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The Impact of Informal Institutions on Microfinance Performance

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Spring 2012

NEKN05 Economics: Master Essay
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Abstract

In recent years, microfinance has evolved as an alternative method of providing credit to poor borrowers in developing countries. Despite high expectations and appraisals, the performance of microfinance institutions has been found to differ significantly between different countries. Previous research has focused mainly on formal institutions and macroeconomic conditions as potential explanations for these differences. Due to the informal characteristics of microfinance, however, this thesis shifts focus by instead analysing the effects of informal institutions on the cross-national variation in microfinance performance. Empirically, this is done in a number of cross-country multiple linear regression models. Average country-level microfinance performance data over the years 2003-2010 is used together with survey data on informal and formal institutions. In its largest sample, this study covers 72 developing countries from all over the world. The results of this study generally support the hypothesis that informal institutions are important determinants of microfinance performance. In particular, the microfinance interest rates are found to be significantly lower in countries with relatively strong collectivist cultural norms. Moreover, microfinance institutions tend to perform better in countries that have higher levels of social trust, a more equal income distribution, and that are more culturally homogeneous. As such, the results also confirm the idea that social collateral can serve as a substitute for physical collateral. All in all, this study concludes that microfinance can work as a viable substitute for formal financial institutions in countries where formal institutions are weak, but cooperative informal institutions are strong.

Keywords: *microfinance, new institutional economics, informal institutions, trust, culture*

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List of Abbreviations

CGAP	Consultative Group to Assist the Poor
ELF	ethnolinguistic fractionalisation
GBS	Global Barometer Surveys
GDP	gross domestic product
IDV	individualism index
MFI	microfinance institution
MIX	Microfinance Information Exchange
NIE	new institutional economics
OLS	ordinary least squares
OSS	operational self-sufficiency
PAR	portfolio at risk
RESET	regression specification error test
RL	rule of law
ROSCA	rotating savings and credit association
VIF	variance inflation factor
WDI	World Development Indicators
WGI	Worldwide Governance Indicators
WVS	World Values Survey

1 Introduction

One major issue facing poor people in developing countries is their lack of access to credit through formal lenders and financial institutions, implied by their lack of physical collateral. This makes poor people particularly vulnerable to income shocks and has a negative impact on their entrepreneurial activities and investment rates. In the end, this may also hamper economic growth and development. Microfinance, or microcredit, is an increasingly often-suggested solution to this problem. Generally, microfinance institutions (MFIs) use the features of informal group lending schemes to reach the poor. Following the 2006 Nobel Peace Prize laureate Muhammad Yunus' Grameen Bank of Bangladesh, the number of MFIs providing loans to poor people around the world has also increased rapidly.

Development economists have generally welcomed this so-called 'microfinance revolution' as a new tool for credit market expansion, poverty reduction and social change. At the same time, however, others have been more sceptical and criticised the method. In particular, the MFI repayment rates, interest rates and sustainability ratios differ quite substantially between different countries, regions and institutional environments (Ahlin et al. 2011). As argued by Armendáriz and Morduch, microfinance has great potential but "cannot be expected to work everywhere or for everyone" (2010: 5). Despite this cross-national variation in microfinance performance, as well as the relatively vast amount of research already conducted on the topic of microfinance, surprisingly few studies have analysed the country-level conditions in which microfinance seems to work best.

Previous empirical studies analysing the determinants of microfinance performance have focused mainly on MFI characteristics or formal institutions and the macroeconomic context (Cull et al. 2007; Ahlin et al. 2011). This study takes another focus, by arguing that MFI performance also depends on informal institutions. This hypothesis builds on previous case and experimental studies suggesting that social capital and trust improve microfinance performance (Karlan 2005; Karlan et al. 2009; Cassar and Wydick 2010). Nevertheless, this is, to the author's awareness, the first cross-national study that also takes informal institutions into account as potential determinants of MFI performance.

1.1 Research Question

This study's aim is to empirically analyse the determinants of the cross-national variation in MFI performance, by including indicators of both informal and formal institutions. This task is important since it may provide an institutional answer to the previously unsolved issue of why MFIs perform better in some societies than in others. As such, it may also give an answer to the problem that "we do not yet have a good theory of why people repay their micro-credit loans that does not rely on people's innate desire to repay" (Banerjee and Duflo 2010: 75). Second, this may also have important policy implications for how to improve microfinance performance. Third, this study's focus on informal institutions may also provide a potential solution to the question of whether or not microfinance can serve as a substitute for formal credit providers in countries where formal institutions are weak, but informal institutions are strong.

The general research question of this study is:

What are the effects of informal institutions, such as trust and collectivist social norms, on country-level microfinance performance, as measured by MFI default rates, interest rates and sustainability ratios?

1.2 Methods and Material

As the main theoretical framework, this study applies theories of the new institutional economics (NIE). In its empirical part, quantitative, econometric methods are applied to test the hypothesis that informal institutions affect microfinance performance. More specifically, a number of cross-country multiple linear regressions are performed to assess the determinants of MFI performance variations. Country-level MFI performance data is collected from the Microfinance Information Exchange's (MIX) database *MIX Market*, averaged over the period 2003-2010. Data on cultural and institutional indicators is collected from various sources, including survey-based measures from the World Values Survey (WVS). In its largest sample, this study covers 72 developing countries from all around the world. Finally, these results are also checked for robustness.

1.3 Limitations

The main limitations of this study are due to lack of data, particularly on informal institutions. First of all, an obvious limitation is the difficulty of quantifying concepts such as culture, norms and values. For instance, data on trust and individualist/collectivist cultural norms are based on surveys and, as such, imperfect measures. Previous studies, however, have found these survey-based indicators to serve as useful proxies for country-level informal institutions and cultural values (Knack and Keefer 2003). Second, this survey data is only available for a limited number of countries, which may cause a sample bias. Still, the sample is relatively large in relation to the number of countries with present MFIs (MIX 2010). Also, the sample still shows large cross-national variations in all the included variables. Third, this study only focuses on country-level analyses. Thus, while microfinance performance differences could also be due to certain MFI and/or within-country characteristics, these potential effects are neglected in this study. Instead, aggregated country-level and time-period averages are applied. Another concern neglected in this study is reverse causality. While a country's MFI performance could, at least theoretically, affect its institutions, this possibility is assumed to be unlikely. The main reason for this is that microfinance still makes up a relatively limited share of the whole economy, and that institutions take long time to change (Williamson 1998). Finally, it should also be noted that only MFI *performance* is analysed, not the microfinance *impact* on, for instance, poverty reduction.

1.4 Disposition

The outline of this paper is as follows. In Chapter 2, the theoretical framework of this paper is presented and discussed. This chapter includes a short background on the economics of microfinance, followed by a discussion on the NIE and the importance of informal and formal institutions for microfinance performance. This chapter also outlines the theoretical hypotheses that are being tested in this paper. In Chapter 3, the empirical framework, data and methodology of this study are presented. This chapter also defines and discusses the variables applied, as well as the basic regression equation. Chapter 4, thereafter, presents and analyses the descriptive statistics, regression results and robustness checks. Finally, Chapter 5 concludes with a summarising discussion, together with some policy implications and suggestions for future research.

2 Theoretical Framework

The economic theories of microfinance generally depart from the neoclassical economic assumptions of perfect competition and no transaction costs. The main reason for this is that microfinance has evolved as a potential solution to informational imperfections and market failures, in which formal lenders are unsuccessful in serving poor borrowers. As such, microfinance theories can also be seen as an application of the NIE on the economics of microfinance (Lepenies 2008). Furthermore, the similarities between microfinance and informal financial markets also provide an important reason for studying the relationship between microfinance and informal institutions. In particular, theories of social capital, trust and cultural norms are discussed in the following sections.

2.1 The Economics of Microfinance

In developing countries, many entrepreneurs lack access to the formal financial sector. These are poor people running small and informal businesses, often in rural areas (Secondi 2008). While access to credit may be crucial for these entrepreneurs and businesses, formal banks are generally not interested in providing loans to them. The reason for this is twofold. First, the loans are often considered too small to be economically viable. Second, the loans are often considered too risky, due to the borrowers lack of physical assets to provide as collateral. Thus, poor borrowers generally have to turn to the informal credit market instead, by borrowing from friends, relatives or local informal moneylenders.

A fundamental problem of credit markets is the risk of default, both involuntary and strategic, which are also outcomes of informational imperfections (Ray 1998). In formal credit markets, this problem is generally solved by the use of collateral in some monetary form. Thus, lending to poor people who lack collateral "is expensive due to high screening, monitoring and enforcement costs" (Karlan 2007: 52). In informal credit markets, however, the lenders often have more information about the borrowers. As such, they may also rely on other nonmonetary forms of collateral. Nevertheless, informal credit markets are often characterised by very high interest rates (Robinson 2009). Moreover, other characteristics of informal credit markets are informational constraints, segmentation, interlinkage, interest-rate variation, credit rationing and exclusivity

(Ray 1998). Thus, in combination with weak formal institutions, the problem of providing credit to small and poor borrowers remains an important issue, particularly in developing countries.

The effects of this problem is an inefficient outcome where poor people cannot make use of their entrepreneurial potentials, and where otherwise profitable investments will not be undertaken. In the end, this will lead to an underutilisation of economic potential and, as such, may hamper economic growth. Moreover, the lack of credit also has negative direct effects for the livelihoods of the poor. As a potential solution to this problem, however, recent years have seen a rapid increase in the number of MFIs providing credit and other financial services to poor people around the world. The central feature of microfinance, or microcredit, is that it provides small loans to poor people who lack assets and physical collateral. By imitating the features of informal credit markets, and by lending to groups instead of individuals, microfinance aims to overcome the informational constraints. That is, to solve the problems of loans being too small and risky. Other common features of microfinance are gradual repayments, sequential lending and focus on female borrowers (Yunus 1999).

Over the last three decades, microfinance has turned into a 'movement'. Today, MFIs cover over 150 million people, of which over 100 million are living below the poverty line of one dollar per day (Armendáriz and Morduch 2010). Still, however, between 1 and 2 billion people remain unbanked or under-banked (Armendáriz and Morduch 2010). In other words, there is still a great potential for further expansions of the microfinance movement around the world.

According to Yunus (1999), the idea of microfinance is that, instead of relying on collateral, the borrowers' prospects of earning a higher income and eventually moving out of poverty is sufficient to motivate them paying back their loans. Other economists, however, have argued that group lending and the use of information are the essential features of microfinance (Ray 1998). In contrast to formal financial institutions, these economists argue, microfinance has evolved as a solution to "market failures that stem from poor information, high transaction costs, and difficulties enforcing contracts" (Armendáriz and Morduch 2010: 23). In other words, the microfinance evolution is due to the presence of informational asymmetries, adverse selection and moral hazard, which make formal financial institutions unsuccessful in serving the poor.

By imitating the features of informal group lending in credit cooperatives and rotating savings and credit associations (ROSCAs), microfinance may thus solve the hidden information problem

that generally characterises formal financial institutions (Armendáriz and Morduch 2010). As such, a central feature of microfinance is group responsibility, or joint liability, which leads to self-selection through positive assortative matching (Ray 1998). This means that no group member is allowed to borrow again in the case of default. As a consequence of this, the borrowers will benefit from using their local information to form groups with as non-risky borrowers as possible through screening (Hermes and Lensink 2007). Moreover, the risk of default is also lowered through peer monitoring. This means that group members, through group pressure, can influence other borrowers in the group to use their money more risk-aversely (Ray 1998).¹

When peer monitoring does not function well, however, a common "concern is that loans are not always used for what they were intended" (Secondi 2008: 393). Instead of using the loan for business and investment, borrower may end up spending it on consumption. Such misuse would increase the risk of default and, consequently, decrease repayment rates. Thus, while microfinance is not free from drawbacks, it is generally assumed to be a possible way of providing credit to poor people without relying on physical collateral or unreasonably high interest rates (Armendáriz and Morduch 2010). Nevertheless, as argued by Armendáriz and Morduch, microfinance "cannot be expected to work everywhere or for everyone" (2010: 5). Previous empirical studies have found large country-level variations in the financial performances, such as repayment rates, interest rates and sustainability ratios, of MFIs around the world (Cull et al. 2007; Ahlin et al. 2011).

Using data on the financial performance of 124 MFIs, Cull *et al.* (2007) aim to explain the MFI performance variation by the type of lending method applied. Nevertheless, Cull *et al.* (2007) also find regional dummy variables to be significant, concluding that it could be cultural and "social factors that are ultimately driving the relationships [they] find rather than lending methods" (2007: 111). A recent study by Ahlin *et al.* (2011) further investigates this question by analysing the cross-national variation in MFI performance in a country-level macroeconomic context. In their study, they conclude that "the country context appears to be an important determinant of MFI performance" (Ahlin et al. 2011: 105). While, for instance, low income inequality is found to have positive effects on MFI performance, they also find that "MFIs don't always do better, and sometimes seem to do substantially worse, where institutions are more advanced" (Ahlin et al.

¹ While not all microfinance *per se* takes the form of group lending, this, or similar lending methodologies, is still a central feature of microfinance, and also the most commonly used (Armendáriz and Morduch 2010).

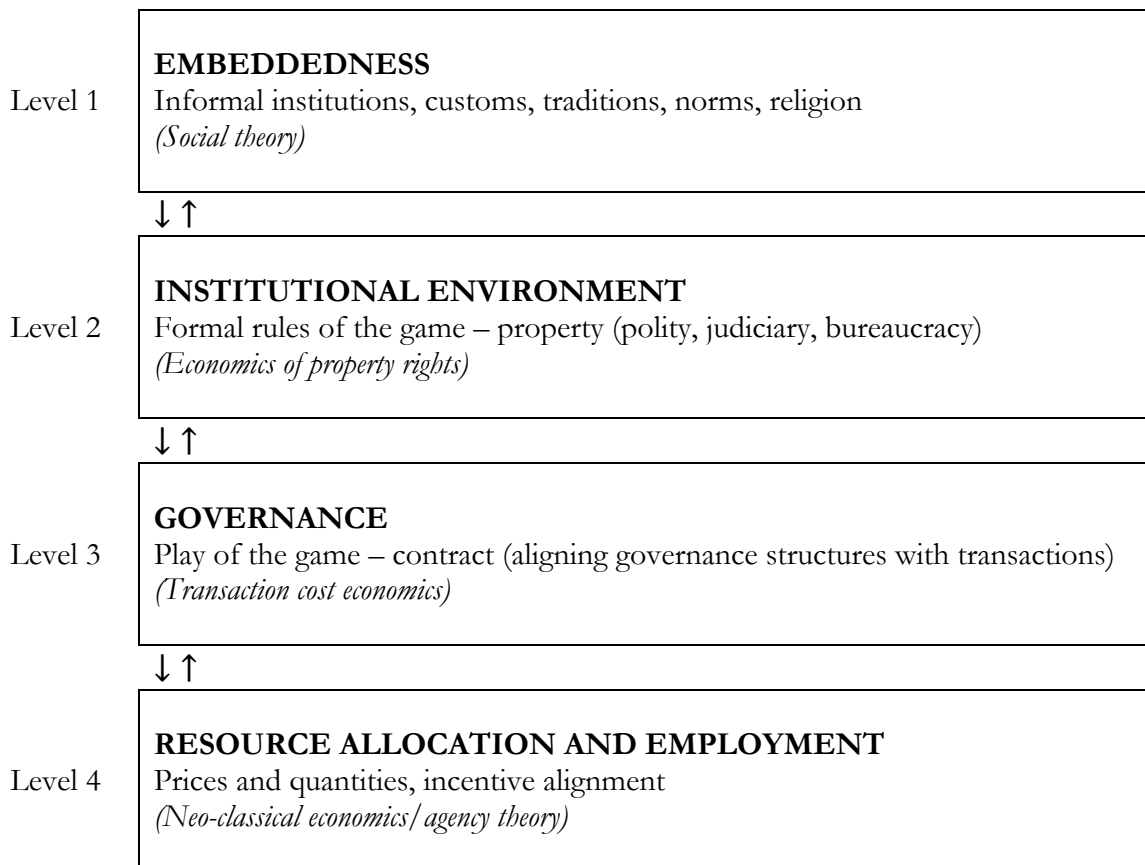
2011: 119). A potential reason for these non-conclusive results may be that Ahlin *et al.* (2011) are not taking informal institutions into account. Instead, they are only focusing on formal and macroeconomic institutions' impact on microfinance performance. Previous experimental case studies, however, find that individuals with stronger social connections and a similar culture tend to have higher repayment rates (Cassar et al. 2007; Karlan 2007). As such, the concept of social capital is often applied as a potential explanation for microfinance success (Ito 2003).

2.2 The New Institutional Economics and Informal Institutions

The NIE framework is particularly suitable for analysing microfinance, as it abandons the neoclassical assumptions of perfect information and no transaction costs (Furubotn and Richter 2005). Instead, NIE theorists argue that formal and informal institutions are created to reduce transaction costs and risks. A common definition of institutions is as "the humanly devised constraints that structure political, economic and social interactions" (North 1991: 97). As such, institutions also differ from organisations, which may be defined as "the different modes of governance that agents implement to support production and exchange" (Ménard and Shirley 2005: 1). Thus, it should be noted that, despite its name, an MFI is considered as an organisation and not an institution.

The economics of institutions and the interactions between formal and informal institutions are further illustrated in Figure 1 below, which is based on Williamson (1998).

Figure 1: Williamson's economics of institutions



Source: Williamson (1998: 26, 'Figure 1').

As shown in Figure 1, Williamson (1998) distinguishes between four levels of institutions and analysis. This multilevel framework also illustrates how institutions “consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights)” (North 1991: 97). In Figure 1, the embeddedness and institutional environment levels represent these informal and formal institutions, respectively (Williamson 1998). Moreover, a higher level puts constraints on the lower levels. As such, for instance, the informal institutions of the embeddedness level (Level 1) impose constraints on the formal institutional environment (Level 2), and so on. Over time, there is also feedback from lower levels back to higher levels (Williamson 1998). This feedback possibility, however, is mainly present in the long run and not considered in this paper.

Thus, the focus of this study is on the effects that the first and second levels of this institutional matrix, particularly the former, may have on MFIs and their performance. By many economists, and in previous studies on microfinance, this social embeddedness level is often taken as given (Williamson 1998). At the same time, informal institutions, including culture, customs, traditions,

norms and religion, "have a lasting grip on the way a society conducts itself" (Williamson 1998: 27). The formal institutional environment, then, provides the formal rules of the game. This includes the polity, judiciary and bureaucracy of government, as well as property rights and the rule of law. In other words, formal institutions consist of rules and regulations, while informal institutions are made up of moral, ethical and behavioural norms. Both of these types of institutions, and how they differ across countries, are likely to affect microfinance performance.

For example, MFIs potential for overcoming the informational constraints through the mimicking of informal networks is assumed to differ between different societies. An important reason for this is that both formal and informal institutions, including cooperative behaviour, differ between different countries (Ménard and Shirley 2005). As such, the performance of MFIs is also assumed to vary with different institutional contexts and environments. While the impact of formal institutions on MFI performance has been analysed before (Ahlin et al. 2011), the hypothesis of this paper is that informal institutions also affect country-level MFI performance, and possibly even more than formal institutions. The reason for this is that microfinance has evolved as an alternative path for overcoming the shortcomings of formal institutions in developing countries, such as weak legal and financial systems. Instead, microfinance is assumed to rely on strong informal institutions, such as high levels of social capital and trust. In other words, microfinance performance is assumed to be high as long as social collateral can serve as a viable substitute for physical and monetary collateral (Karlán et al. 2009).

2.2.1 Social Capital and Trust

Social capital and trust are commonly related to microfinance in previous theoretical literature and case studies. As an informal institution, social norms "specify what actions are regarded by a set of persons as proper or correct, or improper and incorrect" (Coleman 1990: 243). Social capital, in turn, may be defined as "features of social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions" (Putnam 1993: 167). With respect to financial performance, a case study on group banking in Peru suggests that social connections lead to higher repayment rates, at least on the individual level (Karlán 2007). Trust and trustworthiness are also particularly central themes within the theories of social capital (Keefer and Knack 2005).

As with MFI performance, the levels of trust and trustworthiness vary significantly across countries. In relation to microfinance, this is particularly important since trust-promoting social norms can solve problems of credible commitments (Keefer and Knack 2005). The reason for this is that, in the absence of trust, contracting parties have to rely on spot markets instead of contracts across time and space (Keefer and Knack 2005). Spot markets, however, are incompatible with credit transactions, since the latter relies on the promise of future repayments. In other words, trust is a necessity for any credit market relying on credible promises rather than collateral. As such, it is also assumed to be an important determinant of microfinance performance.

Similarly, the joint liability and sequential lending features of microfinance make trust a necessity as any individual group member must trust its peers. Moreover, trust and norms "produced by common values, informal networks, and associational memberships can be viewed as analogous to legally enforced property and contract rights" (Knack 2003: 17). As such, trust may also serve as an imperfect substitute for formal institutions in countries where those are weak (Keefer and Knack 2005). Taken together, the literature on social capital and trust suggests that a society's level of trust should have a positive impact on its microfinance performance. Thus, this leads to the following hypothesis:

H1: *The higher a society's level of trust, the better the performance of MFIs.*

2.2.2 Norms and Cultural Beliefs

Generally, the broad concept of culture may be defined as "the values shared within a community" (Ostrom 2005: 27). Thus, in addition to the content of a society's norms and values, its level of cultural homogeneity also has some important implications. On the one hand, cooperative rules and norms are more likely to evolve in societies that share a common set of values (Ostrom 2005). On the other hand, when "participants in a situation come from many different cultures, speak different languages, and are distrustful of one another, the costs of devising and sustaining effective rules are substantially increased" (Ostrom 2005: 27). Similarly, norms, beliefs and other informal institutions are affected both by a society's history and by its ethnolinguistic heterogeneity (Shirley 2005). In relation to financial performances, experimental case studies have found that more culturally homogeneous ROSCAs have lower default rates

(Cassar et al. 2007; Karlan 2007). A country's level of ethnolinguistic fractionalisation, or cultural heterogeneity, is therefore assumed to affect its MFI performance negatively. This potential effect is consequently controlled for in the empirical part of this study.

Other concepts of culture and norms may also be important in relations to microfinance and informal institutions. In particular, the theories of norms and cultural beliefs differ between collectivist and individualist societies (Greif 1994; 2005). In collectivist societies, "social structure that are based on kin, place of birth, or religion ... are prominent and members of those societies feel involved in the lives of other members of the group" (Greif 2005: 762). In individualist societies, "the individual and family, rather than the larger, innate social structure, are prominent and individuals expect that others will interfere relatively little in their affairs" (Greif 2005: 762). Moreover, individualist cultural beliefs are assumed to weaken "the dependence of each individual on any specific group, thereby limiting each group's ability to use economic, social, and moral sanctions against individual members" (Greif 1994: 942). Applied to microfinance, peer monitoring should consequently work better in collectivist relative to individualist societies. Well-functioning peer monitoring, then, should lead to higher MFI performance. Furthermore, individualist societies rely more on formal institutions, while collectivist societies rely more on informal institutions (Greif 1994). Due to the informal characteristics of microfinance, this leads to the second hypothesis of this paper:

H2: The more collectivist a society, the better the performance of MFIs.

2.2.3 Formal Institutions and Macroeconomic Indicators

Finally, formal institutions and the macroeconomic context may also affect microfinance performance (Ahlin et al. 2011). Regarding the macroeconomic environment, high levels of economic growth may increase demand as well as business and investment opportunities for microfinance clients. At the same time, the microfinance sector may depend on a strong informal economy, which tends to become weaker with economic growth and development (Ahlin et al. 2011). As a net effect, some previous empirical findings suggest that "MFIs cover their costs better when macroeconomic growth is higher, due in large part to lower default rates and operating costs" (Ahlin et al. 2011: 106). Other studies, however, have not found economic

growth to be a statistically significant determinant of microfinance performance, except for a negative relationship with the portfolio at risk measure of default rates (Gonzalez 2007).

Moreover, previous studies have found income inequality to be associated with lower microfinance performance, in terms of higher default and interest rates, and lower MFI sustainability (Ahlin et al. 2011). Three possible theoretical explanations are suggested for this negative impact of income inequality on MFI performance (Ahlin et al. 2011). First, inequality may be related to dualistic economies, meaning that microfinance clients and entrepreneurs lack linkages to broader markets. Second, with high inequality, microfinance may be captured by the relatively better-off local elites. As these elites are less dependent on the MFIs, they are also likely to have lower repayment disciplines. Third, it may also be the case "that MFIs in more unequal countries focus more on social goals, aiming to serve the poorer clientele despite the higher operating and default costs entailed" (Ahlin et al. 2011: 115). Thus, since both growth and inequality have previously been found to affect MFI performance, both of these potential effects are further controlled for in this study.

Finally, differences in formal institutions may also be an important determinant of the cross-national variation in microfinance performance. As discussed in relation to Williamson's (1998) institutional framework, the formal institutional environment provides the rules of the game. In particular, property rights and the rule of law are important indicators of this formal institutional level (North 1991; Williamson 1998). However, the impact of formal institutions on MFI performance is not necessarily positive (Ahlin et al. 2011). On the one hand, strong formal institutions and rule of law may create a stable macroeconomic environment. On the other hand, previous empirical results also "suggest that microfinance is a substitute for, or even benefits from, weak institutions" (Ahlin et al. 2011: 106). A possible explanation for this is that strong formal institutions may create other opportunities outside the microfinance sector. As such, borrowers are less dependent on the MFIs, and default rates may be higher (Ahlin et al. 2011). In other words, microfinance performance is assumed to be more related to informal than to formal institutions, and possibly even negatively to the latter. More specifically, the third and final hypothesis of this study is the following:

H3: *The weaker a society's rule of law, the better the performance of MFIs.*

3 Data and Methodology

The overarching hypothesis of this paper is that institutions, particularly informal, matter in the sense of being significant determinants of the cross-national variation in microfinance performance. The method used to empirically test this hypothesis is a quantitative, econometric approach. In a number of cross-sectional multiple linear regressions, three different indicators of the aggregated country-level MFI performance are used, respectively, as the dependent variable. The three MFI performance indicators are measures of default rates, interest rates and sustainability ratios. A number of country-level indicators are used as independent variables, including measures of informal and formal institutions. All the included explanatory variables are either theoretically assumed to affect microfinance performance, or have previously been found to have explanatory power on country-level MFI performance. All models are estimated via ordinary least squares (OLS) and further checked for robustness.

Cross-sectional regressions, rather than panel estimations, are chosen for a number of reasons. First of all, the availability of time-series data is generally insufficient, both regarding MFIs and most of the independent variables. Also, inspections of the time-series data available indicate that the cross-national variation is much larger than variations over time. Regarding the possibility to combine country-level data with MFI-level data, this would cause an extremely unbalanced panel. More importantly, the included explanatory variables are only reported on a country-level basis anyway. Thus, aggregated country-level data averaged over the years 2003-2010 is used for most variables, with average MFI size being the control variable for MFI characteristics.

3.1 Dependent Variables: Microfinance Institution Performance

The Consultative Group to Assist the Poor (CGAP) recommends a number of financial ratios to compare MFI performances. In this paper, three of these ratios are used, respectively, as the dependent variable in a number of multiple regressions. Since neither default nor interest rates are reported directly in the MIX's (2010) database *MIX Market*, the portfolio at risk and yield on gross portfolio are used as proxies. This is also in line with the CGAP (2003) microfinance consensus guidelines, and further recommended by Armendáriz and Morduch (2010). The

operational self-sufficiency is used as proxy for MFI sustainability ratios, as in previous empirical studies on microfinance performance (Cull et al. 2007; Ahlin et al. 2011).

The indicator of default rates is included since a main concern of microfinance is whether or not repayment rates can remain high, despite its non-use of collateral. As a measure of default rates, the portfolio at risk (PAR) after 30 days ratio is commonly applied (Armendáriz and Morduch 2010). Thus, this measure is the first financial ratio used as a dependent variable, and calculated as:

$$PAR(30 \text{ days}) = \frac{\text{Portfolio at risk (after 30 days)}}{\text{Gross loan portfolio}}$$

The numerator, portfolio at risk, measures the "value of all loans outstanding that have one or more instalments of principal past due more than a certain number of days" (CGAP 2003: 6). Thus, divided "by the gross loan portfolio, the portfolio at risk measure gives the percentage of loans outstanding that are at substantial risk of default as signaled by difficulties that have already emerged" (Armendáriz and Morduch 2010: 247).

Second, an indicator of average interest rates is used since MFIs have been widely criticised for charging too high interest rates to borrowers (Cull et al. 2009). The real portfolio yield, or the real yield on gross loan portfolio, "is effectively an average interest rate (including loan-related fees), with weights given by the volume of loans at different prices" (Armendáriz and Morduch 2010: 247). Thus, this financial indicator is used as the dependent variable in another set of regressions, and calculated as:

$$\text{Yield on gross loan portfolio} = \frac{\text{Cash financial revenue from loan portfolio}}{\text{Average gross loan portfolio}}$$

The *real* yield on gross portfolio, which is used in this paper, is also adjusted for inflation.

Finally, the operational self-sufficiency (OSS) ratio is used to analyse the cross-national variation in MFI sustainability/profitability ratios. This commonly used indicator of MFI financial performance "measures the extent to which the operating revenues of a microfinance institution cover its operating costs" (Armendáriz and Morduch 2010: 243). This last ratio is calculated as:

$$OSS = \frac{\textit{Operating revenue}}{\textit{Financial expense} + \textit{Loan-loss provision expense} + \textit{Operating expense}}$$

An operational self-sufficiency ratio of 100 percent or higher indicates that the MFI is self-sufficient. That is, it can continue to operate at its present scale without additional outside funding (Armendáriz and Morduch 2010). The numerator, operating revenue, is mainly generated from interests and fees paid by borrowers. As such, the operational self-sufficiency ratio is *positively* related to the interest rate. The financial expense includes, for instance, interests and fees paid by the MFI to commercial banks, shareholders, investors and depositors. The operating expense includes costs such as rents, wages and transport costs. Finally, the loan-loss provision expense is the amount set aside to cover defaulted loans. Thus, the operational self-sufficiency ratio is *negatively* related to default rates. In other words, this MFI sustainability indicator takes positively into account both the extent to which the borrowers repay their loans and how much they pay in interests. This, however, complicates the use of this indicator somewhat. In this study, high microfinance performance namely means high repayment rates (that is, *low* default rates) as well as *low* interest rates. However, the net effect of combined low default and interest rates on the operational self-sufficiency ratio is ambiguous, as they may take each other out. Despite this, the ratio is commonly used as an MFI performance indicator, as the self-sufficiency of MFIs has been a particular long-run concern (Armendáriz and Morduch 2004). As such, it is also included here to measure the net effects on the sustainability/profitability of MFIs.

Data on these MFI performance indicators is collected from the database *MIX Market* (MIX 2010). This database is managed by the non-profit organisation MIX, providing "objective, qualified and relevant microfinance performance data and analysis" (MIX 2010). As such, the *MIX Market* database includes financial and social performance information and data on a large number of MFIs from all around the world (MIX 2010). This database is also commonly used in previous empirical studies on microfinance performance (Cull et al. 2007; 2009; Ahlin et al. 2011).

Since the aim of this paper is to explain the cross-national variation in microfinance performance, and since the institutional variables are reported on country levels only, the MFI performance data is applied on an aggregated country level. First of all, the yearly median values of the MFI performance indicators in each country, as reported by the MIX (2010), are collected. The main reason to use median values, rather than means, is that this "removes the influence of outliers,

such as the influence of extremely large MFIs on outreach results or exceptionally efficient MFIs on efficiency results" (MIX 2010). This use of medians also follows the methodology used in previous studies (Ahlin et al. 2011). The *MIX Market* data is further adjusted for inflation, subsidised costs of fund, in-kind subsidy, loan loss provisioning and write-off policies (MIX 2010). These adjustments follow the CGAP (2003) recommendations on standard adjustments for microfinance performance data. Second, to control for yearly variations, country averages over the time period with available data (that is, over the years 2003-2010) are calculated and weighted according to the number of institution reported in each country and year. This control for time deviations also follows the idea that institutional change takes many years (Williamson 1998), as well as the practical matter of data on informal institutions only being reported sporadically.

As such, data on each of the three MFI performance indicators are collected and computed on an aggregated country level. To increase reliability of the data, countries with less than 10 MFI observations over the whole 2003-2010 period are excluded. Finally, this gives a sample of 72 different countries with available MFI performance data. As with previous cross-country analyses of MFI performance (Ahlin et al. 2011), this study makes no claims on using a random sample. Rather this sample is purposely selected on the criteria of data availability. At the same time, this sample includes all countries with reliable data on microfinance activities reported in 2010 (MIX 2010).

3.2 Independent Variables: Trust, Individualism and Rule of Law

Two different measures of informal institutions are used as independent variables. These are social trust and individualist versus collectivist cultural norms. Theoretically, these measures of informal institutions should affect MFI performance, as discussed in the previous chapter. Nevertheless, they have, to the author's awareness, never been used as potential explicators in previous cross-national analyses on microfinance performance. The hypotheses, as stated previously, are that a society's level of trust should affect its MFI performance positively, while a high degree of individualism should affect it negatively.

The first independent variable, trust, serves as a proxy for social capital (Knack and Keefer 2003). The methodology of measuring country-level interpersonal social trust follows that used by, for

instance, Knack and Keefer (2003). As such, the trust indicator is a survey-based measure of the level of social trust in different societies. Such a measure is generally collected from the WVS (2012). This survey asks the following question to a large number of individuals in different countries (WVS 2012):

'Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?'

A country's level of social trust is then measured as the percentage of people answering that *'Most people can be trusted'* (in contrast to *'Can't be too careful'*), after removing the *'Don't know'* answers (WVS 2012). While such an attitudinal measure may, for obvious reasons, be subject to sampling error, response bias and translation difficulties, it has also been criticised for not measuring the trusting behaviour of individuals (Glaeser et al. 2000). At the same time, however, experimental studies have found that this measure "may be good at predicting the overall level of trustworthiness in society" (Glaeser et al. 2000: 813). Similarly, cross-national studies have also found this survey-based measure of social trust to be highly correlated with the norms of civic cooperation, or trustworthiness, in different societies (Knack and Keefer 2003). That is, the average answers given to this survey-based trust-in-people question seem to be a strong indicator of the general trustworthiness behaviour in different countries, while not necessarily corresponding to each individual's personal level of trust (Knack and Keefer 2003). As such, it is still assumed to serve as a useful proxy for country-level social capital and trust. In contrast to previous case studies and experimental methods of analysing the trust and social capital impact on MFI performance (Karlán 2005; 2007; Cassar et al. 2007), this measure also has the advantage of using the same question over time and space. As such, this measure allows for the possibility of cross-national comparisons.

Up to date, five waves of the WVS (2012) have been conducted, each including the answers to this question in a relatively large number of countries. Since the countries included in each wave differ, this study uses the answers reported in the most recent survey available for each country. For most countries included in this study, this is the fifth wave conducted in 2005-2008 (28 countries). For a smaller number of countries this corresponds to the fourth wave in 1999-2000 (10 countries) and the third wave in 1995-1998 (4 countries). Since informal institutions, such as trust, are assumed to change very slowly over time (Williamson 1998), this use of data should not cause too much of a time bias. In order to improve the sample size, the WVS (2012) data is also

complemented with the corresponding survey data collected by the Global Barometer Surveys (GBS). This database includes the Latinobarómetro (2012), the Afrobarometer (2009), the East Asian Barometer (2009) and the Arab Barometer (2007).² These surveys ask the same question as the WVS (2012) to approximately the same number of individuals in each country. All in all, this gives a sample of 58 countries with available data on both trust and the MFI performance indicators.

The second independent variable is the national-culture dimension of individualism versus collectivism. The measure used for this variable is the individualism index (IDV), developed and collected by Hofstede *et al.* (2010). The individualism versus collectivism country scores were initially based on data collected from IBM's employee values scores, and later extended (Hofstede *et al.* 2010). In the composition of this index, individualism is defined as "a society in which the ties between individuals are loose: everyone is expected to look after him- or herself and his or her immediate family only" (Hofstede *et al.* 2010: 519). The opposite, collectivism, is defined as "a society in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lives continue to protect them in exchange for unquestioning loyalty" (Hofstede *et al.* 2010: 515). The individualism index is then ranged from 0 to 100, where a high value indicates a high degree of individualism and a low value indicates a high degree of collectivism. These country scores are also relatively stable over time (Hofstede *et al.* 2010). Combined with data on the MFI performance indicators and trust, this index is available for a sample of 40 countries.

As the country-level formal institutions are also assumed to affect MFI performance (Ahlin *et al.* 2011), the third independent variable is an indicator of formal institutions. As argued by North (1991) and Williamson (1998), the most important indicators of the formal institutional level are probably property rights and the rule of law. Hence, the rule of law (RL) index is used as measure of formal institutions. This index is developed by Kaufmann *et al.* (2010) and reported in the World Bank's (2011) database Worldwide Governance Indicators (WGI). This rule of law indicator captures "perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann *et al.* 2010: 4).

² Countries included from the Latinobarómetro are Bolivia, Costa Rica, Ecuador, Honduras, Nicaragua, Panama and Paraguay (weighted averages of fifteen rounds 1995-2010); from the Afrobarometer are Benin, Kenya, Madagascar, Malawi, Mozambique and Senegal (third round 2005-2006); from the East Asian Barometer are Cambodia and Mongolia (second round 2005-2008); and from the Arab Barometer is Lebanon (first wave 2006-2007).

The index ranges from -2.5 for weak governance performance to 2.5 for strong governance performance. To control for time variation, the country-level averages of the rule of law index over the period 2003-2010 are computed and applied in the regressions. As discussed in the previous chapter, the rule of law's impact on MFI performance is theoretically somewhat ambiguous, but assumed here to be negative. Country-level measures of this indicator are available for the full sample including 72 developing countries.

Since the sample sizes of the three institutional indicators differ, three different regressions are performed for each dependent MFI performance variable, respectively. The baseline estimations include all of the three independent institutional variables and, as such, a sample size of 40 countries. Second, regression models where the individualism index is excluded are also performed, increasing the sample size to cover 58 countries. Finally, a third group of models is used, only including rule of law as an independent institutional variable and, hence, covering the full sample of 72 countries. The two latter alternative model specifications are used for two reasons. First, the larger sample sizes increase the reliability of the results. Second, comparisons of the different models' explanatory power are also undertaken to assess the importance of the cultural variables excluded in the alternative specifications.

3.3 Control Variables: Growth, Inequality and Fractionalisation

As the macroeconomic context has previously been found to affect MFI performance, these effects need to be controlled for. As argued in the previous chapter, particularly the rate of economic growth and the level of income inequality in different countries seem to be important determinants of the cross-national variation in MFI performance (Ahlin et al. 2011). Thus, the average growth rates in gross domestic product (GDP) per capita over the period 2003-2010, as well as the most recently reported Gini index for all countries, are used as two macroeconomy-related control variables in the regressions. Measures of both of these variables are collected from the World Bank's (2012) database World Development Indicators (WDI). While the effects of economic growth on MFI performance are, at least theoretically, somewhat ambiguous, income inequality is assumed to affect it negatively (Ahlin et al. 2011).

Moreover, ethnolinguistic fractionalisation (ELF) is used as a control variable related to informal institutions. This indicator is included in order to catch the effects of within-country cultural

heterogeneity. The reason for this control is that large cultural differences may reduce a society's general level of trust as well as its microfinance performance (Glaeser et al. 2000; Cassar et al. 2007; Karlan 2007). Measures for this variable are collected from Alesina *et al.*'s (2003) dataset on fractionalisation. This dataset includes data on ethnic, linguistic and religious heterogeneity in different countries. The ethnolinguistic fractionalisation is then calculated as the average of ethnic and linguistic differences in each country, reflecting "the probability that two randomly selected individuals from a population belonged to different groups" (Alesina et al. 2003: 158-159). Note that, while the trust and individualism indicators serve as proxies for cultural country characteristics, this last cultural indicator only measures the level of cultural heterogeneity in a society, regardless of its type of culture. As discussed before, high ethnolinguistic fractionalisation is assumed to have negative effects on MFI performance.

Finally, the MFI sizes are also assumed to be a significant determinant of microfinance performance (Cull et al. 2007). As in previous cross-national studies on MFI performance, this size effect also needs to be controlled for (Ahlin et al. 2011). Here, this is done by including the natural logarithm of the number of active borrowers per MFI in each country as a last control variable. Country-level values for this MFI size indicator are computed based on *MIX Market* data from 2010 (MIX 2010). Based on previous studies, this indicator is assumed to affect microfinance performance positively, where larger MFIs tend to have lower default rates, lower interest rates and higher sustainability ratios (Cull et al. 2007).

3.4 Estimation Equation

The baseline estimation equation of this study has the following specification:

$$\begin{aligned}
 & Performance_i \\
 &= \alpha + \beta_1(Trust_i) + \beta_2(IDV_i) + \beta_3(RL_i) + \beta_4(Growth_i) + \beta_5(Gini_i) \\
 &+ \beta_6(ELF_i) + \beta_7(Size_i) + \varepsilon_i
 \end{aligned}$$

where $Performance_i$ is the country-level MFI performance in country i . As previously discussed, the portfolio at risk (PAR_i) (as indicator of default rates), the yield on gross portfolio ($Yield_i$) (as indicator of interest rates), and the operational self-sufficiency (OSS_i) (as indicator of sustainability ratios) are each separately used as the dependent variable $Performance_i$. The

independent variables included in this baseline regression model are the institutional indicators of social trust ($Trust_i$), individualist cultural norms (IDV_i) and rule of law (RL_i), as well as the control variables GDP per capita growth ($Growth_i$), income inequality ($Gini_i$), ethnolinguistic fractionalisation (ELF_i), and the logarithm of active borrowers per MFI ($Size_i$). In alternative specifications of this baseline model, first, the individualism index is omitted and, second, both the trust and individualism variables are excluded. As previously mentioned, all the regression models are estimated via OLS and further tested for robustness.

4 Results and Analysis

As discussed in the previous chapter, country-level data for the dependent MFI performance variables is collected from the *MIX Market* database and averaged over the years 2003-2010 (MIX 2010). Country-level survey data for social trust is collected from the WVS (2012) and the GBS (2009). For each country, values from the latest survey with available data are used, generally corresponding to the years 2005-2008. Data for the individualism index is collected from Hofstede *et al.*'s (2010) most recent survey on national culture, as reported in 2010. The rule of law index is collected from Kaufmann *et al.*'s (2010) database WGI, and also averaged over the years 2003-2010. Regarding the control variables, ethnolinguistic fractionalisation is collected from Alesina *et al.*'s (2003) database from 2003, while data on GDP per capita growth and the Gini index is collected from the World Bank's (2012) database WDI. The country-level data on economic growth is averaged over the 2003-2010 period, while the most recently reported Gini index for each country is used. Finally, the control for average MFI size is also based on the *MIX Market* and calculated for the year 2010 (MIX 2010). For a full variable description, with definitions and sources, see Appendix A (Table 7).

In the full sample of this study, 72 different countries are included. These are also all the countries with MFI performance data reported by the *MIX Market* in 2010 (MIX 2010). The regional coverage includes 23 countries from Sub-Saharan Africa, 17 from Latin America and the Caribbean, 16 from Eastern Europe and Central Asia, 11 from South and East Asia, and 5 from the Middle East and North Africa. Of these countries, 22 are low-income countries, 27 are lower middle-income countries, and 23 are upper middle-income countries (World Bank 2012). The numbers of MFIs in these countries vary quite significantly, but the average number of total MFIs over the 2003-2010 period is 124 per country (MIX 2010). In total, these MFIs had almost 100 million active borrowers in 2010 (MIX 2010). For the regressions including the cultural variables of trust and individualism, however, lack of data reduces the covered sample size to 58 and 40 countries, respectively. The included countries, together with some country-level statistics, are shown in Appendix A (Table 8).

4.1 Descriptive Statistics

The descriptive statistics for all the variables included in the regressions are shown in Table 1 below.

Table 1: Descriptive statistics

	Mean	Median	Max.	Min.	Std. Dev.	Obs.
Portfolio at risk (30 days)	4.16	4.29	11.47	0.05	2.44	72
Yield on gross portfolio (real)	25.61	22.42	74.99	6.11	13.40	72
Operational self sufficiency	101.15	102.99	153.62	57.12	17.31	72
Most people can be trusted	19.66	18.00	52.30	4.90	10.12	58
Individualism index	25.74	25.00	65.00	6.00	11.38	43
Rule of law	-0.63	-0.63	1.26	-1.85	0.52	72
GDP per capita growth	3.88	3.60	15.09	-1.03	2.52	72
Gini index	41.25	40.19	63.14	27.80	8.71	72
Ethnolinguistic fractionalisation	49.23	48.45	92.64	6.90	25.05	72
(Log) Active borrowers per MFI	9.51	9.31	13.01	6.32	1.29	72

Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Kaufmann *et al.* (2010), World Bank (2012) and Alesina *et al.* (2003).

As seen in Table 1, there are relatively large between-country variations in all the dependent variables. The default rates, as approximated by portfolio at risk, vary between 0 and 11 percent, with a mean value of 4 percent and a standard deviation of 2 percentage points. The interest rates, as measured by yield on gross portfolio, vary between 6 and 75 percent, with a mean of 26 percent and a standard deviation of 13 percentage points. The operational self-sufficiency ratios vary between 57 and 154 percent, with a mean of 101 percent and a standard deviation of 17 percentage points. As further seen in Table 1, large cross-national variations are also found in all the independent variables. For descriptive statistics on the dependent variables separated per

region, see Appendix A (Table 9). Generally, Sub-Saharan Africa seems to be the region with the lowest MFI performance. That is, compared to other regions, Sub-Saharan Africa has higher average default and interest rates and lower sustainability ratios.

Next, the pairwise sample correlations between the included variables are shown in Table 2 below.

Table 2: Correlations

	PAR	Yield	OSS	Trust	IDV	RL	Growth	Gini	ELF
Yield	0.321*** (72)								
OSS	-0.355*** (72)	-0.006 (72)							
Trust	-0.336** (58)	-0.374*** (58)	0.219* (58)						
IDV	0.148 (43)	0.381** (43)	-0.058 (43)	-0.086 (40)					
RL	0.020 (72)	0.018 (72)	0.000 (72)	-0.128 (58)	0.184 (43)				
Growth	-0.509*** (72)	-0.082 (72)	0.045 (72)	0.183 (58)	0.106 (43)	0.090 (72)			
Gini	0.543*** (72)	0.457*** (72)	-0.030 (72)	-0.316** (58)	0.056 (43)	0.085 (72)	-0.327*** (72)		
ELF	0.271** (72)	0.132 (72)	-0.278** (72)	-0.153 (58)	0.050 (43)	-0.214* (72)	-0.260** (72)	-0.108 (72)	
Size	-0.308*** (72)	-0.189 (72)	0.178 (72)	0.086 (58)	-0.093 (43)	0.160 (72)	0.149 (72)	-0.025 (72)	-0.217* (72)

Note: Pairwise samples. Included observations in parenthesis. * significant at 10%; ** significant at 5%; and *** significant at 1%.

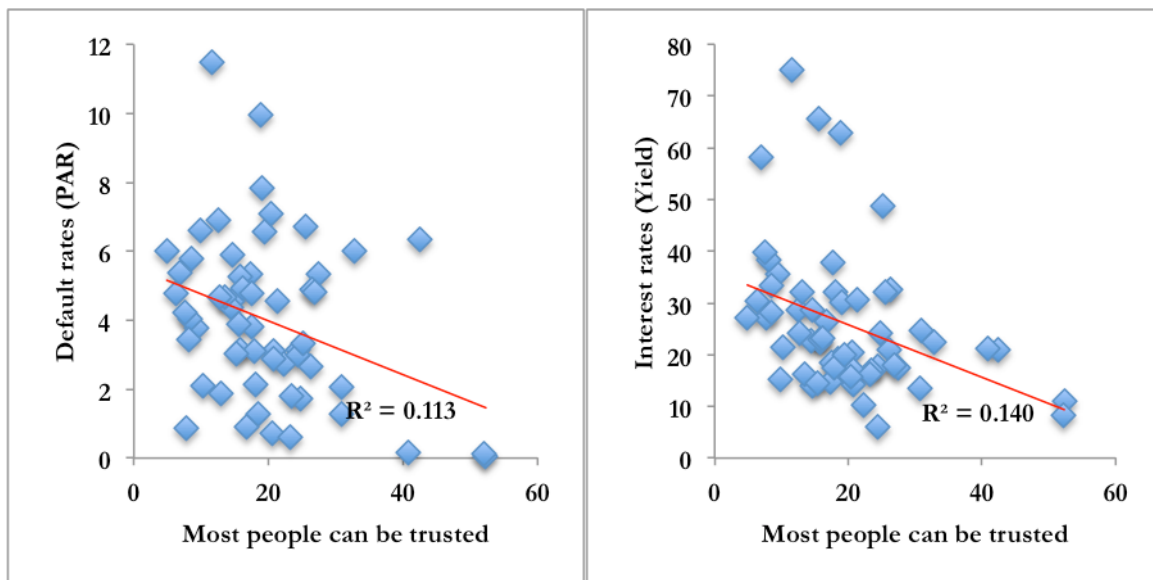
Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Kaufmann *et al.* (2010), World Bank (2012) and Alesina *et al.* (2003).

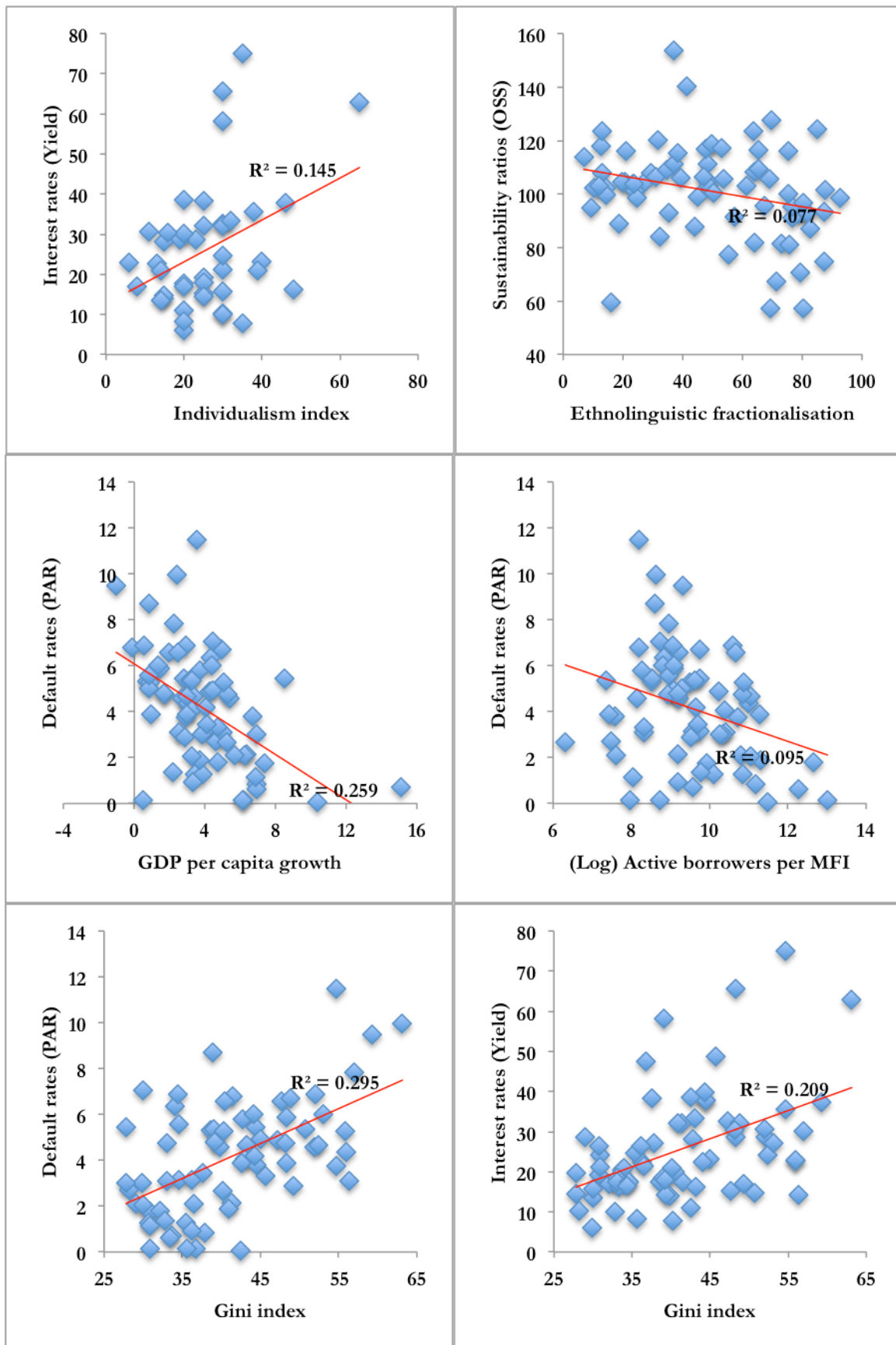
As seen in Table 2, the default rate (portfolio at risk) is negatively correlated with social trust, GDP per capita growth and MFI size, and positively correlated with ethnolinguistic fractionalisation and income inequality. As such, this initial assessment of the data suggests that default rates tend to be lower in countries with relatively high trust, low ethnolinguistic fractionalisation, high economic growth, low income inequality and large MFI sizes. The interest rate (yield on gross portfolio) is also negatively correlated with social trust, and positively correlated with the individualism index and income inequality. This suggests that interest rates

tend to be lower in countries with relatively high trust, strong collectivist cultural values and low income inequality. Finally, the operational self-sufficiency is positively correlated with social trust and negatively correlated with ethnolinguistic fractionalisation. This suggests that the sustainability/profitability ratios of MFIs tend to be higher in countries with relatively high trust and low ethnolinguistic fractionalisation. Thus, this first analysis of the data seems to support the hypotheses that high levels of trust, collectivist cultural norms, equal income distributions and ethnolinguistic homogeneity are associated with better microfinance performance, in terms of lower default and interest rates as well as higher self-sufficiency ratios. The rule of law measure of formal institutions, however, is not significantly correlated with any of the MFI performance indicators.

Some of the strongest and most significant pairwise correlations between the MFI performance indicators and explanatory variables are plotted graphically in Figure 2 below.

Figure 2: Graphical correlations (scatter plots)





Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Alesina *et al.* (2003) and World Bank (2012).

In the following sections, these suggested relationships between country-level institutions and microfinance performance are further investigated in a number of cross-sectional regressions. First, however, these regression models and results are diagnostically tested for heteroskedasticity, multicollinearity, functional form and normality.

Neither the Breusch-Pagan-Godfrey (Godfrey 1978; Breusch and Pagan 1979) nor White's (1980) test for heteroskedasticity could reject the null hypothesis of homoskedasticity in any of the models. Similarly, the variance inflation factor (VIF) test showed no indications of severe multicollinearity problems in any of the models. As a test for general specification, Ramsey's (1969) regression specification error test (RESET) was performed and found not to reject the null hypothesis of no specification errors in any of the models. As a further test for omitted variables, the natural logarithm of GDP per capita in 2010 (World Bank 2012), the rural population as percentage of total population in 2010 (World Bank 2012), and geographic latitude coordinates (CIA 2011) were also separately included as additional explanatory variables in all the regressions. These variables, however, were neither found to be statistically significant, nor to increase the models' explanatory power as measured by the adjusted R-squared. Moreover, the inclusion of these variables did not change the general results significantly. Finally, the Jarque-Bera statistics (Jarque and Bera 1987) could not reject the null hypothesis of normal distribution for the portfolio at risk regressions. However, this normality test rejected normal distribution for the yield on gross portfolio regressions, and marginally rejected normality for the operational self-sufficiency regressions. This issue of non-normal distributions is further analysed in a number of robustness checks (Section 4.4).

4.2 Default Rates

The OLS multiple regression results for the three different model specifications with default rates (portfolio at risk) as the dependent variable are shown in Table 3 below.

Table 3: Portfolio at risk regression results

Dependent variable:	Portfolio at risk (30 days)		
	Model 1	Model 2	Model 3
Most people can be trusted	-0.027 (0.029)	-0.018 (0.022)	
Individualism index	0.009 (0.024)		
Rule of law	0.540 (0.554)	0.797* (0.460)	0.416 (0.413)
GDP per capita growth	-0.119 (0.165)	-0.194* (0.097)	-0.266*** (0.093)
Gini index	0.130*** (0.032)	0.124*** (0.026)	0.130*** (0.026)
Ethnolinguistic fractionalisation	0.030** (0.011)	0.020** (0.009)	0.022** (0.009)
(Log) Active borrowers per MFI	-0.528*** (0.190)	-0.533*** (0.164)	-0.421** (0.167)
Constant	3.596 (2.773)	4.614** (2.284)	3.032 (2.242)
Adjusted R-squared	0.561	0.545	0.486
Prob. (F-statistic)	0.000	0.000	0.000
Included observations	40	58	72

Note: OLS. Standard errors in parenthesis. * significant at 10%; ** significant at 5%; and *** significant at 1%.

Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Kaufmann *et al.* (2010), World Bank (2012) and Alesina *et al.* (2003).

As seen in Table 3, the results from the baseline model specification indicate that income inequality, ethnolinguistic fractionalisation and MFI size are statistically significant determinants of default rates, as measured by portfolio at risk after 30 days. That is, the MFI default rates tend to be lower in countries with a more equal income distribution, higher levels of cultural

homogeneity and larger average MFI sizes. The adjusted R-squared values suggest that this model explains 56 percent of the cross-national variation in MFI default rates.

In the second model specification, the individualism index is excluded to increase the sample size from 40 to 58 included countries. As seen in Table 3, this alternative model specification generally confirms the results of the basic model specification. Here, however, the rule of law and GDP per capita growth coefficients also become marginally significant determinants of the country-variations in MFI default rates. Thus, this alternative model suggests that default rates also tend to be lower in countries with weaker formal institutions and higher economic growth rates. Compared to the baseline model specification, however, the explanatory power of this alternative model is somewhat lower, with an adjusted R-squared value of 55 percent.

In the third model specification, trust is also excluded with the sample size increased to include the full sample of 72 countries. These results are also relatively similar, with GDP per capita growth, income inequality, ethnolinguistic fractionalisation and MFI size being statistically significant determinants of the cross-national variation in MFI default rates. The explanatory power of this model specification, however, is also slightly lower with an adjusted R-squared value of 49 percent.

To conclude, the regression results from these three model specifications suggest that MFI default rates are generally lower in countries with relatively high economic growth rates, low degrees of income inequality and cultural fractionalisation, and large MFI sizes. The coefficients on the informal institutional variables suggest that default rates are lower in countries with relatively high levels of social trust and strong collectivist cultural norms. These results, however, are not found to be statistically significant. Strong formal institutions, as measured by the rule of law, are found to increase the MFI default rates. This coefficient, however, is only marginally significant in one of the three model specifications.

4.3 Interest Rates

Next, the OLS multiple regressions results for the three model specifications with interest rates (yield on gross portfolio) as the dependent variable are shown in Table 4 below.

Table 4: Yield on gross portfolio regression results

Dependent variable:	Yield on gross portfolio (real)		
	Model 1	Model 2	Model 3
Most people can be trusted	-0.242 (0.204)	-0.283* (0.168)	
Individualism index	0.546*** (0.166)		
Rule of law	-0.196 (3.843)	1.794 (3.450)	0.725 (2.769)
GDP per capita growth	-1.049 (1.143)	0.394 (0.727)	0.872 (0.620)
Gini index	0.675*** (0.219)	0.656*** (0.198)	0.809*** (0.174)
Ethnolinguistic fractionalisation	0.097 (0.076)	0.120* (0.068)	0.109* (0.061)
(Log) Active borrowers per MFI	0.235 (1.319)	-0.721 (1.230)	-1.669 (1.123)
Constant	-13.575 (19.224)	4.785 (17.144)	-0.158 (15.038)
Adjusted R-squared	0.444	0.252	0.230
Prob. (F-statistic)	0.000	0.002	0.000
Included observations	40	58	72

Note: OLS. Standard errors in parenthesis. * significant at 10%; ** significant at 5%; and *** significant at 1%.

Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Kaufmann *et al.* (2010), World Bank (2012) and Alesina *et al.* (2003).

As seen in Table 4, both the individualism and Gini indices are found to be strongly significant and positive determinants of the cross-national variation in MFI interest rates (as measured by the real yield on gross portfolio). As such, these regression results suggest that the MFI interest rates tend to be lower in countries with relatively strong collectivist cultural values and a more

equal income distribution. The adjusted R-squared value of the baseline model specification suggests that this model explains 44 percent of the cross-national variation in MFI interest rates. In the second model specification, where the individualism index is excluded and the sample size is larger, trust and ethnolinguistic fractionalisation also become marginally significant determinants of MFI interest rates. These results suggest that interest rates may also be lower in countries with relatively high levels of social trust and cultural homogeneity. Finally, the results for the third model specification are also found to be relatively similar to the second model.

At the same time, however, the adjusted R-squared values for the two alternative models are much lower (25 percent and 23 percent, respectively) than for the basic model specification (44 percent). Thus, whether a country is relatively individualist or collectivist seems to be an important determinant of its MFI interest rates. More specifically, MFI interest rates tend to be lower the more *collectivist* a society is, as hypothetically expected. Yet, this finding contrasts to previous empirical studies, which have found the general country-level economic performance to be positively related to *individualist* cultural values (Greif 1994; Hofstede et al. 2010). This emphasises the particularities of microfinance as differing from formal financial institutions. Moreover, these results suggest that microfinance, at least in terms of interest rates, may work better in countries with strong informal institutions. Finally, this also supports the hypothesis that microfinance may work as a substitute for formal lenders in countries where formal institutions are weak, but informal institutions are strong. With respect to interest rates, this should work through the presence of strong collectivist cultural norms.

4.4 Sustainability Ratios

Finally, the OLS multiple regression results for the three model specifications with sustainability ratios (operational self-sufficiency) as the dependent variable are shown in Table 5 below.

Table 5: Operational self-sufficiency regression results

Dependent variable:	Operational self sufficiency		
	Model 1	Model 2	Model 3
Most people can be trusted	0.526* (0.273)	0.246 (0.201)	
Individualism index	0.073 (0.222)		
Rule of law	-5.799 (5.139)	-9.127** (4.128)	-2.366 (4.002)
GDP per capita growth	-3.156** (1.528)	-1.062 (0.870)	-0.472 (0.897)
Gini index	0.055 (0.293)	-0.015 (0.237)	-0.149 (0.252)
Ethnolinguistic fractionalisation	-0.100 (0.102)	-0.117 (0.081)	-0.200** (0.088)
(Log) Active borrowers per MFI	1.585 (1.764)	2.240 (1.471)	1.817 (1.623)
Constant	86.021*** (25.706)	82.170*** (20.508)	100.196*** (21.735)
Adjusted R-squared	0.098	0.109	0.036
Prob. (F-statistic)	0.170	0.062	0.194
Included observations	40	58	72

Note: OLS. Standard errors in parenthesis. * significant at 10%; ** significant at 5%; and *** significant at 1%.

Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Kaufmann *et al.* (2010), World Bank (2012) and Alesina *et al.* (2003).

As seen in Table 5, none of the three model specifications succeeds particularly well in explaining the cross-national variation in MFI operational self-sufficiency ratios. In the first model specification, trust is found to be a marginally significant determinant of operational self-sufficiency ratios, together with GDP per capita growth rates. In the second model specification,

rule of law is the only statistically significant coefficient. In the third model specification, ethnolinguistic fractionalisation is the only statistically significant determinant of cross-country variations in MFI sustainability ratios. Taken together, these results indicate that the MFI sustainability ratios may be higher in countries with higher levels of social trust, lower economic growth, weaker formal institutions and higher cultural homogeneity. As also seen in Table 5, however, the adjusted R-squared values for these models indicate low explanatory power. In fact, none of the models are found to be significant, with F-statistic probability values all exceeding the 5 percent level.

A possible reason for why these models are relatively unsuccessful in explaining the cross-national variation in MFI sustainability ratios may be the opposing effects of default and interest rates on the operational self-sufficiency measure. As found in the previous two sections, the included institutional variables seem to have similar effects on both the default and interest rates. The operational self-sufficiency ratio (as defined in Section 3.1), however, should *ceteris paribus* increase with lower default rates, but decrease with lower interest rates. This means that an explanatory variable, such as income inequality, which is found to increase both MFI default and interest rates will have an ambiguous net effect on the operational self-sufficiency ratio. While this paper's institutional model, as such, is found to be a relatively poor predictor of MFI sustainability ratios, it still remains a relatively good predictors of the cross-national variation in both MFI default and interest rates. In the next section, these results are further checked for robustness.

4.5 Robustness

As a first robustness check, the most influential outliers are excluded from the baseline regressions on MFI interest rates (three outliers excluded) and sustainability ratios (one outlier excluded). With these outliers excluded, the Jarque-Bera (Jarque and Bera 1987) statistics no longer reject the null hypothesis of normal distribution. As an alternative correction for non-normality, without omitting outliers, the natural logarithm of the real yield on gross portfolio is also used as the dependent variable. The results from these regressions are shown in Appendix B (Table 10). Overall, the baseline regression results are found to be robust to the exclusion of outliers, as well as to the alternative lognormal specification of the interest rates regression. That is, MFI interest rates are still found to be significantly lower in countries with stronger collectivist cultural norms and a more equal income distribution. Similarly, MFI sustainability ratios are still

found to be significantly higher in countries with higher levels of social trust and lower economic growth. With the most influential outliers excluded, the adjusted R-squared values also indicate stronger explanatory power. Thus, the models now explain 57 and 25 percent of the cross-national variation in MFI interest rates and sustainability ratios, respectively.

As a second robustness check, regional dummy variables are also included in the three basic regression models. This is done in order to control for other regional and geographical differences. The regional categorisation includes Sub-Saharan Africa, South and East Asia, Eastern Europe and Central Asia, Latin America and the Caribbean, as well as Middle East and North Africa as the omitted category. These regression results are shown in Appendix B (Table 11). First, regarding the MFI default rates, income inequality and MFI size still remain statistically significant. Ethnolinguistic fractionalisation, however, is no longer significant. Instead, the regional dummies for Sub-Saharan Africa and Eastern Europe and Central Asia become marginally significant, suggesting that these regions tend to have higher average default rates. Second, when controlling for regional differences, the individualism index is the only statistically significant determinant of interest rates. While the predictive power (as measured by the adjusted R-squared) is somewhat lower for this model than for the original specification, this still shows that the lower interest rates in collectivist countries is a robust finding. Finally, for the sustainability ratios, all the regional dummy variables, except that for Eastern Europe and Central Asia, are found to be statistically significant. This suggests lower self-sufficiency ratios in South and East Asia, Latin America and the Caribbean, and Sub-Saharan Africa. The significance of these regional dummies indicates that there may be other non-included variables that further affect this MFI performance indicator. The trust coefficient, however, still remains marginally significant. Thus, MFIs in relatively trusting countries are found to perform better, in terms of MFI self-sufficiency ratios, even after controlling for regional differences.

As a third robustness check, country-level weighted averages are used instead of medians for the dependent MFI performance variables (MIX 2010). These regression results are shown in Table 6 below.

Table 6: Regression results using weighted averages instead of medians

Dependent variable:	Portfolio at risk (30 days)	Yield on gross portfolio (real)	Operational self sufficiency
Most people can be trusted	-0.081** (0.033)	-0.097 (0.193)	0.615*** (0.197)
Individualism index	0.034 (0.026)	0.600*** (0.159)	0.075 (0.160)
Rule of law	0.400 (0.584)	-0.102 (3.636)	-5.888 (3.674)
GDP per capita growth	-0.283 (0.174)	-0.642 (1.074)	-3.344*** (1.102)
Gini index	0.108*** (0.034)	0.730*** (0.206)	-0.300 (0.213)
Ethnolinguistic fractionalisation	0.006 (0.012)	0.149** (0.072)	0.015 (0.074)
(Log) Active borrowers per MFI	0.176 (0.205)	-0.509 (1.259)	2.911** (1.269)
Constant	0.250 (2.924)	-20.469 (18.452)	88.581*** (18.377)
Adjusted R-squared	0.492	0.510	0.384
Prob. (F-statistic)	0.000	0.000	0.002
Included observations	38	39	39

Note: OLS. Standard errors in parenthesis. * significant at 10%; ** significant at 5%; and *** significant at 1%. Excluded outliers are Indonesia and Zambia (for 'PAR'), Ghana (for 'Yield') and Pakistan (for 'OSS').

Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Kaufmann *et al.* (2010), World Bank (2012) and Alesina *et al.* (2003).

As seen in Table 6, this alternative data usage does not alter the baseline regression results significantly for interest rates and sustainability ratios. The main difference is that the coefficients on ethnolinguistic fractionalisation (for interest rates) and MFI size (for sustainability ratios) also become statistically significant. Thus, in addition to the previous results, MFI interest rates may also be lower in countries with higher degrees of cultural homogeneity, while sustainability ratios may also be higher in countries with larger MFI sizes. For default rates, however, this use of weighted averages instead of medians does change the results somewhat. Trust now becomes a statistically significant determinant of default rates, instead of ethnolinguistic fractionalisation and MFI size. Thus, when using weighted averages instead of medians, the baseline regression model finds that MFI default rates are significantly lower in countries with higher levels of social trust and a more equal income distribution. In other words, this robustness check gives additional

support to the hypothesis that strong informal institutions affect microfinance performance positively.

Finally, the baseline regressions are also performed using country-level median values for 2008 only, as being the single year with the largest data sample. These results are shown in Appendix B (Table 12). In this regression, MFI default rates are found to be significantly lower in countries with higher levels of social trust and more equal income distributions. MFI interest rates tend to be lower in countries with stronger collectivist cultural norms and more equal income distributions. Finally, MFI sustainability ratios are found to be significantly higher in countries with lower economic growth rates. Thus, while these robustness checks sometimes showed smaller differences in the results, the general hypothesis of informal institutions being an important determinant of the cross-national variation in MFI performance seems to be a robust finding.

5 Conclusion

This paper has analysed the effects of informal institutions and other country-level variables on microfinance performance, as measured by MFI default rates, interest rates and sustainability ratios. More specifically, the hypothesis that informal institutions (such as social trust and cultural norms) may be important determinants of the cross-national variation in MFI performance was tested in a number of multiple linear regression models, and generally confirmed.

First of all, the results support the theoretical hypotheses that microfinance performance is higher in countries with higher levels of social trust, stronger collectivist cultural values and a higher degree of cultural homogeneity. One of the most robust findings is that MFI interest rates tend to be significantly lower the more *collectivist* a country is. This is an important finding since previous studies on individualist versus collectivist cultural norms have found high general economic performance to be associated with strong *individualist* cultural values (Greif 1994; Hofstede et al. 2010). As such, this also highlights the particularities of microfinance as a phenomenon relying more on informal than formal institutions. Moreover, social trust is found to be positively related to MFI performance, and in some cases even significantly so. This supports the idea that social capital and trust may serve as a substitute for physical collateral (Karlan et al. 2009). The finding that MFIs tend to perform better in more culturally homogeneous countries also supports previous experimental case study findings (Cassar et al. 2007; Karlan 2007), as well as Ostrom's (2005) theories on institutional diversity.

The rule of law index, used as indicator for formal institutions, is mostly found to be non-significant. Still, when found statistically significant, the rule of law is associated with lower MFI performance, as in higher default rates and lower sustainability ratios. Thus, formal institutions seem to be relatively unimportant for, or even negatively affecting, the general performance of MFIs. Income inequality, however, is found to be an important determinant of the country-level MFI performance variations. In particular, countries with more equal income distributions are found to have significantly lower MFI default and interest rates. This also supports previous findings (Ahlin et al. 2011), and suggests that microfinance works better in countries with relatively low income inequality. Finally, the effects of economic growth are found to be inconclusive, as growth both predicts lower MFI default rates and lower sustainability ratios.

To conclude, this study has shown that informal institutions tend to be important determinants of country-level MFI performance. Thus, in countries with relatively high levels of social trust, strong collectivist cultural norms and high degrees of homogeneity, MFI interest rates are found to be lower and repayment rates to be higher. These results give strong support to the idea that microfinance may work as a substitute for, or at least complement to, formal financial institutions in developing countries with strong cooperative-supporting informal institutions. Regarding the incentives for repayments (Bhatt and Tang 2001; Banerjee and Duflo 2010), these results also suggest that the more similar borrowers are to their peers, both culturally and with respect to income levels, the more they tend to repay their loans. For development economists, these findings also emphasise the importance of incorporating informal institutions further into economic theory.

On the one hand, clear policy implications from these results are hard to draw as microfinance performance is found to largely depend on a county's culture and informal institutions. Such norms and values both develop slowly and are difficult to change (Williamson 1998). On the other hand, these findings suggest that the large variation in MFI performance is not a valid argument for the critical standpoint that microfinance cannot work. Instead, these results suggest that social collateral can function well as a substitute for physical collateral. Moreover, microfinance actually seems to work best where it is most needed, that is, in countries where formal institutions are weak. These optimistic results also give some support to the possibility of expanding microfinance's use of informal networks to include other financial services, such as savings and insurance (Hulme and Arun 2009). Microfinance expansions leading to larger MFI sizes should also increase performance. Finally, these results also suggest that equality-enhancing wealth and income distribution policies could be one good way to promote a country's microfinance sector.

Due to the relatively small sample of countries included in this study's basic model, however, more research would be good in order to confirm these results. In particular, more research is needed on the determinants of MFI sustainability/profitability ratios. When more data becomes available, panel estimations could also be a way to complement these cross-sectional analyses. Other interesting suggestions for future research include within-country studies, as well as research on other cultural and institutional variables that could further affect the performance of MFIs. Finally, more research would also be needed in order to link these institutional effects on microfinance performance to its potential impact on, for instance, poverty reduction.

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Appendix A: Data Description

Table 7: Variable description

Variable name	Definition	Source
Portfolio at risk (30 days) [PAR]	Portfolio at risk after 30 days divided by gross loan portfolio. Weighted average of yearly adjusted median values over the period 2003-2010 (percentage).	MIX (2010) <i>MIX Market</i>
Yield on gross portfolio (real) [Yield]	Cash financial revenue from loan portfolio divided by average gross loan portfolio, adjusted for inflation. Weighted average of yearly adjusted median values over the period 2003-2010 (percentage).	MIX (2010) <i>MIX Market</i>
Operational self sufficiency [OSS]	Operating revenue divided by the sum of financial expense, loan-loss provision expense and operating expense. Weighted average of yearly adjusted median values over the period 2003-2010 (percentage).	MIX (2010) <i>MIX Market</i>
Most people can be trusted [Trust]	Percentage of individuals answering 'Most people can be trusted', in contrast to 'Can't be too careful', to the question 'Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?'. Values from most recent survey wave reported.	WVS (2012); GBS (2009)
Individualism index [IDV]	Hofstede's second dimension of national culture, originally based on the IBM research project. Degree of individualism (versus collectivism) in a country's culture, ranging from 0 ('Collectivism') to 100 ('Individualism').	Hofstede <i>et al.</i> (2010)
Rule of law [RL]	WGI's fifth dimension of governance, capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, the quality of contract enforcement, property rights, the police, the courts, and the likelihood of crime and violence. Aggregate governance indicator ranging from around -2.5 (weak) to 2.5 (strong) governance performance. Reported as average over the period 2003-2010.	Kaufmann <i>et al.</i> (2010); World Bank (2011) WGI
GDP per capita growth [Growth]	Annual percentage growth rate of GDP per capita based on constant local currency. Reported as average over the period 2003-2010.	World Bank (2012) WDI
Gini index [Gini]	Measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution, ranging from 0 (perfect equality) to 100 (perfect inequality). Most recent values reported.	World Bank (2012) WDI
Ethnolinguistic fractionalisation [ELF]	Average of ethnic and language fractionalisation, reported in percentage. Probability that two randomly selected individuals from a population belong to different groups (calculated as one minus the Herfindahl index of ethnolinguistic group shares).	Alesina <i>et al.</i> (2003)
(Log) Active borrowers per MFI [Size]	Natural logarithm of number of active borrowers per MFI in 2010.	MIX (2010) <i>MIX Market</i>

Note: All data from *MIX Market* (MIX 2010) are adjusted for inflation, subsidised cost of fund, in-kind subsidy, and loan loss provisioning and write-off policies, following the standard adjustments for microfinance performance data as recommended by CGAP (2003).

Table 8: Countries included in regressions

	MFI (2003- 2010)	Most people can be trusted	Individual- ism index	Eastern Europe and Central Asia			
Sub-Saharan Africa				Albania	45	24.4	20.0
Benin	89	27.4	-	Armenia	73	24.7	-
Burkina Faso	43	14.7	15.0	Azerbaijan	163	20.5	-
Cameroon	101	-	-	Bosnia and Herzegovina	114	15.8	-
Congo	61	-	-	Bulgaria	145	22.2	30.0
Cote d'Ivoire	29	-	-	Georgia	84	18.1	-
Ethiopia	121	24.4	20.0	Kazakhstan	158	-	-
Ghana	227	8.5	15.0	Kyrgyzstan	173	16.7	-
Guinea	31	-	-	Macedonia	32	13.5	-
Kenya	133	9.8	25.0	Moldova	23	17.9	-
Madagascar	73	32.8	-	Mongolia	41	10.2	-
Malawi	46	6.9	30.0	Romania	52	20.3	30.0
Mali	100	17.5	-	Russia	356	26.2	39.0
Mozambique	56	25.2	-	Serbia	32	15.3	25.0
Niger	37	-	-	Tajikistan	193	-	-
Nigeria	100	25.6	30.0	Uzbekistan	118	-	-
Rwanda	44	4.9	-	Latin America and the Caribbean			
Senegal	91	26.8	25.0	Argentina	89	17.6	46.0
Sierra Leone	44	-	20.0	Bolivia	174	20.7	-
South Africa	32	18.8	65.0	Brazil	140	9.4	38.0
Tanzania	74	8.1	25.0	Chile	33	12.6	23.0
Togo	63	-	-	Colombia	167	14.5	13.0
Uganda	98	7.6	-	Costa Rica	91	17.3	15.0
Zambia	37	11.5	35.0	Dominican Republic	55	26.4	30.0
South and East Asia				Ecuador	320	20.7	8.0
Afghanistan	98	-	-	El Salvador	110	14.6	19.0
Bangladesh	336	23.5	20.0	Guatemala	132	15.7	6.0
Cambodia	118	7.7	-	Haiti	51	-	-
China	81	52.3	20.0	Honduras	124	19.1	20.0
India	649	23.3	48.0	Mexico	289	15.6	30.0
Indonesia	270	42.5	14.0	Nicaragua	202	19.4	-
Nepal	221	-	30.0	Panama	24	21.4	11.0
Pakistan	170	30.8	14.0	Paraguay	47	12.7	-
Philippines	500	8.4	32.0	Peru	408	6.3	16.0
Sri Lanka	122	-	35.0	Middle East and North Africa			
Vietnam	101	52.1	20.0	Egypt	94	18.5	25.0
				Iraq	41	40.8	30.0
				Jordan	54	30.9	30.0
				Lebanon	24	16.2	40.0
				Morocco	79	13.0	25.0

Source: MIX (2010), WVS (2012), GBS (2009) and Hofstede *et al.* (2010).

Table 9: Descriptive statistics per region

	Mean	Median	Max.	Min.	Std. Dev.	Obs.
Portfolio at risk (30 days)						
Sub-Saharan Africa	5.81	5.44	11.47	3.01	2.05	23
South and East Asia	2.54	1.80	6.36	0.05	2.31	11
Eastern Europe and Central Asia	2.53	2.39	7.07	0.15	1.66	16
Latin America and the Caribbean	5.18	4.77	9.48	2.89	1.73	17
Middle East and North Africa	1.90	1.29	4.92	0.15	1.80	5
Yield on gross portfolio (real)						
Sub-Saharan Africa	29.67	22.32	74.99	6.11	17.83	23
South and East Asia	16.86	16.19	33.38	7.80	8.08	11
Eastern Europe and Central Asia	22.65	21.15	47.56	10.18	8.73	16
Latin America and the Caribbean	29.01	28.65	65.55	14.30	11.96	17
Middle East and North Africa	24.04	23.08	32.21	19.11	5.02	5
Operational self sufficiency						
Sub-Saharan Africa	92.62	93.22	127.54	57.31	15.52	23
South and East Asia	98.13	103.85	116.27	57.12	19.56	11
Eastern Europe and Central Asia	107.14	106.37	140.37	77.44	14.55	16
Latin America and the Caribbean	102.49	104.37	118.82	59.48	13.05	17
Middle East and North Africa	123.28	120.24	153.62	102.21	18.82	5

Source: Author's calculation, based on data from MIX (2010).

Appendix B: Robustness Results

Table 10: Regression results with outliers excluded

Dependent variable:	(Log) Yield on gross portfolio (real)	Yield on gross portfolio (real) <i>outliers excluded</i>	Operational self sufficiency <i>outliers excluded</i>
Most people can be trusted	-0.012 (0.007)	-0.136 (0.128)	0.632** (0.237)
Individualism index	0.017*** (0.006)	0.428*** (0.103)	-0.007 (0.193)
Rule of law	-0.043 (0.130)	-0.132 (2.363)	-6.075 (4.438)
GDP per capita growth	-0.049 (0.039)	-0.404 (0.733)	-3.757*** (1.331)
Gini index	0.024*** (0.007)	0.606*** (0.138)	-0.095 (0.257)
Ethnolinguistic fractionalisation	0.001 (0.003)	0.048 (0.049)	-0.039 (0.090)
(Log) Active borrowers per MFI	-0.002 (0.045)	-0.192 (0.842)	2.171 (1.532)
Constant	2.082 (0.652)	-8.529 (11.971)	87.323*** (22.198)
Adjusted R-squared	0.479	0.570	0.254
Prob. (F-statistic)	0.000	0.000	0.021
Included observations	40	37	39

Note: OLS. Standard errors in parenthesis. * significant at 10%; ** significant at 5%; and *** significant at 1%. Excluded outliers are Malawi, Mexico and Zambia (for 'Yield') and Pakistan (for 'OSS').

Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Kaufmann *et al.* (2010), World Bank (2012) and Alesina *et al.* (2003).

Table 11: Regression results including regional dummy variables

Dependent variable:	Portfolio at risk (30 days)	Yield on gross portfolio (real)	Operational self sufficiency
Most people can be trusted	-0.028 (0.032)	-0.268 (0.245)	0.511* (0.288)
Individualism index	0.002 (0.026)	0.575*** (0.197)	-0.124 (0.232)
Rule of law	0.524 (0.541)	-0.495 (4.090)	-6.035 (4.816)
GDP per capita growth	-0.250 (0.171)	-1.043 (1.296)	-1.685 (1.526)
Gini index	0.159*** (0.047)	0.519 (0.358)	0.523 (0.422)
Ethnolinguistic fractionalisation	0.007 (0.018)	0.059 (0.133)	0.022 (0.157)
(Log) Active borrowers per MFI	-0.453* (0.228)	-0.315 (1.726)	2.119 (2.032)
Sub-Saharan Africa	2.305* (1.310)	2.622 (9.912)	-25.657** (11.671)
South and East Asia	1.812 (1.178)	1.482 (8.910)	-26.519** (10.491)
Eastern Europe and Central Asia	2.140* (1.153)	-5.020 (8.726)	-16.430 (10.274)
Latin America and the Caribbean	0.356 (1.197)	1.866 (9.055)	-25.842** (10.663)
Constant	2.088 (3.491)	-1.200 (26.414)	76.658** (31.101)
Adjusted R-squared	0.588	0.380	0.220
Prob. (F-statistic)	0.000	0.007	0.068
Included observations	40	40	40

Note: OLS. Standard errors in parenthesis. * significant at 10%; ** significant at 5%; and *** significant at 1%.

'Middle East and North Africa' being the omitted category for the 'Region' dummy variables.

Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Kaufmann *et al.* (2010), World Bank (2012) and Alesina *et al.* (2003).

Table 12: Regression results for sample year 2008

Dependent variable:	Portfolio at risk (30 days)	Yield on gross portfolio (real)	Operational self sufficiency
Most people can be trusted	-0.051* (0.027)	-0.286 (0.250)	0.465 (0.414)
Individualism index	0.009 (0.021)	0.604*** (0.205)	0.235 (0.336)
Rule of law	0.373 (0.469)	-1.840 (4.709)	-6.749 (7.796)
GDP per capita growth	-0.171 (0.139)	0.141 (1.457)	-5.247** (2.318)
Gini index	0.126*** (0.027)	0.805*** (0.269)	0.189 (0.445)
Ethnolinguistic fractionalisation	0.002 (0.010)	0.093 (0.094)	-0.182 (0.155)
(Log) Active borrowers per MFI	-0.243 (0.164)	-1.449 (1.665)	-0.725 (2.676)
Constant	2.222 (2.348)	-12.043 (23.726)	108.908*** (38.996)
Adjusted R-squared	0.585	0.399	0.051
Prob. (F-statistic)	0.000	0.001	0.281
Included observations	39	39	40

Note: OLS. Standard errors in parenthesis. * significant at 10%; ** significant at 5%; and *** significant at 1%. Excluded outliers are Indonesia (for 'PAR') and Mexico (for 'Yield').

Source: Author's calculation, based on data from MIX (2010), WVS (2012), GBS (2009), Hofstede *et al.* (2010), Kaufmann *et al.* (2010), World Bank (2012) and Alesina *et al.* (2003).