auditors and accounting quality is context dependent; their study suggests that Big Four auditors do not universally enforce higher accounting quality. Focusing on listed corporations primarily from relatively rich countries, Gul et al. (2013) find that cost of debt is lower for firms using Big Four auditors, but the effect is most pronounced in countries with strong investor protection. To answer the challenge of Francis and Wang (2008) to learn more about audit quality and its possible consequences in different settings, we turn to nonprofits in developing and emerging markets and use a unique hand-collected dataset from the microfinance industry as our case.

The microfinance industry offers several advantages for novel audit research. First, the industry has grown rapidly and represents a major industry in the World's poorest countries (Demirguc-Kunt and Klapper, 2012), thus allowing exploration of contexts and settings not normally examined in accounting research (Dechow et al., 2010; De Zoysa and Rudkin, 2010). Access to good financial data from developing and emerging markets is a major challenge and a main explanation for the scarcity of research on Asian, African and Latin-American countries. However, the microfinance industry allows us to apply third-party data that are reliable and of high quality. Second, most microfinance institutions (MFIs) fit the characteristics of nonprofit organizations, and thus far, nonprofits have been subject to extremely little audit research (Tate, 2007). In fact, we are aware of no international

study that has investigated the association between auditor choice and fund-raising in the not-for-profit sector. This situation is highly unfortunate; the nonprofit sector is huge in many countries (cf. Harris and Krishnan, 2012; Tate, 2007), and given that nonprofits in general are involved in helping people in some type of need, it is of great importance that nonprofits are able to optimize the cost/benefit-relationship associated with using external (expensive) auditors. Third, the microfinance industry is frequently involved in fund raising, which is a prerequisite when the association between audit quality and access to capital is to be investigated. In fact, access to debt capital is considered necessary to cover an increasing world demand for microfinance services (Ledgerwood et al., 2013), because retained profits, subsidies and donations do not match the huge demand for microcredit by low-income families (Gosh and van Tassel, 2013).

Our study is motivated by recent research showing that effectiveness of the well-known Big Four/non-Big Four dichotomy as an audit quality indicator is context specific (Francis and Wang, 2008). This study investigates whether the association between fund-raising and use of Big Four auditors is as uniform as suggested by research on listed, typically Western, corporations (e.g., Pittman and Fortin, 2004; cf. Hay et al., 2006). Focusing on access to debt capital, the study is unable to document a significant relationship between use of Big Four auditors and fund raising opportunities. Although we discuss several caveats to this novel research and propose that more research on audit quality and fund raising across different contexts is needed, we regard our initial results to be of importance. First, our study on nonprofits in poor countries supplements recent research (e.g., Francis and Wang, 2008; Eilifsen and Willekens, 2008) suggesting that Big Four auditors may not be universally associated with more credible financial reporting. Second, even if the audit quality itself is superior, the *signaling* effect (to external stakeholders) from using Big Four auditors in some countries and contexts might be different and perhaps more limited than previous research suggests. Third, if Deloitte, Ernst & Young, KPMG, and PWC intend to maintain their position as world-leading auditors, it should be of concern to these audit firms that the benefits from using

their services might be smaller than previously assumed, at least in some settings. Fourth, and perhaps most important, if Big Four auditors are more expensive than others (as documented by, e.g., Choi et al., 2008; Vermeer et al., 2009; Peel and Makepeace, 2012), our research has potential consequences when firms and organizations are to evaluate costs and benefits flowing from their auditor choice (cf. discussion in Boone et al., 2010).

This paper is organized as follows: Section 2 discusses prior research and develops the study's hypothesis. Section 3 outlines the research methodology and presents the data sample. Empirical findings are explained and discussed in Section 4, and Section 5 concludes.

2. Prior Research and Hypothesis Development

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 misstatements that are uncovered during the course of an audit. Audit fees (Knechel et al., 2008; Lin and Hwang, 2010), auditor size (Francis and Krishnan, 1999; Boone et al., 2010), and auditor reputation (Hope at al., 2008; Pratoomsuwan, 2012) 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 use of a Big Four auditor is related to high-quality auditing is supported by many empirical studies (e.g.,, 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 use of Big Four auditors as an indication of high quality as follows: "…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).

Prior research suggests that earnings are of higher quality for companies using a Big Four auditor (see discussion in, e.g., Francis and Wang, 2008). More-credible financial reporting is associated with lower information asymmetries between firm insiders and outside investors and, hence, decreased agency costs. The lower information risk caused by higher-quality auditing is expected to lead to increased fund raising possibilities and lower cost of capital (e.g., Khurana and Raman, 2006) because capital providers can forecast companies' future cash flows with a greater degree of certainty. Both the positive association between fund-raising and use of Big Four auditors and the negative association between use of these auditors and the cost of (both debt and equity) capital have been documented empirically (Boone et al., 2010; Pittman and Fortin, 2004). Thus, the prevailing view in the audit literature has traditionally been that use of such auditors generally is beneficial for firms when raising funds. However, prior research also indicates that there is no free lunch; most empirical studies strongly suggest that Big Four auditors are more expensive than other auditors (Hay et al., 2006), particularly for small- and medium-sized firms (Choi et al., 2008).

Most Big Four research has traditionally focused on US companies (cf. Fleischer and Goettsche, 2012; Hay et al., 2006). More recent international research finds that the evidence on general audit quality differentiation is country specific (Eilifsen and Willekens, 2008). Inspired by research suggesting that the role of a Big Four versus a non-Big Four auditor can be highly context-dependent (Francis and Wang, 2008), we turn to the microfinance industry to investigate whether the conclusions on increased fund-raising possibilities following use of Big Four auditors are applicable to settings other than listed, Western companies.

The microfinance industry has grown large; currently, it provides microcredit to more than 200 million individuals (Maes and Reed, 2012). More than 500 million poor families have a savings account (according to Christen et al., 2004; the number is most likely higher today), and 135 million poor families have some type of microinsurance policy (Lloyd's, 2012). The growth in the microfinance market is remarkable; soon, the microfinance sector may become the World's largest banking market in terms of number of customers (Mersland, 2013). 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 consequences of mechanisms of external control in the microfinance industry has greatly increased as more investors and creditors have become involved in microfinance. To date, however, academic evidence is scarce (Hartarska, 2009).

The vast majority of MFIs pursue the dual objective of financial sustainability *and* social outreach. 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 frequently registered as either commercial banks or non-bank financial institutions; as non-profit organizations that are often referred to as non-governmental organizations (NGOs); or as formally registered, member-based organizations such as savings and credit cooperatives (SACCOs) (Mersland, 2009). However, prior research suggests that there is no difference in performance between different types of MFIs (Mersland and Strøm, 2009). Nonetheless, because of the dual objectives and considerable numbers of grants and subsidies, correct performance measurements can be unusually complex to obtain (Manos & Yaron, 2009). Moreover, the industry has been criticized for weak corporate governance (Mersland and Strøm, 2009). These factors suggest that information asymmetries between managers and capital providers may be more serious in the microfinance industry than in other industries, making the benefits from

high-quality auditing (or, in general, control mechanisms) potentially higher in this industry (cf. Gul et al., 2013).

To service the high demand for microloans it is contended that MFIs need to shift their funding focus from donors to the capital markets (Briere and Szafarz, 2015). In this study, we investigate the association between fund-raising and use of Big Four auditors using observations from 59 emerging and developing economies (see data sample section). The large number of subsidies and grants obscures correct measurement of cost of capital. Additionally, very different interest regimes make it challenging to aggregate costs of capital across countries (cf. Chen et al., 2011). Therefore, we focus the analysis of possible gains from using a Big Four auditor on binary indicator variables for access to various types of debt capital rather than using cost of capital variables (although the latter is employed in robustness tests).

Based on theory and prior empirical research (Boone et al., 2010; Pittman and Fortin, 2004), a natural starting point is to hypothesize that MFIs using Big Four auditors will more easily access capital than will those using other, presumably lower quality, auditors. This starting point is strengthened by the fact that small firms and institutions suffer particularly from informational problems and thereby have the most to gain from high-quality auditing (Gul et al., 2013). However, Francis and Wang (2008) find that the association between auditor choice and accounting quality is not invariant across countries (see also Tsipouridou and Spathis, 2012); specifically, their research suggests that the influence of Big Four auditors on accounting quality might be less in countries with weaker investor protection. With weak investor protection, Big Four auditors often do not have incentives to enforce high earnings quality. On the contrary, when investor protection is low, enforcement of high earnings quality might lead to auditors being dismissed (Jaggi and Low, 2011). Building on Francis and Wang (2008), among others, it should thus come as no surprise that Gul et al. (2013) find that the negative relationship between use of Big Four auditors and cost of debt

documented in prior research (e.g., Pittman and Fortin, 2004) is particularly strong in strict investor-protection regimes. Most countries in our sample are known to have weak investor protection; thus, it is possible that the association between use of Big Four auditors and access to capital is less pronounced in this study than in previous studies that typically are based on Western observations.

Another aspect of our sample is that it includes an additional stakeholder group typically absent in prior research, i.e., the donors. Because of the importance of donors in the microfinance industry, it is possible that investors' relative influence on audit quality is lower than in other settings. One may argue that donors are less professional capital providers than investors, thereby causing audit quality to be of less importance in microfinance than in industries without donors. However, the opposite possibility cannot be ignored (cf. Harris and Krishnan, 2012). In fact, 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, the presence of donors might increase the positive association between fund-raising possibilities and use of a Big Four auditor. The latter contention is indirectly supported by Krishnan and Schauer (2000), who report higher audit quality in their sample of not-for-profit entities (US Voluntary Health and Welfare Organizations) for users of Big Four auditors. In general, the role of accounting (and hence auditing) may not be similar between nonprofits and profit maximizers. Unfortunately, very little research on audit quality has been conducted on nonprofits (Tate, 2007). An important contribution of our study is to contribute to filling the gap.

An additional topic that has received relatively little attention in audit research is the possible difference between real and perceived audit quality. Boone et al. (2010) document that perceived differences in audit quality can be larger than the actual differences (cf. Cassell et al., 2013); even if there may not be a real difference in audit quality between Big Four auditors and non-Big Four

auditors, the clients of Big Four auditors might still access capital more easily. Little is known about how stakeholders perceive audit quality (of Big Four auditors relative to other auditors) in developing and emerging markets. With their Western origin, it is reasonable to assume that Big Four auditors have a stronger position in developed countries than in developing and emerging markets. However, international influence is strong in the microfinance industry. Ashbaugh and Warfield (2003) document a positive association between audit quality and foreign stakeholders (cf. Leuz et al., 2009); it is not unlikely that the international relationships of many MFIs may reinforce a possible positive association between fund raising and use of Big Four auditors. The large distances between capital providers and MFIs, both geographically and culturally, may cause a particularly large demand for (well-known) Big Four auditors from MFIs trying to raise capital.

With respect to culture, national cultural values may also affect managerial decisions (Hope at al., 2008). Hope et al. (2008) claim that their results establish a link between national culture and accounting quality through a firm's choice of auditor. In particular, they find that firms in more secretive countries are less likely to hire a Big Four auditor. Many of the developing and emerging countries in our sample might be categorized as 'secretive' according to the definition of Hope et al. (2008). However, based on their study, we cannot say whether the importance of Big Four auditors for fund-raising, in particular, is related to the secrecy dimension.

Overall, it is uncertain whether the (positive) association between use of Big Four auditors and fund-raising possibilities is stronger or weaker in our sample of nonprofits from developing and emerging markets than in traditional research from the US and other Western countries. As a starting point – based on conventional arguments – we maintain the hypothesis of a positive association, as follows:

- *There is a positive association between use of Big Four auditors and access to various sources of debt capital in our international sample of microfinance institutions.*

The investigation is based on binary indicator variables for access to the MFIs' various sources of debt financing: commercial debt, subsidized debt and government agency debt. Regarding the commercial debt variable, we have data for both local and international commercial debt. As an additional test of access to capital, we also examine access to voluntary savings (from clients). One might have proposed sub-hypotheses for the different variables. For instance, based on the finding that foreigners avoid investing in poorly governed firms (Leuz et al., 2009), one might assume that use of Big Four auditors is more important when trying to access international than local commercial capital (Leuz et al., 2009). Moreover, Big Four auditors might be less important for government agencies than for commercial capital providers (Guedhami et al., 2009). However, given the novelty of this study, we refrain from launching such clear-cut hypotheses. Additionally, we test for an association between auditor type and access to funds rather than for causal effects of auditor choice on fund raising (cf. Hope et al., 2008).

3. Research Design and Data Sample

3.1. Research Design

Following a long tradition in Big Four auditing research, we make use of multivariate logit regressions in this study (see, e.g., Chen et al., 2011; Guedhami et al., 2009). In our model, the binary indicator variable for access to capital (*CapAccess*) is the dependent variable. The binary indicator variable for use of Big Four auditors is the test variable, as in the following:

$$CapAccess = \alpha + \beta BigFour + \boldsymbol{\gamma Control} + \varepsilon$$

Control is a vector of control variables. We control for MFI size using the log of assets as our size proxy, the typical size proxy in audit research (Hay et al., 2006). Risk is controlled for using portfolio at risk > 30 (PAR30) as the risk measure, the most commonly used risk measure in the microfinance

industry (Gutierrez-Nieto and Serrano-Cinca, 2007). PAR30 refers to the outstanding balance of loans more than 30 days past due divided by average outstanding gross loan portfolio.[1] Note that market-based risk metrics (such as the market model beta) are not applicable for non-listed institutions. Profitability is controlled for through return on assets (ROA). We expect international connotations to have favorable consequences for fund-raising (cf. discussion in, e.g., Guedhami et al., 2009). Thus, we control for possible international initiation through a binary indicator variable. Microfinance is an industry in which certain players are regulated by local banking authorities, but other entities do not experience this regulation (for more details, see, e.g., Arun, 2005; McGuire, 1999). Regulations can be imposed in a manner that improves access to capital; we control for this consideration through a binary indicator variable. Because of the limited sample size (see below), neither country-specific regressions nor the inclusion of country-specific indicator variables in the pooled regressions is appropriate. Thus, it is important to include sufficient controls to account for differences between countries. We apply four country control variables. Based on the findings of Francis and Wang (2008) and Gul et al. (2013), we control for investor protection. Specifically, we apply the investor protection index in the 'Doing Business' data from the World Bank. Furthermore, we use the Human Development Index (HDI) from the UN Development Programme as a control variable for level of economic development of the countries in which the examined MFIs are located. HDI is a composite index incorporating GDP per capita, health and education indicators. More-developed countries have more-developed financial markets, which may affect the demand for accounting transparency (Guedhami at al., 2009) and the relative use of debt (to equity) financing (Gul et al., 2013). Moreover, as a further control for differences between national financial systems, we include market share of domestic banks in each country. Finally, we apply inflation as a country control variable.

The inflation variable is potentially particularly important in a robustness test where we investigate different costs of capital variables as alternative CapAccess proxies. We use standard OLS rather than

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[1] Note that we do not include leverage as an explanatory variable. Given that we focus the analysis on access to debt capital, the use of leverage on the right-hand side of the equation would defeat the purpose of the test.

logit-regressions in this alternative multivariate analysis (see, e.g., Kim et al., 2011). Finally, because we have access to a large number of MFI characteristics, we examine more descriptive statistics than just those related to the variables applied in the multivariate analysis to gain more knowledge about auditor choice for nonprofits in developing and emerging markets.

3.2. Data Sample

Following the rapid growth of the microfinance industry, the increased need for independent MFI information has led several firms to offer specialized rating assessments of MFIs. These rating assessments are much wider than traditional credit ratings, as they claim to measure MFIs' ability to reach their multiple sets of objectives simultaneously (Reille et al., 2002). The purpose of published rating reports is to present independent information that stakeholders, such as lenders, donors, owners or managers, can use to make informed decisions. Our dataset is hand-collected from these rating reports, using data reported by five of the leading rating agencies in the microfinance industry. The dataset contains information from 405 MFIs in 73 countries. However, some rating reports do not list the name of the auditor; we have information on auditor choice from MFIs in 59 countries (see Table 1). Lawrence et al. (2011) document that differences in audit quality between Big Four and non-Big Four users can be industry-dependent. An advantage of our study is that all entities examined belong to the same industry and are similar with respect to products offered and clients served.

Table 1

Mitra et al. (2008) report that there are approximately 16 active rating agencies in the microfinance industry. The five selected rating 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 *Crisil* and *M-Cril*. All these agencies consider the entire world to be their market. The agencies are official rating

agencies approved by the Rating Fund of the Consultative Group to Assist the Poor (C-GAP, a branch of the World Bank) (www.ratingfund2.org).

The rating reports constituting our database are from 2000 to 2009, with the vast majority of reports published in the last five years of this period. The rating agencies differ in their emphasis and in the abundance of available information. This results in different numbers of observations for different variables and in different years being reported. Where appropriate, all numbers in the dataset have been annualized and dollarized using then-current official exchange rates. Descriptive statistics for variables applied in the study are displayed in Table 2.

Table 2

Of the 255 observations on auditor choice, 29% are from MFIs audited by any of PWC, KPMG, Deloitte or Ernst & Young (now: EY). Table 2 presents separate results for the Big Four versus the non-Big Four sub-sample (cf. Kim et al., 2011). According to a simple t-test, there is no difference in access to local commercial debt and government agency debt between the two sub-samples. However, MFIs employing a Big Four auditor appear to have easier access to international commercial debt (57% compared with 35% for those not using a Big Four auditor) and international subsidized debt (67% vs. 41%). Although the variable is only used as a robustness check (see below), we note that improved access to clients' savings seems to be *negatively* associated with use of a Big Four auditor. Nonetheless, because these differences may be attributable to MFI characteristics other than simply auditor choice, it is premature to draw strong conclusions based on the simple bivariate analysis.

As for the control variables, MFIs audited by Big Four auditors appear to be larger than others are as measured by the log of assets, a finding consistent with prior research (Hay and Davis, 2004). Moreover, MFIs employing Big Four auditors seem to be less risky as measured by PAR30. The lower risk could be due to stricter requirements from Big Four auditors, but it could also be attributed to

Big Four auditors shying away from risky clients (Lai, 2013). Moreover, we note that Big Four users on average are more profitable as measured by ROA. The t-test suggests no difference in the proportion of MFIs initiated from abroad and the proportion of MFIs being subject to regulation. With respect to country control variables, we find evidence of lower mean inflation in countries covering the Big Four sub-sample.

We have included cost of debt variables in Table 2 because we later are going to apply these variables in robustness tests. We again stress that these variables are not easily aggregated and no country-specific analysis is doable (because of few observations per country). Interest on loans is paid interest divided by total debt. Real interest rate (log) is the natural logarithm of one plus the real interest rate on loans. As measured by t-tests, however, we do not find any differences in costs of capital depending on auditor choice.

Table 3

To gain further insight into the possibly context-dependent meaning of audit quality (cf. Francis and Wang, 2008; Gul et al., 2013), we present additional descriptive statistics for the Big Four and the non-Big Four sub-sample (see Table 3). Although the variables are not necessarily related to fund raising and cost of capital *per se*, several interesting observations can be made. First, for many of the characteristics, there is no difference between MFIs employing Big Four auditors and those that do not. As for MFI type, there is no difference in proportion of MFIs incorporated as shareholder corporations (banks and non-bank financial institutions) between the two sub-samples. However, significantly more NGOs and significantly fewer cooperatives among MFIs employ a Big Four auditor. Consistent with the previously discussed size proxy (the log of assets), Big Four users have more branch offices than do the rest. There are no significant differences related to product types, but for unknown reasons, MFIs initiated by religious organizations are more likely to choose Big Four auditors. We also note that MFIs using Big Four auditors operate in more-competitive markets than do others. There is no difference in MFI age between the sub-samples; however, it is noteworthy

that many MFIs are relatively young. Prior research suggests that the association between access to debt capital and the choice of a Big Four auditor is strongest in an entity's early years (Pittman and Fortin, 2004).

Social performance is important for most MFIs (compare their 'dual bottom line'); therefore, we have included the three most commonly used proxy variables in Table 3. Only the outreach metric is significantly different between our two sub-samples; MFIs using Big Four auditors have a higher number of clients on average. The financial indicators presented (additional to those outlined in Table 2) suggest that Big Four users are more efficient, as measured by personnel productivity. Because external auditing in itself is a governance mechanism (Hope et al., 2008), it is interesting to investigate the relationship between use of Big Four auditors and other governance indicators such as board and CEO characteristics. Few differences are documented, but we note that Big Four users have a greater number of international board members, but fewer board members representing clients. The presence of board-reporting internal auditors is an interesting governance variable and may be regarded as an alternative measure of audit quality (cf. Hay et al., 2008). Internal auditing may also affect demand for external auditing services (Knechel and Willekens, 2006). Table 3 shows that the frequency of board-reporting internal auditors is much higher among MFIs using Big Four auditors, a finding we investigate further in the multivariate analyses (see Section 4). The last part of Table 3 reports CEO characteristics, but we are unable to document any significant differences between our two sub-samples based on the t-tests.

4. Multivariate analysis

Sub-section 4.1. presents the results of both the main multivariate analysis and several robustness tests. Sub-section 4.2. discusses the results and identifies issues for future research.

4.1. Empirical findings

In the main analysis, binary indicator variables for access to local commercial debt, international commercial debt, international subsidized debt and government agency debt are applied as dependent variables, and a binary indicator variable for use of Big Four auditors is applied as the test variable. In addition, the control variables discussed in Section 3.1 are included as explanatory variables. The results of the analysis are presented in Table 4.

Table 4

Starting with the dummy variable for access to local commercial debt, we note a negative coefficient on the Big Four variable. Negative coefficients suggest a negative relationship between use of Big Four auditors and access to capital. However, the result is not statistically significant at the conventional 5% level. We note, however, that the dummy variable for international initiation is significant. The coefficient is negative and this finding is not surprising; if international initiation has a positive influence on access to international capital, it is expected that internationally initiated MFIs relatively less frequently apply local capital markets to fund their operations.

Next, we turn to the analysis of access to international commercial debt. In contrast with the previous analysis, the sign on the Big Four variable switches from negative to positive. Nonetheless, the coefficient remains insignificant. T-tests suggested that Big Four users have significantly higher access to international commercial debt. The significance disappears in a multivariate setting. The 'real' explanatory variables for access to international commercial debt appear to be size and risk. Big Four users are significantly larger and significantly less risky than non-users, as displayed in Table 2. It is these size and risk effects, not auditor choice, that seem to be the driving force for access to international commercial debt. Although insignificant, we note that the coefficient on the international initiation variable now is positive – not negative as in the analysis of local commercial debt. The country control variable for importance of the domestic bank market is negative, a finding that is not surprising given that we are analyzing access to international capital.

We now turn to subsidized debt. Because we have only 9 cases where MFIs have access to local subsidized debt – a result strongly indicating that local debt is not subsidized – we focus the analysis on international subsidized debt. The bivariate analysis in Table 2 suggested that access to international subsidized debt is positively associated with use of Big Four auditors. However, once again, the significance disappears in a multivariate setting. Furthermore, the difference in access again seems to be attributed to MFI size and risk.[2]

The last of the main regressions analyzes access to government agency debt. The dummy for international initiation has a significantly negative coefficient. Government agency debt is often local and, thus, the result is consistent with that reported for local commercial debt. The coefficient on the Big Four variable remains insignificant. This result is somewhat consistent with the finding of Guedhami et al. (2009) that stakeholders representing the public sector (in their study: state owners) place less value on credible financial reporting and are less likely to require use of a Big Four auditor. Overall, our primary analyses show consistent results; auditor choice appears to have no consequence for access to debt capital. The coefficient on the Big Four variable is negative on two occasions (local commercial debt and government agency debt) and positive on two occasions (international commercial debt and international subsidized debt), but never statistically significant.

As a further test of fund raising possibilities, we conduct an additional analysis in which a binary indicator variable for access to (voluntary) savings is applied as the dependent variable, see rightmost columns of Table 4. MFIs are not necessarily banks in the sense that they universally accept deposits. Table 2 shows that approximately 30% of the sample offer savings. For these MFIs, an additional source of debt financing becomes relevant; in fact, savings may be a large source of

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[2] From a statistical point of view, several insignificant explanatory variables may reduce the model's ability to detect significant relationships (because of too much 'noise'). However, in simplified multiple regressions in which the binary indicator variables for access to debt financing are regressed on only *BigFour*, size and risk, the coefficient on *BigFour* remains insignificant (not tabulated).

capital.[3] This alternative analysis presents the most significant coefficient on the Big Four variable, although a p-value of 5.1% is not significant under the 5% threshold. Nonetheless, the negative coefficient of the test variable may be interpreted to provide some evidence in favor of what Beisland et al. (2015) refer to as the signaling effect of deposits; when MFIs have access to savings, they are less dependent on other sources of (professional) capital and are therefore less dependent on signaling high-quality governance structures through the choice of external auditor. This analysis further demonstrates that savings are positively related to size, risk and regulation. It is interesting to note the positive coefficient on our risk proxy, although we find it somewhat surprising that voluntary savings are associated more with late repayment of loans. The finding that regulation is positively associated with savings is expected; in fact, being regulated is often a pre-requisite for being allowed to accept savings. We also note that MFIs that accept savings are less likely to be initiated from abroad, and they are situated in less-developed countries (as measured by the HDI) and in countries where formal banks have a relatively lower share of the credit market.

Studies on the determinants of cost of debt across countries are scarce (Gul et al., 2013); therefore, as described in Section 3.2, we use two cost of debt variables as alternative dependent variables. However, we stress that these tests should only be regarded as supplementary robustness tests as long as country-specific analyses are inapplicable. Consistent with the expectation that cost of debt variables are difficult to aggregate across completely different interest rate regimes, the explanatory power of the regressions is relatively low and the results should be interpreted with caution. Nonetheless, Table 5 shows that the results on these robustness tests are rather similar to the other findings of our study. Size, international initiation and the country control variable of HDI appear to be the main explanatory variables for cost of capital. The binary variable for auditor choice is never significant. The results of Table 5 are in some respects consistent with the study of Hartarska (2009), which does not document any significant relationship between the existence of external auditors and

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[3] Mandatory savings is often applied in the microfinance industry; clients are required to save to access credit. We focus this analysis on the portion of this 'capital provision' that is voluntary.

an MFI's financial performance (although her study does not separate Big Four auditors from other auditors). Overall, despite the inherent weaknesses in some of our dependent variables, all tests lead to the same conclusion; we cannot find any evidence that use of Big Four auditors improves fund-raising possibilities.

Table 5

Most MFIs subscribe to the dual objectives of financial sustainability and social performance (poverty reduction). However, increasingly strict commercial players have recently entered the market for microfinance. None of these large commercial banks is included in our sample. Nevertheless, one may generally argue that whereas NGOs and cooperatives typically are strictly nonprofit entities, a for-profit objective might be more explicit for banks and non-bank financial institutions incorporated as shareholder companies (Galema et al., 2012). To perform an even more clear-cut analysis of nonprofit entities, we separate shareholder corporations from NGOs and cooperatives and re-run all tests on these two sub-samples (not tabulated). This alternative procedure also serves to test the contention of Chen et al. (2011) that the governance role of auditing varies between firm types. Nonetheless, the Big Four variable is insignificant in all tests for both sub-samples with one exception: the coefficient is significantly negative when voluntary saving constitutes the dependent variable, but only for NGOs and cooperatives. This finding suggests the presence of a signaling effect of auditor choice, but only for sub-samples of MFIs. Collectively, the results obtained when splitting the MFIs according to whether they are pure nonprofits or shareholder firms possibly subscribing to for-profit objectives are consistent with the main analysis.

Based on the findings of Gul et al. (2013) that the cost-of-debt effect of use of Big Four auditors is moderated by the investor protection level, we conclude this section by re-running all regressions inclusive of an interaction variable constructed as the product of the Big Four variable and the investor protection variable (results not tabulated). However, this additional variable is never

significant. This alternative specification does not alter the results previously reported for the Big Four variable.

4.2. Discussion of results and suggestions for future research

The findings of this study raise several interesting questions for future research. First, most research on Big Four auditors is conducted on US and other Western corporations; much more research in other settings is called for. Big Four auditors may not deliver superior audit quality in all countries; Francis and Wang (2008) do not find evidence of higher audit quality when investor protection is weak. A possible explanation is that Big Four auditors do not want to enforce high accounting quality, which may lead to client dismissal, if they are not exposed to high levels of litigation risk (Gul et al., 2013; Tsipouridou and Spathis, 2012). Consistent with the study of Francis and Wang (2008), Gul et al. (2013) find that the Big Four effect on cost of debt is positively associated with investor protection. However, inconsistent with the Francis and Wang (2008) investigation, Gul et al. (2013) also document a universal Big Four effect on the cost of debt across countries.

Our main analysis is unable to document any effect on access to debt capital from hiring Big Four auditors. Moreover, robustness checks suggest that this conclusion is independent of the investor protection level. The latter result contrasts with both Francis and Wang (2008) and Gul et al. (2013). A possible explanation for the discrepancy might be the choice of countries covered by our study. All 30 countries covered by Gul et al. (2013) are included among the 42 countries studied by Francis and Wang (2008); however, of our 59 countries, only 9 and 4 are included in the study by Francis and Wang (2008) and the study by Gul et al. (2013), respectively. The 50 countries not covered by any of these studies are generally very poor and characterized by low investor protection. Our results suggest that below a given investor protection threshold (cf. Jaggi and Low, 2009), there is no Big Four effect at all. Specifically, findings indicate no funding benefits from the use of Big Four auditors in poor African, Asian and Latin American countries, among which the majority of our sample is

collected. Nonetheless, to draw strong conclusions based on these novel results might be premature; given that this is the first study to investigate the relationship between funding and audit quality in most of these countries, more research is needed.

It is possible that our results can be attributed to audit quality perception. The study of Francis and Wang (2008) focuses on real and concrete measures for audit quality, i.e., accounting quality metrics such as abnormal accruals, likelihood of reporting a loss, and earnings conservatism. One could argue that the fund-raising implications of auditor choice are more affected by perceived than by real audit quality. Studying auditor choice as an indicator of audit quality, Boone et al. (2010) distinguish between actual and perceived audit quality (also see De Zoysa and Rudkin, 2010). They find little evidence of differences in actual audit quality between Big Four auditors and a sample of Second-tier audit firms, but document a pronounced difference in perceived audit quality. Moreover, Cassell et al. (2013) suggest that the difference in perceived audit quality between Big Four auditors and Second-tier audit firms has decreased over the past decade. Karjalainen (2011) documents that both the actual and perceived quality of audits are relevant in the pricing of debt capital.

We know from prior research that auditor reputation is important when evaluating audit quality (Hope et al, 2008; Pittman and Fortin, 2004). Inspired by the research of Boone et al. (2010) and Karjalainen (2011), one may ask if the perception of audit quality is different in developing and emerging countries. Even if previous studies suggest a global reputational advantage for Big Four auditors (see discussion in Gul et al, 2013), prior research ignores many of the World's poorest countries. Do brand names such as PWC and Deloitte have the same standing in, e.g., Cambodia, Peru and Zambia, as in the US and Western Europe? Emerging and developing economies have less-developed financial markets and very different auditing environments (cf. discussion in Lin and Liu, 2009). If the Big Four do not have the superior reputations in our sample-countries that they do in developed countries, it is no wonder that we do not document positive associations with access to

capital.[4] Thus, our results might be attributed to Big Four auditors not being *perceived* as higher-quality auditors. Nonetheless, given that many capital providers most likely originate from developed countries, it can be argued that we should have found a significant association between use of Big Four auditors and our proxies for international (foreign) capital access consistent with existing (mostly Anglo-Saxon) research (of, e.g., Pittman and Fortin, 2004). In the poor countries covered by our sample, an unexplored topic is whether the *presence* of an external auditor (in industries where this is not obvious) is more important than auditor type (cf. Kim et al., 2011).

Because our study is the first (to the best of our knowledge) to perform a cross-country analysis of how auditor type may associate with fundraising among nonprofits, the study includes interesting aspects not covered by the above-discussed investigations. We cannot rule out the possibility that both the audit quality in itself and the possible consequences of audit quality can be different between the nonprofit sector and listed corporations (cf. Clatworthy et al., 2002). This viewpoint can be approached from the supply side as well as from the demand side. For instance, it may be that Big Four auditors supply lower audit quality in a nonprofit sector such as microfinance, e.g., because they have limited experience with organizations pursuing social performance in addition to financial sustainability. Evidence from publicly listed companies does suggest that supply-side characteristics such as auditor industry expertise influences fund-raising and cost of capital (Krishnan et al., 2013).

Regarding the demand side, stakeholders such as donors and providers of subsidized debt may care less about audit quality and use of Big Four auditors than do capital providers of for-profit entities. The traditional, clear principal-agent relationship may be somewhat blurred for nonprofits compared with profit-maximizers (Clatworthy et al., 2002). Consistent with this contention, Harris and Krishnan (2012) report that auditor reputation may be of less importance in the not-for-profit sector. Kitching

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[4] All our observations are from this century. The reputation of the Big Four can have been negatively affected by the audit scandals around the turn of the century. A question that cannot be answered from our data is whether the reputation of the Big Four was *more* negatively affected in poor countries than in rich, Western countries.

(2009), on the other hand, finds a positive association between audit quality and contributions to (US) charities. However, she also documents that charities' reputation and audit quality are substitute mechanisms for signaling the credibility of financial information to donors, consistent with audit quality being of relatively lower importance in the nonprofit sector. Unfortunately, we do not have good data on the reputation of our investigated MFIs.

In another study of the microfinance industry, Beisland et al. (2015) focus on governance mechanisms, inclusive of auditing, and find that auditor choice has a low association with other governance mechanisms. Their results are consistent with the notion that auditor type is *the* (single one) most important signal of the quality of governance structures, but the authors also note that another (completely opposite) valid interpretation of their results is that auditor choice is not at all important when control mechanisms are designed. Our findings are consistent with the latter interpretation. Our findings can also be related to the Chinese study of Chen et al. (2011), which concludes that the relationship between audit quality and cost of (equity) capital is stronger for not-state-owned enterprises than for not-for-profit state-owned-enterprises.

Khurana and Raman (2006) document how investors do not perceive auditing as compensating for weak governance (see also Knechel and Willekens, 2006). If audit quality is of low importance as a control mechanism in the microfinance industry (cf. Hartarska, 2009), one may ask if other governance indicators are more relevant for fund raising (cf. discussion in Chen et al., 2011; see Harris and Krishnan, 2012). In this respect, it is notable that the binary variable for international initiation may also be seen as a governance indicator; 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 number of board members who are elected by donors and number of international board members. The international initiation variable is often significant in our regressions, suggesting that it may proxy for

improved control and reduced agency costs. On the other hand, the other metric of governance in the regression analysis – the presence of regulations – is never significant in the main analysis. Thus, the existence of regulations may not necessarily reduce agency costs for capital providers.

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. Table 3 includes several possible governance metrics. One of the most direct measures for the quality of governance structures is the presence of board-reporting internal auditors. Less than half of the MFIs examined have internal auditors, but Table 3 indicates a distinct difference between the MFIs that use a Big Four auditor and those that do not; the frequency of internal auditors is twice as large among Big Four users. Prior research suggests that internal auditing can supplement external auditing for nonprofits (Beisland et al., 2015; Vermeer et al., 2009; cf. Knechel and Willekens, 2006). As an untabulated additional test, we have replaced the Big Four variable with the binary indicator variable for the presence of board-reporting internal auditors in our regressions; we do find some evidence that the latter variable is associated with improved fund raising. Specifically, the variable is positively associated with the dummy for access to international subsidized debt, and it is negatively associated with interest on loans. This finding lends some support to the notion that our lack of significance for the external auditing variable could be attributed to other control mechanisms being considered more important by stakeholders of nonprofit institutions.

5. Conclusions

As instructively discussed by Lin and Liu (2009), high-quality auditing will only be adopted if the benefits of the choice outweigh the cost of the choice. The main benefits from using a Big Four auditor have historically been considered increased fund raising possibilities and lower costs of capital (Boone et al., 2010; Pittman and Fortin, 2004). In this study, however, we are not able to document such benefits. Several explanations could be valid. In accordance with the evidence of

Francis and Wang (2008) that Big Four auditors do not universally enforce high-quality earnings, it may be that no incremental audit quality effect results from employing Big Four auditors in many of the World's poorest countries. Alternatively, based on the study of Boone et al. (2010), one may contend that actual audit quality is not necessarily the difference in these countries; it may be that stakeholders do not *perceive* Big Four auditors to supply higher audit quality than other auditors do. Another possibility is that there could be real differences in audit quality across the Big Four/non-Big Four dichotomy, but that audit quality is regarded as less important by capital providers of nonprofits than by capital providers of professional companies; the benefits of high-quality auditing may simply be larger for for-profit, listed corporations. Given that capital provision sometimes fits the characteristics of charity in the microfinance industry, it may be that control structures, in general, are less important among nonprofits. It may also be the case that alternative control structures, such as internal audits or supervision by international stakeholders, are more valuable in the nonprofit sector. Other explanations may also be valid; for instance, cultural variations may cause differences in managers' tendency to hire certain auditors (cf. Hope et al., 2008).

Irrespective of the explanations for the findings, there are potentially important policy implications of our study. Most importantly, Big Four auditors are more expensive than other auditors – in developing as well as in developed countries (Hay et al., 2006; Chung and Narasimhan, 2002), for unlisted entities (Peel and Makepeace, 2012), for nonprofits (Vermeer et al., 2009), for small organizations (Choi et al., 2008) and with respect to non-audit services (Fleischer and Goettsche, 2012). Why, therefore, should an organization pay extra for auditing if no benefits from the higher price can be documented? This argument may be even more valid for nonprofit organizations. That is, even if microfinance has been criticized for not being the quick fix in the fight against poverty that Nobel Laureate Mohammed Yumus in his Nobel lecture in 2006 expected that it would be, most people do agree that microfinance has a role to play in bringing people out of poverty (Imai et al., 2012; Odell, 2010). Therefore, there is no need for MFIs to spend excessively large amounts of

money on auditing that could have been used to supply poor people with entrepreneurial capital unless clear benefits from the extra payment can be documented.

Some caveats are, however, in order. First, we have a limited number of observations. Next, our data contains little information on access to equity; therefore, it may be the case that our indicator variables for access to the various sources of debt capital do not capture all aspects of fund raising. Moreover, even if no relationship to access to capital is found, the capital may still be cheaper for users of Big Four auditors. Although we do not find evidence of such an association, we acknowledge that it is statistically challenging to aggregate observations across very different interest rate regimes, particularly in an industry where grants and subsidies are common. Finally, it is notable that our results are average findings for 59 countries; we cannot rule out that a Big Four effect is present in some of these countries even if no association can be detected in the aggregate. Overall, we regard our findings on the possible consequences of audit quality for nonprofits in developing and emerging markets, as initial results in an area that so far has been subject to little academic research.

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Table 1: Geographical Distribution of Data Sample

Country	Observations No.	%	Country	Observations No.	%	Country	Observations No.	%
Albania	3	1.18 %	Georgia	4	1.57 %	Mozambique	2	0.78 %
Armenia	3	1.18 %	Ghana	4	1.57 %	Nicaragua	4	1.57 %
Azerbaijan	5	1.96 %	Guatemela	5	1.96 %	Niger	2	0.78 %
Benin	7	2.75 %	Guinea	1	0.39 %	Nigeria	1	0.39 %
Bolivia	18	7.06 %	Haiti	2	0.78 %	Paraguay	1	0.39 %
Bosnia Herzegovina	14	5.49 %	Honduras	6	2.35 %	Peru	13	5.10 %
Brazil	14	5.49 %	India	10	3.92 %	Philippines	2	0.78 %
Bulgaria	2	0.78 %	Jordan	4	1.57 %	Romania	1	0.39 %
Burkina Faso	2	0.78 %	Kazakhstan	2	0.78 %	Russian Federation	12	4.71 %
Cambodia	8	3.14 %	Kenya	5	1.96 %	Rwanda	4	1.57 %
Cameroun	3	1.18 %	Kosovo	3	1.18 %	Senegal	4	1.57 %
Chad	1	0.39 %	Kyrgyzstan	4	1.57 %	Serbia	1	0.39 %
Chile	2	0.78 %	Madagascar	2	0.78 %	South Africa	1	0.39 %
Colombia	1	0.39 %	Malawi	1	0.39 %	Tajikistan	7	2.75 %
Dominican Republic	1	0.39 %	Mali	2	0.78 %	Tanzania	2	0.78 %
Ecuador	13	5.10 %	Mexico	8	3.14 %	Togo	5	1.96 %
Egypt	4	1.57 %	Moldova	1	0.39 %	Tunisia	1	0.39 %
El Salvador	3	1.18 %	Mongolia	3	1.18 %	Uganda	3	1.18 %
Ethiopia	7	2.75 %	Montenegro	2	0.78 %	Zambia	2	0.78 %
Gambia	1	0.39 %	Morocco	6	2.35 %	Total	255	100 %

Table 1 lists the geographical distribution of the sample that is used in this study. The dataset was collected by hand and contains information from rating reports, so-called *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 or directly from MFIs' websites. The sample period is 2000 to 2009, with the vast majority of observations being from the last 5 years of this period.

Table 2: Descriptive Statistics for Data Applied in Multivariate Analyses

		Big Four			Not Big Four			Difference
		Mean	St. dev.	No. Obs.	Mean	St. dev.	No. Obs.	in means
Dependent variables	Local commercial debt (binary)	0.35	0.48	62	0.43	0.50	162	-0.08
(access to capital)	International commercial debt (binary)	0.57	0.50	67	0.35	0.48	161	**0.22**
	International subsidized debt (binary)	0.67	0.48	63	0.41	0.49	160	**0.26**
	Government agency debt (binary)	0.37	0.49	63	0.39	0.49	161	-0.03
	Voluntary saving (binary)	0.22	0.41	74	0.35	0.48	181	**-0.14**
Control variables	Size (ln[assets])	15.96	0.95	74	14.90	1.12	180	**1.06**
	Risk (PaR30)	0.03	0.06	74	0.06	0.07	176	**-0.03**
	ROA	0.05	0.06	74	0.03	0.07	179	**0.02**
	International initiation (binary)	0.54	0.50	74	0.41	0.49	179	0.13
	Regulated entity (binary)	0.29	0.54	73	0.28	0.45	180	0.00
	Investor protection	4.19	1.04	74	4.46	1.18	181	0.27
	HDI	0.71	0.11	74	0.67	0.15	180	0.03
	Domestic bank market (percentage share)	39.36	30.87	74	34.92	24.74	181	4.44
	Inflation	0.06	0.06	74	0.08	0.06	181	**-0.02**
Cost of debt capital	Interest on borrowings	0.05	0.07	74	0.06	0.06	180	-0.01
	Real interest rate (log)	0.00	0.07	74	0.04	0.27	179	-0.04

Table 2 lists descriptive statistics for the variables applied in the multivariate analysis; data are listed separately for Big Four and non-Big Four users. The difference in means between the two sub-samples is presented, with boldface denoting significantly different means (at a 5% level) as measured by a standard two-sided t-test. The dependent variables applied in the main analysis are binary indicator variables for access to specific sources of debt capital. The variables are equal to 1 if the MFI has access to the capital source in question, and 0 otherwise. In robustness tests, cost of capital variables are applied as explanatory variables: Interest on borrowings is paid interest divided by total debt. Real interest rate (log) is the natural logarithm of one plus the real interest rate on loans.

Table 3: Further Descriptive Statistics

		Big Four			Not Big Four			Difference
		Mean	St. dev.	No. Obs.	Mean	St. dev.	No. Obs.	in means
MFI type	Shareholder corporation (binary)	0.34	0.47	74	0.28	0.45	181	0.06
	NGO (binary)	0.62	0.49	74	0.48	0.50	181	**0.14**
	COOP (binary)	0.01	0.11	74	0.22	0.41	181	**-0.20**
	Branch offices (number of)	19.03	22.78	71	9.11	13.16	179	**9.92**
	Pure financial services (binary)	0.82	0.38	74	0.81	0.39	181	0.01
	Loan products (number of)	4.18	2.53	74	4.19	2.63	179	-0.01
	Urban vs. rural market (index 1 to 3)	2.34	0.85	74	2.14	0.87	176	0.20
	Village bank (binary)	0.19	0.39	74	0.20	0.40	176	-0.01
	Individual loans (binary)	0.88	0.33	74	0.87	0.34	180	0.01
	Solidarity group loans (binary)	0.69	0.47	74	0.66	0.47	178	0.03
	Religious initiation (binary)	0.26	0.44	74	0.15	0.35	179	**0.11**
	Government initiation (binary)	0.15	0.36	73	0.10	0.29	178	0.06
	Age MFI (years)	15.95	5.67	74	16.03	7.40	180	-0.09
	Market competition (index 1 to 7)	4.77	1.59	73	4.12	1.45	172	**0.65**
Social performance	Average loan amount (in USD)	893.26	920.43	72	840.16	1054.26	173	53.11
	Woman percentage (of clients)	0.68	0.24	40	0.71	0.22	79	-0.03
	Total number of clients	28733	44702	70	14554	36180	153	**14179**
Financial indicators	Operating expenses/Loan portfolio	0.27	0.21	74	0.25	0.17	178	0.02
	Personnel productivity (credit clients/employees)	149.19	93.29	73	115.29	68.39	175	**33.90**
	Debt-to-equity ratio	1.45	20.19	74	4.36	12.27	179	-2.91
Board characteristics	Board size (number of members)	6.91	2.71	70	6.74	3.23	174	0.18
	Board meetings (per year)	6.39	3.76	51	8.21	11.32	129	-1.82
	International directors (number of)	1.09	1.44	57	0.42	1.06	137	**0.66**
	Female directors (number of)	1.70	1.42	43	1.70	1.67	114	0.00
	Client directors (number of)	0.15	0.90	62	1.60	3.49	155	**-1.45**
	Donor directors (number of)	0.36	0.91	61	0.17	0.83	153	0.19
	Debt holder directors (number of)	0.15	0.54	62	0.05	0.35	155	0.10
	Female chair (binary)	0.23	0.42	56	0.20	0.40	147	0.03
	Board reporting Internal auditors (binary)	0.64	0.48	73	0.32	0.47	165	**0.32**
CEO characteristics	CEO/Chair duality (binary)	0.06	0.23	70	0.12	0.32	169	-0.06
	CEO/Founder duality (binary)	0.40	0.49	67	0.34	0.48	135	0.06
	Female CEO (binary)	0.24	0.43	70	0.28	0.45	161	-0.04
	Formal business education CEO (binary)	0.83	0.38	42	0.84	0.36	109	-0.01

Table 3 lists additional descriptive statistics. The variables are in general self-explanatory, but the following may be noted: 'Market competition' is a self-constructed index for the degree of competitiveness in the local market in which the MFI operates, based on information given in the rating report. The index takes values from 1 (low) to 7 (high). Urban vs. rural market is a three-point complexity index where 1 denotes that the MFI's main market is urban, 2 is rural and 3 is a combination of urban and rural. For the binary variables, 1 represents 'yes', 0 represents 'no'. The difference in means between the two sub-samples is presented, with boldface denoting significantly different means (at a 5% level) as measured by a standard two-sided t-test.

Table 4: Main Analysis of Access to Capital

Dependent variable:	Dummy local commercial debt		Dummy int. commercial debt		Dummy int. subsidized debt		Dummy gov. agency debt		Dummy voluntary saving	
	Coeff.	*z-value*	*Coeff.*	*z-value*	*Coeff.*	*z-value*	*Coeff.*	*z-value*	*Coeff.*	*z-value*
BigFour	-0.603	-1.63	0.348	0.95	0.563	1.47	-0.597	-1.57	-0.976	-1.95
Size (ln[assets])	0.230	1.64	**0.338**	2.25	**0.384**	2.51	0.253	1.66	**0.570**	2.93
Risk (PaR30)	-2.258	-0.84	**-6.178**	-2.00	**-6.043**	-2.15	2.148	0.88	**5.579**	2.03
Profitability (ROA)	-1.964	-0.86	-1.972	-0.82	-4.569	-1.86	4.392	1.67	-4.762	-1.35
International initiation	**-0.613**	-2.06	0.250	0.82	0.606	1.95	**-0.976**	-3.02	**-1.903**	-4.00
Regulated entity	-0.176	-0.47	-0.353	-1.01	-0.737	-1.86	0.054	0.14	**1.827**	4.33
Investor protection	-0.004	-0.04	-0.194	-1.44	0.099	0.73	-0.183	-1.34	0.164	0.92
HDI	1.189	0.97	2.271	1.81	1.238	0.97	1.628	1.26	**-4.085**	-2.73
Domestic bank market	-0.003	-0.57	**-0.015**	-2.32	-0.008	-1.39	0.010	1.71	**-0.037**	-3.44
Inflation	0.055	0.02	0.900	0.34	-2.853	-1.06	-5.215	-1.76	4.359	1.29
n	214		217		212		214		243	
Pseudo R^2	3.46 %		9.79 %		12.71 %		10.63 %		40.92 %	

Table 4 lists regression coefficients, z-values, number of observations (n) and Pseudo R^2 from the following logit regression: CapAccess = α + βBigFour + **γControl** + ε. The dependent variable CapAccess is a binary indicator variable for access to local commercial debt, a binary indicator variable for access to international commercial debt, a binary indicator variable for access to international subsidized debt, a binary indicator variable for access to government agency debt or a binary indicator variable for access to voluntary savings. BigFour is a binary indicator variable for use of Big Four auditors. Control is a vector of control variables. Control includes Size (the log of assets), Risk (PAR30 – the proportion of the loan portfolio that is more than 30 days past due), profitability (ROA - return on assets), a binary indicator variable for international initiation of the MFI, a binary indicator variable for MFI regulation, investor protection, the Human Development Index (HDI), the proportion (in percent) of the credit market served by domestic banks, and the inflation of the countries in which the MFIs are situated. Regression coefficients in **boldface** are significant at the conventional 5% level (tested two-sided).

Table 5: Alternative Analysis Using Cost of Capital Proxies

Dependent variable:	Interest on borrowings		Real interest rate (log)	
	Coeff.	*z-value*	*Coeff.*	*z-value*
BigFour	-0.008	-0.75	-0.056	-1.69
Size (ln[assets])	-0.001	-0.33	**0.039**	2.95
Risk (PaR30)	-0.035	-0.52	0.365	1.64
Profitability (ROA)	-0.007	-0.10	-0.169	-0.77
International initiation	**-0.017**	-2.02	**-0.063**	-2.23
Regulated entity	-0.009	-0.96	-0.010	-0.31
Investor protection	-0.001	-0.20	0.018	1.49
HDI	**0.093**	2.70	**0.373**	3.28
Domestic bank market	0.000	-0.83	**-0.001**	-2.51
Inflation	0.103	1.40		
n	243		242	
Adjusted R^2	4.53 %		9.33 %	

Table 5 repeats the analysis of Table 4 using cost of capital variables as dependent variables. Because the dependent variables now are continuous rather than binary variables, OLS estimation replaces logit estimation. The cost of capital variables investigated includes interest on borrowings (paid interest divided by total debt) and real interest rate (log) (the natural logarithm of one plus the real interest rate on loans).