

Empirical Studies on Culture, Individual Finance Choices, and the Performance of Financial intermediaries

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DECLARATION

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ABSTRACT

Finance represents an important axle of economic growth and development globally. Through financial intermediation, savings can be transmitted into investment, which then has an impact on growth and development. Across the developing world, Microfinance Institutions (MFIs) play a key role in harnessing savings of low income earners who make up majority of the populations therein. To ensure reduced intermediation costs wherein a smaller proportion of such savings is lost or left untransmitted into investment, more efficient financial sectors are needed. Where financial sectors are weaker and less efficient, higher intermediation costs result. This may have an effect on the important intermediation function of harnessing and transmitting saving to investment, and on the performance and ultimately sustainability of intermediaries like MFIs which are active in the developing world. In some cases, this may even give rise to large informal finance sectors, wherein exploitative practices of informal finance service providers then leads to even higher intermediation costs.

In recent decades however, financial sector reforms like liberalisation and innovations stemming from technological advances like mobile money have significantly reduced intermediation costs across the developing world and strengthened the financial sectors of countries therein. However, informal finance has remained popular and resilient in some countries and regions. The continued popularity of informal finance mechanisms in some parts of the world has baffled researchers for a long time. It has been easy, and logically so, to blame credit market imperfections like the cost of using formal financial services for the growth and popularity of informal finance. Continuing down this path of blaming credit market imperfections for the resilience of informal finance may however only tell part of the story given a lot of the cost drivers which have been behind the imperfections in credit markets have been reduced. In this study, we hypothesise that the cultural environment in which individuals undertake financial transactions and in which financial intermediaries operate has an effect both on the individual decision to use formal or informal financial services, and on the performance of financial intermediaries, MFIs in this case. Theoretically, culture, depending on its enshrined values – what a society considers good or bad – has important bearings on the cost of designing, delivering, and finally using formal financial services.

Four standalone studies are conducted to assess the effect of culture on finance decisions and outcomes, the first two on individual finance choices wherein cross-sectional data is used and probit models applied in the empirical estimation; and the last two on performance of MFIs, with the use of panel data, and a random effects model in the third, and Data Envelopment Analysis, followed by a tobit model in the fourth. Individual- and firm-level data from both developed and developing economies relating to finance choices and performance respectively is extracted from global sources like the World Bank, and culture data from Hofstede's cultural dimensions database and the World Values Survey.

Findings of the empirical analysis indicate that culture has an effect on individual finance choices, and firm performance. Individuals are more likely to use formal financial services in more individualistic, longer-term oriented, and more indulgent cultures. The use of informal finance mechanisms is more likely in high uncertainty avoidance, high trust, and more religious cultures. These findings are supported by empirical and theoretical literature on differential levels of trust and social capital in different cultural contexts, which then affect the level and costs of financial intermediation. At the firm level, MFIs achieve better financial performance in high power distance and more individualistic cultures, and better social performance in more masculine and more indulgent cultures. Empirical and theoretical literature on the level of information asymmetry and asymmetry reduction strategies and related costs in different cultures support these findings.

These findings have policy implications for developing and emerging economies. The findings highlight the need for global development partners, policymakers and practitioners to consider cultural influences in formulating and pursuing their development-related objectives, especially in relation to financial services provision. In particular, development-related policies must be customised to respective regions and countries due to cultural differences which may influence the cost and ultimately ability to reach these objectives. The empirical evidence presented here opposes the application of a ‘one-size fits all’ rule with respect to development strategies as has been the case in much of the past.

From a theoretical perspective, the present research provides further understanding on individual finance choices in different cultural contexts and how these choices go on to affect the performance of financial institutions, MFIs in this case. It is a first-hand attempt to link individual choices, firm performance, and culture. The study introduces the Technology acceptance model (TAM), a model which has been applied more to technology and innovation, to financial inclusion. It additionally links culture to market imperfections like information asymmetry, arguing that these imperfections have a dual effect on both the supply and demand sides. Thirdly, the study links social capital to cultural measures like trust, providing deeper insight on the importance of this capital and its effects on financial services provision in different contexts.

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LIST OF ABBREVIATIONS

ALB	Average Loan Balance
ASCA	Accumulated Saving & Credit Association
BCC	Banker, Charnes & Cooper
CCR	Charnes, Cooper & Rhodes
COOP	Cooperative
CRS	Constant Returns to Scale
DEA	Data Envelopment Analysis
DMU	Decision-Making Unit
EAP	East Asia & Pacific
ECA	Europe & Central Asia
FINEFF	Financial Efficiency
FINREV	Financial Revenue
GLP	Gross Loan Portfolio
IDG	Indulgence/Restraint
IDV	Individualism/Collectivism
LAC	Latin America & Caribbean
LTO	Long-Term Orientation
MAS	Masculinity/Femininity
MENA	Middle East & North Africa
MFI	Microfinance Institution
NAB	Number of Active Borrowers
NFB	Number of Female Borrowers
NGO	Non-Governmental Organisation
NLO	Number of Loan Officers
NLOUT	Number of Loans Outstanding
OPEXP	Operating Expense
OSS	Operational Self-Sufficiency
OTE	Overall Technical Efficiency
PDI	Power Distance

PTE	Pure Technical Efficiency
ROA	Return on Assets
ROSCA	Rotating Savings & Credit Association
SAS	South Asia
SE	Scale Efficiency
SHF	Shareholder Firm
SOCEFF	Social Efficiency
SSA	Sub-Saharan Africa
TE	Technical Efficiency
UAI	Uncertainty Avoidance Index
VRS	Variable Returns to Scale
WVS	World Values Survey

Chapter 1

INTRODUCTION

1.1. Introduction

Financial intermediation has been pivotal in driving economic- and development-related outcomes across the world. As easy as making such an assertion may seem today, the contribution of financial intermediaries to economic growth and development remained largely overlooked by economists prior to the 20th Century. One of the clearest and earliest links between financial intermediation and economic outcomes was presented in 1934 by Schumpeter (1934, pp. 78), positing that *"the banker stands between those who wish to form new combinations and the possessors of productive means. He is essentially a phenomenon of development, though only when no central authority directs the social process. He makes possible the carrying out of new combinations, authorises people, in the name of the society as it were, to form them. He is the ephor of the exchange economy."* Less than a decade later, Schumpeter coined the term 'creative destruction', indicating the need for continuous product and process innovation in enhancing development. Today, financial intermediaries are recognised to be essential in the 'creative destruction' or innovation process through their efficient resource allocation function. In doing so, financial intermediaries mobilize savings from surplus-spending units which is then allocated to deficit-spending units through credit.

In explaining the need for financial intermediaries, theoretical literature rests on the economics of asymmetric information which Akerlof (1970) elaborates on in detail. In particular, Akerlof (1970) underscores the ability of intermediaries to reduce information collection and processing costs in a bid to differentiate between 'good' and 'bad' clients. This then gives a bigger number of people better access to fairly-priced financial services. Similar views are echoed in Levine (2005) wherein the author posits that the ability of financial intermediaries to reduce information and transaction costs which arise from information asymmetry between borrowers and lenders gives them the mandate to exist across the world. What much of the theoretical literature in the past failed to address was that the mechanisms through which these costs can be reduced may not always be the same across the world. Essentially, a lot of such mechanisms will be dictated by institutions in respective countries, a fact which only recently made its way into mainstream economics and finance research. Mainstream empirical research on institutions is grounded in Institutional Economics, and dwells on theories relating mainly to information asymmetry and transaction costs. The focus on institutions in empirical research has however most often taken a unidirectional route, notably one of considering only the formal aspects of institutions. This approach has resulted in incomplete analyses when the role of institutions is raised, due to the dual nature of institutions highlighted in North (1992). In his analysis, North (1992) suggests that countries need two distinct and

not necessarily complementary sets of institutions to meet the challenge of development: those that foster exchange by lowering transaction costs and encouraging trust; and those that influence the state to protect private property rather than expropriate it. Informal institutions make up the former category, while formal institutions make up the latter. Williamson (2000) further highlights this dual nature of institutions in his Levels of social analysis indicated in Figure 1.1 below. In the analysis, Williamson (2000) explains that Level 1, which comprises of informal institutions forms the foundation of subsequent levels, namely Levels 2, 3, and 4.

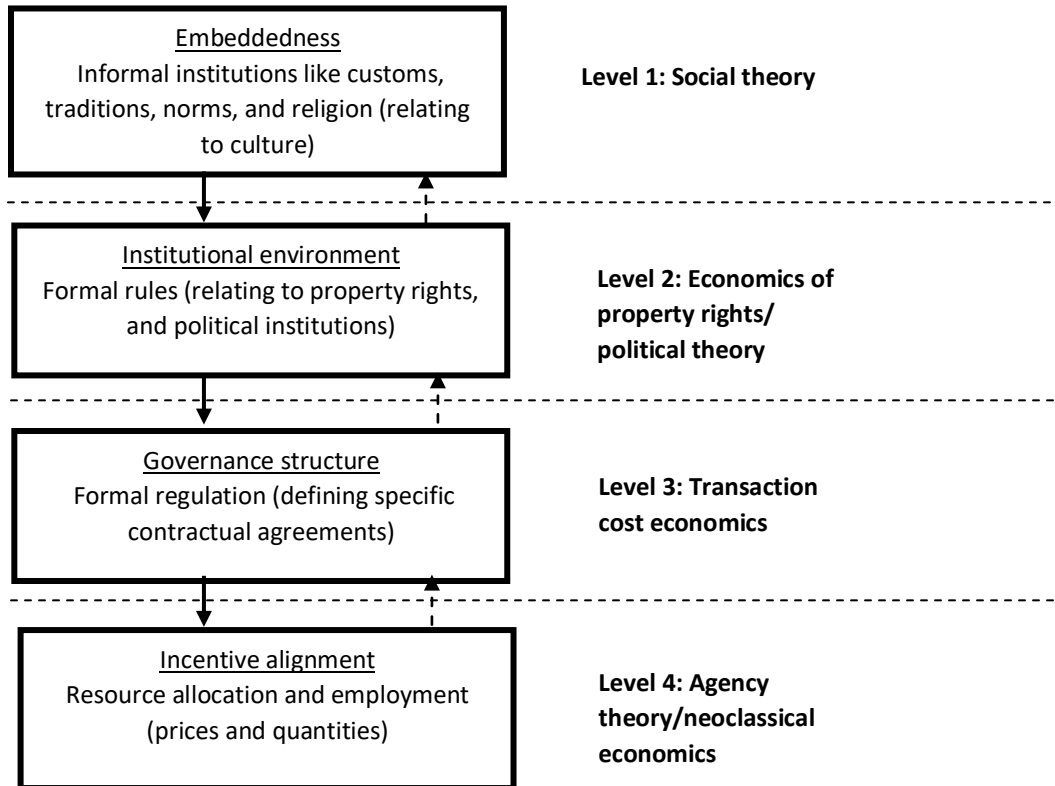


Figure 1.1: Levels of social analysis
Source: Author's adaptation from Williamson (2000)

A country's institutions – formal and informal – will affect financial intermediation costs through their effect on information asymmetry reduction strategies and related costs, and consequently affect individual decisions on the use of financial services, and the performance of financial services providers like MFIs.

A major implication of the discourse above on institutions is that financial systems do not work in a vacuum. Institutions matter. In a bid to uphold Schumpeter's creative destruction process, smooth and efficient flows of financial resources must be ensured. Ample theoretical and empirical evidence exists to prove the beneficial effects of well-developed financial systems to economic growth and development. The basic argument behind this is the efficient allocation of capital within an economy fosters economic growth, firstly by acting on the saving rate, and on the fraction of saving channelled to investment

(Levine, 1997). It then acts as a catalyst in Schumpeter's creative destruction process in ensuring a continuous renewal in production processes and procedures. As Almarzoqi et al. (2015) further elaborate, effective financial systems do not simply channel household savings into value-creating investments, but go further to monitor borrowers, and help agents pool, share and diversify risk. However, the ability of financial systems to efficiently carry out these intermediation functions and thus facilitate economic growth and development depends to a large extent on its institutions. The importance of institutions is further highlighted in Goldstein & Turner (1996), Naceur et al. (2014); Ajide (2017); and Aluko & Ajayi (2018). Consider for example a country's formal institutions like those relating to regulation and supervision in the financial sector. Though regulation of the financial sector is indispensable, it has often served as a double-edged sword. On one edge, it has enhanced the resilience of financial systems by ensuring only viable and efficient financial institutions are authorised to operate. On the other edge however, regulation has stifled risk-taking and innovation and impeded the growth of financial sectors and thus economies as a whole.

1.2. Statement of the problem

The challenge of poverty reduction and development has for decades received standard, ready-made solutions most often revolving around the provision of funds of some sort by international development financiers, multilateral development agencies, and governments to those in need. The funding of financial inclusion initiatives is a typical example here. A CGAP (2017)¹ report on financial inclusion funding indicates the South Asia (SAS) and Sub-Saharan Africa (SSA) regions are two of the biggest benefactors of such funding. However, the SSA region consistently lags behind almost all other regions of the developing world on key measures like formal account ownership, which as of 2017 stood at 33%, up from 23% in 2011². Interestingly South Asia which has benefited from an almost equal amount of funds has recorded near exponential growth in comparison to SSA on the same measures between 2011 and 2017, despite taking off from a similar point. Precisely, from 32% in 2011, the region grew to 68% formal account holders in 2017. Figures on this funding are presented in Figure 1.2 below. Prior research blamed such differences in development outcomes on formal institutional factors like regulation which stifled risk-taking and innovation, made financial intermediation costly and thus impeded the growth of financial sectors and economies. In systems where financial repression occurred, the effect on financial sector development was more severe. Quantitative restrictions on credit allocation, directed lending, legal ceilings on lending and deposit rates, public ownership of major banks, and entry restrictions represent some of such repressive policies. As Graham (1996) highlights, a good fraction of Sub-Saharan Africa

¹<https://www.cgap.org/sites/default/files/organizational-documents/CGAP-Annual-Report-Dec-2010.pdf>, consulted on 09/02/2019

² Global Findex 2017, <https://datacatalog.worldbank.org/dataset/global-financial-inclusion-global-findex-database>

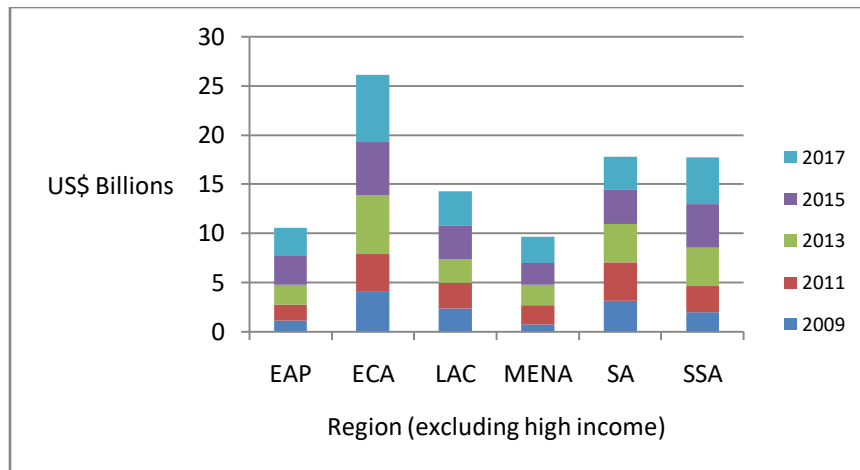


Figure 1.2: Financial inclusion funding, 2009 - 2017
Source: CGAP, 2017

witnessed such repression in the years leading up to the 1980s. In a bid to restructure their economies following economic crises in the late 1970s, financial reforms represented a key strategy. Efforts to promote financial sector development were thus made, an important one of these being financial liberalisation. Liberalisation essentially aimed to reverse the repressive financial policies and regulations adopted in earlier years by respective country governments. The McKinnon-Shaw hypothesis (McKinnon, 1973; Shaw, 1973) posits that financial liberalisation is a prerequisite for financial sector development. Removing interest rate ceilings and government regulations for example should stimulate savings, and overall increase investment levels. Such high investment levels will then be beneficial for growth and development. Financial liberalisation drastically lowered the costs of financial intermediation imposed by countries' formal institutions. Interestingly however, formal institutions continue to be hypothesised and perhaps overlaboured in empirical research on institutional determinants of financial outcomes, despite public efforts which have reduced the costs imposed by these institutions. Yet, differences in financial outcomes like financial inclusion, and the performance of financial service providers which have been vital in reducing intermediation costs and bringing financial services closer to the masses like MFIs however still persist, even when macroeconomic differences like the level of wealth and infrastructural differences (Hanedar et al., 2014; Olaniyi & Adeoye, 2016; Fanta & Makina, 2019) among others have been controlled for. Some other variable, not at all accounted for or perhaps not sufficiently considered in empirical research may be behind these differences. In this study, the informal institutional framework, which includes elements like trust, religion, term orientation, and risk attitudes, is hypothesised to have an effect on financial outcomes. Informal institutions, as suggested by North (1992) could have important implications on the mechanisms and costs of information asymmetry reduction, which Akerlof (1970) explains are key in the financial intermediation process.

With respect to development, while the drivers of poverty may broadly be similar or universal, the effectiveness of applied poverty-reduction strategies like the provision of funds for financial inclusion initiatives may depend on the underlying socio-cultural environments in which these strategies are applied. Unless due thought is given to the socio-cultural contexts in which development interventions are applied, the results will continue to be unbalanced, with some countries and regions more likely to get out of poverty than others, not due to a lack of funds, but to tailor-made ‘one-size-fits-all’ solutions implemented in different cultural contexts. Is there then a need to customise development strategies to different socio-cultural contexts to ensure higher impact or better effectiveness? Or should development partners continue with the same tailor-made responses to the resilient poverty reduction problem the developing world faces, irrespective of the cultural context?

The scarcity of informal institutions-related studies in explaining financial outcomes and phenomena motivates one axis of this research. Aggarwal & Goodell (2014) highlight a typical informal institution in this regard, namely culture. In explaining phenomena like differential financial inclusion levels across the world, culture has only been hypothesised as a potential determinant in a handful of studies like Lu et al. (2021), Korynski & Pytkowska (2016) and Cuéllar & Isabel (2018). On the other axis, two key gaps in research studies on culture and finance choices where existent are identified. Culture has empirically been proven to affect economic growth (Knack & Keefer, 1997; Johnson & Lenartowicz, 1998; Guiso et al., 2006), financial sector development (Dutta & Mukherjee, 2011; Klein & Klein, 2017), financial access (Aggarwal & Goodell, 2014), legal systems, with respect to property and creditor rights protection (La Porta et al., 1998; Licht et al., 2001; Stulz & Williamson, 2003), risk taking (Karagaretnam et al., 2011; Ashraf et al., 2016), financial firms performance (Halkos & Tzermes, 2011; Boubakri et al., 2017), and capital structure (Boubakri & Saffar, 2016; Haq et al., 2017). In much of this literature, the range of culture variables used has been restrictive in its choice and application. In practice, the number of available culture datasets is small. However, the range of variables covered in them is quite broad. Such variables cut across aspects relating to trust, collectivism, religion, respect for authority, attitudes towards risk, language, gender, thrift, and future orientation to name a few. Much of mainstream research on cultural influences has dwelt only on a few of these variables. In an important study on culture and finance, Stulz & Williamson (2003) explain why countries with weaker formal institutions like creditor rights do not make the effort to improve these institutions, and thus enjoy these development-related benefits of stronger institutions. The only culture variables hypothesised for this inertia in their study, amidst the plethora of possible variables are religion and language. Meanwhile, Knack & Keefer (1997) and Dutta & Mukherjee (2011) dwell almost entirely on trust in explaining economic outcomes. Ample room remains for consideration of a broader range of culture variables in empirical research. In this study,

these often singly-used variables are brought together. This presents a bigger and clearer picture, and better opportunity for understanding the role of informal institutions on economic and finance outcomes.

A second issue with available empirical culture-based studies in economics and finance is that they typically tend to dwell on the developed world. This applies both when the analysis is region-, and country-based. Typical cases here include Guiso et al. (2004) on social capital in Italy; Renneboog & Spaenjers (2012) and León (2013) on religion in Holland and the USA respectively; Guin (2017) and Spycher (2018) on language in Switzerland and Germany/France respectively; and Campus & Muysken (2013), and Korynski & Pytkowska (2016) on cultural measures in the EU. With the exception of China which has received direct attention in culture-based studies as seen in Turvey & Kong (2010), there has been limited focus on the developing world. The regions' limited representation has often only been found in global studies like Knack & Keefer (1997), Dutta & Mukherjee (2011), El Ghoul & Zheng (2016), Ashraf & Arshad (2017), Cuéllar (2018), and Levine et al. (2018). This has limited any policy implications that may possibly emanate thereof to the developed world, or the specific country under consideration. In addition to applying a broader range of culture measures, this research considers a broad sample which considers not only the developed world, but cuts across the developing world, touching on six key geographic regions, namely East Asia & Pacific (EAP), Europe & Central Asia (ECA), Latin America & Caribbean (LAC), Middle East & North Africa (MENA), South Asia (SAS), and Sub-Saharan Africa (SSA). The focus on the developing world and later on specific regions helps avert the possibility of extrapolating wrong policy choices on these parts of the world, and then on respective developing regions with different contextual arrangements.

With specific focus on studies using Hofstede's dimensions (described next), this study considers six cultural dimensions in the database. This contrasts with the consideration of only a few measures like the individualism/collectivism measure in a lot of empirical research, or when more measures are considered, a complete omission of term orientation and indulgence, two equally relevant but only recently added measures in the database. This study is also a novel attempt to link culture to individual finance choices, and the effect of these choices on the performance of financial institutions, especially MFIs which have been vital in reducing intermediation costs and broadening access to financial services.

1.3. Measuring cultural values in cross-country research

Due to its interdisciplinary nature and application, culture remains difficult to define. The core foundation of culture as depicted in most definitions is values. Values relate in simple terms to what a society or group considers good or bad, and acceptable or unacceptable with respect to human interactions or behaviour (North, 1992; Stulz & Williamson, 2000). Values then shape attitudes which translate into behaviour or noticeable actions. Culture then can be defined as “transmitted and created content and

patterns of values, ideas, and other symbolic-meaningful systems as factors in the shaping of human behavior” (Kroeber & Parsons, 1958), or as “the collective programming of the mind that distinguishes the members of one group or category of people from another” (Hofstede, 2001), or even in more practical terms as “those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation” Guiso et al. (2006). As Chui et al. (2002) say, culture is composed of certain values that shape behaviour as well as one’s perception of the world.

Despite the available empirical evidence, the introduction of culture as a potential determinant of some hitherto unexplained economic observations has been weak. In fact one of the reasons for limited attention being paid to culture variables arises from its ubiquitous nature which has resulted in measurement difficulties. There has also been a lack of clear channels through which culture can enter the economic discourse. As North (1990, pp. 107) notes, attaching numerical values or indicators to a country’s institutions of which culture is included (a Level 1 institution, see Figure 1.1 above) is a near impossible task. It has thus been difficult to design testable, refutable hypotheses relating to the variable. Fortunately however, the development of subjective perception-based datasets has allowed for a deeper look into the link between culture or institutions in general, and economic and development-related outcomes. Resulting from surveys, mainly via assessment of cultural preferences, values and beliefs of people using questionnaires and structured interviews with respondents across different countries, such datasets have greatly eased the introduction of informal institutions into economic research. Among the most widely used of these datasets in empirical research are cultural value dimensions, like those of Hofstede (1983), Schwartz (1994), House et al. (2004), and Inglehart et al. (2014) in the ongoing and increasingly popular World Values Survey project. Cultural dimensions seek to depict societal cultures on a continuum of broad categories like tolerance for uncertainty and ambiguity, concern for oneself relative to others, distribution of roles between the genders, and commitment to long term values among others. Two of these cultural value datasets are used in this research, namely Hofstede’s cultural dimensions³, and the World Values Survey⁴. Most empirical studies use a limited range of cultures measures, and often data from one dataset only. A broader range of culture measures from over one dataset is used in this study. This considerably adds to the literature on the role of cultural influences in the finance domain.

Hofstede’s cultural indices are based on survey data collected between 1967 and 1973 from IBM employees working in 72 national subsidiaries with different occupations as well as languages. Hofstede was able to replicate his study in the course of the 1970s with non-IBM executives from different countries. Using factor analysis, he came out with four cultural dimensions (added a further two in 2011) revealing common problems identified by the employees, but with solutions differing from country to

³ <https://www.hofstede-insights.com/country-comparison>, consulted on 29/03/2019

⁴ <http://www.worldvaluessurvey.org/WVSCContents.jsp>, consulted on 29/03/2019

country, in: social inequality, including the relationship with authority; the relationship between the individual and the group; concepts of masculinity and femininity; the social and emotional implications of having been born as a boy or a girl; and ways of dealing with uncertainty and ambiguity, which turned out to be related to the control of aggression and the expression of emotions (Hofstede et al., 2010, pp. 30). Each country has a score on a 0 to 100 scale for each dimension with increasing scores implying higher values on the variables measured. The dataset has six cultural value dimensions, namely Power distance, Individualism/Collectivism, Masculinity/Femininity, Uncertainty avoidance, Long-/Short-term orientation, and Indulgence/Restraint.

Power Distance measures “*the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally*” (Hofstede et al., 2010 pp. 61). Individualism/Collectivism concerns the relationship between individuals and groups. *Individualism* pertains to *societies in which the ties between individuals are loose: everyone is expected to look after him- or herself and his or her immediate family*. Individualistic cultures are thus characterized by less cohesion in groups (Hofstede et al., 2010 pp. 92). Masculinity/Femininity deals with the social implications of gender. A society is called *masculine* when “*emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life*” (Hofstede et al., 2010 pp. 140). Uncertainty Avoidance measures “*the extent to which the members of a culture feel threatened by uncertain or unknown situations*” (Hofstede et al., 2010 pp. 191). Long-term orientation deals with change, the basic notion being that the world is in a constant change process, and preparing for the future is always needed (Hofstede, 2011). Indulgence/restraint is an indicator of ‘happiness’. *Indulgence* is about the good things in life. In an indulgent culture it is good to be free or follow one’s impulses. Friends are important and life is worth living. People feel they are in control of their lives (Hofstede, 2011).

Commenced since 1981, the World Values Survey (WVS) studies changing values and beliefs and their impact on social and political life of people in over 100 countries across the world. With over 400,000 individual respondents in this nationally representative survey, data on the WVS, available since 1984 and presented in waves of about 5yrs based on the frequency of the surveys cuts across a number of subjects ranging from economic development, democratization, religion, trust, gender equality, social capital, and subjective well-being among others. The dataset currently has six waves, each corresponding to surveys conducted over the respective period 1981 – 1984, 1990 – 1994, 1995 – 1998, 1999 – 2004, 2005 – 2009, and 2010 – 2014. Data collection towards the seventh wave is currently in progress, with data relating to this process due in 2021⁵.

⁵ Initially programmed for release in mid 2020, the data collection process was greatly hampered by the Covid-19 pandemic.

Both Hofstede's cultural dimensions and the World Values Surveys (WVS) are survey-based datasets. The WVS however is a much broader dataset, covering a wider array of variables and subjects, as well as countries. While much of Hofstede's database was developed in the 1980s, the WVS, though started in the 1980s has been updated over time to include more countries and also spot changing cultural values. A closer look at WVS data for countries which have been covered in more than one data wave (six waves in all between 1984 and 2014) however indicates very slight changes in respective country scores on each variable used. This is in fact not strange, considering the fact that culture is a highly time-invariant variable, changing only in the order of centuries as Williamson (2000) explains as part of Level 1 institutions. In fact Huntington (1996) argues that cultural values are deeply rooted in history and transmit from generation to generation, again reflecting this time-invariant nature of culture. Given the age of Hofstede's dataset and the controversies its use may raise today, recent research has attempted to prove the dataset's continued applicability. One of these is Beugelsdijk et al. (2015) who replicate Hofstede's first four measures using two birth cohorts, an older corresponding to Hofstede's 1960s – 1970s study period workforce, and a younger corresponding to the current workforce. Findings indicate that cultural change is absolute and not relative, implying country scores on Hofstede's dimensions relative to other countries have not changed much. Both datasets are thus comparable with respect to their results. The last two variables on Hofstede's database, namely Long/Short-term orientation and Indulgence/Restraint were developed using data from the WVS. All six of Hofstede's cultural dimensions are used in this research, in addition to trust, religion, and religiosity from the WVS.

The choice of Hofstede's dimensions and the World Values Survey over others is motivated on two grounds: firstly, Hofstede's data facilitates the inclusion of a larger number of countries into the analysis. Secondly, Hofstede's dimensions have been replicated by other researchers, and the replications show no loss of validity, indicating that the cultural differences described in the dimensions are current and enduring. The WVS on the other hand is more current, has a broad range of culture measures, and is also more representative than a lot of other culture databases with respect to countries and variables covered.

1.4. Research questions

Based on the research problem presented above, the main research question addressed here is: Does culture determine finance choices and outcomes? The following questions are invoked in this regard:

- i. Does culture determine financial inclusion?
- ii. Does culture determine the choice between formal and informal saving and credit mechanisms?
- iii. Does culture influence the performance of Microfinance Institutions (MFIs)?
- iv. How efficient are MFIs of different ownership forms, and does culture determine this efficiency?

1.5. Objectives of the research

This research seeks to assess the effect of culture, an informal institution, firstly on individual finance choices and decisions, and then on the performance of financial intermediaries, MFIs being the specific case. Four objectives structured around this main objective make up this thesis. These are:

- i. To examine the role of culture in determining financial inclusion.
- ii. To examine the role of culture in determining the choice between formal and informal saving and credit mechanisms.
- iii. To analyse the effect of culture on the performance of MFIs
- iv. To assess the efficiency of MFIs of different ownership forms, and examine the role of culture as a determinant of this efficiency.

1.6. Scope of the study

Empirical research abounds on individual finance choices like the decision to use formal and informal finance services like savings and credit. Much of this research applies survey-based data relating to people's choices, with such data collected either at country level or at a global level like the Global Findex database of Demirgüç-Kunt et al. (2018), which is used in a lot of empirical research in this domain. The Global Findex is a global, nationally representative database of financial inclusion indicators relating to how adults around the world save, borrow, make payments and manage risk. The data is survey-based, and results from interviews with about 150,000 adults in over 140 developing and high-income countries around the world. Launched by the World Bank in 2011, data on these measures is published every three years, with over 100 indicators on financial inclusion, including by gender, age group, and household income. The database currently has three waves, notably the 2011, 2014 and 2017 waves, with the fourth expected in the course of 2021⁶. With respect to firm performance, secondary data on specific financial institutions with respect to their published financial statements is often used where available. A widely publicly used database in the microfinance industry is the Mix Market database. Founded in 2002, the Mix Market contains data on over 2000 Financial Service Providers (FSPs) operating in over 100 countries across the world. FSPs are rated through a 'diamond' system from 1 – 5 to indicate their frequencies of reporting and levels of disclosure. 4 and 5 diamond FSPs have more complete and audited financial statements over a period of at least two consecutive years, and thus the most reliably reported information. The database has since 2018 been taken over by the World Bank which currently serves as its host platform.

Because the main theme or subject under study has a direct link to poverty reduction and development, particular emphasis is laid in explaining the findings on developing countries, since poverty

⁶ The data had been expected in 2020, but has been met by severe delays due to the Covid 19 pandemic.

remains a more aching problem in the developing than in the developed world. Cognizance is taken of the fact that a lot of prior research using Hofstede's cultural dimensions only applies four of the six measures, with Long-term orientation and Indulgence/Restraint only recently added in 2011 and still only fairly applied as cultural measures in empirical research. As these two variables provide more insight especially in relation to the level of trust which is very essential in financial intermediation, and happiness measures which may influence individual choices, both have been considered to paint a clearer picture of culture's effect on the financial outcomes under study. The inclusion of these latter two variables however eliminates a number of countries from the analysis, because the data on these relatively new variables is not available for every country in the database. Finally, this study focuses on informal institutions. The reason for this is their novelty in economics and finance research in explaining a lot of hitherto unexplained economic outcomes. Though included, the effect of formal institutions is not looked deeper into, despite the fact that much of mainstream research on institutions has followed the formal institutions route. A joint study with formal and informal institutions may be quite interesting in itself in explaining the role of institutions as a whole on economic and finance outcomes.

1.7. Structure of the thesis

In meeting the main objective of this study – that of assessing the role of culture in determining individual finance choices and the performance of financial intermediaries, four standalone studies are conducted, two relating to individuals finance choices, and the other two to the firm and its performance.

In the first study, the decision to access and use formal financial services, referred to in the literature as financial inclusion is hypothesised to be determined by culture. A global cross-section sample of 85 countries, comprising 50 developing and 35 developed countries is used. This sample relates to over 90,000 individual observations. A probit model is used in the empirical analysis. Six variables which make up an often used culture dataset – Hofstede's cultural dimensions – are used as the culture measures. Findings indicate that culture determines financial inclusion. Living in high power distance, more masculine, and high uncertainty avoidance cultures reduces the likelihood for financial inclusion. Meanwhile, living in more individualistic, longer-term oriented, and more indulgent cultures increases the likelihood for financial inclusion.

In the second study, the choice between formal and informal financial services is analysed. Culture is hypothesised to determine this choice. Four variables from Hofstede's dimensions, plus a further three from the World Values Survey make up the culture measures in this study. Savings and credit participation data on a cross-section of 65 countries from the Global Findex database is used. This sample relates to over 74,000 individual observations. A probit model is used in the empirical analysis. Findings indicate that living in more individualistic cultures and cultures of higher religiosity, increases

the likelihood for individuals to borrow formally. Informal credit use is more likely in high uncertainty avoidance, high trust, and more religious cultures. Living in more individualistic, high trust cultures and cultures of higher religiosity significantly increases the likelihood for individuals to save. In individualistic cultures, individuals will most likely save formally; in high trust cultures and cultures of higher religiosity, the likelihood for informal saving is higher.

In the third study, the effect of culture on microfinance performance is assessed. Performance in this study considers both the financial and social objectives of microfinance in keeping with the industry's double bottom-line. Ratios are used to measure this performance. Data on the performance of 503 MFIs from 44 countries over the period 2012 – 2018 is extracted from the Mix Market, a widely used microfinance database. All six variables from Hofstede's dimensions make up the culture measures here. A random effects model is used in the empirical analysis, followed by instrumental variables estimation for endogeneity reasons. Findings indicate that microfinance achieves better financial performance and is generally more self-sufficient in high power distance cultures, and though of lower statistical significance, in more individualistic cultures. Meanwhile, microfinance achieves better social performance in more masculine and more indulgent cultures.

In the fourth study, the efficiency of 468 MFIs from 44 countries is assessed using Data Envelopment Analysis (DEA). The effect of culture on this efficiency is empirically analysed using a Tobit model. Hofstede's cultural dimensions make up the culture measures in this study. The analysis goes a step deeper to consider the different legal forms of MFIs, and to assess the effect of culture on their respective efficiencies. Findings indicate that microfinance is more efficient in individualistic and long-term oriented cultures. Non-Governmental Organisation (NGO) MFIs are the most financially and socially efficient MFIs in high power distance cultures. NGOs are also the most financially efficient MFIs in individualistic cultures. Shareholder-owned MFIs are the most socially efficient MFIs in individualistic cultures. Across all other cultures, Cooperatives are the most efficient MFI form, on both financial and social considerations, while NGOs are the least efficient. The efficiency gap between Shareholder-owned MFIs and Cooperatives in different cultures is however much closer than that between Shareholder-owned MFIs and NGOs.

Overall, this thesis is divided into six chapters. The first chapter introduces the research, presenting a background and research problem, research objectives, questions, and scope of study. Chapters 2 and 3 focus on culture and individual finance choices/decisions, while Chapters 4 and 5 focus on culture and the performance and efficiency of MFIs respectively. A summary of the research is presented in Chapter 6, with respect to the empirical findings. This is closely followed by policy implications, the theoretical contribution, and a conclusion.

Chapter 2

DETERMINANTS OF FINANCIAL INCLUSION: DOES CULTURE MATTER?

2.1. Introduction

Access to financial services represents a major driver in the quest for sustainable socio-economic development across the world. Such access has been proven empirically to be a key facilitator of poverty reduction and development, through its efforts to foster and promote female empowerment (Ashraf et al., 2010), higher savings for onward use in education, healthcare, and household/productive assets acquisition (Dupas & Robinson, 2009; Steinert et al., 2017), and better financial risk management among others (Swamy, 2014; Naceur et al., 2015; Demirgüç-Kunt et al., 2018). Empirical evidence linking access to financial services with lower income inequality, and higher economic growth is further provided by Classens & Perotti (2007) and Aslan et al. (2017). To enhance financial access and thus reap these development-related benefits, well-functioning financial systems are needed. Primarily, access to well-functioning financial systems facilitates the creation of equal opportunities. This then enables economically and socially excluded people to integrate better into the economy and actively contribute to development while protecting themselves against economic shocks.

Across the developing world, billions of people still remain unbanked and heavily reliant on informal finance mechanisms. This has had significant effects on poverty and economic development levels therein. Significant progress has however been made in boosting financial inclusion globally. As of 2017, 69% of adults globally had an account at a financial institution. This represents an 18% total increase between 2011 and 2017. Majority of those with no accounts reside in the developing world. In comparison to the developed world where 94% of adults own an account, only 63% do in the developing world. A regional comparison across the developing world reveals even starker differences as indicated in Figure 2.1 below. Historically, Sub-Saharan Africa (SSA) has remained the developing region with the lowest percentage of adult account holders, 33% as of 2017, up from 23% in 2011⁷. From a low of 32%, South Asia (SAS) has grown to 68% formal account holders in 2017, making the region the fastest growing with respect to account ownership. Unlike the SSA region thus, the SAS region has made better progress on this inclusion measure. Ironically, the SSA region has consistently benefited year on year and significantly above just about all the other regions from vast amounts of funds towards promoting financial access from both public and private actors (Tomilova & Dashi, 2017⁸). In addition to the SAS region, considerable financial inclusion progress has been made in Europe & Central Asia (ECA), Latin America & Caribbean (LAC), and East Asia & Pacific (EAP) regions.

⁷ Global Findex 2017, <https://datacatalog.worldbank.org/dataset/global-financial-inclusion-global-findex-database>

⁸ CGAP Brief available at <https://openknowledge.worldbank.org/handle/10986/30111>, consulted on 11/04/2019

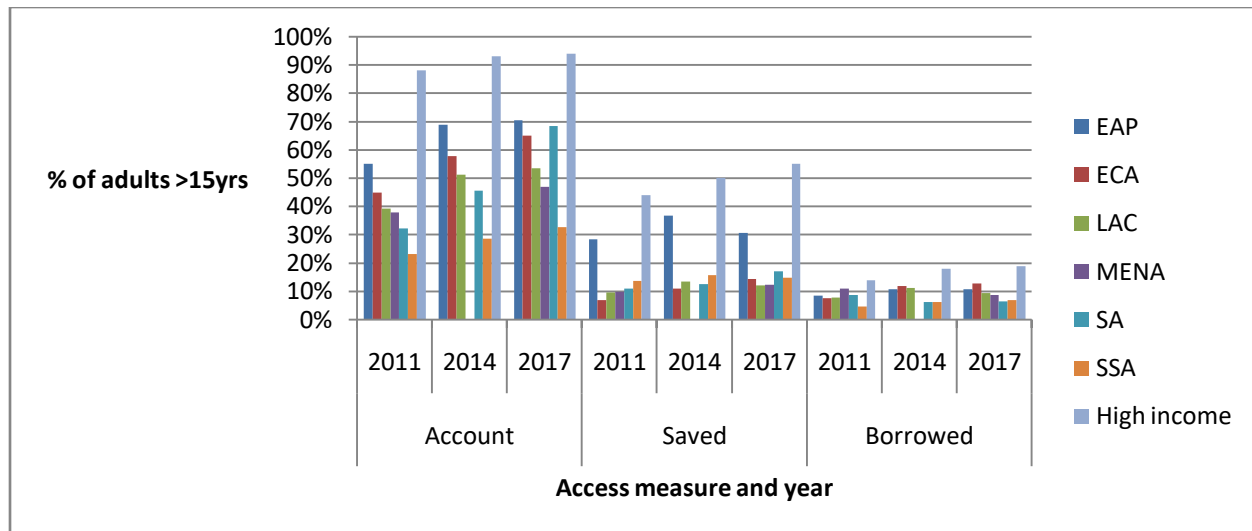


Figure 2.1: Formal financial services access/use between 2011 and 2017

Source: Global Findex, 2018

Overall, SSA and the Middle East & North Africa (MENA) regions still lag behind the rest of the developing world with very little progress on financial inclusion measures. Interestingly, though account ownership is lowest in SSA, the use of these accounts for purposes like saving is relatively higher than it is in the other regions with the exception of EAP.

Advanced for the observed low financial inclusion across the developing world are reasons which empirical literature mostly identifies as necessity-based. These include the lack of money, high cost of financial services, physical distance to formal financial institutions, lack of documentation and the lack of confidence in financial institutions (Demirgüç-Kunt & Klapper, 2013). To an extent, the continuous parallel existence of formal and informal finance across much of the developing world has been a result of poor-functioning financial systems. Gonzalez-Vega (2003) for example laments government intervention in credit markets via policies like directed lending and subsidized interest rates which ultimately failed to crowd out informal finance actors. This failure enabled informal finance build the necessary resilience to survive over time. Interestingly, even when public policies and actions have sufficiently reduced barriers of access to financial services and strengthened financial systems, informal finance has proven its resilience and remained popular even among the banked. A typical example is Kenya, one of the countries in Sub-Saharan Africa with the highest financial inclusion figures. Here, data from a 2009 national survey indicates that majority of the adult population in the country including those with accounts at formal financial institutions still rely heavily on informal financing mechanisms (Sile & Bett, 2015). Culture is hypothesised to be at play here in explaining this phenomenon. Deriving directly from institutional economics, culture theoretically has an effect on the level of information and transaction costs in an economy. These costs, as North (1990) and Williamson (2000) explain, could include the cost of entering into, monitoring, and enforcing contracts. Transaction costs form a central

theoretical axis in institutional economics. In low trust cultures for example, the costs of screening, monitoring, and enforcing contracts may be high. Such high costs may then deter people from using formal financial services, even when they have access to such services. Additionally, informality as explained by Geertz (1962) may provide an avenue for socialising and amassing social capital which is very useful in developing contexts. Relying on such informal finance mechanisms may be a way of building such social capital. This may explain the Kenya situation seen in Sile & Bett (2015) above. Higher social capital then reduces the cost of accessing and using financial services. The introduction of cultural influences is a novel addition to the vast empirical literature on financial inclusion determinants.

Despite its theoretical underpinnings and relevance, culture or informal institutions in general has received little attention in explaining economic and financial outcomes like low financial inclusion. Empirical evidence in most cases has relied on a host of variables which Naceur et al. (2015) classify as structural, and policy-related. Among these variables are population density and the level of bank competition. Both of these may influence the cost of providing financial services. Non-policy characteristics like the inflow of remittances have equally been found to influence the decision to access or use financial services. Such variables have been instrumental in explaining financial outcomes on country-specific bases, like individual saving decisions. They however have not fully explained the cross-country and cross-region variation in documented formal and informal finance use across the world, or even the popularity of informal finance in countries with relatively better developed financial systems like Kenya. A study by Soumaré et al. (2016) finds significant differences on determinants of access to finance between West and Central Africa, two of the regions with the lowest levels of financial inclusion in the world, and the rest of Africa. Unlike in the rest of Africa for example, gender is a very strong determinant of access to finance in Central Africa, but remains of little significance in West Africa. Meanwhile, household size is a significant determinant of financial inclusion in West Africa, but not in Central Africa. The authors conclude that the leading forces driving access to finance in these two regions are not always the same as in the entire African region.

This chapter seeks to answer one question: does culture determine financial inclusion? To answer this question, the role of culture as a determinant of financial inclusion is empirically assessed using a global cross-section sample of 85 countries which comprises of 50 developing and 35 developed countries. The decision to own an account at a formal financial institution, and the use of this account for savings and credit purposes are considered as the financial inclusion measures. Data on account ownership and use is obtained from the Global Findex database of 2017, while that on culture is obtained from Hofstede's cultural dimensions⁹. Over 90,000 individual observations are used in the sample. Regression analysis using a probit model indicates that culture determines financial inclusion. Living in

⁹Available at <https://www.hofstede-insights.com/country-comparison>, consulted on 29/03/2019

high power distance, more masculine, and high uncertainty avoidance cultures reduces the likelihood for financial inclusion. Meanwhile, living in more individualistic, longer-term oriented, and more indulgent cultures increases the likelihood for financial inclusion.

The remainder of the chapter is structured as follows: in the next section, a conceptual framework relating to financial inclusion and exclusion, and culture is presented. A theoretical framework relating to this study, empirical evidence, and hypotheses follow thereafter. Section 3 dwells on the methodology, commencing with the datasets, and moving on to the econometric model. Results of the empirical analysis are presented later in the section with an explanation of the findings, followed by a conclusion.

2.2. Literature review

2.2.1. Financial inclusion and exclusion

Historically, ownership and use of accounts in formal financial institutions, otherwise dubbed financial inclusion has been critically low across the developing world. Through their saving and credit products and services, formal financial institutions should ideally help individuals smooth their incomes and meet their consumption needs. This however is not always the obvious outcome in developing countries. Several barriers exist to access to these formal financial services by individuals. Among these barriers are those relating to infrastructure and geography like distance from service providers, affordability like cost of services and income levels, conditions like documentation required, socio-cultural context like trust in financial services, religion, and no need for financial services; and demography like household setting relating to size and family makeup (Corr, 2006 pp. 10-13; Beck et al., 2009). Faced with these barriers to formal financial services access, vast populations across the developing world rely on informal financial services. The financial intermediation function in developing countries is thus carried out by a dual financial sector comprising the formal and informal sectors. The categorization of formal/informal with respect to financial service provision arises on legal grounds in most countries, with respect to regulation. Precisely, the formal financial sector is subject to far more regulation than the informal financial sector.

2.2.2. Culture, institutional quality and finance: concepts and theoretical link

Guiso et al. (2006) define culture as “those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation”. This definition restricts the potential channels of culture’s influence to two standard ones—prior beliefs, and values or preferences. Values form the core of every culture, and relate to what a society or group considers acceptable or unacceptable with respect to human behaviour. Following this line of thought, culture depicts the process via which values are transmitted fairly unchanged across generations both through conscious learning and observation by ethnic, religious, and social groups (North, 1990; Guiso et al., 2006). Culture falls within a country’s institutional framework, precisely its informal institutions. North (1990) broadly describes

institutions as “the rules of the game in a society”, essentially encompassing formal institutions which protect and enforce the various rights like property and creditor rights; and informal institutions, which define a society’s underlying norms of conduct. An example of these norms of conduct defined by a country’s values and thus its culture is presented in Hofstede’s cultural dimensions. This is an often used culture database in empirical research. The database contains six measures, namely Power distance, Individualism/collectivism, Masculinity/Femininity, Uncertainty avoidance, Long/Short-term orientation, and Indulgence/Restraint. Power Distance measures “*the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally*” (Hofstede et al., 2010 pp. 61). Individualism/Collectivism concerns the relationship between individuals and groups. *Individualism* pertains to *societies in which the ties between individuals are loose: everyone is expected to look after him- or herself and his or her immediate family*. Individualistic cultures are thus characterized by less cohesion in groups (Hofstede et al., 2010 pp. 92). Masculinity/Femininity deals with the social implications of gender. A society is called *masculine* when “*emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life*” (Hofstede et al., 2010 pp. 140). Uncertainty Avoidance measures “*the extent to which the members of a culture feel threatened by uncertain or unknown situations*” (Hofstede et al., 2010 pp. 191). Long-term orientation deals with change, the basic notion being that the world is in a constant change process, and preparing for the future is always needed (Hofstede, 2011). Indulgence/restraint is an indicator of ‘happiness’. *Indulgence* is about the good things in life. In an indulgent culture it is good to be free or follow one’s impulses. Friends are important and life is worth living. People feel they are in control of their lives (Hofstede, 2011).

Both formal and informal aspects of institutions can affect the incentives and costs associated with financial intermediation. Osili & Paulson (2006) provide a detailed illustration of the effect of institutions on an individual’s decision to hold some financial asset like demand deposits. The authors model institutional quality via the assumption that the individual believes there is some probability that the bank or other financial institution will abscond with his/her funds. This in other words indicates the likelihood of expropriation by firm managers or by the government. It also indicates the possibility that the institutional framework may not be sufficient to ensure funds will be invested in profit-maximizing projects or proceeds reinvested or returned to investors. The probability that an individual places on the likelihood of expropriation is to a good extent a function of the quality of the institutions in the individual’s country of origin. The individual often will engage in due diligence to minimize the risk of expropriation prior to investing in the asset. The level of diligence as well as related costs depends on the quality of institutions, implying that institutions influence the expected costs of participation in financial

markets. Finally and from a supply perspective, higher institutional quality will lower the costs that the financial institutions incur in providing services to individuals and households.

Overall, due to its foundation on values and beliefs, culture and its core elements like trust and religion may directly influence the decision to participate in formal finance markets as explained by the Technology Acceptance Model (TAM). TAM explains the acceptance of novel technologies by individuals in different societies. It posits that perceived usefulness and perceived ease of use determine an individual's intention to use a system, with intention to use serving as a mediator of actual system use (Venkatesh & Davis, 1996). Perceived usefulness is also directly impacted by perceived ease of use. In societies where people are accustomed to informality in financial transactions, the acceptance of formal financial services may be met with high inertia, if the perceived value to be added by such an 'innovation' is not high enough. Such perceived value depends on the perceived ease of use of such services, which again is influenced by external variables like service design and related features, affordability, and related costs of access and use among others.

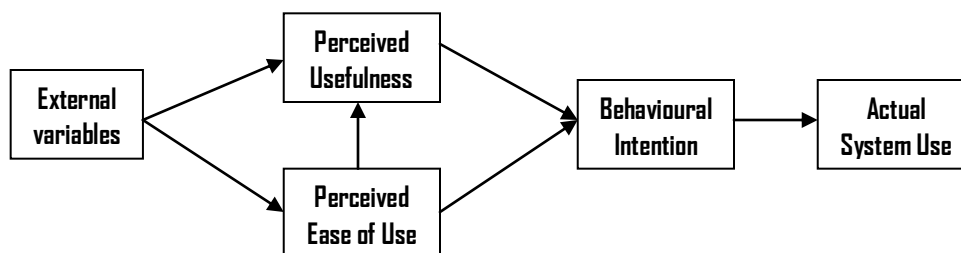


Figure 2.2: The Technology Acceptance Model (TAM)

Source: Adapted from Venkatesh & Davis (1996)

On a more economic and social science basis, a number of theories have been used to explain the financial exclusion problem and partly the popularity of informal finance. While some are deeply rooted in economic theory, others are interdisciplinary, cutting across subjects in the social sciences like psychology, sociology, geography and economics. In the economic domain, one of the key foundations of such theories is rationality. By this, the behaviour or choices of economic agents, notably households and firms is assumed to be rationally determined by self-interest, and to be well informed and competitive. Financial exclusion by this reasoning is strictly the result of consumer choice, choices which can be influenced by a number of factors like the economic costs of using formal financial services and government policy which distorts credit markets. A typical theory premised on this is the Neoclassical economic theory, which in several facets compliments the provisions of TAM above. A second and perhaps more relevant theory to this study is New Keynesian theory which explains financial exclusion as resulting from market distortions embedded in the microeconomy, like information asymmetry between lenders and borrowers, and related credit constraints. As a risk management measure, lenders may use

interest rates and/or other credit rationing tool like the requirement of collateral which may directly exclude potential users of financial services (Stiglitz & Weiss, 1981).

At an interdisciplinary level lies Institutional theory whose premise is institutions like laws, regulation and governance in effective markets and their historical evolution. Notably, institutions affect transaction and related costs of doing business, including the cost of entering into contracts (financial in this case), and contract enforcement. Depending on the strength of institutions, these costs may be high and thus directly exclude potential users of financial services (North, 1990; Williamson, 2000). Institutions however have a dual nature, classified on the level of formality. Informal institutions consist of the norms, unwritten rules or codes of conduct which guide individual behaviour in different societies. A typical case here is the culture of a people, which derives from societal values, notably what a society considers right or wrong, good or bad with respect to interactions between people. Interestingly, a country's formal institutions like its laws, regulations, and governance mechanisms derive from these informal institutions as depicted by Williamson (2000) in Figure 1.1 above. Culture is a Level 1 institution and represents the foundation on which subsequent institutions lie. Depending on the particular values embedded in a culture, the level of transaction costs relating to the resolution of information asymmetry, entering contracts, monitoring, and contract enforcement may be high (or low). The level of these costs may then have direct effects on financial inclusion. Overall, the institutional framework of a country determines the cost and risks of financial services provision, via relevant information asymmetry reduction channels.

2.2.3. Empirical evidence: Cultural determinants of financial inclusion

Existing empirical literature on culture and financial outcomes has dwelled on a broad range of variables among which are individualism, uncertainty avoidance, trust, and religion. With respect to financial inclusion, some measures in empirical research, used in different combinations in different studies include account ownership at a formal financial institution, formal saving, formal credit, use of technology in financial transactions like mobile money , and intensity of accounts use for deposit and withdrawal purposes (Osili & Paulson, 2006; Zins & Weill, 2016; Cuéllar & Isabel, 2018; Xu, 2020; Lu et al., 2021).

Lu et al. (2021) empirically assess the effects of individualism on financial inclusion in a cross-sectional study, using individualism data from Hofstede's cultural dimensions database, and financial inclusion data from the Global Findex database of 2014. A broad set of measures relating to household access to, and use of financial services are used for financial inclusion. Among these are account ownership, and savings at a formal financial institution. Basing their argument on the theoretical point that individualism is associated with a wide radius of trust and weak support of informal networks, the authors find a positive relationship between individualism and financial inclusion. Upon further analysis

using additional culture measures for robustness, the authors prove a significant negative relationship between masculinity and financial inclusion, and a negative but insignificant relationship between power distance and financial inclusion. With financial development, defined as the average ratio of private credit to GDP as the financial outcome of interest, Ang (2019) assesses the effect of individualism on financial outcomes. The author finds a strong positive relationship between individualism and financial development. In a prior study, Hlophe (2018) establishes a long run positive relationship between financial development and financial inclusion. A similar positive relationship between individualism and financial inclusion can thus be extrapolated here on the bases of Hlophe (2018) and Ang (2019).

Using panel data on 26 countries for the period 2006 – 2015, Cuéllar & Isabel (2018) assess the effects of a broad range of variables in which Hofstede's measures of uncertainty avoidance and term orientation are included, on financial inclusion, measured using bank credit access. Findings from the empirical analysis indicate that financial inclusion is higher in more risk tolerant and long-term oriented countries. The authors however fall short in providing any theoretical explanations relating to this finding. Ahunov & Hove (2020) explain this by linking uncertainty avoidance to trust, arguing that a negative relationship exists between the two variables. This relationship is proven empirically by the authors, wherein they find lower financial inclusion in countries of high uncertainty avoidance, resulting from lower trust in banks. Still in relation to trust, findings of a positive relationship between trust and financial inclusion are found by Soumaré et al. (2016), Abel et al. (2018), and Xu (2020).

As in Cuéllar & Isabel (2018), Muntin (2020) finds a positive relationship between long-term orientation and financial inclusion, though the focus on financial inclusion here is on women only. Meanwhile the same study finds a negative relationship between masculinity and financial inclusion of women. Gender also features prominently in Osei-Tutu & Weill (2020), wherein the authors make reference to languages. Arguing on grounds of stylized facts that women continue to have poorer access to financial services than men, and on theoretical grounds that language indirectly influences behaviour at the subconscious level, the authors hypothesise that language determines financial inclusion of women. Precisely, gendered languages, languages like French which require reference to gender-specific nouns and pronouns like 'le/la' lead individuals to draw distinctions between genders. Such languages reduce the likelihood for financial inclusion of women, measured with respect to formal ownership of a bank account, formal access to bank credit, and formal saving on a bank account. The authors do find, as hypothesised, a lower likelihood for women to access and use formal financial services in countries with gendered languages. Further controls indicate a negative relationship between power distance and financial inclusion across all inclusion measures, but mixed results for individualism and masculinity.

Korynski & Pytkowska (2016) measure financial inclusion in the European Union (EU) using Data Envelopment Analysis (DEA). The authors define financial inclusion as efficiency with which a

financial system transforms inputs like financial inclusion policy into outputs, notably the use of financial services. They apply DEA to compute a financial inclusion index for each EU member state, and then use a Tobit model to find the effect of a set of explanatory variables of which Hofstede's cultural dimensions are included on these efficiency scores. Findings indicate that Individualism and Indulgence are positively correlated with the degree of efficiency in provision of financial services while Power Distance is negatively correlated. However, further results from the regressions show that when controlled for GNI per capita, only Indulgence and Masculinity significantly predict the efficiency score. Precisely, financial systems are more efficient in countries where the population's lifestyle drives higher spending (Indulgence), prompting higher demand for financial services. In less masculine countries (more feminist) wherein society values cooperation, caring for the weak and generally higher social inclusion, financial systems are equally highly efficient. As Claessens (2005) explains, higher social inclusion will lead to higher demand for financial services as social inclusion encompasses a number of other inclusive targets relevant for financial inclusion like education, employment, and training.

Religion and related deep rooted customs and beliefs like an aversion to interest-based transactions may influence the use of formal financial services. Ghatak (2013) proves this empirically in the case of India, while Zulfiqar et al. (2016) prove same in the case of Pakistan. Due to religious and/or other local customs and beliefs, there may be a resistance to change and fear of using modern financial services. This resistance may be heightened when the perceived usefulness of such services is low, or the perceived ease of use is high as suggested by the Technology Acceptance Model. This is similar to what Osili & Paulson (2006) term "cultural capital", which they suggest may prevent individuals from accessing formal financial services, credit to be precise, even when such services are widely and readily available. Overall, Christianity favours account ownership; Islam on the other hand disfavors account ownership still as found by Neba & Mbotta (2018). In fact Adeyemi et al. (2012) in their research on financial inclusion among Muslim micro-entrepreneurs in part of Nigeria point to high debt phobia or fear of inability to repay loans and its related repercussions in the Muslim community.

2.2.4. Hypothesis

Hofstede's cultural dimensions are used in this study to capture culture. There are six dimensions in all, namely power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, long/short term orientation, and indulgence/restraint. These measures are used either individually or in some combination in the research studies of El Ghouli & Zheng (2016), Korynski & Pytkowska (2016), Cuéllar & Isabel (2018), Ang (2019), Ahunov & Hove (2020), Osei-Tutu & Weill (2020), and Lu et al. (2021). Among the most widely used measures of financial inclusion in empirical research are account ownership at a financial institution, formal saving, and formal credit. All three relate to the percentage of

people in each country aged fifteen and above who indicate ‘yes’ to survey questions on the respective variables, and are used either entirely or in some combination in Soumaré et al. (2016), Zins & Weill (2016), Lanie (2017), Muntin (2020), Osei-Tutu & Weill (2020), and Lu et al. (2021). More on this is discussed in Section 2.3.2.2 below. All three are used to capture financial inclusion in this study.

Hofstede (1984, pp. 98) posits that high *power distance* cultures are characterized by higher inequality. He further observes that “inequality in power and inequality in wealth go hand in hand”. Because formal financial services often discriminate on the basis of income (Zins & Weill, 2016; Demirgüç-Kunt et al., 2018), a negative relation is expected between power distance and financial inclusion, with respect to all three measures. Similar findings are made by Korynski & Pytkowska (2016) Osei-Tutu & Weill (2020), and Lu et al. (2021). *Individualistic* cultures are characterized by less cohesion in groups (Hofstede et al., 2010 pp. 92). Due to higher competitive pressures owing to a higher prioritization of individual achievements or the ‘I’ over ‘We’, and generally less dependence on others in individualistic cultures, the likelihood for people to own and use accounts in their own names is higher. Korynski & Pytkowska (2016) and Lu et al. (2021) arrive at similar findings. *Masculine* cultures value achievement and material success and generally tend to exhibit opportunistic tendencies (Hofstede et al., 2010 pp. 140; Zheng, et al. 2012). *Feminine* cultures on the other hand mainly value interpersonal relationships and modesty and social inclusion in general. The direct result of masculinity is higher inequality especially on gender grounds which may prompt vulnerable groups to use less formal financial services, especially where discrimination on gender and income-related grounds carries on into formal financial services. A negative relationship is thus expected between masculinity and financial inclusion. Similar findings of a negative relationship between masculinity and financial inclusion are made by Korynski & Pytkowska (2016), Muntin (2020), and Lu et al. (2021). High *uncertainty avoidance* cultures are characterized by an emphasis on rules, beliefs, and institutions that provide certainty, conformity and predictability (Hofstede et al., 2010 pp. 191). Transaction costs in such cultures tend to be high as people spend more time and money trying to gather as much information as possible on counterparts prior to transactions. Such high costs may directly exclude vast populations from the use of formal financial services, implying a negative relationship is expected between uncertainty avoidance and financial inclusion. Cuéllar & Isabel (2018) and Ahunov & Hove (2020) also find financial inclusion to be lower in high uncertainty avoidance countries. In *long-term oriented* cultures, people are more likely to use formal finance as they look forward to investing for longer periods, which formal finance is equipped for. Policies in such countries are usually inclusive too, resulting in less inequality (Fogel et al., 2011). A positive relationship is thus expected between long-term orientation and financial inclusion. Cuéllar & Isabel (2018) and Muntin (2020) equally find financial inclusion to be higher in longer-term oriented countries. Korynski & Pytkowska (2016) posit that financial systems are more efficient in countries

where the population's lifestyle drives higher spending, prompting higher demand for financial services. A positive relationship is thus expected between *indulgence* and financial inclusion.

Table 2.1: Hypotheses relating to culture and account ownership

Hypothesis	Culture measure	Account ownership	Formal saving	Formal credit
2a	Power distance	-	-	-
2b	Individualism/Collectivism	+	+	+
2c	Masculinity/Femininity	-	-	-
2d	Uncertainty avoidance	-	-	-
2e	Long/short term orientation	+	+	+
2f	Indulgence/Restraint	+	+	+

Source: Author, 2019

2.3. Methodology

2.3.1. Datasets

2.3.1.1. Measuring financial inclusion

Financial inclusion data was extracted from the Global Findex database of Demirgüç-Kunt et al. (2018). The Global Findex is a global, nationally representative database of financial inclusion indicators relating to how adults around the world save, borrow, make payments and manage risk. The data is survey-based, and results from interviews with about 150,000 adults in over 140 developing and high-income countries around the world. Launched by the World Bank in 2011, data on these measures is published every three years, with over 100 indicators on financial inclusion, including by gender, age group, and household income. The database has widely been used in research related to financial inclusion (see Allen et al., 2016; Klapper & Singer, 2015; Zins & Weill, 2016; and Deléchat et al., 2018).

2.3.1.2. Measuring culture

Hofstede's cultural dimensions make up the culture measures in this study. This data is survey-based, and extracted from Hofstede's dimensions of national culture database. Section 1.3 above gives an elaborate description of the database. The database has six cultural value dimensions. All six are used in this study, and are summarily described in Section 2.2.2 above. Country scores on the respective variables range between 0 and 100, with higher scores implying a higher measure in each category. A few outliers however do exist in the data, with country scores above 100 on some dimensions. Two examples here include the Slovak Republic with a Power distance score of 104 and Greece with an Uncertainty avoidance score of 112.

2.3.1.3. Sample selection

This is a global study, involving both developed and developing countries. 142 countries were initially selected for this study. This was on the basis of financial inclusion data availability on the Global Findex

database. As culture is the main explanatory variable, over 50 countries were dropped from the initial sample due to the lack of complete culture data in Hofstede's database. The final dataset comprises 85 countries, 35 of which are high income, and 50 developing countries. Developing countries used in the sample come from six developing regions, namely East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, South Asia, and Sub-Saharan Africa.

Table 2.2: Regions / countries covered

Region	N	Countries
East Asia & Pacific (EAP)*	6	China, Indonesia, Malaysia, Philippines, Thailand, Vietnam
Europe & Central Asia (ECA)*	17	Albania, Armenia, Azerbaijan, Belarus, Bosnia & Herzegovina, Bulgaria, Croatia, Georgia, Kazakhstan, Macedonia, Moldova, Montenegro, Romania, Russia, Serbia, Turkey, Ukraine
Latin America & Caribbean (LAC)*	9	Argentina, Bolivia, Brazil, Colombia, Dominican Republic, El Salvador, Mexico, Paraguay, Peru
Middle East & North Africa (MENA)*	8	Algeria, Egypt, Iran, Iraq, Jordan, Lebanon, Libya, Morocco
South Asia*	3	Bangladesh, India, Pakistan
Sub-Saharan Africa*	7	Burkina Faso, Ghana, Mozambique, Nigeria, South Africa, Tanzania, Zambia
High Income (OECD)	28	Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Japan, Latvia, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, United Kingdom, United States
High Income (Non OECD)	7	Hong Kong, Hungary, Lithuania, Malta, Saudi Arabia, Singapore, Uruguay
<i>Total number of countries</i>	85	

*Excludes any high income countries in the respective regions. These countries are reported under the category *High income (Non OECD)*

2.3.2. Model, variables, and estimation

2.3.2.1. Model and estimation

A probit model is utilized in this study to analyse the effect of national culture patterns on financial inclusion. Probit models make up one of three commonly used models in econometric analysis which apply when the dependent variable is binary. The other two include Logit models, and the Linear Probability model (LPM). The LPM generally represents the easiest of these methods both with respect to computation and interpretation. It is based on an assumption that the probability of an event y occurring, $Prob(y_i = 1)$ is linearly related to a set of explanatory variables x_1, x_2, \dots, x_n . Recall y_i is binary, and thus represents a series of zeros and ones. Despite its simplicity, the LPM has one major limitation: the predicted probabilities may be less than zero (negative) or greater than 1. One way to solve this problem will be to truncate the probabilities at 0 or 1. Truncation will however directly result to many observations with exactly 0 or 1 probabilities, which may be very unrealistic depending on the dependent variable under consideration. Probit and Logit models represent more advanced binary models which address the key limitation of negative or above one probabilities of the LPM. To do this, both models transform the regression model using some function, such that the fitted values are bounded within the (0, 1) interval

(Brooks, 2008, pp. 514). The difference in both models lies in the function used for this transformation. The Logit model uses a cumulative logistic distribution, wherein the logistic function F , which is a function of any random variable, z , is given by

$$F(z_i) = \frac{1}{1 + e^{-z_i}}$$

e is the exponential. The Probit model on the other hand uses a cumulative normal distribution. The function F , in this case is given by

$$F(z_i) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{z_i}{\sigma}\right)^2}$$

As Long (1997) and Brooks (2003) explain, the results obtained using either the probit or logit models tend to be very similar. The choice thus often boils down to a personal one. This study however adopts a probit model in keeping with the literature, wherein probit models have more widely been used in cross-country studies on financial inclusion, as applied in Zins & Weill (2016), and Lanie (2017).

In using the probit model here, assume the decision to be financial included depends on a latent variable y^* which is determined by a set of exogenous variables, included in vector x' , so that:

$$y_i^* = x_i' + u_i$$

$$y_i = 1 \text{ if } y_i^* > 0; y_i = 0 \text{ if } y_i^* \leq 0$$

where i represents individuals, β is a vector of parameters, and u is a normally distributed error term with mean 0 and variance 1. There is a critical threshold y_i so that if $y_i^* > y_i$ then an individual is financially included (owns an account at a financial inclusion, saves and/or borrows formally). y_i is not observable either, and is assumed to be distributed normally with the same mean and variance. Thus it is possible to estimate the parameters of interest, β , to obtain information on y_i^* .

$$Prob_i = Prob(y_i = 1|x') = Prob(y_i \leq y_i^*) = Prob(Z_i \leq \beta x_i') = F(\beta x_i')$$

where Z is a standard normal variable, $Z \sim N(0, \sigma^2)$ and $F(z_i) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{z_i}{\sigma}\right)^2}$ is the cumulative distribution function of a normal variable. Overall thus, the probit model here quantifies the probability that individual i in country j will be financial included, $Prob(Y_{ij} = 1)$, given an underlying set of exogenous variables x :

$$Prob(Y_{ij} = 1|x_i) = \alpha + \delta Culture_j + \gamma D_i + \lambda M_j + \theta Z_j + u_{ij}$$

where the coefficients δ , γ , λ , and θ are XY matrices for the respective explanatory variables and controls of national culture dimensions, Individual- and country-specific characteristics (D) like age, population density and related demographic measures, Macroeconomic setting (M), and Formal institutions (Z); α is the matrix of intercepts, while u_{ij} represents the idiosyncratic error term. The model is estimated using the Maximum Likelihood Estimator, and the marginal effects on the latent variable are calculated from the different coefficients estimated in the model.

2.3.2.2. Variables

Following Zins & Weill (2016) and Osei-Tutu & Weill (2020), three variables are used in this research for financial inclusion. These include Formal account ownership, Formal savings, and Formal credit. Each of these variables is binary, taking on the value 1 if individuals affirm to the respective questions indicated below and zero otherwise from responses to questions on the Global Findex 2017 survey¹⁰.

To estimate account ownership, the following question was used: “*An account can be used to save money, to make or receive payments, or to receive wages or financial help. Do you, either by yourself or together with someone else, currently have an account at a bank or another type of formal financial institution? Yes or no?*”. In countries around the world like Cambodia, the Central African Republic, Kyrgyz Republic, and the Republic of Yemen, more than 95% of adults do not have an account at a formal financial institution. To estimate the use of an account to save, the following question was used: “*In the PAST 12 MONTHS, have you, personally, saved or set aside any money for any reason by using an account at a bank or another type of formal financial institution? Yes or no?*”. To estimate the use of an account to borrow, the following question was used: “*In the PAST 12 MONTHS, have you, by yourself or together with someone else, borrowed any money from a bank or another type of formal financial institution? Yes or no?*”. For the main explanatory variable – culture –, all six of Hofstede’s cultural dimensions are focused on as the culture measure in this study in line with Korynski & Pytkowska (2016). These are described in Section 2.2.2 above.

Following previous research studies on finance choices of individuals and firms, a range of variables are controlled for in this research, from individual demographic characteristics to country-specific characteristics like the macroeconomic and formal institutional environments.

Individual Demographics

Previous research findings indicate that the decision to use formal finance services is highly influenced by age, gender, education level, income level, and employment status of individuals (Osili & Paulson, 2006; Camara et al., 2014; Tuesta et al., 2015; Zins & Weill, 2016). Controls are made for each of these individual characteristics. Gender is a dummy variable equal to one if the individual is *Female* and zero otherwise. Three dummy variables are used for education (educ_PRI, educ_SEC, and educ_TER) to represent educational attainment up to primary, secondary, and tertiary levels respectively. Meanwhile, four dummy variables are used for income level to respectively represent quintiles from the poorest to the richest 20%. The fifth quintile dummy (richest 20%) is omitted. Finally the employment status of individuals is controlled for via a dummy emp_stat with a one indicating the individual is employed and a zero otherwise.

¹⁰ Global Findex 2017 Questionnaire, <https://globalfindex.worldbank.org/sites/globalfindex/files/databank/2017%20Findex%20questionnaire.pdf>

Country Macroeconomic environment and related characteristics

To account for macroeconomic differences at country level which may potentially influence the results, controls are made for the level of wealth, population density, and financial sector development. This follows research studies of Olaniyi & Adeoye (2016), and Rajput (2017). Following Hanedar et al. (2014), El Ghouli & Zheng (2016), and Levine et al. (2018), the level of financial sector development in respective countries for example is controlled for, using the percentage of private credit by banks to GDP measure. In line with Delechat et al. (2018), the level of wealth of a country measured by GDP per capita is controlled for.

Country Formal institutions

A country's formal institutions derive from its informal institutions of which culture is included as depicted in Williamson (2000). In line with Osili & Paulson (2006) and Neba & Mbotta (2018), the legal origin of countries is controlled for. The legal origin of a country is a dummy variable equal to 1 if a country's legal origin is English Common Law and 0 if the legal origin is French, German, or Scandinavian Civil Law. Additional controls are made for property and creditor rights following Beck et al. (2005) and Levine et al. (2018).

2.4. Estimation Results and Discussion**2.4.1. Descriptive statistics**

Summary statistics for all the variables included in the model are presented in Table 2.3 below. Across the sample, 69.31% of all individuals have an account at a formal financial institution. The youngest here is 15 and the oldest is 99 years old, with an average age across the sample of 44. Women make up 50.02% of the respondents. 51.87% of the respondents in the sample have at least secondary education, and approximately 60.4% are employed. Across the sample, the use of formal accounts for saving and borrowing purposes is low. 29% of account owners used the accounts for saving purposes, while even 13.05% used the accounts for borrowing purposes. Based on the sample, Power distance (PDI) is lowest in Austria (11) and highest in Malaysia and Slovak Republic (104). Meanwhile Individualism (IDV) ranges between 10 (Bolivia) and 91 (USA); Masculinity (MAS) is between 5 (Sweden) and 110 (Slovak Republic); Uncertainty avoidance (UAI) is lowest in Singapore (8) and highest in Greece (112); the Shortest- and Longest-term oriented (LTO) societies respectively are Ghana (4) and Japan (88); and the least and most Indulgent societies are Pakistan (0) and Mexico (97). For developing countries in the sample, scores on respective measures range between 49 (Argentina) and 104 (Malaysia) for power distance; 10 (Bolivia) and 65 (South Africa) for individualism; 20 (Belarus) and 80 (Albania) for masculinity; 30 (China and Vietnam) and 95 (Russia and Ukraine) for uncertainty avoidance; 4 (Ghana) and 87 (China) for long-term orientation; and 0 (Pakistan) and 97 (Mexico) for indulgence.

Table 2.3: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i><u>Dependent variables</u></i>					
Account ownership	97,028	0.693	0.461	0	1
Saved at a financial institution	97,028	0.290	0.454	0	1
Borrowed from a financial institution	97,028	0.130	0.337	0	1
<i><u>Culture measures: Hofstede</u></i>					
Power distance	97,028	66.307	20.181	11	104
Individualism/Collectivism	97,028	40.383	21.358	10	91
Masculinity/Femininity	97,028	49.443	17.610	5	110
Uncertainty avoidance	97,028	67.348	22.087	8	112
Long/short-term orientation	97,028	46.242	23.961	4	88
Indulgence/Restraint	97,028	41.236	21.436	0	97
<i><u>Demographic controls</u></i>					
Female	97,028	0.501	0.500	0	1
Age	96,746	44.393	18.209	15	99
Education level: Primary	97,018	0.286	0.452	0	1
Education level: Secondary	97,018	0.519	0.500	0	1
Education level: Tertiary	97,018	0.189	0.391	0	1
Income level: Poorest 20%	97,028	0.170	0.376	0	1
Income level: Second poorest 20%	97,028	0.181	0.385	0	1
Income level: Middle 20%	97,028	0.195	0.396	0	1
Income level: Fourth 20%	97,028	0.211	0.408	0	1
Income level: Richest 20%	97,028	0.243	0.429	0	1
Employment status: employed	96,028	0.604	0.489	0	1
<i><u>Macroeconomic controls</u></i>					
GDP per capita (Ln)	97,028	9.148	1.200	6.134	11.586
Population density (Ln)	97,028	4.441	1.361	1.163	8.977
Private credit by banks as % of GDP	97,028	67.280	43.740	9.162	223.391
<i><u>Formal institution controls</u></i>					
Legal origin UK	97,028	0.228	0.420	0	1
Property rights	97,028	60.604	18.548	6.8	97.1
Creditor rights	97,028	1.962	0.951	0	4

In this table, summary statistics for the key variables used in this study are presented. The dependent variables include Formal account ownership, Formal savings, and Formal borrowing. All three dependent variables are binary with values of 0 or 1.

In Table 2.4 below, the sampled regions are further summarised with respect to their financial inclusion and culture scores¹¹. Based on the sample, formal account ownership is lowest in Sub-Saharan Africa (SSA) with 37%, and highest in the industrialised (Organisation for Economic Cooperation and Development, OECD) countries (95%). Formal saving is lowest in the Latin America & Caribbean (LAC) region (11%), and again highest in the OECD (53%). Meanwhile formal borrowing is lowest in South

¹¹ Complete data on each country is presented further below in Table II.1 Appendix I

Asia (SAS) at 6%, followed by SSA at 7%. The OECD again has the highest formal borrowing. If focus is made on the developing world in these statistics, then formal account ownership is highest in the Europe & Central Asia (ECA) region (62%); formal saving is highest in the East Asia & Pacific (EAP) region (26%); and formal borrowing is jointly highest in the EAP and ECA regions (14%).

Table 2.4: Regional average scores for financial inclusion and culture variables

FINANCIAL INCLUSION MEASURES				CULTURE MEASURES (HOFSTEDE)					
Region	Account ownership at a financial institution (% aged 15+)	Saved at a financial institution (% aged 15+)	Borrowed from a financial institution (% aged 15+)	Power distance	Individualism/Collectivism	Masculinity/Femininity	Uncertainty avoidance	Long/Short-term orientation	Indulgence/Restraint
EAP	59%	27%	14%	82	22	50	42	51	40
ECA	62%	15%	14%	84	27	45	88	65	26
LAC	45%	11%	12%	68	24	52	80	23	66
MENA	46%	12%	10%	75	36	51	68	17	26
SAS	46%	12%	6%	71	27	54	57	49	15
SSA	37%	15%	7%	71	29	47	53	22	57
OECD	95%	53%	18%	45	65	50	65	53	52
NOECD	83%	36%	12%	63	44	51	66	55	40
<i>Sample</i>	59%	23%	12%	70	34	50	65	42	40

In this table, regional average scores for the dependent and main explanatory variables used in this study are presented. The dependent variables include Formal account ownership, Formal savings, and Formal borrowing. Data on these variables is obtained from the Global Findex 2017 database. Data on the main explanatory variables (Culture) is obtained from Hofstede's culture dimensions.

With respect to the culture measures and across the developing world, the ECA and EAP regions have the highest power distance scores across the sample, respectively 84 and 82. The LAC region has the lowest (68). The most individualistic region is the Middle East & North Africa (MENA) region (36), while the least individualistic (most collectivist) is the EAP (22). Masculinity is fairly evenly distributed across the sample, though some regions like the ECA and SSA score below the sample mean of 50 (respective scores of 45 and 47). Uncertainty avoidance is highest in the ECA, followed by the LAC region (scores of 88 and 80 respectively), and lowest in the EAP region (42). Term orientation is longest in the ECA region (65) and shortest in the MENA and SSA regions with respective scores of 17 and 22. Finally, with a score of 66, the LAC region is the most indulgent across the sample, while the least indulgent (most restraint) is the South Asia (SAS) region with a score of 15.

2.4.2. Regression analysis

2.4.2.1. Results

Table 2.5 below displays the results and the marginal effects of the probit estimations for the effects of culture on financial inclusion defined with respect to the decisions to own an account at a formal financial institution, and to save and borrow formally. Results of the extended model with all controls – client demographics, macroeconomic, and formal institutional environment are also presented (see respective

Table 2.5: Effect of culture on financial inclusion

VARIABLES	(1) acc_own	(2) acc_own	(1) sav_fi	(2) sav_fi	(1) brw_fi	(2) brw_fi
<i>Culture</i>						
pdi	-0.00167*** (0.000105)	4.07e-05 (0.000106)	-0.00192*** (9.90e-05)	-0.000629*** (9.97e-05)	-0.000278*** (8.25e-05)	1.96e-05 (8.54e-05)
idv	0.00608*** (9.39e-05)	0.00343*** (0.000104)	0.00316*** (8.78e-05)	0.00139*** (9.68e-05)	0.000510*** (7.32e-05)	-0.000413*** (8.31e-05)
mas	-0.00254*** (9.45e-05)	-0.00269*** (9.67e-05)	-0.000490*** (7.40e-05)	-0.000461*** (7.47e-05)	-0.000632*** (6.15e-05)	-0.000319*** (6.45e-05)
ua	-0.000584*** (6.36e-05)	-0.000682*** (8.74e-05)	-0.00191*** (6.00e-05)	-0.00155*** (7.84e-05)	-5.45e-05 (5.07e-05)	-0.000529*** (6.77e-05)
lto	0.00541*** (5.45e-05)	0.00193*** (6.83e-05)	0.00339*** (6.21e-05)	0.00123*** (7.56e-05)	0.000497*** (5.15e-05)	-0.000288*** (6.30e-05)
idg	0.00355*** (6.91e-05)	0.000853*** (7.54e-05)	0.00298*** (7.67e-05)	0.000908*** (8.41e-05)	0.000712*** (6.20e-05)	-0.000159** (6.99e-05)
<i>Demographic controls</i>						
female		-0.00985*** (0.00243)		0.00195 (0.00254)		0.00176 (0.00213)
age		0.00230*** (7.14e-05)		0.000648*** (7.85e-05)		-0.000145*** (6.86e-05)
educ_pri		0.0189 (0.0150)		-0.00610 (0.0164)		-0.00258 (0.0153)
educ_sec		0.130*** (0.0149)		0.0833*** (0.0163)		0.0481*** (0.0152)
educ_ter		0.258*** (0.0153)		0.165*** (0.0164)		0.0789*** (0.0153)
inc_pr20		-0.135*** (0.00386)		-0.184*** (0.00422)		-0.0313*** (0.00357)
inc_sp20		-0.110*** (0.00383)		-0.138*** (0.00396)		-0.0168*** (0.00336)
inc_md20		-0.0790*** (0.00380)		-0.0924*** (0.00376)		-0.0117*** (0.00321)
inc_fr20		-0.0532*** (0.00375)		-0.0612*** (0.00360)		-0.00824*** (0.00307)
emp_stat		0.116*** (0.00246)		0.0977*** (0.00280)		0.0909*** (0.00247)
<i>Macroeconomic controls</i>						
lngdppc		0.0766*** (0.00245)		0.0513*** (0.00247)		0.0158*** (0.00204)
lnpdens		0.00778*** (0.00135)		0.00822*** (0.00108)		-0.00731*** (0.000920)
pvtcgdp		0.000757*** (4.83e-05)		0.000440*** (4.28e-05)		-0.000182*** (3.69e-05)
<i>Formal institutions</i>						
legor		0.0735*** (0.00375)		0.0285*** (0.00389)		-0.0175*** (0.00326)
propr		0.000167 (0.000123)		0.000707*** (0.000139)		0.000966*** (0.000116)
credr		0.0130*** (0.00155)		0.00444*** (0.00148)		0.00557*** (0.00124)
<i>Statistics</i>						
Observations	97,028	95,736	97,028	95,736	97,028	95,736
Pseudo R ²	0.1803	0.3073	0.1288	0.2153	0.0093	0.0554
Log likelihood	-49036.014	-40761.04	-50895.058	-45349.701	-37232.343	-35118.088

Predicted probability 0.6935 0.6963 0.2898 0.2914 0.1305 0.1310

This table reports probit regression results, notably the marginal effects and standard errors for the effect of culture on individual decisions to own a formal account. Hofstede’s dimensions (model 1) make up the culture measures here. Controls are made for client demographic characteristics, country macroeconomic setting, and formal institutional environment. ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

models 2). Living in high power distance, more masculine, and high uncertainty avoidance cultures reduces the likelihood for financial inclusion. Meanwhile, living in more individualistic, longer-term oriented, and more indulgent cultures increases the likelihood for financial inclusion.

2.4.2.2. Discussion of findings

Table 2.6 below presents a summary of the results, with respect to the expected relationships put forward in the hypotheses in Table 2.1, and the actual findings which are discussed below.

Table 2.6: Summary of results

<i>Hypothesis</i>	<i>Culture measure</i>	<i>Account ownership</i>		<i>Formal saving</i>		<i>Formal credit</i>	
		<i>Expected</i>	<i>Actual</i>	<i>Expected</i>	<i>Actual</i>	<i>Expected</i>	<i>Actual</i>
2a	Power distance	-	-	-	-	-	-
2b	Individualism/Collectivism	+	+	+	+	+	+
2c	Masculinity/Femininity	-	-	-	-	-	-
2d	Uncertainty avoidance	-	-	-	-	-	-
2e	Long/short term orientation	+	+	+	+	+	+
2f	Indulgence/Restraint	+	+	+	+	+	+

This table summarises the results in this study, firstly indicating the hypothesis, and then the actual findings on the relationship between culture and financial inclusion

Power distance

Findings indicate a negative relationship between power distance and the likelihood to be financially included. Living in a high power distance culture reduces the likelihood to own a formal account by approximately 0.17%. This finding is in line with those of Korynski & Pytkowska (2016), Osei-Tutu & Weill (2020), and Lu et al. (2021), and satisfies hypothesis 2a in this study relating to power distance. Hogel et al. (2011) argue that people in high power distance cultures will generally be less innovative. If we consider formal financial services as a novel technology, then unless people perceive such services both as useful and easy to use as provided for in the Technology Acceptance Model (TAM), they will not use the services. Because financial service providers often discriminate on the basis of variables like income (Zins & Weill, 2016), a wider gap will result between service providers and their clients, especially the poorer ones who make up a majority of the population in developing countries. Formal financial services will then be perceived as less easy to use, and will not be taken up by prospective clients. With respect to account use, living in high power distance culture reduces the likelihood to save formally by 0.19%, and the likelihood to borrow formally by 0.028%, a smaller figure. Power distance thus has a greater negative effect on formal saving than it does on formal credit. When people in high

power distance cultures are financially included, they are more likely to use their formal accounts for credit rather than for saving purposes, implying they perceive formal credit services more useful and easier to use than formal saving. Formal credit services will thus fare better than saving in such cultures.

The resulting financial inclusion figures may however not always conform on the basis of a global sample comprising developed and developing countries, due to significant macroeconomic and formal institution differences. This explains why the difference in account ownership between Austria, the country with the lowest power distance in the sample (11) and Malaysia, the country with the highest (104) is small. These respective figures are 98% and 85%. In contrast, the difference in account ownership between Austria and Iraq, the country with the second highest power distance score (95) in the sample is quite significant, notably 98% for Austria against 20% for Iraq. While higher inequality may still remain in countries with stronger formal institutions, the cost of using formal financial services will be far lower than otherwise for all groups of persons in these countries. In line with the stylized facts, these results hold even more when high income countries are excluded. The developing country with the lowest power distance score in the study's sample for example is Argentina (49); the highest again is Iraq (95). Account ownership scores for the two countries respectively are 48% and 20%.

Individualism/collectivism

Findings indicate a positive relationship between individualism and the likelihood to be financially included. Living in a more individualistic culture increases the likelihood to own a formal account by approximately 0.61%. This is in line with the findings of Korynski & Pytkowska (2016), and Lu et al. (2021), and confirms hypothesis 2b above. With respect to account use, living in an individualistic culture increases the likelihood to save formally by 0.32%, and the likelihood to borrow formally by 0.051%. On the basis of these marginal effects, people in more individualistic cultures are more likely to save formally than they are to borrow. Formal saving products will thus fare better than formal credit products in individualistic cultures. The reverse is true for more collectivist cultures, wherein people will be less likely to use formal financial services.

One of the key characteristics of individualistic cultures highlighted by Postelnicu & Hermes (2018) is higher trust in strangers – generalised trust, as opposed to trust in one's kin or close relations – particularised trust. Lu et al. (2021) also link individualism with a wider radius of trust. People in such cultures are by consequence more likely to trust in, and use formal financial services irrespective of their familiarity with the service provider. This is supported by the theoretical framework advanced earlier on institutional theory relating to transaction costs. With higher generalised trust, information and related costs of entering financial contracts will be lower. The same follows for agency and monitoring costs. By this analysis, the ownership of formal accounts will be higher in the USA, the most individualist country

in the sample (65) than it will be in Bolivia, the least individualistic or most collectivist country (10). The corresponding account ownership figures in the respective countries are 93% and 51%.

Masculinity/femininity

Findings indicate a negative relationship between masculinity and the likelihood to be financially included. Precisely, living in a more masculine culture reduces the likelihood to own a formal account by 0.25%. This finding is in line with those of Korynski & Pytkowska (2016), Muntin (2020), and Lu et al. (2021) who find financial inclusion to be higher in more feminine societies, and confirms hypothesis 2c above. With respect to account use, living in a masculine culture reduces the likelihood to save formally by 0.049%, and the likelihood to borrow formally by 0.063%. Formal saving products will thus fare better in masculine societies than formal credit services will.

Claessens (2005) suggests that financial exclusion is generally part of a bigger social exclusion problem. Masculine cultures as described by Hofstede (2010, pp. 140) are essentially more competitive and value personal over societal success. This conservative view, according to the provisions of Institutional theory will lead to more costly strategies for coping with market distortions embedded in the microeconomy like information asymmetry between lenders and borrowers, which represent a major cause of low financial inclusion as explained by New Keynesian theory. A higher likelihood for uncontrolled risk-taking arises in masculine cultures due to competitive pressures. Discrimination especially on gender and related grounds, and inequality result in such cultures as the costs of reducing market distortions go up. Feminine cultures on the other hand value interpersonal relationships and modesty, and usually will be more inclusive in their social policies. The likelihood for people to be financially excluded is thus far lower in feminine cultures than it will be in corresponding masculine cultures. In more masculine Iraq (score of 70), formal account ownership will be far lower than it will be in less masculine Thailand (score of 34). The respective scores for formal account ownership in these two countries are 20% and 81%.

Uncertainty Avoidance

Findings indicate a negative relationship between uncertainty avoidance and the likelihood to be financially included. Living in a high uncertainty avoidance culture reduces the likelihood to own a formal account by 0.058%. This finding confirms earlier findings of Cuéllar & Isabel (2018), and Ahunov & Hove (2020). A similar though statistically insignificant relationship is found by Korynski & Pytkowska (2016). With respect to account use, living in a high uncertainty avoidance culture reduces the likelihood to save formally by 0.19%, and the likelihood to borrow formally by 0.0055%, which is lower. Thus when people in high uncertainty avoidance cultures use formal financial services, it will more likely be credit than saving. Formal credit products will thus fare better in high uncertainty avoidance cultures.

Uncertainty avoidance prompts an emphasis on rules, beliefs, and institutions that provide certainty, conformity and predictability (Hofstede et al., 2010 pp. 191). In low uncertainty avoidance societies, the time and cost of entering into financial contracts will be far lower than in corresponding high uncertainty avoidance cultures where ample due diligence is required prior to such contracts. This is supported by the provisions of Institutional theory in relation to the level of transaction costs. Such high costs will directly exclude vast populations from access to and use of formal financial services. Additionally, people in high uncertainty avoidance cultures will exhibit higher inertia to take up new services like those offered by formal financial institutions due to their prioritisation of conformity. By the provisions of TAM, unless such services are perceived both as useful and easy to use, their uptake will be low in high uncertainty avoidance cultures, implying product design and delivery do matter a lot too. China with an uncertainty avoidance score of 30 will have higher formal account ownership than Romania with a score of 90. This in fact is the case: the respective figures are 80% and 58%.

Long-term orientation

Findings indicate a positive relationship between long-term orientation and the likelihood to be financially included. Precisely, living in a longer-term oriented culture increases the likelihood to own a formal account by 0.54%. This result is in line with Cuéllar & Isabel (2018) and Muntin (2020), and confirms hypothesis 2e above. The findings however contradict those of Korynski & Pytkowska (2016) whose findings reveal a negative though statistically insignificant relationship between term orientation and financial inclusion. With respect to account use, living in a long-term oriented culture increases the likelihood to save formally by 0.34%, and the likelihood to borrow formally by approximately 0.05%. On the basis of these marginal effects, people in longer-term oriented cultures are more likely to save formally than they are to borrow. Formal saving products will thus fare better than credit products in long-term oriented cultures. The reverse is true for short-term oriented cultures, wherein people will be less likely to use formal financial services. Informal finance may thus be more pronounced in short-term oriented cultures.

A key reason for the observed positive relationship here is policies in long-term oriented countries are usually inclusive, thus resulting in less inequality. In addition to being future-inclined and progressive, long-term oriented societies generally welcome change with optimism. Theoretically, the resolution of information asymmetry will be facilitated in such cultures due to their pragmatic and open approach in dealing with change processes and society as a whole. This overall will ease the functioning of formal financial institutions, and provide for higher uptake of their services as they are adapted over time with respect to the usefulness and ease of use as provided for by TAM. With the shortest-term orientation in the sample (4), formal account ownership in Ghana will be lower than that in China with a

term orientation score of 80 or Japan with the highest term orientation in the sample of 88. The corresponding account ownership figures are 42%, 80%, and 98% respectively.

Indulgence/restraint

Finally, findings indicate a positive relationship between indulgence and the likelihood to be financially included. Precisely, living in a more indulgent culture increases the likelihood to own a formal account by approximately 0.36%. This finding is in line with that of Korynski & Pytkowska (2016). With respect account use, living in an indulgent culture increases the likelihood to save formally by approximately 0.30%, and the likelihood to borrow formally by 0.071%. On the basis of these marginal effects, people in more indulgent cultures are more likely to save formally than they are to borrow. Formal saving products thus fare better than credit products in indulgent cultures. The reverse is true for restraint cultures, wherein people will be less likely to use formal financial services. Informal finance may thus be more pronounced in restraint cultures.

Korynski & Pytkowska (2016) find financial systems to be more efficient in countries where the population's lifestyle drives higher spending, thus prompting higher demand for financial services, as people will be more likely to take upon and use novel innovations like those relating to formal financial services as TAM explains. In restraint societies on the other hand, the likelihood for the use of formal financial services is reduced by more conservative lifestyles and overall lower demand for financial services. In high restraint Pakistan (score of 0), formal account ownership stands at 18%. Meanwhile formal account ownership stands at 35% in high indulgent Mexico (score of 97). The cost of using formal financial services may be relatively high in Mexico as in much of the LAC region due to weak formal institutions. This provides a possible explanation why the financial inclusion figures in Mexico are not higher than they currently are in comparison to Pakistan given their wide cultural differences.

2.5. Conclusion

Some of the poorest countries and regions in the world are those with the least developed financial systems. Usually, financial inclusion in these countries is bafflingly low. Interestingly, these same countries and regions have tended to be the ones with the highest public funding for financial inclusion over the years. Sub-Saharan Africa is a typical case in time. Historically, empirical literature has dwelled on structural characteristics like the macroeconomic environment of respective countries as key determinants of this low financial inclusion across the developing world. The role of formal institutional factors like governance, laws and regulation, and political stability among others have entered the debate over the last few decades and have greatly enhanced the world's understanding of some hitherto unexplained development variations across similar countries and regions. The major omission in all these analyses so far has been the origin of these formal institutions – the informal institutional context relating

to factors like values and culture. Culture has been proven, based on the analysis in this study to affect individual financial decisions relating to the decision to use formal financial services. Precisely, the findings below are made:

Firstly, living in high power distance, more masculine, and high uncertainty avoidance cultures reduces the likelihood for financial inclusion. Meanwhile, living in more individualistic, longer-term oriented, and more indulgent cultures increases the likelihood for financial inclusion.

Secondly, the likelihood for individuals to save and borrow formally is significantly higher in more individualistic, longer-term oriented, and more indulgent cultures. However, the likelihood for formal savings is higher than that for formal credit in these respective cultures. While both saving and credit products will do better in these cultures, saving products will perform slightly better than credit products. Meanwhile, the likelihood for individuals to save and borrow formally decreases in high power distance, more masculine, and high uncertainty avoidance cultures. Interestingly, this decreased likelihood is lower for formal credit than it is for formal saving. This suggests that the few individuals who use formal financial services in such cultures are more likely to prefer credit than saving products. Formal credit products may thus fare better in high power distance, high uncertainty avoidance, and more masculine cultures.

In sum, the findings of this research study will be of particular interest to policymakers, social investors, and other actors in the inclusive finance field, as they enable these persons or groups design policies to foster higher financial inclusion across the developing world. The reliance on credit provision which had in the past been central to pro-poor financial services provision may actually have been counter-productive in some countries, as their cultures were more savings-inclined. In more individualistic, longer-term oriented, and more indulgent cultures, formal saving products will thrive better than formal credit products. Finally, in cultures where people are less likely to use formal financial services, there intuitively should be a correspondingly higher reliance on informal finance services. Whether this is the case or not makes the subject of the proceeding chapter.

Chapter 3

CULTURE AND INDIVIDUAL FINANCE CHOICES: FORMAL VERSUS INFORMAL SAVING AND CREDIT MECHANISMS

3.1. Introduction

Globally, several strategies have been applied towards the reduction of poverty and enhancement of development. Prominent among these is the promotion of initiatives which increase access to financial services. The focus of such access has historically been on credit and savings services. As Udry (1991) explains, credit access guarantees the availability of financial resources which can be used to buy inputs, finance business start-ups, and help households smooth consumption in the face of idiosyncratic and/or covariate risks. Saving on the other hand facilitates capital accumulation by households, firms, and governments. As with credit, saving facilitates consumption smoothing and the financing of productive investments in human and business capital at the household level (Dupas & Robinson 2009; Karlan et al., 2014; Brune et al., 2016). This, Prina (2015) argues has direct effects on income levels, health, education and related welfare outcomes.

Given the importance of access to financial services, whether or not people borrow/save and how and where they do remain important concerns especially in developing countries where poverty is rife and capital accumulation is low. Individuals could either borrow or save formally in banks, Microfinance Institutions (MFIs) or other formal financial institutions; or informally in a diverse number of ways or sources like friends & family, suppliers, or in semi-formal organisations like saving clubs. Included in the latter category are Rotating Savings & Credit Associations (ROSCAs) and Accumulated Savings & Credit Associations (ASCAs). In some countries, microfinance organisational forms like Saving & Credit Cooperatives (SACCOs) which are owned and operated on a not-for-profit basis by their members according to democratic principles, are only loosely regulated, or even completely out of the regulatory authority of central authorities. SACCOs or simply Credit Unions may thus be classified as semi-formal finance, depending on the legal provisions relating to their operation in different countries. A more elaborate discussion relating to the legal demarcations of formal and informal finance follows further down in Section 3.2.1. Karlan et al. (2014) and Panizza (2015) opine that the choice of instrument with respect to the level of formality can have a direct effect on the level of investment in human capital, and on income and wealth inequality.

A good number of persons across the developing world continue to rely on informal credit and saving mechanisms. This trend has persisted, despite financial liberalization efforts of developing country governments. Such liberalisation has led to the proliferation of financial institutions and digital finance innovations. Liberalisation overall has considerably reduced the costs of banking for the poor. Ayyagari et

al. (2010) argue that limited access to formal financial services constitutes a major growth constraint for developing economies. However, the continuous focus on the formal aspects of access to financial services greatly undermines the potentially important role informality may play especially in developing contexts. The general perception has been that informal finance transactions like savings and credit exist only in rural areas where there are no formal financial institutions like Commercial banks (Kgowedi et al., 2002). This however is not the case as informal finance mechanisms are increasingly being used in urban areas, and to finance complex firm activities. In China for example, the existence of alternative informal financing channels in the private sector has prompted China's rapid growth despite its inefficient banking system, poor legal infrastructure and institutional quality (Allen et al., 2005; Reidel et al., 2007; Tanaka & Molnar, 2008). Such informal financing channels usually are based on reputation and relationships. Huang (2012) documents the primordial role rotating savings, credit organizations, rural cooperative foundations, and mutual benefit funds played in the early stage of the China's reform especially in allowing rural households to transition from agriculture to entrepreneurship, up till the 1990s.

The debate around the continued popularity of informal finance mechanisms especially across the developing world is not new. This debate has revolved around market imperfections relating to issues like credit rationing, interest rates, and related barriers to the use of formal financial services (Stiglitz, 1989; Zeller, 1994; Yeyati et al., 2004; Allen et al., 2016; Demirgüç-Kunt et al., 2018). In this study, non-economic factors relating to the socio-cultural environment or informal institutions in general are hypothesised to explain the continued use of informal finance mechanisms. Also, whether there is a trade-off in the use of formal and informal financial services by individuals, and whether this trade-off is driven by cultural differences represents one route duly looked at in this study. In other words, can formal and informal finance sustainably operate concurrently in the same environment? And does culture have any effect on this dynamic? Though often overlooked in economics and finance research, factors like trust, religion, and attitudes towards risk may influence individual and firm financing decisions. Religion, depending on its principles for example could impose indirect costs on borrowing like the risk-sharing requirement in credit contracts in Islamic banking. As Guerin et al. (2013) argue, debt cannot be understood simply as a financial matter, but primarily as a social transaction that occurs within existing socio-cultural, political and geospatial settings. Credit policies, the authors conclude will only be appropriate, relevant and targeted when the local circumstances of social interactions and processes shaping debt are understood.

Theoretically, the role of informal institutions in shaping finance choices is supported by financial intermediation theories like information asymmetry theory, and firmly grounded in Institutional economics. In a bid to differentiate between 'good' and 'bad' clients, Akerlof (1970) highlights the ability of intermediaries to reduce information collection and processing costs. North (1992) argues that the level

of such costs and applicable strategies for their reduction are to a large extent determined by a country's institutions. An analysis of the role of informal institutions in determining finance choices will provide added understanding on the reasons for approaching one source of finance over another. This will help reorient saving/credit policies and programmes for a better impact, especially in developing settings.

Using savings and credit participation data on a cross-section of 65 countries from the Global Findex database¹², and informal institution data specifically relating to culture from Hofstede's cultural dimensions¹³ and the World Values Survey¹⁴, the effect of culture on the decision to save and borrow formally and informally is empirically assessed. Over 74,000 individual observations are used in the sample. Regression analysis using a probit model indicates that culture influences the decision to borrow and save, and the choice between formal and informal sources. Living in more individualistic, high uncertainty avoidance, high trust, more religious cultures, and cultures of higher religiosity significantly increase the likelihood for individuals to borrow. In more individualistic cultures and cultures of higher religiosity, individuals are more likely to borrow formally. The reliance on informal credit is more likely in high uncertainty avoidance, high trust, and more religious cultures. Meanwhile, living in high power distance and more masculine cultures significantly reduces the likelihood to borrow. When people in such cultures borrow however, they will be more likely to rely on informal credit channels. With respect to saving, living in more individualistic, high trust cultures and cultures of higher religiosity significantly increases the likelihood for individuals to save. With the exception of individualistic cultures where such saving is likely to be formal, there is a higher likelihood for informal savings in high trust cultures and cultures of higher religiosity. Meanwhile, living in high power distance, more masculine, high uncertainty avoidance and more religious cultures significantly reduces the likelihood to save. This likelihood however is significantly lower for informal savings across all the culture variables.

In the next section of this study, a conceptual framework is presented as well as literature on credit and savings participation and their respective determinants. Section 3.3 focuses on the methodology, commencing with the datasets, and moving on to the econometric model. Finally, results of the probit estimations are presented in Section 3.4, alongside a discussion of these results. Concluding remarks follow thereafter.

3.2. Literature review

3.2.1. Financial intermediation: a focus on developing contexts

Globally, the financial intermediation function is carried out by a dual financial sector comprising the formal and informal sectors. Ayyagari et al. (2010) list five main sources of financing available to firms:

¹²Available at https://globalindex.worldbank.org/#data_sec_focus, consulted on 14/03/2019

¹³Available at <https://www.hofstede-insights.com/country-comparison>, consulted on 14/03/2019

¹⁴Available at <http://www.worldvaluessurvey.org/WVSCContents.jsp>, consulted on 14/03/2019

bank financing which dwells on financing from commercial banks; informal finance which includes financing from informal sources such as moneylenders or an informal bank; operations finance which includes trade credit; investment funds which includes special development financing or other state services; and internal finance that includes equity finance, internal funds or retained earnings, and loans from family and friends. These diverse sources broadly relate to formal and informal finance. The categorization of formal/informal with respect to financial service provision arises on legal grounds in most countries, with respect to regulation. Informal finance relates to financial transactions that occur outside official financial institutions and that are not regulated by governmental authorities (Hanedar et al., 2014). Such transactions can be undertaken or facilitated by providers ranging from relatively simple groups like family/friends to more complex moneylenders, savings collectors, indigenous savings and credit clubs like ROSCAs, ASCAs, and microfinance organisational forms like SACCOs or Cooperatives depending on their regulation in different countries. Still on legal grounds, Ayyagari et al. (2010) view informal financial institutions as the entire gamut of non-market institutions such as credit cooperatives, moneylenders, and others that do not rely on formal contractual obligations enforced through a codified legal system.

On a more theoretical basis, Aliber (2015) categorizes formal and informal finance on the bases of applicable strategies for minimizing information asymmetry and transaction costs. To cope with these problems, informal finance relies on strategies that are generally not available to most formal financial institutions. While banks cope with information asymmetry by rationing according to objectively observable criteria such as occupation and past credit history, informal finance makes use of personal acquaintance with the applicant or other agent with whom the applicant is in frequent contact. This is an interesting element of informal finance, and potentially points to the role of social capital in facilitating access to such services. Still in line with this theoretical categorization, Allen et al. (2014) break informal finance into two types. The first type is based on monitoring, and relates to the (non)existence of an information advantage to overcome problems. The second type is based on the enforcement or the recourse mechanism in case of delinquency, precisely the (non)existence of non-violent methods like social sanctions. Their dichotomy results in ‘constructive informal finance’ and ‘underground financing’. Key forms of the former include trade credit and borrowing from family and friends, which relate to transactions that “*derive their information and enforcement technology from business or social relationships*”. Key forms of the latter include loan sharks and other such informal finance forms which charge high interest, finance speculative activities, and may resort to violence for enforcement purposes. Transactions in this category have no superior information advantage, and only rely loosely on a network. Constructive informal finance sources use personal, community, or business relationships to reduce asymmetric information and reduce risk through economic collateral. Pricing is based both on risk and the

closeness of the relationship. In cases of default or delinquency, there are sufficient economic and social connections that facilitate resolution. A direct consequence for the choice between formal and informal finance which Allen et al. (2014) perhaps do not clearly state is the cost of financial intermediation. These costs depend on the strategy applied by either finance category in reducing information asymmetry or resolving conflicts in financial contracts. This forms the theoretical basis of the consideration of culture as a potential determinant of finance choices in this study: culture determines not only applicable strategies identified in the categorization of Allen et al. (2014) above, but also the cost of using these strategies.

3.2.2. Saving and credit participation

3.2.2.1. Reasons for saving and for contracting credit

A good proportion of credit in developing countries is contracted for productive reasons like the purchase of productive equipment or other investment in fixed assets. Also commonly cited as a reason for contracting credit is consumption reasons, most often to deal with transitory or unexpected consumption needs as noted in Ledgerwood (1999 pp. 66-67), Kedir (2003) in the case of Ethiopia, and Guerin et al. (2013) in the case of India. Zins & Weill (2016) additionally find health, education and farm or business as the main loan forms in Africa. Though often less considered, social obligations significantly contribute to debt in developing countries. As Thornton et al. (2010) and Gray & Dowd-Urbe (2013) argue, borrowing for social and political reasons is just as common in the developing world as is borrowing for economic reasons. Due for instance to high socio-cultural expectations attached to funerals in South Africa, considerable loans are taken in the country for funerals (Case et al., 2013). Meanwhile weddings are used as a key means in India to increase the social status of individuals. Considerable credit is thus contracted in India for weddings (Bloch et al., 2004; Guerin et al., 2013), and in Morocco for festivities (Duflo et al., 2008).

With savings on the other hand, theoretical literature suggests two key motives for saving: to provide for retirement based on the lifecycle hypothesis (Modigliani & Brumenberg, 1954), and for bequests or inheritance, based on the permanent income hypothesis (Friedman, 1957). The lifecycle hypothesis explains how people deal with differing incomes over their lifetimes, from their youthful years through their professional or working age years, to their retirement years. Over their youthful years when they are yet to get working fully, people borrow to meet their consumption needs. Over their working years, they earn more and use this income both to repay the credit contracted over their youthful years, and to save in preparation for retirement or old age, a period over which they will be economically inactive and thus earn less, running down prior savings to meet their consumption needs. The permanent income hypothesis on the other hand explains how a person's income and expectations for future income influences his/her spending. Essentially, a person's spending will be consistent with his/her permanent

income – what (s)he expects to earn on average over a long-term basis or even their lifetime, and not on his/her current income. Any extra income earned above the permanent income in any period will not considerably change his/her spending pattern, but will rather go towards savings in order to guard against a future decline in income. A third and equally important hypothesis relating to the motives for saving, the relative income hypothesis (Duesenberry, 1949) posits that an individual's spending does not depend on his/her income level, but on the standard of living in the environment where the individual lives. Thus people in the same environment will spend similar amounts of money, and their savings will be a result of differences between earnings and the amount of spending that occurs within the desired standard of living. Kindleberger & Herrick (1977, pp.90) thus argue that savings are not strictly made on economic considerations, but are a reflection of the society's value system and the importance it attaches to accumulating wealth. This suggests that an individual's saving choices are subject to the socio-cultural environment in which he/she grows. Chudzian et al. (2015) for example identify different saving motives among Brits and Poles. The British save more for precautionary reasons and for specific purposes like planned holidays; the Polish save more for bequest reasons relating to the future of their children, with saving for specific purposes being less important. Savings are even more important in the developing world, and are a key determinant of welfare, due to the absence of efficient credit and insurance markets. Deaton (1989) identifies limited borrowing opportunities as a key motivation for saving. Savings are thus made in some cases to enable people benefit from credit services, otherwise termed compulsory savings (Kalala et al., 2001; Cozarenco et al., 2016). Overall, savings to manage irregular income streams, and for specific purposes like healthcare, children's education, and acquisition of household assets or durable goods dominate saving motives in much of the developing world (Attanasio & Székely, 2000; Giannatale & Roa, 2016; Steinert et al., 2017). Weddings, funerals, and other similar social and religious obligations which have a direct bearing on individual social statuses also provide an important savings motive in the developing world (Case et al., 2008; Anukriti et al., 2018).

3.2.2.2. Saving mechanisms and sources of credit

Empirical literature identifies several formal and informal saving and credit mechanisms globally. Cozarenco et al. (2016) identify two broad categories of saving products, namely compulsory and voluntary saving products. The former forms what the authors term 'hidden collateral' of microcredit, and relates to savings tied to loan requirements. The latter are demand-driven, and are typically unforced. Kalala et al. (2001) identify several types of these savings, among which are passbook savings, demand deposits, term deposits, high-yield savings, entrepreneur savings, and even door-to-door or daily savings. Credit services on the other hand differ on the bases of their terms, repayment facilities, collateral requirements, and delivery methodology with respect to individuals or groups among others (Banerjee, 2013). Irrespective of the saving or credit product type, Laureti & Hamp (2011), Banerjee (2013) and

Field et al. (2013) argue that product design with respect to flexibility on the demand side like adaptation to client cashflows and costs of provision on the supply side is essential to ensure effective uptake by targeted client groups.

Over time, service providers have slowly adapted to the flexibility requirement in designing saving and credit products. However, across the poorer regions of the world, formal saving and credit levels still remain alarmingly low. With respect to credit, Turvey et al. (2010) suggest that low formal credit figures may be a direct result of crowding out by other credit sources, notably informal credit. Informal credit use is very high across the developing world. Such informal credit comes from diverse sources, among them unorganized forms like friends & family/relatives, moneylenders, and suppliers (trade credit), or more organized groups like ROSCAs. Duflo et al. (2008) find that while 36% of households in Morocco had an outstanding debt, only 11.7% of this represented formal borrowing, precisely 9% from a bank and 2.7% from a microcredit institution. Meanwhile in Pakistan, Fatima (2009) finds less than 1% of female borrowers use formal credit sources. Interestingly, 65.17% of respondents borrow from friends and relatives, with an additional 34.23% relying on other informal credit sources. Zins & Weill (2016) find broad use of informal credit in Africa, the main source of this credit being family and friends (37.5%). Similar findings on the high use of informal credit are documented by Turvey & Kong (2010) in China, and Guérin et al. (2013) in India. Borrowing from friends & family remains the most popular form of informal credit around the world (Lee & Persson, 2016). The World Bank Global Financial Development Report (2014)¹⁵ indicates that individuals in developing countries are more likely to borrow from friends and family than in developed countries. Individuals in developing economies are three times more likely to borrow from family and friends than from formal financial institutions.

With respect to saving, constrained access to formal sector savings by the poor is recognized in empirical literature to be prompted by factors affecting access on both the supply and demand sides. Included on the supply side are the unavailability of formal financial service providers prompted by infrastructure and related reasons, and generally high operating costs in dealing with small and often financially illiterate savers who characteristically often have no documentation. Reported on the demand side are informal and self-reported barriers like transaction costs, distance to providers, people having too little money to save, lack of documentation, distrust in the financial system, and religion among others (Karlan et al., 2014; Allen et al., 2016; Demirgüç-Kunt et al., 2018). To meet their saving needs, the poor often revert to the informal sector. Saving at home, in livestock, and in saving clubs represent popular informal saving choices across the world (Fafchamps et al., 1998; Oladeji & Ogunrinola, 2001; Carpenter, 2002; Aliber et al., 2015; Githinji et al., 2018).

¹⁵<http://documents.worldbank.org/curated/en/225251468330270218/Global-financial-development-report-2014-financial-inclusion>, consulted on 09/02/2019

3.2.3. Theoretical framework: linking culture, credit, savings, and (in)formality

3.2.3.1. Savings, credit, and culture

Globally, capital accumulation is an important reason for saving as discussed earlier in Section 3.2.2.1. In developing countries, people have a more urgent priority – that to deal with volatile and unpredictable incomes. Saving in such contexts ceases from being solely about capital accumulation, but more importantly encompasses the smoothing of consumption by individuals. This importance of consumption smoothing is highlighted by Deaton (1989) who suggests that individual consumption patterns in developing countries are markedly smoother than their incomes. Saving, and of equal importance, credit become useful here as supported theoretically by the Life cycle hypothesis of Modigliani (1957) discussed earlier wherein individuals seek to smooth consumption over the course of a lifetime – borrowing in times of low-income and saving during periods of high income. Faced with the same consumption-smoothing circumstances however, some people may show a higher preference for credit than others as Meier & Sprenger (2007) argue. Such people demonstrate a high level of impatience, and will prefer to enjoy rewards soon but suspend costs until later. In other words, they show a higher preference for payoffs that are closer to the present time when considering trade-offs between two future moments, finance decisions or choices theoretically referred to as the present bias. Culture plays a significant role in shaping such individual preferences between savings and credit use partly through its effect on the present bias. As Meier & Sprenger (2007) opine, credit use is higher among people with a higher present bias. Thus credit products will be preferred over savings in smoothing consumption in cultures where people are more present biased, and vice versa.

3.2.3.2. Informality and its origins

An important theory relating to the existence and resilience of informality is the modernization theory, which posits that as societies develop economically, they tend to become more formalized in economic and related transactions. Informality then is a direct result of low economic development. Based on his study of savings clubs in Indonesia, Geertz (1962) asserts that over time, a society's informal finance mechanisms precisely ROSCAs will tend to disappear as people become adapted to the modern economy and the formal institutional structures that correspond to it. Geertz thus suggests that informality is highly essential, but its usefulness can only be maximized at the very primary stages of a country's development. Seibel (2001) complements this assertion, but proposes a more familiar scenario as to how savings clubs in a given context change over time. Rather than a complete disappearance, Seibel posits an evolution from traditional saving groups into ROSCAs, then into ASCAs and finally into any number of permanent financial institutions. If the modernization theory proves right in every case, then one will expect less

informality in China with a higher Human Development Index (HDI) of 0.752 than in India with 0.640¹⁶. Informal finance data as well as empirical evidence however points to a high reliance on informal finance sources in China (Turvey & Kong, 2010). Could China's generally weaker formal institutional framework be contributing to this? Or are there cultural factors responsible for this dynamic?

Recent economic literature provides extensive evidence showing that informal finance mechanisms are not just intermediate steps but can also be efficient solutions to market failure. In explaining this, standard literature on informal credit markets considers information asymmetry as a key driver of informal loans. Information asymmetry results in adverse selection which leads to the requirement of collateral. This then restricts loans and encourages informality. How a society deals with information – both with respect to access and processing, including related transaction costs could be attributed to its underlying informal institutions and culture. Allen et al. (2014) argue that the effectiveness of informal credit sources in supporting firm operations largely depends on how they overcome the asymmetric information problem. The mechanism they use should correspondingly address the moral hazard and adverse selection problems that drive away formal financing in the first place. Tanaka & Molnar (2008) explain that the central question in reducing information asymmetry is how to screen/monitor appropriately when collateral is limited. Informality has a major advantage in terms of information collection techniques, and cost reduction by utilising social relationships which work well in close-knit societies. On this basis, superior information and monitoring technology explain the popularity of informal finance.

3.2.3.3. Social capital and finance choices

Among the top reasons for exclusion from the use of formal financial services are information and collateral requirements of lenders. One way for individuals to overcome these hurdles with respect to accessing credit is the use of social capital. In analyzing the necessity of ROSCAs like much of informal finance in a country's development, Geertz (1962) turns to the description of ROSCAs as a socializing mechanism. The author defines "socialization" as a process by which both children and adults learn of any new patterns of behaviour which are of functional importance in society. Theoretically, these social aspects of informal finance offer a key part of the explanation surrounding the resilience of informal finance mechanisms in much of the developing world.

Social capital theory suggests that resources embedded in one's social networks, or which can be accessed or mobilized through ties in such networks (social capital) has the potential to generate huge returns to individuals or groups based on the quantity held. This important function of social capital explaining why embedded resources in social networks may enhance economic outcomes is premised on

¹⁶Human Development Index report of 2018, available at <http://hdr.undp.org/en/2018-update>, consulted 14/02/19

four pivots, documented in Lin (2001, pp. 20): *information*--a facilitation of the flow of information like that relating to opportunities and choice alternatives; *influence*--an exertion of influence on agents like those who play a critical role in decisions in organisations; *social credentials*--a certification of an individual's social credentials which may influence his/her accessibility to resources; and *reinforcement*--a reinforcement of identity and recognition as a member of a social group which provides both emotional support and public acknowledgment of one's claim to certain resources.

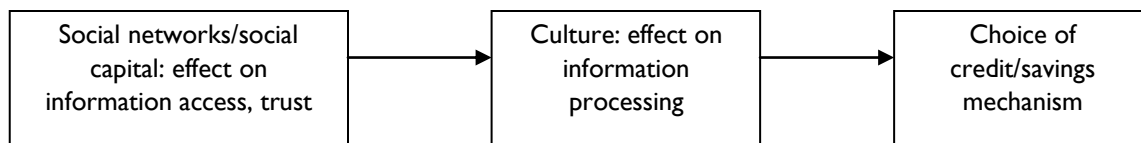


Figure 3.1: Social capital and individual saving/credit choices

Source: Author, 2019

In developing societies where resources and opportunities are scarce and where information flow is severely hindered by institutional and structural factors, social capital becomes an important asset in the hands of individuals. Licht et al. (2005) argue that how people get information is conditioned by their social networks; how they interpret this information is influenced by culture. Thus culture calibrates thoughts and actions, such that they are compatible with prevailing values.

The depiction of culture in this study is based on cultural dimensions of Hofstede (1980, 2010), and the World Values Survey, both of which are survey-based datasets. Both datasets are described in greater detail in Section 1.3 above. Essentially, Hofstede's database comprises of six culture measures namely power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, long and short-term orientation, and indulgence/restraint. The WVS on the other hand is a comprehensive database with a wider range measures on elements like trust in people and institutions, religion, governance, importance of friends in life, and membership in political associations among others.

3.2.4. Evidence

3.2.4.1. *Informal institutional determinants of formal and informal credit*

Time preferences and risk

In assessing the determinants of credit participation among SMEs in Vietnam, Nguyen & Otake (2014) find higher credit use among enterprises owned and/or managed by more impatient or strong present-biased individuals. Credit use is equally found to be higher in more risk-tolerant firms, as such firms are often more motivated to involve in risky investments (Nguyen & Otake, 2014; Fufa, 2016). Duflo et al. (2008) and Mpiira et al. (2013) reach a similar conclusion, citing risk aversion for low credit participation prompted by a fear among potential borrowers of not being able to repay loans. However and as proven empirically by Nguyen & Otake (2014), risk averse individuals and those with weak present-bias

preferences or firms owned/managed by such persons are more likely to contract credit from formal sources than they are from informal sources. Precisely, informal credit use is higher among risk-tolerant and strongly present-bias firm owners/managers.

Religion

Religious people are less likely to participate in credit programmes for religious reasons, especially if they feel such programmes and their conditions go against religious norms and beliefs (Duflo et al., 2008). Davutyan & Öztürkkal (2016) for instance find a lower likelihood of formal credit use among more religious persons, due to religious norms and beliefs relating to credit, and social capital considerations which may prompt higher informal borrowing among persons of the same religious standing.

Social capital

Firms with higher social capital or which make efforts to build and maintain good relationships or networks with their suppliers, buyers, competitors, formal lenders and other business contacts are more likely to participate in credit markets (Nguyen & Otake, 2014). On the choice between formal and informal credit however, the ‘quality’ of such social capital may matter. Firms whose networks include officials and formal lenders are more likely to use formal credit, while those whose networks comprise of informal lenders are more likely to use informal credit. Still on social capital, Duflo et al. (2008) find higher credit participation in areas of higher population density which eases creation of solidarity groups, and in villages where the distance to the credit office is smaller. Formal lenders usually are much further than informal ones, suggesting that there may be cost reasons related to distance for low formal credit use.

Trust

Turvey & Kong (2010), Allen et al. (2014), El Ghouli & Zheng (2016), and Levine et al. (2018) review the role of social trust on informality in credit markets. Turvey & Kong (2010) find strong evidence of a positive relationship between trust and the use of informal credit, especially from friends & family in rural China. In other words, the more trustworthy individuals are, the more likely they will be to use this form of informal credit. The authors conclude that informal credit does not emanate from the effects of credit rationing. Informal credit, they argue, may just be a result of higher social trust and the resulting lower information, monitoring and related lending costs in using this credit channel. They then suggest that informal credit could crowd out formal credit. Meanwhile Levine et al. (2018) question whether social trust affects the ability of firms to obtain financing through informal channels when crises reduce the flow of bank loans to firms in economies with differing levels of social trust. Using firm-level performance data on 3,600 firms in 34 countries from 1990 through 2011, the authors find that greater social trust facilitates access to informal credit particularly in crisis periods where the normal bank lending channel is obstructed. This higher informal credit access in higher social trust countries cushions

the effects of financial crises on corporate profits and employment. Similarly, Allen et al. (2014) find interpersonal trust and happiness measures to be positively associated with the usage of constructive informal credit in a country like trade credit and borrowing from family and friends. Such informal financing ('constructive') is prevalent in regions where access to bank loans is extensive and business-government relationships are good. El Ghouli & Zheng (2016) however contradict these findings by indicating that firms use less trade credit in countries where people trust each other more.

Language, and other cultural influences

Bedendo et al. (2017) investigate how the cultural origin of managers affects the financing decisions of the firms they run with respect to the choice between formal and informal finance, namely bank loans and trade credit respectively. The authors base their study on the autonomous province of South Tyrol in Northern Italy, a geographical area that shares a common regulatory, institutional, and macroeconomic setting. It is one of the richest areas in the EU, and home to individuals who belong to two main cultural groups: Italian and Germanic. The authors dwell on linguistic differences between these two groups. As an indication for instance of the level of future-time reference, the authors consider the meaning of words. A key word used in their motivation is the German word for debt, "Schuld", which means fault or guilt. Using cross-sectional data on asset and liability structure of firms in the study area and cultural origin of the firm managers as of the latest year prior to 2016, the authors find significant differences with respect to financing decisions between firms that are managed by individuals with an Italian cultural background and firms managed by individuals with a Germanic cultural background. Precisely, firms run by individuals from the Italian cultural group resort significantly more to trade credit than companies run by individuals from the Germanic cultural group. El Ghouli & Zheng (2016) investigate the effect of national culture, measured using Hofstede's cultural dimensions on trade credit provision. Empirical findings indicate that suppliers located in countries with higher collectivism, power distance, uncertainty avoidance, and masculinity scores tend to offer more trade credit to their customers.

3.2.4.2. Informal institutional determinants of formal and informal saving

Religion, trust, and importance of thrift

Using religion as a proxy for individual cultural backgrounds, León (2013) assesses the effect of culture on households saving behaviour in the USA. Findings following panel estimation reveal that religious people save significantly more than non-religious individuals. Additionally, active religiosity like frequent church attendance is even more strongly positively correlated with savings behaviour than merely being religious is. Earlier empirical evidence by Renneboog & Spaenjers (2012) relating to religion and household finance following a Dutch-based survey suggest that religious households consider themselves more trusting, think longer term, and overall are more likely to save than non-

religious ones. Protestants are more likely to trust people they are not acquainted with, implying potentially higher social capital may accrue to Protestants, especially the more religiously active ones. Catholics meanwhile attach more importance to thrift and are more risk averse than Protestants. Both denominations however have a stronger bequest motive and will thus save more. These findings are in line with earlier ones of Guiso et al. (2006), who in their study on culture and economic outcomes find that a preference for thrift, and the importance of teaching children the value of thriftiness increases country saving rates. Guiso et al. (2006) additionally prove empirically that religious people show a higher preference for thrift than non-religious ones, though the level of such preference varies in different denominations, with Catholics showing a higher preference than Protestants. An earlier study by Guiso et al. (2003) also proves that being raised religiously increases the level of trust. Active religious participation like attendance of church services further increases this trust ten times over. Overall higher religiosity leads to more thriftiness, higher trust, and higher savings among individuals.

Campos & Muysken (2013) investigate the effect of culture and institutions, respectively proxied by the preference for thrift, religion, and trust, on private saving across Northern and Southern European Union countries. Results following Pooled OLS regression analysis indicate a positive relation between thrift and private savings. As this suggests, people who find thrift an important characteristic to pass through their children tend to save more themselves. A positive relation is equally found between trust and private savings. Precisely, higher trust is associated with higher institutional quality, which in turn leads to higher private saving rates. A surprisingly negative relationship is found between religiosity and private saving, implying an increase in the degree of secularization is associated with higher levels of private saving. This the authors explain may be due to the fact that religious people are less responsible since they believe there is a divine force looking after them.

Guiso et al. (2004) consider the role of social capital by directly linking financial development, notably the reliance on formal rather than informal financing to the level of social capital. As an important determinant of the level of trust and trust being a necessary condition for the development of financial markets, social capital should affect the level of financial development. Due to potentially more severe sanctions for deviants in high social capital communities for example, people may trust each other more. Using household data drawn from the Survey of Household Income and Wealth (SHIW) in Italy, the authors find that low social capital areas often rely on transactions within narrow subgroups, such as families and friends. Meanwhile in high social capital areas, households invest a smaller proportion of their wealth in cash and a bigger proportion in stock.

Language

Guin (2017) uses language as a proxy for individual cultural backgrounds to assess the effect of culture on households saving behaviour in Switzerland. By exploiting historical language borders within

Switzerland, the author assesses the saving behaviour of households located in the Romanic-speaking part (Italian, French) of the border, and those of the German-speaking part. The idea behind this is speaking a similar language is a necessary condition for social interaction, and it enables the transmission of beliefs and preferences across and within generations. Significantly time preferences and norms relating to formality/informality may differ. Impatient households are more likely to consume today than to save (Sutter et al., 2013). Findings indicate that households in the Romanic-speaking part are less likely to save and more likely to spend excessively. Such households have a shorter term orientation and are more indulgent. Similar findings on language and saving preferences are made by Spycher (2018), in relation to French- and German- speaking students in Switzerland. French-speaking students save less and regret their purchases more frequently than German-speaking students, or consume more impulsively. Unlike in Guin (2017), Spycher (2018) attributes these differences to risk preferences, not time preferences.

Other cultural influences

An often used study group in culture and savings research studies is immigrants, wherein their saving actions are compared to cultural traits in their countries of origin. Carroll et al. (1994, 1999) analyse the savings behavior of first-generation immigrants to Canada and the United States. They find mixed empirical support for their hypothesis, that immigrants from different countries of origin with distinct cultural backgrounds exhibit distinct saving patterns. Immigrants from Asia for example do not save more than their home savings rate. Masella et al. (2017) conduct a similar study of culture and saving habits of second generation migrants in Germany, in a panel study. Five different cultural measures are used in their analysis, namely Attitudes towards teaching children thrift, Importance of wealth accumulation, Indulgence versus restraint, Long-term versus short-term orientation, and Uncertainty avoidance. Findings indicate that second-generation immigrants tend to save more in Germany if thrift, wealth accumulation, and long-term orientation are valued more in the country of origin. Meanwhile, a negative relation is found for the Indulgence measure and savings. Finally, Costa-Font et al. (2018) investigate the saving behaviour of up to three generations of these immigrants from different countries of origin living in the United Kingdom. Using as their proxy for culture the savings/GDP measure of the country of origin from 1990 until 2010 extracted from the World Development Indicators, the authors link each immigrant to the saving rates from their country of origin. Findings suggest that immigrants coming from countries with high saving rates also tend to save more in the United Kingdom.

The main empirical findings presented above are summarised in Table 3.1 below.

Table 3.1: Summary of main empirical findings on culture and finance choices

Study	Dependent variable	Explanatory variable	Finding
Mpiira et al. (2013)	Credit use (informal)	Present-bias preference	Positive
Nguyen & Otake (2014)	Credit use (informal)	Risk tolerance	Positive
Sutter et al. (2013)	Saving likelihood	Present-bias preference	Negative
Guiso et al. (2006)	Saving likelihood	Religion	Positive
Léon (2013)	Saving (formal)		Positive
Duflo et al. (2008)	Credit use (formal)		Negative
Guiso et al. (2004)	Savings (informal)	Social capital	Positive
Duflo et al. (2008)	Credit use		Positive
Nguyen & Otake (2014)			
Turvey & Kong (2010)	Credit use (informal)	Trust	Positive
Allen et al. (2014)			
Levine et al. (2018)			
Campos & Muysken (2013)	Saving	Trust Religiosity	Positive Negative
El Ghoul Zheng (2016)	Credit use (informal)	Power distance Collectivism Uncertainty avoidance Masculinity	Positive Positive Positive Positive
Masella et al. (2017)	Saving	Indulgence Long-term orientation Uncertainty avoidance	Negative Positive Inconclusive

Notes: This table presents a summary of the empirical evidence reviewed in this section.

3.3. Methodology

3.3.1. Datasets

Data on credit and savings was extracted from the Global Findex database, a global, nationally representative database of financial inclusion indicators relating to how adults around the world save, borrow, make payments and manage risk. The data is survey-based, and results from interviews with about 150,000 adults in over 140 developing and high-income countries around the world. Launched by the World Bank in 2011, data on these measures is published every three years, with over 100 indicators on financial inclusion, including by gender, age group, and household income. The database has widely been used in research studies relating to credit and saving like those of Beck et al. (2015), Klapper & Singer (2015), Zins & Weill (2016), and Deléchat et al. (2018). Four of Hofstede's dimensions – Power distance, Individualism, Masculinity, and Uncertainty avoidance, plus Trust, Religion, and Religiosity from the World Values Survey capture national culture. Both datasets are described in Section 1.3.

Sample selection

This is a global study, involving both developed and developing countries. From an initial dataset of 142 countries comprising of countries on the Global Findex database, over half of the initial sample is

dropped due to lack of culture data. This results in a final dataset of 65 countries, 25 of which are high income, and 40 developing countries. All countries in the final dataset have data on both Hofstede's cultural dimensions, and the World Values Survey. Table 3.2 below presents the study countries/regions.

Table 3.2: Study Regions/countries

Region	N	Countries
East Asia & Pacific (EAP)*	6	China, Indonesia, Malaysia, Philippines, Thailand, Vietnam
Europe & Central Asia (ECA)*	11	Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakhstan, Moldova, Romania, Russia, Turkey, Ukraine
Latin America & Caribbean (LAC)*	6	Argentina, Brazil, Colombia, Ecuador, Mexico, Peru
Middle East & North Africa (MENA)*	9	Algeria, Egypt, Iran, Iraq, Jordan, Lebanon, Libya, Morocco, Tunisia
South Asia*	2	India, Pakistan
Sub-Saharan Africa*	6	Burkina Faso, Ghana, Ethiopia, Nigeria, South Africa, Zambia
High Income (OECD)	19	Australia, Canada, Chile, Estonia, Finland, France, Germany, Italy, Japan, Netherlands, New Zealand, Norway, Poland, Slovenia, Spain, Sweden, Switzerland, UK, USA
High Income (Non OECD)	6	Hong Kong, Hungary, Kuwait, Singapore, Trinidad & Tobago, Uruguay
<i>Total number of countries</i>	<i>65</i>	

Countries represented in the study and their geographic regions are presented here. *Excludes all high income countries in the respective regions.

3.3.2. Model, variables, and estimation

3.3.2.1. Model and estimation

A probit model is utilized in this study to analyse the effect of national culture patterns on the use of saving and credit services by individuals. Probit models are widely used in econometric analysis, and apply when the dependent variable is binary. The probit model here quantifies the probability that individual i in country j will use formal and informal credit and saving mechanisms, depicted $Prob(Y_{ij}) = 1$, given some underlying set of exogenous variables x , viz:

$$Prob(Y_{ij} = 1 | x_i) = \alpha + \delta Culture_j + \gamma D_i + \lambda M_j + \theta Z_j + u_{ij}$$

where the coefficients β , γ , λ , and δ are XY matrices for the respective explanatory variables and controls of national culture dimensions, individual- and country-specific characteristics (D) like age and related demographic measures, Macroeconomic setting (M), and Formal institutions (Z); α is the matrix of intercepts, while u_{ij} represents the idiosyncratic error term. The model is estimated using the Maximum Likelihood Estimator, and the marginal effects on the latent variable are calculated from the different coefficients estimated in the model. This estimation method solves the problem of heteroskedasticity associated with estimation procedures like the Linear Probability Model (LPM). Unlike the LPM, the probit model constrains the conditional probability of inclusion of individuals in the formal financial market to lie between zero and one.

3.3.2.2. Variables

Following Zins & Weill (2016), six variables are used in this research regarding credit and saving choices. For Credit, these include Credit in the past 12 months, Formal credit, and Informal credit. For Savings, these include Savings in the past 12 months, Formal saving, and Informal Saving. Each of these variables is binary, taking on the value 1 if individuals affirm to the respective questions on the Global Findex 2017 survey¹⁷ indicated below and zero otherwise:

Credit

“Have you, by yourself or together with someone else, borrowed money from any source for any reason in the PAST 12 MONTHS?”. *“In the PAST 12 MONTHS, have you, by yourself or together with someone else, borrowed any money from: - a bank or another type of formal financial institution? - family, relatives or friends?”* Worthy of note here is informal credit could be contracted from a number of sources. Key among these on which data is available are credit from shopowners, private lenders, friends and family, and saving clubs. Based on Lee & Persson (2016), borrowing from friends & family is the most popular form of informal credit around the world. With the exception of China-based research studies on borrowing from friends and family like in Turvey & Kong (2010), there is surprisingly a lack of research into informal borrowing from friends & family, despite its widespread use and popularity. This explains its choice as the informal credit source in this study. Also, more complete data is available on this credit source than is the case in the other three categories in the Global Findex 2017 database.

Saving

“In the PAST 12 MONTHS, have you, personally, saved or set aside any money for any reason?”; *“In the PAST 12 MONTHS, have you, personally, saved or set aside any money by: Using an account at a bank or another type of formal financial institution? - Using an informal savings group/club or a person outside the family?”*. While individuals have a plethora of informal saving options, saving clubs use represents one of the most popular of these. Its popularity is depicted in empirical studies like Oladeji & Ogunrinola (2001), Carpenter (2002), Aliber et al. (2015) and Githinji et al. (2018). This also is the only informal saving source on which data is available on the Global Findex 2017 database, hence its choice.

Culture

Saving and credit programme participation including from formal and informal sources is focused on, and hypothesised to be determined by national culture, proxied by trust, religion, and religiosity from the WVS in line with Campos & Musken (2013), and Hofstede’s cultural dimensions of power distance, individualism/collectivism, masculinity/femininity, and uncertainty avoidance, in line with El Ghoul &

¹⁷ Global Findex 2017 Questionnaire available at <https://globalfindex.worldbank.org/sites/globalfindex/files/databank/2017%20Findex%20questionnaire.pdf>

Zheng (2016). Both datasets have widely been used in research studies of Guiso et al. (2003, 2006), Tabellini (2010), Campos & Muysken (2013), and El Ghouli & Zheng (2016) among others. Data on the WVS database is available in six waves covering surveys conducted over the respective periods 1981 – 1984, 1990 – 1994, 1995 – 1998, 1999 – 2004, 2005 – 2009, and 2010 – 2014. Not every country is represented in every wave. For better country representation, this study relies on the two most recent waves. For countries with data in both waves, an average value for the respective culture measure is taken. A similar procedure is followed in Campos & Muysken (2013).

The WVS provides data on trust, religion, and religiosity. To capture *Trust*, the response to the following question on the WVS is used: “*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*”. The percentage of people who respond “*Most people can be trusted*” makes up the Trust data here. A similar variable is used in Guiso et al. (2003), Tabellini (2010), and Campos & Muysken (2013) among others.

To capture *Religion*, the response to the following question on the WVS is used: “*For each of the following, indicate how important it is in your life: Religion. Would you say it is...*”. The percentage of respondents who indicate ‘*Very important*’ to this question make up the Religion data here. A similar variable is used in Kanagaretnam et al. (2015).

To capture *Religiosity*, the responses to two questions on the WVS are used: “*Now I am going to read off a list of voluntary organizations. For each organization, could you tell me whether you are an active member, an inactive member or not a member of that type of organization?: Church or religious organization*”. The percentage of respondents who indicate “*Active member*” make up the first religiosity measure here. For the second question, the percentage of persons who indicate “*Once a week*” to “*Apart from weddings and funerals, about how often do you attend religious services these days?*” makes up the second measure. Both measures are used in studies relating to religion and economic outcomes like in McLeary & Barro (2003), Campos & Muysken (2013), and León (2013). As Wald et al. (1990) explain, religious associations enhance social networks. Regular church attendance serves a similar purpose. Following our theoretical framework, social capital plays an important role in determining finance choices. Both religiosity variables here have direct bearings on social capital. An average value is thus taken following the approach of Campos & Muysken (2013). Religion is dissociated from religiosity in this study. It is possible for people who believe religion is important not to be religious, or not to have had or have any contact with religion. The argument here is based on the fact that religion may have an effect on trust as Guiso et al. (2003) find, which then has an effect on finance choices. However and as explained again by Guiso et al. (2003), religiosity increases trust by a greater magnitude than simply finding religion important or being raised religiously does. Unlike merely being religious, religiosity may thus present more fertile grounds for informal finance use.

Control variables

Following previous research studies on finance choices of individuals and firms, a range of variables are controlled for in this research, namely individual demographic characteristics, and country-specific macroeconomic and formal institutional environments.

Previous research findings indicate that the decisions to contract credit and more importantly from formal and informal sources and to save are highly influenced by age, gender, education, and income levels (Kedir, 2003; Nguyen, 2007; Duflo et al., 2008, Kedir et al., 2011; Xue, 2016). Controls are made for each of these individual characteristics. Gender is a dummy variable equal to one if the individual is *Female* and zero otherwise. Three dummy variables are used for education, to represent educational attainment up to primary, secondary, and tertiary levels respectively. Meanwhile, five dummy variables are used for income level to respectively represent quintiles from the poorest to the richest 20%. The fifth quintile dummy (richest 20%) however represents the omitted category.

The level of wealth, financial sector development, population density, and openness of respective countries' economies represent some commonly used macroeconomic determinants of finance choices. Following Hanedar et al. (2014), El Ghoul & Zheng (2016), and Levine et al. (2016), the level of financial sector development in respective countries is controlled for, using the percentage of private credit by banks to GDP measure. In line with Delechat et al. (2018), the level of wealth of a country measured by GDP per capita is controlled for, as well as population density as a measure of social capital, and remittances for economic openness.

A country's formal institutions derive from its informal institutions of which culture is included as depicted in Williamson (2000). In line with Osili & Paulson (2006), the legal origin of countries is controlled for. The legal origin of a country is a dummy variable equal to 1 if a country's legal origin is English Common Law and 0 if the legal origin is French, German, or Scandinavian Civil Law. As La Porta et al. (2008) find, formal institutions like property and creditor rights are much stronger in Anglo-Saxon or Common law countries. Additional controls are thus made for creditor and property rights following Beck et al. (2003) and Levine et al. (2016). Bae & Goyal (2009) prove for example that the cost of borrowing is significantly lower in countries with stronger institutions like property and creditor rights. This in turn may spur credit participation, particularly from formal credit providers.

Table 3.3 below presents a descriptive summary of the variables used in this study and their sources.

Table 3.3: Summary description of variables used in the study

Variable	Notation	Description	Source
<i>Dependent variable: Saving</i> Saved in the past 12 months	sav_yr	% of population aged 15 and over who admit to have saved any money over the past 12 months	Global Findex 2017
Saved at a financial institution (formal)	sav_fm1	% of population aged 15 and over who admit to have saved at a formal financial institution	Global Findex 2017

Saved at a savings club (informal)	sav_infml	% of population aged 15 and over who admit to have saved informally with a savings club or person outside the family	Global Findex 2017
<i><u>Dependent variable: Borrowing</u></i>			
Borrowed in the past 12 months	brw_yr	% of population aged 15 and over who admit to have borrowed any money in the past 12 months	Global Findex 2017
Borrowed from a financial institution (formal)	brw_fm1	% of population aged 15 and over who admit to have borrowed from a formal financial institution	Global Findex 2017
Borrowed from friends and family (informal)	brw_infml	% of population aged 15 and over who admit to have borrowed informally from friends and family	Global Findex 2017
<i><u>Culture measures: Hofstede</u></i>			
Power distance	Pdi	Composite index ranging from 0 to 100, higher score meaning more authoritarian and bureaucratic structures	Hofstede's cultural dimensions
Individualism/Collectivism	Idv	Composite index ranging from 0 to 100, higher score meaning more individualistic societies	Hofstede's cultural dimensions
Masculinity/Femininity	Mas	Composite index ranging from 0 to 100, higher score meaning a higher preference for certainty	Hofstede's cultural dimensions
Uncertainty avoidance	Ua	Composite index ranging from 0 to 100, higher score meaning a higher preference for certainty	Hofstede's cultural dimensions
<i><u>Culture measures: World Values Survey</u></i>			
Trust	Trust	% of people who say most people can be trusted	World Values Survey
Religion	religion	% of people who say religion is very important in life	World Values Survey
Religiosity	religiosity	% of people who are active members in religious groups and attend church service regularly	World Values Survey
<i><u>Client demographic controls</u></i>			
Female	female	Dummy variable = 1 if individual is female	Global Findex 2017
Age	Age	Variable indicating individual's age (in years)	Global Findex 2017
Education level	Educ	Dummy variable indicating individual's educational level	Global Findex 2017
Income level	Inc	Dummy variable indicating individual's income level	Global Findex 2017
Employment status: employed	emp_stat	Dummy variable = 1 if individual is employed	Global Findex 2017
<i><u>Macroeconomic controls</u></i>			
GDP per capita (Ln)	lngdppc	Logarithm of gross domestic product per capita	World Development Indicators
Population density (Ln)	lnpdens	Number of people per square kilometre	World Development Indicators
Private credit by banks as a % of GDP	pvtcgdp	% of private credit extended by banks to GDP. Proxy for financial structure	World Development Indicators
Remittances as a % of GDP	Remit	% of remittances to GDP. Proxy for openness of economy	World Development Indicators
<i><u>Formal institution controls</u></i>			
Legal origin	Legor	Dummy variable = 1 if country has a common law legal origin	A.Shleifer Havard webpages (scholar.harvard.edu/shleifer)
Property rights	Propr	Index indicating strength of property rights protection	Heritage foundation
Creditor rights	Credr	Index indicating strength of creditor rights protection	Djankov et al., 2007

This table presents a descriptive summary of all variables used in this study, and their sources.

3.4. Estimation results and discussion

3.4.1. Descriptive statistics

Prior to summarizing each variable in detail, the pair-wise correlation matrix for the measures of the main explanatory variable, culture is shown. This is important, given that the data comes from two identical survey-based datasets. The results are presented in Table 3.4 below. Multicollinearity as explained by Hsiao (2003) becomes a concern if the correlation coefficient between variables is above 0.70.

Table 3.4: Correlation coefficients for culture measures (Hofstede and World Values Survey)

	pdi	idv	mas	ua	trust	religion	religiosity
pdi	1						
idv	-0.715	1					
mas	0.004	0.094	1				
ua	0.227	-0.135	-0.124	1			
trust	-0.427	0.370	-0.085	-0.502	1		
religion	0.336	-0.359	0.055	0.087	-0.668	1	
religiosity	0.006	-0.128	0.151	-0.138	-0.362	0.389	1

Notes: This table presents correlation coefficients for the culture measures used in this study. The data on these variables comes from Hofstede's cultural dimensions database and the World Values Survey.

In Table 3.5 below, descriptive statistics for the variables used in the study are provided. On average 51.24% of individuals across the sample saved in the past year. Of these persons, 28.52% saved formally, while 9.90% saved informally. Meanwhile 48.68% of sampled individuals took credit in the past year, with 12.98% of these borrowing from formal sources and 21.88% from informal sources. For countries included in the sample, Power distance (PDI) is lowest in New Zealand (22) and highest in Slovak Republic (104). Meanwhile Individualism (IDV) ranges between 8 (Singapore) and 91 (USA); Masculinity (MAS) ranges between 5 (Sweden) and 95 (Japan); Uncertainty avoidance (UAI) is lowest in Singapore (8) and highest in Uruguay (100). Trust ranges between 3.2 (Philippines) and 73.7 (Norway). The most and least religious countries in the sample respectively are Tunisia (95.4) and China (2.6), while religiosity ranges between 1.2 (Egypt) and 50.6 (Ghana). The youngest individual in the sample is 15 and the oldest is 99 years old, with an average age across the sample of 41.

Table 3.5: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Dependent variable: Saving</i>					
Saved in the past 12 months	74,975	0.512	0.500	0	1
Saved at a financial institution (formal)	74,975	0.285	0.452	0	1
Saved at a savings club (informal)	53,941	0.099	0.299	0	1
<i>Dependent variable: Borrowing</i>					
Borrowed in the past 12 months	74,975	0.487	0.500	0	1
Borrowed from a financial institution (formal)	74,975	0.130	0.336	0	1

Borrowed from friends and family (informal)	74,975	0.219	0.413	0	1
<i><u>Culture measures: Hofstede</u></i>					
Power distance	74,975	67.137	18.598	22	104
Individualism/Collectivism	74,975	40.119	21.489	8	91
Masculinity/Femininity	74,975	49.307	16.153	5	95
Uncertainty avoidance	74,975	65.505	21.276	8	100
<i><u>Culture measures: World Values Survey</u></i>					
Trust	74,975	26.351	17.546	3.2	73.7
Religion	74,975	47.832	31.904	2.6	95.4
Religiosity	74,975	15.378	12.804	1.2	50.6
<i><u>Client demographic controls</u></i>					
Female	74,975	0.511	0.500	0	1
Age	74,720	44.031	18.109	15	99
Education level: Primary	74,965	0.303	0.460	0	1
Education level: Secondary	74,965	0.506	0.500	0	1
Education level: Tertiary	74,965	0.185	0.388	0	1
Income level: Poorest 20%	74,975	0.172	0.377	0	1
Income level: Second poorest 20%	74,975	0.181	0.385	0	1
Income level: Middle 20%	74,975	0.195	0.396	0	1
Income level: Fourth 20%	74,975	0.211	0.408	0	1
Income level: Richest 20%	74,975	0.242	0.428	0	1
Employment status: employed	73,975	0.604	0.489	0	1
<i><u>Macroeconomic controls</u></i>					
GDP per capita (Ln)	74,975	9.063	1.179	6.604	11.295
Population density (Ln)	74,975	4.414	1.394	1.163	8.977
Private credit by banks as a % of GDP	74,975	69.628	46.593	9.162	223.391
Remittances as a % of GDP	74,975	2.890	3.832	0.019	16.938
<i><u>Formal institution controls</u></i>					
Legal origin	74,975	0.241	0.428	0	1
Property rights	74,975	59.669	18.795	6.8	97.1
Creditor rights	74,975	1.830	1.037	0	4

In this table, summary statistics for the variables used in this study are presented. The dependent variable relates to two categories: Saving and Credit choices (formal and informal). All dependent variables are binary with values of 0 or 1.

In Table 3.6 and Table 3.7 below, data at regional level on the dependent and main explanatory variables is summarised¹⁸. With the exception of the high income regions, formal saving is lowest in the Latin America & Caribbean (LAC) region and highest in the East Asia & Pacific (EAP) region. Informal saving on the other hand is highest in Sub-Saharan Africa (SSA) and lowest in Europe & Central Asia (ECA). Formal credit is highest in the ECA region and lowest in South Asia (SAS). Meanwhile informal credit use is highest in the Middle East & North Africa (MENA) region and lowest in the LAC region.

¹⁸ Complete statistics on each country in the study is presented in Table III.1 and Table III.2, Appendix II

Table 3.6: Regional summary statistics on saving measures (metadata) and culture

Region	SAVING MEASURES			CULTURE MEASURES (SOURCE: HOFSTEDE/WVS)						
	<i>Saved any money in the past year (% aged 15+)</i>	<i>Saved at a financial institution (% aged 15+)</i>	<i>Saved at a saving club or person outside the family (% aged 15+)</i>	<i>Power distance</i>	<i>Individualism/Collectivism</i>	<i>Masculinity/Femininity</i>	<i>Uncertainty avoidance</i>	<i>Trust</i>	<i>Religion</i>	<i>Religiosity</i>
EAP	59%	27%	14%	82	22	50	42	32.1	55.2	19.6
ECA	37%	14%	5%	84	29	41	90	19.3	38.7	7.3
LAC	36%	10%	6%	68	25	57	75	9.9	51.7	30.3
MENA	40%	13%	9%	75	36	50	69	15.6	85.9	11.3
SAS	35%	13%	15%	66	31	53	55	27.2	66.9	15.5
SSA	58%	19%	27%	71	29	49	53	14.9	79.3	41.8
OECD	73%	55%	5%	45	66	46	64	39.6	20.3	13
NOECD	55%	36%	7%	64	34	55	59	26.6	42.9	16
Sample	49%	23%	11%	69	34	50	63	23.2	55.1	19.4

In this table, regional average scores for saving, the dependent variable and main explanatory variables (Culture) used in this study are presented. The saving variables include *Saved any money in the past year*, *Saved formally*, and *Saved informally*. Data on these variables is obtained from the Global Findex 2017 database. Data on Culture is obtained from Hofstede's dimensions and World Values Survey.

Table 3.7: Regional summary statistics on credit measures (metadata) and culture

Region	CREDIT MEASURES			CULTURE MEASURES						
	<i>Borrowed any money in the past year (% aged 15+)</i>	<i>Borrowed from a financial institution (% aged 15+)</i>	<i>Borrowed from friends and family (% aged 15+)</i>	<i>Power distance</i>	<i>Individualism/Collectivism</i>	<i>Masculinity/Femininity</i>	<i>Uncertainty avoidance</i>	<i>Trust</i>	<i>Religion</i>	<i>Religiosity</i>
EAP	49%	14%	30%	82	22	50	42	32.1	55.2	19.6
ECA	48%	16%	28%	84	29	41	90	19.3	38.7	7.3
LAC	36%	11%	16%	68	25	57	75	9.9	51.7	30.3
MENA	47%	10%	33%	75	36	50	70	15.6	85.9	11.3
SAS	40%	5%	31%	66	31	53	55	27.2	66.9	15.5
SSA	46%	9%	31%	71	29	49	53	14.9	79.3	41.8
OECD	61%	19%	13%	45	66	46	64	39.6	20.3	13
NOECD	48%	14%	13%	64	34	55	59	26.6	42.9	16
Sample	47%	12%	24%	69	34	50	63	23.2	55.1	19.4

In this table, regional average scores for borrowing or credit, the dependent variable and main explanatory variables (Culture) used in this study are presented. The saving variables include *Borrowed any money in the past year*, *Borrowed formally*, and *Borrowed informally*. Data on these variables is obtained from the Global Findex 2017 database. Data on Culture is obtained from Hofstede's dimensions and World Values Survey.

As hypothesised in this study, cultural differences at country and regional levels may account for the figures observed in the preceding two tables. Whether or not this is the case, is assessed in the next Section of the empirical analysis which follows.

3.4.2. Regression analysis

3.4.2.1. Results

Culture and saving choices

Table 3.8 below reports regression results for the effects of culture on individual decisions to save, including both formally and informally. Based on the results, living in a more individualistic, high trust culture, and culture of higher religiosity significantly increase the likelihood for individuals to save. In individualistic cultures, there is a higher likelihood for such savings to be formal. With respect to trust, results indicate a higher likelihood for informal savings over formal savings in high trust cultures. A similar finding of a higher informal than formal savings likelihood is equally found in cultures of higher religiosity. Meanwhile, living in a high power distance, more masculine, high uncertainty avoidance, and more religious culture significantly reduces the likelihood to save. This likelihood however is significantly lower for informal savings across all the culture variables. A positive likelihood is even found for religion and informal saving. These relationships hold across practically all measures even when controls are added in the extended model.

Table 3.8: Effects of culture on individual saving choices

VARIABLES	(1)	(2)	(1)	(2)	(1)	(2)
	sav_yr	sav_yr	sav_fml	sav_fml	sav_infml	sav_infml
<i>Culture measures</i>						
pdi	-0.00153*** (0.000142)	-0.00158*** (0.000142)	-0.00184*** (0.000127)	-0.00108*** (0.000124)	-0.000907*** (0.000105)	-0.00202*** (0.000119)
idv	0.00205*** (0.000120)	0.000235* (0.000133)	0.00271*** (0.000103)	0.00123*** (0.000113)	-0.000804*** (9.53e-05)	-0.00128*** (0.000114)
mas	-0.00232*** (0.000115)	-0.00154*** (0.000124)	-0.00130*** (9.38e-05)	-0.00100*** (9.87e-05)	-0.00107*** (0.000121)	4.57e-05 (0.000144)
ua	-0.00115*** (0.000111)	-0.00174*** (0.000153)	-0.00194*** (9.46e-05)	-0.00114*** (0.000125)	7.17e-05 (8.45e-05)	5.20e-05 (0.000139)
trust	0.00340*** (0.000187)	0.00259*** (0.000185)	0.00188*** (0.000161)	0.00118*** (0.000156)	0.00250*** (0.000150)	0.00149*** (0.000170)
religion	-0.000948*** (8.07e-05)	0.000398*** (8.71e-05)	-0.00158*** (7.34e-05)	-1.67e-05 (7.68e-05)	0.00144*** (5.77e-05)	0.00102*** (6.86e-05)
religiosity	0.00561*** (0.000161)	0.00383*** (0.000179)	0.00201*** (0.000146)	0.000871*** (0.000160)	0.00304*** (9.76e-05)	0.00217*** (0.000126)
<i>Demographic controls</i>						
female		0.0101*** (0.00336)		-0.000186 (0.00288)		0.00226 (0.00245)
age		-0.000229** (0.000104)		0.000736*** (9.09e-05)		-0.000248*** (8.12e-05)
educ_pri		0.0204 (0.0219)		-0.0234 (0.0186)		0.00701 (0.0173)
educ_sec		0.120*** (0.0217)		0.0690*** (0.0185)		0.0159 (0.0173)
educ_ter		0.212*** (0.0220)		0.159*** (0.0186)		0.0179 (0.0175)
inc_pr20		-0.218*** (0.00533)		-0.188*** (0.00477)		-0.0447*** (0.00408)
inc_sp20		-0.158***		-0.143***		-0.0304***

inc_md20	(0.00522)	(0.00449)	(0.00389)
	-0.107***	-0.0944***	-0.0197***
inc_fr20	(0.00511)	(0.00425)	(0.00369)
	-0.0596***	-0.0589***	-0.0124***
emp_stat	(0.00502)	(0.00407)	(0.00350)
	0.128***	0.100***	0.0321***
	(0.00350)	(0.00316)	(0.00268)
<i>Macroeconomic controls</i>			
lngdppc	0.0388***	0.0300***	-0.0456***
	(0.00340)	(0.00288)	(0.00272)
lnpdens	0.00265	0.0136***	-0.00198
	(0.00171)	(0.00134)	(0.00190)
pvtcgdp	1.23e-05	0.000443***	0.000101
	(7.47e-05)	(5.97e-05)	(6.42e-05)
remit	-0.00386***	-0.00948***	-0.00112**
	(0.000650)	(0.000602)	(0.000485)
<i>Formal institution controls</i>			
legor	0.00197	0.0215***	-0.0133***
	(0.00564)	(0.00493)	(0.00381)
propr	0.000736***	0.000892***	0.000983***
	(0.000179)	(0.000155)	(0.000179)
credr	0.0130***	0.00819***	0.0216***
	(0.00196)	(0.00165)	(0.00151)
<i>Statistics</i>			
Observations	74,975	73,710	74,975
Pseudo R ²	0.059	0.136	0.119
Log likelihood	-48905.098	-44108.831	-39477.962
Predicted probability	0.513	0.512	0.285
			0.287
			0.096
			0.085

This table presents the marginal effects and standard errors (in parentheses) from probit regressions for the effect of culture on the decision to save, both formally and informally. Seven culture measures are used, four from Hofstede's dimensions and three from the World Values Survey (model 1). Additional controls are made in Models 2. ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

Power distance

Findings indicate a negative relationship between power distance and the likelihood to save, both formally and informally. Living in a high power distance culture reduces the likelihood to save by 0.15%. The likelihood to save formally is reduced by 0.15%, while, the likelihood to save informally is reduced by 0.091%. This implies high power distance cultures favour informal over formal savings.

Individualism/Collectivism

Findings indicate a positive relationship between individualism and the likelihood to save. Living in an individualistic culture increases the likelihood to save by 0.21%. There is also a higher likelihood of 0.27% for such savings to be formal, and lower likelihood of 0.08% for such savings to be informal. Thus, people in individualistic cultures are more likely to use formal mechanisms for their saving needs.

Masculinity/Femininity

Findings indicate a negative relationship between masculinity and the likelihood to save, both formally and informally. Living in a masculine culture reduces the likelihood to save by 0.23%. This likelihood however is lower for formal saving (0.13%) than it is for informal saving (0.11%), and suggests a higher likelihood for informal over formal savings in masculine cultures.

Uncertainty avoidance

Findings indicate a negative relationship between uncertainty avoidance and the likelihood to save. Living in a high uncertainty avoidance culture reduces the likelihood to save by 0.12%. This reduced likelihood is higher for formal saving (0.19%) than it is for informal saving (0.0072%). Thus people in high uncertainty avoidance cultures are more likely to rely on informal than formal saving mechanisms.

Trust

Findings indicate a positive relationship between trust and the likelihood to save. Living in a high trust culture increases the likelihood to save by 0.34%. This likelihood is higher for informal than it is for formal saving. Living in a high trust culture increases the likelihood for formal saving by 0.19% and for informal saving by 0.25%.

Religion

Living in a culture where religion is considered important (more religious culture) reduces the likelihood to save, formally especially. The likelihood to rely on formal saving mechanisms reduces by 0.16% in such cultures, while the likelihood to rely on informal saving mechanisms increases by 0.14%. The results thus suggest a higher likelihood to rely on informal saving mechanisms in more religious cultures.

Religiosity

Unlike in religious cultures, active religious participation (religiosity) increases the likelihood to save. This likelihood is higher for informal than formal saving. Higher religiosity increases the likelihood to save by 0.56%. While the likelihood for formal saving increases by 0.20%, that for informal saving increases by 0.30%, suggesting more reliance on informal saving mechanisms in such cultures.

Culture and credit choices

Table 3.9 below reports regression results for the effects of culture on individual decisions to borrow, including both formally and informally. Based on the results, living in more individualistic, high uncertainty avoidance, high trust, more religious culture, and cultures of higher religiosity significantly increases the likelihood for individuals to borrow. In individualistic cultures, there is a higher likelihood for such credit to be formal. In high uncertainty avoidance cultures, there is a higher likelihood for people to borrow informally than there is for formal credit use. With respect to trust and religion, there is again a higher likelihood for informal over formal credit use in high trust and more religious cultures. In cultures of higher religiosity however, there is a higher likelihood for formal over informal credit use. Meanwhile, living in high power distance and more masculine cultures significantly reduces the likelihood to borrow. With respect to the choice between formal and informal credit, the likelihood for formal credit is however lower than that for informal credit. Findings even indicate a positive likelihood for informal credit use in high power distance cultures. A similar tale holds for masculinity where a higher likelihood for informal

over formal credit is revealed by the results. With the exception of individualism and masculinity, the results hold across all measures when controls are added in the extended model.

Table 3.9: Effects of culture on individual borrowing choices

VARIABLES	(1)	(2)	(1)	(2)	(1)	(2)
	brw_yr	brw_yr	brw_fml	brw_fml	brw_infml	brw_infml
<i>Culture measures</i>						
pdi	-0.000901*** (0.000147)	-0.00115*** (0.000151)	-0.000551*** (0.000101)	-0.000404*** (0.000105)	0.00266*** (0.000120)	0.00121*** (0.000125)
idv	0.00188*** (0.000124)	0.000567*** (0.000140)	0.000439*** (8.48e-05)	-0.000442*** (9.70e-05)	-0.000586*** (0.000104)	0.000908*** (0.000120)
mas	-0.000396*** (0.000116)	0.000201 (0.000128)	-0.00126*** (7.80e-05)	-0.000788*** (8.58e-05)	1.38e-06 (0.000103)	-0.000230** (0.000115)
ua	0.000329*** (0.000115)	0.000837*** (0.000159)	9.45e-05 (7.85e-05)	-0.000200* (0.000106)	0.000145 (9.44e-05)	0.000116 (0.000139)
trust	0.00274*** (0.000190)	0.00214*** (0.000194)	-0.000234* (0.000128)	-0.000343*** (0.000129)	0.00176*** (0.000157)	0.00127*** (0.000163)
religion	1.43e-05 (8.33e-05)	0.000920*** (9.19e-05)	-0.000642*** (5.84e-05)	-0.000240*** (6.44e-05)	0.00158*** (6.69e-05)	0.000367*** (7.42e-05)
religiosity	0.00270*** (0.000169)	0.00121*** (0.000191)	0.00115*** (0.000118)	0.00102*** (0.000135)	0.000437*** (0.000135)	-7.47e-05 (0.000155)
<i>Demographic controls</i>						
female		-0.00230 (0.00354)		0.00147 (0.00242)		-0.00275 (0.00293)
age		-0.00111*** (0.000110)		-0.000152* (7.88e-05)		-0.00231*** (9.25e-05)
educ_pri		0.0249 (0.0234)		0.00629 (0.0180)		0.0413* (0.0214)
educ_sec		0.0929*** (0.0233)		0.0505*** (0.0178)		0.0512** (0.0213)
educ_ter		0.177*** (0.0235)		0.0864*** (0.0179)		0.0317 (0.0215)
inc_pr20		-0.0422*** (0.00574)		-0.0362*** (0.00405)		0.0748*** (0.00470)
inc_sp20		-0.0299*** (0.00560)		-0.0196*** (0.00380)		0.0469*** (0.00467)
inc_md20		-0.0189*** (0.00544)		-0.0173*** (0.00364)		0.0405*** (0.00456)
inc_fr20		-0.0112** (0.00530)		-0.00997*** (0.00348)		0.0274*** (0.00447)
emp_stat		0.154*** (0.00367)		0.0890*** (0.00280)		0.0657*** (0.00316)
<i>Macroeconomic controls</i>						
lngdppc		0.0223*** (0.00357)		0.0207*** (0.00247)		-0.0433*** (0.00296)
lnpdens		-0.0126*** (0.00177)		-0.0106*** (0.00115)		-0.00251 (0.00157)
pvtcgdp		0.000520*** (7.78e-05)		2.97e-05 (5.14e-05)		5.99e-05 (6.90e-05)
remit		0.000954 (0.000688)		0.00556*** (0.000459)		-0.00113** (0.000549)
<i>Formal institutions</i>						
legor		0.0607*** (0.00593)		-0.0109*** (0.00421)		0.00282 (0.00485)
propr		8.48e-05		0.000511***		-0.00240***

credr		(0.000191) 0.0158*** (0.00207)		(0.000131) 0.00859*** (0.00137)		(0.000156) 0.0123*** (0.00176)
<i>Statistics</i>						
Observations	74,975	73,710	74,975	73,710	74,975	73,710
Pseudo R ²	0.019	0.063	0.014	0.063	0.031	0.072
Log likelihood	-50967.489	-47842.461	--28527.932	-26744.44	-38185.298	-35796.414
Predicted probability	0.487	0.486	0.130	0.130	0.219	0.217

This table presents the marginal effects and standard errors (in parentheses) from probit regressions for the effect of culture on the decision to borrow, both formally and informally. Seven culture measures are used, four from Hofstede's dimensions and three from the World Values Survey (model 1). Additional controls are made in Models 2. ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

Power distance

Findings indicate a negative relationship between power distance and the likelihood to borrow. This negative relationship however is only found for formal credit. Precisely, living in a high power distance culture reduces the likelihood for formal credit use by 0.055%. Living in a high power distance culture on the other hand increases the likelihood for informal credit use by 0.27%.

Individualism/Collectivism

Findings indicate a positive relationship between individualism and the likelihood to borrow, with a higher likelihood of 0.19%. There is also a higher likelihood for such credit to be formal. Findings indicate a negative relationship between individualism and informal credit, with a lower borrowing likelihood of 0.059%. Thus, people in individualistic cultures are more likely to use formal credit.

Masculinity/Femininity

Findings indicate a negative relationship between masculinity and the likelihood to borrow. Living in a masculine culture reduces the likelihood to borrow. This reduced likelihood is higher for formal credit (0.13%). Findings even indicate a positive though statistically insignificant likelihood for informal credit in more masculine cultures (0.0014%), suggesting a higher likelihood for informal over formal credit use in masculine cultures.

Uncertainty avoidance

Findings indicate a positive relationship between uncertainty avoidance and the likelihood to borrow, informally especially. Living in a high uncertainty avoidance culture increases the likelihood to borrow by 0.033%. The findings however indicate a higher likelihood for reliance on informal credit sources than on formal ones. In particular, living in a high uncertainty avoidance culture increases the likelihood for informal credit use by 0.015%. The likelihood for formal credit use is however only increased by 0.0095% in these cultures. People in high uncertainty avoidance cultures are thus more likely to rely on informal credit sources than they are on formal ones.

Trust

Findings indicate a positive relationship between trust and the likelihood to borrow, informally especially. Precisely, living in a high trust culture increases the likelihood to borrow by 0.27%. This positive

relationship is only observed for informal credit, suggesting a higher reliance on informal over formal credit in high trust cultures. Living in a high trust culture increases the likelihood for informal credit use by 0.18%, but decreases the likelihood for formal credit use by 0.023%.

Religion

Living in a religious culture increases the likelihood to borrow, informally especially. In particular, the likelihood to rely on informal credit sources increases by 0.16% in religious cultures. The likelihood to rely on formal credit mechanisms on the other hand decreases by 0.064% in religious cultures. The results thus suggest a higher likelihood for reliance on informal credit mechanisms in religious cultures.

Religiosity

Active religious membership or participation increases the likelihood to borrow. Precisely, higher religiosity increases the likelihood to borrow by 0.27%. Findings however indicate a higher likelihood for formal credit (0.16%) than for informal credit (0.044%) in cultures of higher religiosity.

3.4.2.2. Discussion of findings

Table 3.10 below presents a summary of the main findings in Table 3.8 and Table 3.9 above.

Table 3.10: Summary regression results on the effects of culture on formal and informal saving and credit choices

<i>Culture measures</i>	<i>(In)formal saving and credit measures</i>					
	<i>sav_yr</i>	<i>sav_fmI</i>	<i>sav_infml</i>	<i>bor_yr</i>	<i>bor_fmI</i>	<i>bor_infml</i>
Power distance	-0.00153***	-0.00184***	-0.000907***	-0.000901***	-0.000551***	0.00266***
Individualism	0.00205***	0.00271***	-0.000804***	0.00188***	0.000439***	-0.000586***
Masculinity	-0.00232***	-0.00130***	-0.00107***	-0.000396***	-0.00126***	1.38E-06
Uncertainty avoidance	-0.00115***	-0.00194***	7.17E-05	0.000329***	9.45E-05	0.000145
Trust	0.00340***	0.00188***	0.00250***	0.00274***	-0.000234*	0.00176***
Religion	-0.000948***	-0.00158***	0.00144***	1.43E-05	-0.000642***	0.00158***
Religiosity	0.00561***	0.00201***	0.00304***	0.00270***	0.00115***	0.000437***

Note: Summary results of the probit estimates reported in Tables 3.6 and 3.7 are indicated here. Only results of the original model (model without controls or respective models 1) are indicated.

In high power distance cultures, there is a higher likelihood for individuals to rely on informal over formal finance mechanisms. El Ghouli & Zheng (2016) make similar findings, though only in the credit case. One reason for this is the resulting higher inequality which Hofstede (1984, pp. 98) and El Ghouli & Zheng (2016) identify as being typically characteristic of high power distance cultures. Such inequality directly excludes lots of persons from the use of formal financial services. This is supported by the theoretical provisions advanced earlier on informal finance use as a means of socialisation, wherein people are more likely to interact or transact with others of the same social standing. The direct result of this is less formality in business transactions. Zins & Weill (2016) further explain that formal financial service providers often discriminate on the bases of inequality. With the highest power distance score across developing countries in the sample (95), Iraqis are overall more likely to rely on informal finance

than Argentines (49). Corresponding figures from the Global Findex database confirm these empirical findings. For saving, only 2% of Argentines save informally as against 17% of Iraqis who do. For credit, only 16% of Argentines borrow informally in comparison to 52% of Iraqis.

People in individualistic cultures are more likely to rely on formal than on informal financial services. This confirms earlier findings of El Ghouli & Zheng (2016) who find that lower individualism (higher collectivism) breeds more informality. While the authors do not fully explain this phenomenon, we advance trust here as a possible explaining factor, based on the theoretical provisions advanced earlier in Section 3.2.3. Collectivism breeds higher trust, particularised trust in this case – trust in one's kin, friends and other close acquaintances (Postelnicu & Hermes, 2018). This closed circle has the most likely group of persons with whom people carry out informal financial transactions. Due to the high particularised trust bred in collectivist societies, informal finance will be favoured, as it also serves as a socialisation mechanism, socialisation here referring to the process by which both children and adults learn of any new patterns of behaviour which are of functional importance in society. In individualistic cultures on the other hand, higher generalised trust prevails – trust in strangers and people one is not familiar with. People in such cultures find it easier to use formal financial services, since they are more likely to trust the service providers who they most often will be unfamiliar with. In the real world, people in more individualistic South Africa (score of 62) will be expected to use more formal financial services than people in collectivist Colombia (individualism score of 13). Stylized facts do confirm this finding, though only for formal saving. The corresponding figures are 22% formal saving for South Africa as opposed to 9% for Colombia. Stylized facts interestingly indicate a high reliance on informal finance as well in individualistic South Africa, and a lower use of informal finance in collectivist Colombia. This may not be all surprising as results in Table 3.9 above indicate that the effect of individualism on informal finance choices is also determined by other variables, most especially macroeconomic and formal institutional variables. The popularity of informal finance mechanisms in South Africa can be explained by the country's high level of inequality which keeps vast populations poor and most likely to rely on informal mechanisms for their credit and saving needs. As explained earlier with power distance, when there is more inequality, informal finance will be sought after due to higher discrimination by formal finance service providers on income for instance. Thus despite living in a very individualistic culture, South Africans rely more on informal finance mechanisms than collectivist Colombians (30% as against 5% with respect to saving, and 37% as against 20% with respect to credit). The case of South Africa here suggests the need for deeper within-country cultural demarcations, especially on differences relating to aspects like ethnic backgrounds and language.

Individuals in more masculine cultures are less likely to use formal financial services. Among developing countries in the sample, Thais (low masculinity score of 34) should based on these findings be

more likely to use formal financial services than Iraqis (masculinity score of 70). For credit, 29% of sampled Thais relied on informal credit in 2017 as against 59% of sampled Iraqis, again confirming a higher reliance on informal finance mechanisms in more masculine cultures. Meanwhile 15% of sampled Thais relied on formal credit sources as opposed to only 3% of sampled Iraqis. With respect to saving, the respective figures are 29% formal saving for Thais as against 2% for Iraqis. No data is found for informal finance in Iraq in 2017. Based on 2014 data however, the respective figures for informal savings are 8% in Thailand as opposed to 17% in Iraq. The finding of higher informal finance use in more masculine cultures is thus confirmed by these stylized facts, and in line with the findings of El Ghouli & Zheng (2016). Their explanation for the observed lower reliance on formal financial services in masculine cultures is the level of information collection and monitoring costs on the supply side. Theoretically, the successful delivery of financial services will depend to a large extent on the strategies and relevant costs of reducing information asymmetry. Masculine cultures are generally very competitive implying people may take upon more risk (Hofstede, 2010). A higher level of prudence is thus required in such cultures to minimise potential losses arising from such bigger risks. Social capital presents inexpensive cost-reduction strategies, which are more adaptable to feminine cultures as they prioritise societal over individual success. With few inexpensive cost-reduction strategies in masculine cultures, financial services will be more expensive as service providers seek to reduce their risk of loss. This then excludes people from the use of formal finance services. Korynski & Pytkowska (2016) also find financial systems to be less efficient in masculine cultures, which further compounds the cost of using formal financial services. Informal finance will thus prevail in masculine cultures.

In high uncertainty avoidance cultures, individuals are more likely to borrow than to save as the findings in this study indicate. The findings further indicate a higher likelihood for informal finance use, both with respect to saving and credit in high uncertainty avoidance cultures. The finding is in line with El Ghouli & Zheng (2016), though they dwell on credit in their empirical study. An explanation for this relationship is however not provided in their study. Ashraf et al. (2016) differentiate high and low uncertainty avoidance cultures on the basis of risks taken. While both cultures take upon some risk, this risk is limited to known risks in high uncertainty avoidance, while low uncertainty avoidance cultures take upon, and are more tolerant of both known and unknown risks. In line with Ashraf et al. (2016), and based on the theoretical framework advanced earlier in Section 3.2.3 in relation to transaction costs and strategies for their reduction, we argue that high uncertainty avoidance will lead to higher financial intermediation costs as service providers make more concerted efforts to shield themselves from potential losses or minimize potential risks, especially when such risks are unknown. Informal finance provides cheaper mechanisms for minimizing such costs through a higher use of locally available information, social capital, collateral, and sanctions. Informal finance use in high uncertainty avoidance cultures

largely holds for saving across sampled countries. With the lowest uncertainty avoidance score across sampled developing countries of 30, the Chinese should rely more on formal finance mechanisms for their saving and credit needs, than high uncertainty avoidance Romanians. These results however only hold for saving. For credit, stylized facts indicate a higher reliance by the Chinese on informal than formal credit sources (9% formal versus 28% informal credit). The role of institutions (formal) becomes evident here. With a weaker formal institutional framework, informality abounds in China. Much of China's economic success has been credited to the effectiveness of its informal financial sector (Turvey & Kong, 2010). The results on credit however largely hold for high uncertainty avoidance Romania (score of 90). 21% of sampled Romanians borrowed informally in 2017 as opposed to 15% who borrowed formally.

In high trust cultures (trust in strangers or generalised trust), a higher likelihood for reliance on informal over formal finance mechanisms is found. This finding of a positive relationship between trust and informality is in line with the findings of Guiso et al. (2004), Turvey & Kong (2010), Allen et al. (2014), and Levine et al. (2018). Theoretically, social capital levels in high trust cultures will be higher, as people will be more open to interacting both with strangers and their acquaintances. In addition to the regular formal finance channels, a readily available low-cost informal financing channel also presents itself to individuals in such cultures due to these higher levels of social capital. The likelihood for the use of such informal finance mechanisms is elevated in cultures which are more collectivist. China presents an interesting case of a dual collectivist and high trust culture, qualities which favour both formal and informal finance use. Higher informal saving and credit for example should be expected in China (highest trust score of 60.3) than in the Philippines (lowest trust score of 3.2). Stylized facts do however indicate that Filipinos rely more on informal finance than the Chinese. Across the respective country samples in the Global Findex, 8% of sampled Filipinos saved informally in 2017 as opposed to 4% of Chinese; while 41% of Filipinos borrowed informally in 2017 as opposed to 28% of Chinese. In line with Campos & Muysken (2013), we justify the high reliance on informal finance mechanisms among Filipinos by the fact that Filipinos are more individualistic but exhibit low trust, and will trust their kin and close acquaintances more than they will strangers like formal finance service providers. The Chinese on the other hand are both more collectivist and simultaneously more likely to trust strangers. As Turvey & Kong (2010) argue, informal finance flourishes in China due to high trust, which then affects the speed, cost and convenience of using these services. We however additionally advance higher collectivism in China as a second reason for the high use of informal finance mechanisms, but argue that the Chinese also have cultural characteristics which will support a high use of formal financial services. High informal finance use in China has a lot to do with its weak formal institutional framework (Turvey & Kong, 2010).

In countries where religion is considered important, people are less likely to save. Theoretically, the use of savings as a consumption-smoothing mechanism is supported in low present-bias cultures as

Meier & Sprenger (2007) argue. The finding in this study of a lower saving likelihood in countries where religion is considered important suggests that people in such countries have a high present-bias. Empirical evidence on the relationship between religion and the present-bias is however shallow, and opens an avenue for further research. The results on the likelihood for individual borrowing in cultures where religion is considered important are statistically insignificant. When people do save and borrow however, there is a higher likelihood informal sources will be relied on. Religion breeds higher generalised trust (Guiso et al., 2003; Renneboog & Spaenjers, 2012). This enables people interact more with strangers, and acquire more social capital. As argued in the theoretical framework in this study, social capital is essential in developing settings especially, where information is scarce and costly. Reduced costs of financial intermediation prompted by higher trust and social capital will imply a higher use of informal finance services. Tunisians (religion score of 95.4) should thus be more likely to use informal financial services than the Chinese (religion score of 2.6). Data on the two countries supports this empirical claim. The respective 2017 informal finance figures for the Tunisia and China Global Findex samples are 3% and 4% for informal saving, and 32% and 28% for informal credit.

Religiosity as indicated in the results prompts a higher likelihood for formal credit use, but an opposing higher likelihood for informality with respect to saving. As Barro and McCleary (2003) suggest, active religious participation fosters religious beliefs like hard work, honesty and ethics. Such values are good for economic performance as they enhance trust among people. The downside to this however is such trust will be particularised and not generalised as religious people are more likely to interact with people of similar religious standing, which theoretically limits one's social interactions and capital to their acquaintances only. The reliance on informal saving is supported here, wherein active religious people are more likely to save informally with other group members due to this high particularised trust. Where credit needs are bigger however, such narrow informal networks will not be sufficient. Formal credit will thus be used. Based on the stylized facts, one should expect more informal saving in Ghana (highest religiosity in the sample, score of 50.6) than in Egypt (lowest religiosity in the sample, score of 1.2), and conversely more formal credit in Ghana than in Egypt. The respective figures for Ghana and Egypt are 19% against 16% for informal saving, and 10% against 6% for formal credit. This finding on religiosity and finance choices is in line with those of Campos & Muysken (2013).

3.5. Conclusion

Financial inclusion was the focus of the previous chapter. Empirical evidence prove that the likelihood for individuals to be financially included or use formal financial services increased in more individualistic, longer-term oriented, and more indulgent cultures. Meanwhile, living in high power distance, more masculine, and high uncertainty avoidance cultures reduced the likelihood for financial inclusion. In this

chapter, the focus was on informal financial services. Given their popularity across much of the developing world, the objective was to find out whether individuals rely more on informal finance services in cultures where the use of formal financial services is low. In other words, consideration was given to the thought of whether there is a trade-off in formal and informal financial services use by individuals, and whether this trade-off is driven by cultural differences. According to the results, there is a trade-off between formal and informal finance use. In cultures where the use of formal financial services is supported, informal finance is less pronounced. In cultures however of lower formal financial services use, informal finance thrives. Interestingly, in cultures of higher religiosity, both formal and informal financial services will thrive. The same is true for trust, though this only applies to saving.

Based on the findings in this study, saving products or programmes need to be promoted over credit programmes in more individualistic, higher trust, and cultures of higher religiosity. In these cultures, results indicate a higher likelihood for reliance on saving than on credit. Thus financial inclusion programmes which dwell more on credit provision will not perform as well as those with saving features in such cultures. In individualistic cultures, formal saving products should be promoted as they are more likely to do well. Informal saving products are however more likely in higher trust cultures and cultures of higher religiosity. Using regulation and related policies to crowd out informal finance providers may prove counter-productive in such cultures. Rather than try to crowd out informal finance service providers, it may prove more productive to partner them up with formal financial service providers, an example being informal finance service providers operating special accounts in formal institutions.

A key limitation of this study has been its generalisation of saving and credit products in the empirical analysis. Saving and credit products come in several forms and types, some of which are indicated in Section 3.2.2.2 above. While this generalisation has been necessitated by data unavailability on specific saving and credit products, further research could consider these specificities, as there is a potential for culture to have a different effect on different saving and credit products.

Chapter 4

CULTURE AND THE PERFORMANCE OF MICROFINANCE INSTITUTIONS

4.1. Introduction

The finance industry stands at the centre of efforts to enhance economic development globally. Up until the mid to late 1980's, national governments which hitherto were heavily involved in credit markets lost much of their intervention impetus. This followed a wave of financial liberalisation efforts which swept across much of the developing world, necessitated by credit market failures. One of the fallouts of these liberalisation efforts was the advent of different financial service providers. Prominent among these was Microfinance Institutions (MFIs), whose focus was the provision of financial services to poor and low income earners. Historically, this client group had been excluded from the use of formal financial services due partly to their low incomes. To meet the challenge of serving this group of clients, the microfinance industry relied on public support from governments, development finance institutions, foundations, and Non-Governmental Organisations (NGOs). Through aid and in some cases 'soft' loans, the industry was able to extend financial services, notably through (micro)credit at the time to some of the poorest regions in the world. This fulfilled the social mission of serving the poor which has guided the industry since its creation. Recently however, a global reduction in aid following debates related to its effectiveness in driving down poverty and enhancing development has prompted a rethink of the socially-inclined strategy in microfinance. In fact for the industry to be sustainable in the face of such funding adversities, the need to self-finance became inevitable. This ushered in a financial objective of profit making. Notwithstanding, the social mission of microfinance has remained key to the industry's existence. Funding has thus continually been provided from various sources by actors driven either or both by the incentive to do good, and the incentive to make money. This implies an often concurrent pursuit by MFIs of both the social and financial objective. Such funding often has come in a package relating to financial inclusion as a whole, which relates to facilitating access to and use of formal financial services. US\$37Billion for example was invested in financial inclusion in 2016, up from US\$30Billion in 2014 and US\$26billion in 2011, 29% of this amount from private sources¹⁹.

By funding financial inclusion initiatives with the key outcome being formal account ownership, the hope has been to reduce the reliance on cash especially by poor and low income earners. This then permits them better manage their finances both for consumption and income-smoothing purposes. Better financial management has been of enormous importance in the creation of microenterprises by the poor, women empowerment, child nutrition, health and education, and overall wellbeing at the primary level of

¹⁹ CGAP brief 2017, available at <http://www.cgap.org/sites/default/files/Brief-International-Funding-for-Financial-Inclusion-Dec-2017.pdf>, and consulted on 12/08/2018

society, the household. As justification however for the economic incentives behind such flows, statistics show that their target has not been the poorest countries, but the lower-middle income ones. The Europe & Central Asia (ECA) region for example still receives the highest proportion of these funds (see Figure 1.2, p. 4). It may thus be difficult to dissociate one incentive – social and financial – from the other when it comes to assessing the overall success of poverty-related interventions, and the performance of the institutions through which these funds flow.

There is a continuing debate around the success of microfinance in reducing poverty and enhancing economic development. Rooyen et al. (2012) for example argue that microfinance increases poverty, undermines women, and has a negative effect on children's education. High interest rates, unproductive loans, over-indebtedness, and insufficient loan amounts are among the factors which have rendered microfinance ineffective (Ali et al., 2017). Irrespective of the critique, millions of previously unbanked persons across the world now have access to financial services as a result of microfinance. Such access has facilitated capital accumulation as well as credit for financing of small enterprises, education, healthcare, and asset acquisition (Udry, 1991; Dupas & Robinson, 2009; Karlan et al., 2014; Steinert et al., 2017). The hype surrounding the industry's potential among its promoters is down to such achievements. The relative ease with which microfinance has reached and served the unbanked has varied widely across countries and regions. Microfinance service delivery strategies that have proven successful in some countries and regions have failed in others. Masanjala (2002) empirically proves this point, making reference to the failure of the Grameen group lending mechanism in Zambia. This suggests perhaps that there is no 'one size fits all' rule when it comes to microfinance, and poverty reduction as a whole. Overall, empirical literature thus far has identified the formal institutional environment relating to factors like legal systems, property and creditor rights, and democratic values among others as potential determinants of these observed variations in poverty reduction rates across the developing world. With increased globalisation however and greater economic cooperation among countries, the formal institutional boundaries that separated countries in the past have largely been lessened. Thus continually comparing countries on the grounds of formal institutional differences as has been the focus of economists in the past may only tell part of the story when institutions are mentioned in economics and finance. Williamson (2000) even depicts the formal institutional environment of a country as a derivative of its informal institutions like customs and traditions which relate to the country's cultural framework, suggesting that informal institutions have a bigger role in determining economic and financial outcomes.

The main objective of this study is to assess the effect of culture on the performance of MFIs. In other words, does culture determine the performance of MFIs? Theoretically, institutions like culture have an effect on the costs of financial intermediation. Culture essentially relates to values – what a society considers good or bad – and depicts the process through which these values are passed across generations.

The effect of culture applies on both the demand and supply sides of microfinance service provision, by firstly affecting the level of information asymmetry in a society, and secondly determining the strategies and related costs for the reduction of this asymmetry. Cultural provisions are theoretically grounded in institutional economics, and revolve around information asymmetry, strategies for its reduction, and corresponding costs of applying such strategies. The level of trust, risk taking, attitude towards women, respect for hierarchy, and indulgence among others are all cultural factors which influence the cost and strategies of financial services design and delivery, and thus could potentially have an impact on the performance and sustainability of the service provider. A failure to consider the effects of culture in economic analysis has resulted in the failure of supposedly well designed development strategies by global partners in the development milieu to achieve equally plausible results across the developing world. In relation to financial services provision, studies hypothesising culture as a potential determinant of microfinance performance are few. Even when such studies have been conducted, they either have focused on the developed world, or on countries within the same region in the developing world. This study adds on to the currently available empirical literature firstly by taking a broad cross-regional approach, assessing the performance of microfinance in different regions, both developed and developing. Secondly, it uses a broader range of culture measures, as opposed to the current approach of a few often over-laboured variables like individualism/collectivism followed in much of the currently available empirical literature. Thirdly, a deeper analysis, identifying countries and regions with cultural attributes favouring different microfinance objectives is made. Finally, a number of often individually-used instruments for culture are brought together in this research for robustness tests of the main findings.

Data on culture is extracted from Hofstede's cultural dimensions, while that on MFI performance is extracted from the Mix Market database, currently hosted by the World Bank. Both datasets are described in Section 1.3 above, and further elaborated on in Section 4.3 below. Ratios are used to measure MFI performance, while six variables from Hofstede's database are used as culture measures. Data on the performance of 503 MFIs from 44 countries over the period 2012 – 2018 is analysed. A random effects model is used in the empirical analysis. Findings indicate that microfinance achieves better financial performance and is generally more self-sufficient in high power distance cultures, and though of lower statistical significance, in more individualistic cultures. Meanwhile, microfinance achieves better social performance in more masculine and more indulgent cultures. The findings indicate an urgent need for customization of global development strategies to specific cultural contexts. More on this follows in the remainder of this chapter. Section 4.3 discusses key concepts relating to microfinance, as well as culture, followed by a theoretical framework and empirical evidence on the effect of informal institutions on microfinance performance. The applied methodology follows in the next section, and then culminates in the empirical model, estimation, and discussion of results in the last.

4.2. Concepts, literature and hypothesis

4.2.1. Microfinance: concept and development

Prior to the popularization of microfinance in the 1980's, vast populations across the world and in particular the developing world were excluded from the use of formal financial services. Demand- and supply-side reasons accounted for this. On the supply side, traditional commercial banks failed to serve poor clients due mainly to the high cost of serving them. The poor were financially unviable to take bigger loans, and generally considered more risky due to a fear of non-repayment. Additionally, they provided little guarantees or collateral to reduce this risk on the part of the intermediary. On the demand side, often cited reasons included account opening conditions like required documentation and minimum account opening amounts. Also reported were the costs of using formal financial institutions like transportation costs, general distrust in financial services due to inefficiencies in the financial system and/or religious and other beliefs, and account ownership by another family member (Global Findex Survey, 2017). The recognition by Muhammad Yunus in his Grameen group lending experiment in the late 80's that poor people actually could and did repay their loans popularized the microfinance concept.

Despite its initial focus on (micro)credit provision, microfinance grew to encompass other financial services like savings and insurance (Ledgerwod & Gibson, 2013 pp. 16). In its simplest form, microfinance utilized a number of innovative techniques to bypass the previously high hurdles that prevented the poor from accessing financial services. One of the most important of this was the collateral requirement. The requirement by traditional banking for often physical collateral as guarantee for loans was overcome in microfinance by the use of Joint liability. Here, loans were provided to groups with each member equally liable for repayment of the full principal and interest of defaulting members (Armendáriz & Morduch, 2010 pp. 13 – 14). The intimidating banking environment amid the costly need for clients' physical presence at banking facilities was overcome in microfinance by mobile agents. The complex traditional banking documentation required from clients in personal information provision was overcome in microfinance by agents, among who were community leaders and employed microfinance agents. The often large loan amounts granted by traditional banks to their clients was broken down in microfinance, with multiple clients each receiving small repayable or manageable loans. The often monthly loan repayment requirement in traditional banking was overcome in microfinance by frequent often weekly repayments to coincide with the clients' cashflows from their respective small business ventures (Morduch, 2000; Claessens, 2006; Postelnicu & Hermes, 2018). Most of these innovations were facilitated by the embeddedness of MFIs in the local environmental contexts in which they operated. By being close to the people, microfinance was able to significantly reduce information collection, processing, and related operating costs. More recently, technological advances have made the case for

microfinance expansion, with innovations in Digital finance like Mobile money opening the doors for even more of the world's poor to access and use of formal financial services.

In the pursuit of its social and financial objectives, the microfinance industry has often been embroiled in some controversies. One of these is the exorbitant interest rates charged by MFIs in some countries, like in the cases of BancoSol Bolivia in 1992 (Gonzalez-Vega et al., 1996) and Banco Compartamos in Mexico in 2007 (Rosenberg, 2007). This amounts to unethical client exploitation and the pursuit of financial over social objectives in what has been called Mission drift (Copestake, 2007; Mersland & Strøm, 2010; D'Espallier et al., 2017; Amin et al., 2018). Thus the debate over whether microfinance really caters to the needs of the poor keeps resurfacing, as more and more MFIs across the developing world keep transforming from traditionally social entities to huge commercial ones. By doing so, they target a wealthier clientele with products very closely mimicking those of traditional commercial banks. Such unethical practices extended to loan repayment and collection practices. In India for example, client suicides in Andhra Pradesh were linked to over indebtedness of microfinance clients and coercive collection practices resulting from social pressure (Hossain, 2013; Kaur & Dey, 2013).

4.2.2. Performance of MFIs

Due to its pursuit of a dual social and financial objective, the performance of microfinance has been assessed both on the grounds of its ability to do good or reach its social objective, and to earn a financial return in the process. Such performance has traditionally been measured using financial ratios. Key financial ratios used in this regard include Return on assets, Return on equity, Operational Self-Sustainability, Portfolio yield, and Profit margin. With respect to social performance, commonly used ratios include the Number of active borrowers, Number of female borrowers, Average loan balance per borrower, and Average loan balance divided by the gross national product per capita (Hartarska, 2005; Hartarska & Nadolnyak, 2007; Mersland & Strøm, 2009; Vanroose & D'Espallier, 2009, 2013; Tchakoute-Tchuigoua, 2010, 2011; Ahlin et al., 2011; Cull et al., 2011; Araújo da Costa, 2017; Amin et al., 2018; Lensink et al., 2018; Postelnicu & Hermes, 2018; Wassie et al., 2019). More recently however, the performance of microfinance has been assessed using its efficiency in meeting its social and financial objectives. Parametric and nonparametric efficiency assessment techniques like Stochastic frontier analysis and Data envelopment analysis respectively have most often been used. In using these techniques, empirical research follows either or in a few cases, both of two orientations, namely an input and output orientation. The choice of either depends on the specific view of the researcher with respect to the role of MFIs. While the output orientation considers MFIs as production units, the input orientation considers them just as financial intermediaries. The key in using these techniques therefore lies in the specification of inputs and outputs in relation to the particular orientation used. Typical inputs in

efficiency analysis include Number of loan officers, Number of personnel, Operating expenses, Total assets, and Total savings. Typical outputs include Average loan balance, Borrowers per staff member, Cost per borrower, Cost per saver, Deposits, Gross loan portfolio, Financial revenue, Number of active borrowers, Number of female borrowers, Number of depositors, and Number of loans outstanding (Gutiérrez-Nieto et al., 2007; Haq et al., 2009; Oteng-Abayie et al., 2011; Hartarska et al., 2012; Servin et al., 2012; Marwa & Aziakpono, 2016; Efendic & Hadziahmetovic, 2017; Wijesiri et al., 2015, 2017; Bibi et al., 2018; Fall et al., 2018).

4.2.3. Culture and Microfinance: theory and related literature

A key reason for microfinance's success has been the industry's ability to reduce information asymmetry, and in a cost effective way too. This has been facilitated by innovative lending practices, one of the most acclaimed being the application of the group lending methodology or joint liability concept (Armendáriz & Morduch, 2010 pp. 137). By providing loans to groups, microfinance has successfully reached out to millions of poor people around the world. A good number of these are women, who make up the traditional target of microfinance. This is due to their perceived better repayment records and higher social impact as much of the income made from their activities goes back into the household like children education and healthcare (Aggarwal et al., 2015). The success of group lending and by implication microfinance as a whole has varied in different countries and societies, suggesting perhaps that there may be context-specific factors at play here. One of such context-specific factors which has hitherto been little considered is the socio-cultural framework of a society. Culture relates to values, and depicts the process via which these values are transmitted fairly unchanged across generations both through conscious learning and observation by ethnic, religious, and social groups (North, 1992; Guiso et al., 2006). Hofstede (2001) and Hofstede et al. (2010) consider culture as underlying value systems that are specific to a group or society and that motivate individuals to behave in certain ways. The foundation of culture as depicted in most definitions is values. Values relate to what a society or group considers good or bad, acceptable or unacceptable with respect to human behaviour (North, 1992; Stulz & Williamson, 2003). Values then shape attitudes which translate into behaviour or noticeable actions.

4.2.3.1. Theory

Cultural theory posits that the prevailing culture of a society serves as a constraint to regulate economic activities by providing the written and unwritten rules of the game (Hofstede, 2001). Focusing on the relationship between culture and microfinance is particularly interesting as it provides a platform to understand peoples' behaviours towards financial services, and the ease and efficiency with which MFIs provide these services. Knewton & Qi (2019) argue that for microfinance to be sustainable and truly help in poverty reduction, MFIs must be able to respond to the challenges facing their clients. These challenges

are determined not only by economic circumstances, but more importantly by the clients' personal attributes like his/her character, and attitude and behaviours, all of which are shaped by the socio-cultural context in which he/she lives (Thornton et al., 2012). Firdaus (2020) makes a similar argument that the success of microfinance cannot be separated from its clients' backgrounds, as these backgrounds influence the clients' behaviours towards financial services. Hofstede (1980) theoretically reaffirms this point, arguing that culture has a direct effect on the behaviour of people belonging to a culture. By conditioning peoples' characters, attitudes and behaviours, we argue theoretically in this study that this socio-cultural context has a dual effect on the performance of MFIs firstly by affecting the demand for financial services, and secondly by affecting the supply of these services. This theoretical argument is illustrated in Figure 4.1 below with particular focus on Hofstede's cultural dimensions:

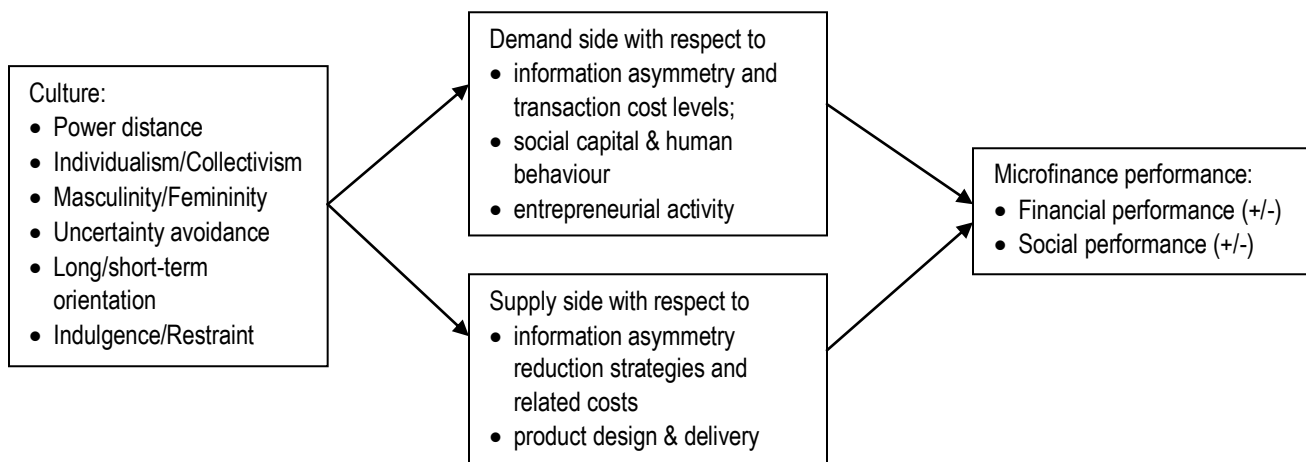


Figure 4.1: Theoretical illustration of the effect of culture on financial and social performance of MFIs
Source: Author, 2020

On the demand side, culture can provide an understanding of how individuals interact and build social networks based on norms and values. Social networks and thus capital serves as a key tool to minimise problems information asymmetry and related problems in the finance industry like moral hazard, adverse selection, and transaction costs (Licht et al., 2005). In a collectivist society for instance, social networks, trust, and respect that have been built will strengthen social capital. This may result in greater informality in transactions, and potentially lead to a high inertia among individuals for the use of formal financial services. Such inertia, as Fogel et al. (2011) indicate is also likely in high power distance cultures where the poor may not be confident enough to access financial services due to their awareness of social strata and the uneven distribution of wealth and power. To the extent that culture conditions human behaviour, decisions like those relating to whether or not to use financial services and the contracting and repayment of loans could heavily impact the performance of financial service providers.

Higher social capital may however be beneficial on the supply side as MFIs will find it easier to offer their products through schemes that focus on collective power like group lending, and will in the process reduce their costs of providing financial services. As provided for in Institutional theory, Thornton et al. (2012) argue that the institutional environment in which a firm operates will have a more profound influence on the firm's formal structures than will market pressures. Hofstede (2001) reinforces these views, arguing that cultural priorities at national level will encourage organisational choices that are in line with these cultural priorities and conducive in maintaining them, and discourage organisational choices that go contrary to these priorities. Thus an awareness of the social structure and set of rules prevailing in a society is essential on the supply side to determine the type of products to offer in a given society, the design and delivery of these products, a typical example being the lending scheme (group lending versus individual lending), collateral structure (joint liability versus individual liability), monitoring and control mechanism, as well as repayment structure. For microfinance to be financially and socially sustainable, the institutional environment must be considered in product design and delivery choices as this will have a direct effect on the performance of the MFI, due to the effect on applicable strategies and the cost of information asymmetry and transaction costs reduction. Overall, the entrepreneurial ability of MFI clients, risk-taking attitudes, attitude towards women, trust and a host of other variables which affect human behaviour and relevant costs of financial services provision are shaped by a country's cultural setting, which in turn influences the success of microfinance.

4.2.3.2. Evidence

Empirical evidence on the effect of culture on the performance of MFIs is sparse. Curiosity on the subject has however recently peaked among researchers. More of this is discussed below.

Fogel et al. (2011) find in relation to power distance, the degree to which people accept that power be distributed unequally, that culture has a negative impact on the number of borrowers and loan size. In their explanation, people in high power distance cultures have realistic expectations on microfinance as a form of social mobility. They are thus less interested in seeking credit, and even if they do borrow, loan sizes will be relatively small. Power distance is however found to have a significant positive impact on the proportion of female borrowers by Fogel et al. (2011) and Manos & Tsytrinbaum (2014), implying better social performance in relation to this measure. However, Kittilaksanawong & Zhao (2018) find that lending to women has a negative effect on the sustainability of MFIs in high power distance cultures, suggesting a trade-off between financial and social performance in high power distance cultures. Zainuddin et al. (2020) however dispute this claim, arguing that women repay better, and in high power distance cultures where microfinance can reach more women, MFIs will by virtue of this better repayment record better financial performance. With the exception of the findings of Kittilaksanawong &

Zhao (2018), the positive relationship between power distance and both the financial and social performance of MFIs is supported in Banász & Csepregi (2017), Stanton & McCumber (2020), and Zainuddin et al. (2020). Group dynamics again come into play in explaining this relationship. In their explanation, Zainuddin et al. (2020) for example argue that high power distance cultures reduce information acquisition and monitoring costs, and generally favour MFI managers who can extend financial services cheaply and more profitably. On the social side, Zainuddin et al. (2020) argue that there will be lower likelihood for discrimination in high power distance cultures due to more formality in relationships. Such formality is also important for the collection of debt. MFIs can thus meet more borrowers, women in particular who are more discriminated against, but more likely to repay their loans implying better financial performance for MFIs. Overall thus, high power distance favours microfinance on both the financial and social fronts, with social performance defined with respect to loan sizes and female borrowers in Stanton & McCumber (2020) and Zainuddin et al. (2020) respectively.

On the basis of empirical research conducted in Tanzania, Kasoga (2017) provides evidence suggesting cultural values influence the appropriateness of microfinance's lending model, with respect to joint and individual liability in group lending contracts. Precisely, the author finds that joint liability products will perform poorly in cultures where people are more individualistic, even if such products are sufficiently cost-effective on the supply side. The reverse holds true for collectivism. Still on individualism and collectivism, Fogel et al. (2011) empirically find a positive relationship between individualism and the number of active borrowers, a commonly used social performance measure in microfinance, and a negative relationship between the same cultural measure and loan size. The explanation advanced for this is individualism prompts people to borrow individually, and individual loans are often smaller than group loans. Scanlon et al. (2017) make a similar finding, though only on the number of active borrowers, but offer a sharply contrasting explanation to that of Fogel et al. (2011). Group loans, they argue will be smaller and have a shorter duration than individual loans. Thus although group lending is found to be more suitable in collectivist cultures, people will be less likely to borrow from MFIs due to potential repayment pressures, wherein members of their often strong social networks like colleagues or families may be sought after by MFIs. Postelnicu & Hermes (2018) and Stanton & McCumber (2020) also find a positive relationship between social performance and individualism. In explaining their result, Postelnicu & Hermes (2018) argue that individualism fosters greater generalised trust, which relates to trust in strangers as opposed to trust in one's kin. People are thus more likely to form groups with strangers, implying higher outreach and better social performance. Burzynska & Berggren (2015) find a negative relationship between individualism and financial performance of MFIs. In other words, less individualistic or more collectivist cultures tend to have more profitable MFIs. Similar findings are made by and Postelnicu & Hermes (2018) and Stanton & McCumber (2020). In

explaining this finding, the authors dwell on strong group dynamics in collectivist cultures or social capital, which can significantly help MFIs reduce information asymmetry costs, and ensure loan repayment through joint liability arrangements or increased effectiveness of peer pressure mechanisms. Thus higher collectivism reduces lending costs and increases repayment rates in microfinance. In individualistic cultures overall, though MFIs will meet more borrowers, the cost and risks of providing these services will be increased as group dynamics cannot be relied on for their reduction. Financial performance may thus be hampered.

Stanton & McCumber (2020) find a positive relationship between masculinity and social performance of MFIs defined with respect to loan sizes. Fogel et al. (2011) and Zainuddin et al. (2020) obtain similar though less significant findings, though in relation to the number of active borrowers. The authors support their finding by indicating that people in masculine cultures are more assertive and aggressive with respect to getting loans, qualities which are supportive of entrepreneurship. Due to this aggression however, poorer loan repayment may obtain as risk taking will be higher. In addition to poor loan repayment, MFIs in masculine cultures will find it more costly to reduce information asymmetry, as these cultures do not value cooperation and relationships that may lead to more effective group participation, or the amassment of social capital as a whole. Financial performance will thus be reduced in masculine cultures. Manos & Tsytrinbaum (2014) and Kittilaksanawong & Zhao (2018) however argue that with traits like assertiveness and a bigger focus on men, MFIs and their clients can take more risks, in which case MFIs can grant bigger loans and thus achieve better financial performance. Overall, Kittilaksanawong & Zhao (2018) find a trade-off between financial and social performance of MFIs with a focus in their analysis on lending to women in microfinance. Precisely, lending to women reduces the sustainability of MFIs. This trade-off is however more pronounced in some cultures or countries, precisely in those ranking high on power distance and individualism, but the effect is less serious in countries ranking higher on masculinity and uncertainty avoidance. The authors thus conclude that MFIs seeking to increase their outreach to women borrowers should direct their loans to women, but only in countries ranking high on masculinity and uncertainty avoidance rather than in countries high on power distance and individualism.

Stanton & McCumber (2020) find a negative relationship between uncertainty avoidance and both financial and social performance of MFIs, suggesting that high uncertainty avoidance cultures are not ideal for microfinance. The authors do not however advance any reasons for the observed relationship. Fogel et al. (2011), Manos & Tsytrinbaum (2014), and Zainuddin et al. (2020) however sharply contrast this finding, arguing that microfinance will reach more borrowers, as people will prefer formality over informality in financial transactions in such cultures and thus trust MFIs more due to a higher preference for security and stability, especially as the biggest competitors to MFIs are informal

financial service providers. Also Kittilaksanawong & Zhao (2018) posit that both MFIs and their clients will be more cautious in their risk-taking and business-planning in high uncertainty avoidance cultures. MFIs will also be more vigilant in their client selection and loan processing and monitoring, and implement rules and adequate safety measures to minimise ambiguity in financial contracts. Better financially performing MFIs will thus be found in high uncertainty avoidance cultures.

Manos & Tsytrinbaum (2014) find a positive relationship between future orientation and social performance of MFIs. Such cultures are usually more inclusive in their policies, and will thus extend financial services to more clients, including the vulnerable. The authors use the future orientation measure in the GLOBE dataset²⁰ of House et al. (2004) in their study as a proxy for term orientation. Stanton & McCumber (2020) however make an opposing finding, arguing that MFIs will achieve lower social performance as term orientation increases, using the loan size proxy as their social performance measure. Kwok & Tadesse (2006) provide an explanation for this, arguing that long-term oriented cultures will be bank-based, and have bigger clients who are beyond microfinance's traditional clients. Banász & Csepregi (2017) on the other hand find no effect of term-orientation on MFI performance. Meanwhile, Stanton & McCumber (2020) find a positive relationship between indulgence and social performance.

With a focus on trust and social capital, Postelnicu & Hermes (2018) empirically find that MFIs perform better socially in societies of lower fractionalization and higher trust, and better financially in societies of higher fractionalisation and lower trust. They conclude by saying microfinance is more successful in cultures which foster the development of social ties and amassment of social capital. On exploring the extent to which social capital (defined as social networks, norms and trustworthiness) affects financial and social performance of MFIs, Sundeen & Johnson (2012) find that social capital affects MFI performance and there is a trade-off between financial and social performance. In particular, MFIs are found to have larger outreach and are more sustainable where there are larger families, where friends are reported as more important, and where there is more technology. The authors thus argue, based on their findings that MFIs can increase outreach and improve sustainability by leveraging aspects of social capital like trust. Burzynska & Berggren (2015) reach a similar conclusion on the effect of trust on microfinance performance, but focus on financial performance. MFIs in countries with higher levels of trust on average have lower costs and lower interest rates. This is due to the ability of MFIs to use soft information in reducing information asymmetry. MFIs in such cultures will thus have a better quality loan portfolio, and overall better financial performance. They conclude by suggesting a stronger explanatory power of culture on financial performance of MFIs, but a weaker explanatory power on social performance. Focusing on the extent to which MFIs lend to female borrowers, and role of informal institutions in determining this social performance, Aggarwal et al. (2015) prove empirically that MFIs

²⁰Available at http://globeproject.com/study_2004_2007#data, consulted 19/03/18

lend relatively more to women in low-trust countries than they do in high-trust countries. This suggests that MFIs use targeting women borrowers as a lending strategy to substitute for the low level of trust in a society, as women are generally seen as more trustworthy borrowers. The empirical evidence presented above is summarised in Table 4.1 below.

Table 4.1: Summary of empirical evidence on culture and MFI performance

Culture measure	Study	Financial performance	Social performance
Power distance	Fogel et al. (2011)	None	Mixed, more positive
	Manos & Tsytrinbaum (2014)	Negative	Positive
	Banász & Csepregi (2017)	Positive	Positive
	Kittilaksanawong & Zhao (2018)	Negative	Positive
	Stanton & McCumber (2020)	Positive	Positive
	Zainuddin et al. (2020)	Positive	Positive
Individualism/Collectivism	Fogel et al. (2011)	None	Positive
	Burzynska & Berggren (2015)	Negative	Positive
	Scanlon et al. (2017)	Negative	Positive
	Postelnicu & Hermes (2018)	Negative	Positive
	Stanton & McCumber (2020)	Negative	Positive
Masculinity/Femininity	Fogel et al. (2011)	Negative	Positive
	Manos & Tsytrinbaum (2014)	Positive	Negative
	Kittilaksanawong & Zhao (2018)	Positive	Negative
	Stanton & McCumber (2020)	Negative	Positive
	Zainuddin et al. (2020)	Negative	Positive
Uncertainty avoidance	Fogel et al. (2011)	None	Positive
	Manos & Tsytrinbaum (2014)	Negative	Positive
	Kittilaksanawong & Zhao (2018)	Positive	Positive
	Stanton & McCumber (2020)	Negative	Positive
	Zainuddin et al. (2020)	Positive	Positive
Long/short-term orientation	Manos & Tsytrinbaum (2014)	Negative	Positive
	Banász & Csepregi (2017)	None	None
	Stanton & McCumber (2020)	Positive	Negative
Indulgence/Restraint	Stanton & McCumber (2020)	None	Positive
Trust	Sundeen & Johnson (2012)	Positive	Positive
	Aggarwal et al. (2015)	Positive	Negative
	Burzynska & Berggren (2015)	Positive	Positive
	Postelnicu & Hermes (2018)	Negative	Positive

This table summarises the main empirical findings presented in this section on the effects of culture on MFI performance.

4.2.4. Hypothesis

This study makes use of Hofstede's cultural dimensions. There are six of such dimensions, each of which is expected to have a different effect on MFI performance, due to their respective direct effects on human behaviour and level of information asymmetry, strategies, and costs relating to its reduction in financial contracts. Table 4.2 gives some of the expected relationships. The first two performance measures – Return on assets (ROA), and Operational self-sufficiency (OSS) – relate to financial performance, while the last three – Number of active borrowers (NAB), Number of female borrowers (NFB), and Average loan balance (ALB) – depict social performance of MFIs. All are discussed further in Section 4.3.

Table 4.2: Hypothesis on the effects of culture on Microfinance performance

Hypothesis	Culture measure	ROA	OSS	NAB	NFB	ALB
H1	Power distance	+	+	-	-	+
H2	Individualism/Collectivism	-	-	+	+	-
H3	Masculinity/Femininity	+	+	+	+	+
H4	Uncertainty avoidance	-	-	+	+	-
H5	Long term orientation	+	+	+	+	+
H6	Indulgence/Restraint	-	-	+	+	-

Source: Author, 2018 based on theoretical and empirical evidence

Power distance

In cultures of *high power distance*, microfinance is expected to achieve good performance on both financial and social measures. Such cultures generally signal high inequality, conformity with rules, and respect for hierarchy. The direct effect of this is innovation may be stifled, and social trust may be reduced through increased fractionalization of society (Bjørnskov, 2008; Mihet, 2013). This will be reflected in the nature of enterprises that abound in such societies – small, labour-intensive, and often very informal, which form microfinance’s traditional clientele. Microfinance must however be well embedded in local socio-cultural contexts and be able to mimic informal finance service providers who are more adapted to serving this client base, especially as such clients may potentially feel too inferior to use microfinance services. With respect to financial performance, Hofstede (2001) argues theoretically that organisational choices conform to, and are encouraged by cultural priorities at national level. Higher levels of bureaucracy in high power distance cultures will scare potential clients, but may result in few more affluent clients getting access to microfinance services with bigger loans. Better financial performance is thus hypothesised in high power distance cultures.

Individualism/collectivism

In *more individualistic cultures*, individual achievements are prioritized (Hofstede et al., 2010). As Postelnicu & Hermes (2018) explain, individualistic cultures are characterized by higher generalised trust which relates to trust towards strangers, as opposed to particularised trust which relates to trust in one’s kin. Because generalised trust is extended to people on whom one has no direct information, it is easier to amass more social capital in individualistic cultures (Bjørnskov, 2006). This is even more the case as people in individualistic cultures put their needs above those of the group, and will take action to pursue their self interests even if it means forming new alliances. Thus innovative lending methodologies applied in microfinance like group lending are more likely to succeed in individualistic cultures due to higher social capital. Theoretically, Licht et al. (2005) argue that social capital has a direct effect on the mechanisms and thus costs of information acquisition in different cultures. Microfinance may thus reach more clients in individualistic societies where social networks are broader, implying better social performance, and will grant bigger loans to their individual clients implying potentially higher return on

assets and higher likelihood for self-sustainability. However, as Stanton & McCumber (2020) argue, the inability of MFIs to leverage the cost reduction advantages of soft information or joint liability which obtains in collectivist cultures implies higher cost burdens and lower financial performance of MFIs.

Masculinity/Femininity

A common practice in microfinance is the provision of loans to women, due partly to their higher perceived trustworthiness and thus repayment potential (Aggarwal et al., 2015); and also their higher involvement at household level implying better social outcomes overall like health and education of children (Cull et al., 2009). Organisational choices, by Hofstede (2001) conform to cultural priorities at national level. Where gender gaps are smaller like in feminine cultures which cater more for society, microfinance will not prioritise the targeting of women in its strategy. Masculine cultures on the other hand which prioritise personal achievements and success, and promote more risk-taking (Hofstede et al., 2010) will see a bigger focus on women as gender gaps are wider. Also, in more masculine cultures, paid jobs and lucrative business opportunities are reserved for men. Women in masculine cultures thus often engage in microenterprise activities, presenting a larger base of microfinance's traditional clientele. Because women are more trusted, bigger loans can be granted them at relatively low cost to the MFI. Thus higher social performance is expected for MFIs in masculine cultures, as well as higher financial performance resulting from the potential to grant bigger loans.

Uncertainty avoidance

High uncertainty avoidance cultures emphasize beliefs, rules, and institutions that provide certainty, conformity and predictability (Hofstede et al., 2010). As Kwok & Tadesse (2006) explain, this desire for certainty and predictability favours banks and increases their penetration rates. The direct result of this is greater competition between banks and MFIs (Cull et al., 2009), in which case the latter will be pushed to the peripheries to serve the poorer masses, and less profitably so. Additionally, the desire for predictability may compel economic agents to gather more information prior to transactions. Higher information and related intermediation costs may reduce the profitability of MFIs, and thus limit their financial performance in high uncertainty avoidance cultures. Social performance may however be favoured as competitive pressures push MFIs to target the poorer masses.

Long term orientation (LTO)

Long term oriented cultures are usually very inclusive in their policies (Hofstede, 2011). Also, such cultures are characterized by higher trust. As explained by Kwok & Tadesse (2006), long term oriented cultures are more flexible and adaptive, and banks dominate the financial system in such cultures as they enjoy high demand from a wide variety of potential clients due to such inclusive policies and high trust. Competition between banks and MFIs will be fiercer, with MFIs ultimately ending up serving the poorer

class. Due however to the futuristic view of such cultures, MFIs can grant bigger loans to their clients as the institutions often may receive more public support and guarantees, and as relatively bigger enterprises can be operated by their clients. Theoretically, with higher trust, stronger social networks may result as people will be more open to interacting with others they are unfamiliar with. Information asymmetry will be more easily reduced in such contexts as Licht et al. (2005) explain. MFIs may thus reach their financial objectives in such cultures by virtue of reduced operating costs and bigger loans.

Indulgence/restraint (IND)

In *indulgent cultures*, people will be more willing to commit to financial contracts. MFIs will thus meet more clients as Stanton & McCumber (2020) argue. However, meeting more clients comes at a risk of potentially lower loan repayment rates as clients are more likely to indulge or misuse loaned funds. Financial performance is thus likely to be lower in indulgent cultures. Theoretically, in cultures where higher social capital obtains, MFIs can reduce these costs and enhance their financial performance by harnessing the benefits of soft information and peer monitoring in joint liability contracts.

4.3. Methodology

4.3.1. Datasets

MFI-level balance sheet and income statement data for the performance of MFIs was obtained from the *Mix Market*²¹ database over the period 2012 – 2018, and currently available in the data catalogue of the World Bank. Founded in 2002, the *Mix Market* contains data on over 2000 Financial Service Providers (FSPs) operating in over 100 countries across the world. FSPs are rated through a ‘diamond’ system from 1 – 5 to indicate their frequencies of reporting and levels of disclosure. 4 and 5 diamond FSPs have more complete and audited financial statements over a period of at least two consecutive years, and thus the most reliably reported information. Mix Market data has been widely used in Microfinance research as seen in Ahlin et al. (2011), Vanroose & D’Espallier (2013), Wijesiria et al. (2017), and Elkhuzen et al. (2018) among others. The sample period (2012 – 2018) was chosen firstly to isolate the effects of the global financial crisis of 2008 – 2010 on risk-taking in the financial services industry, and secondly due to the availability of more complete MFI data on the MIX database, considering that a lot of MFIs in the earlier years of the MIX database’s creation only reported partial performance figures.

All MFIs in the database with at least six years of data over the study period and at least 3 diamonds were retained for the study. In countries like India where data on MFIs abound, only 4 and 5-diamond MFIs were retained. This resulted in a sample of 656 MFIs from 69 countries. Due however to incomplete data relating mainly to MFI-specific controls like portfolio quality and funding structure, 52 MFIs were dropped from the study. Majority of these were from the SSA region (23), followed by the

²¹ Accessible at <https://www.themix.org/mix-market>, consulted 21/03/19

ECA region (17), and then the LAC region (12). Due to a total lack of culture data, or to missing data on some culture measures (especially Long/short-term orientation and Indulgence/restraint), 25 countries were dropped from the study. These included Cambodia, Lao (EAP); Kyrgyzstan, Tajikistan, Uzbekistan (ECA); Costa Rica, Ecuador, Guatemala, Honduras, Nicaragua, Paraguay (LAC); Benin, Cameroon, Côte D'Ivoire, Ethiopia, Kenya, Liberia, Malawi, Mali, Senegal, Sierra Leone, Togo, Rwanda (SSA); and Nepal, Sri Lanka (SAS). A further 101 MFIs belonging to these countries were consequently dropped. The resulting final sample thus comprised of 503 MFIs from 44 countries. Cognizance in working with this sample was taken of the fact that empirical results can be biased due to large number of MFIs from few specific countries. In this sample, the number of 3, 4, and 5 diamond-rated MFIs is highest in the LAC and South Asia regions. To cater for the potential bias, two sets of regressions were done, the first on the whole sample, and the second on the sample with a reduced number of MFIs for countries like India. A comparison of the results indicates no significant difference in the outcome upon use of the reduced sample²². Table 4.3 below presents the countries used in this study and number of MFIs in each.

Table 4.3: MFI dataset

Country	Region	MFIs	Country	Region	MFIs
Albania	ECA	4	Jordan	MENA	4
Angola	SSA	1	Kazakhstan	ECA	9
Argentina	LAC	5	Lebanon	MENA	1
Armenia	ECA	9	Macedonia	ECA	3
Azerbaijan	ECA	19	Mexico	LAC	34
Bangladesh	SAS	30	Moldova	ECA	3
Bolivia	LAC	22	Montenegro	ECA	2
Bosnia & Herzegovina	ECA	12	Morocco	MENA	7
Brazil	LAC	13	Mozambique	SSA	6
Bulgaria	ECA	9	Nigeria	SSA	11
Burkina Faso	SSA	7	Pakistan	SAS	27
Chile	LAC	2	Peru	LAC	38
China	EAP	6	Philippines	EAP	24
Colombia	LAC	17	Romania	ECA	6
Dominica Republic	LAC	9	Russia	ECA	6
Egypt	MENA	6	Serbia	ECA	4
El Salvador	LAC	8	South Africa	SSA	2
Georgia	ECA	8	Tanzania	SSA	7
Ghana	SSA	11	Turkey	ECA	2
India	SAS	81	Ukraine	ECA	2
Indonesia	EAP	6	Vietnam	EAP	12
Iraq	MENA	3	Zambia	SSA	5

Notes: This table indicates countries represented in the study and the number of MFIs in each.

²² Regression results for this reduced sample are available on demand

Culture has historically been measured via surveys and experiments. A number of survey-based datasets on cultural measures exist. Among these are the Hofstede (1983) and Schwartz (1994) cultural dimensions, GLOBE project of House et al. (2004), and the World Values Survey (1980 – 2014). Hofstede's database is used in this research. The database is described in Section 1.3 above.

4.3.2. Model, variables and estimation

4.3.2.1. Model and estimation

In assessing the effects of culture on the performance of MFIs in this panel study, the following econometric model is used:

$$Perf_{ijt} = \alpha + \beta Culture_{jt} + \gamma M_{it} + \lambda X_{jt} + \theta Z_{jt} + \epsilon_{ijt}$$

where $Perf_{ijt}$ = performance of institution i in country j at time t , given by ROA, OSS, NAB, NFB, and ALB; the coefficients β , γ , λ , and δ are XY matrices for the respective explanatory variables and controls of the time-invariant national cultural dimensions, Microfinance-specific (M), Macroeconomic-specific (X), and formal institution-specific (Z) variables; α is the matrix of intercepts, while ϵ_{ijt} represents the composite error term comprising v_{it} , the unobserved MFI-specific attributes which may not be captured in the model but which affect performance like geographic location, and u_{ijt} is the idiosyncratic error term. A logical first step in the empirical analysis is to determine what empirical estimation technique is most appropriate. The Generalised Least Squares (GLS) estimation procedure is used here. The GLS encompasses fixed and random effects estimators. With the fixed effects estimator, the unobserved individual specific attributes or characteristics v_{it} are allowed to correlate with the explanatory variables (Culture, M, X, and Z). By so doing, the unobserved individual specific variables will have the same effect on a given MFI in both past, current and future time periods as will the explanatory variables, thus making their effect on these individual MFIs constant, or 'fixed'. Thus any changes in the MFI or its performance will be attributed to time, and not its specific characteristics. The random effects estimator on the other hand assumes that the unobserved individual specific effects v_{it} is uncorrelated with the observed explanatory variables of all past, current and future time periods of the same individual. In other words, the effects of v_{it} on MFI performance should be 'random', just as should be the case with the observed explanatory variables Culture, M, X and Z. Because of the zero correlation assumption in the random effects model, all individual characteristics which may influence the dependent variable must be specified. The problem with this however is that some variables may not be available therefore leading to omitted variable bias. An even more urgent problem posed by this random effects assumption is endogeneity. This is discussed further below. Despite these drawbacks, one of the main advantages of the random effects estimator is that it estimates time-invariant variables which are rather controlled for or

partialled out in the fixed effects model by first differencing. In this study, the main explanatory variable, Culture is time-invariant thus making the random effects estimator more appropriate.

4.3.2.2. Variables

Table 4.4, presents and describes respective variables used in this study.

Table 4.4: Variables and definitions

<i>Variable</i>	<i>Notation</i>	<i>Description/Computation where applicable</i>	<i>Data source</i>
<i>A. Dependent variables</i>			
Return on assets	ROA	Net income/Total assets	MIX
Operational self-sufficiency	OSS	Financial revenue/(Financial expense + Operating expense)	MIX
Number of active borrowers	NAB	Headcount of the number of active borrowers	MIX
Number of female borrowers	NFB	Headcount of the number of female borrowers	MIX
Average loan balance	ALB	Total loans/Number of active borrowers	MIX
<i>B. Explanatory variables: Culture</i>			
Power distance	PDI	Composite index ranging from 0 to 100, higher score meaning more authoritarian and bureaucratic structures	Hofstede's dimensions
Individualism/Collectivism	IDV	Composite index ranging from 0 to 100, higher score meaning more individualistic societies	Hofstede's dimensions
Uncertainty avoidance	UAI	Composite index ranging from 0 to 100, higher score meaning a higher preference for certainty	Hofstede's dimensions
Masculinity/Femininity	MAS	Composite index ranging from 0 to 100, higher score meaning a more masculine society	Hofstede's dimensions
Long term orientation	LTO	Composite index ranging from 0 to 100, higher score meaning a more future-oriented society	Hofstede's dimensions
Indulgence/Restraint	IND	Composite index ranging from 0 to 100, higher score meaning a freer or less socially restricted society	Hofstede's dimensions
<i>C. Control variables</i>			
<i>I. Formal institutions</i>			
Political stability	POLSTAB	Composite index ranging from -4 to 4, higher score meaning a more politically stable country	World Governance Indicators
Regulatory quality	REGQUAL	Composite index ranging from -4 to 4, higher score meaning better regulatory quality	World Governance Indicators
Legal origin	LGOR	Categorical variable indicating the origin of a country's legal system (Common of civil law)	A.Shleifer Havard webpages (scholar.harvard.edu/shleifer)
Time to start business	TSTARTBUS	Time in days required to start a business with necessary legal paperwork	World Development Indicators
Time to enforce contracts	TCENFORCE	Time in days required to enforce contracts	World Development Indicators
<i>II. MFI-specific</i>			
Age	AGE	Time in years the MFI has existed or been in operation	MIX
Size	SIZE	Total assets in millions of US\$ of the MFI	MIX
Debt/Equity (funding structure)	DEBTEQ	Ratio of MFI's debt to its equity capital	MIX
Portfolio at risk (asset quality)	PAR30	Outstanding loans >30days/adjusted Gross Loan Portfolio (%)	MIX
Operating efficiency	OPEFF	Operating expenses/Gross Loan Portfolio (%)	MIX
Asset structure	GLPTA	Gross loans portfolio/Total assets (%)	MIX
<i>III. Macroeconomic</i>			
National wealth	GDPPC	Gross domestic product per capita	World Development Indicators
Structure of economy	AMSGDP	Agriculture, Manufacturing, & Services respectively/GDP (%)	World Development Indicators

Price stability	INFL	Index, consumer prices	World Development Indicators
Financial structure	DOMCRPVT	Domestic credit to the private sector/GDP (%)	World Development Indicators
Openness to trade	FDIGDP	Foreign Direct Investment/GDP (%)	World Development Indicators
Financial access	ACCTOWN	% of population with accounts at formal financial institutions	World Development Indicators

Variable used in this study are defined in this table. Their sources are also indicated.

Dependent variable

MFI's have a dual financial and social performance mandate unlike commercial banks. As measures of financial performance, Return on assets (ROA) and Operational Self Sufficiency (OSS) are used in this study. The use of ROA and OSS as financial performance measures is in keeping with previous studies using Mixed market data like Hartarska & Nadolnyak (2007), Ahlin et al. (2011), Vanroose & D'Espallier (2013), Barry & Tacneng (2014), Abdulai & Tewari (2016), and Gul et al. (2017). *ROA* is expressed as a percentage, and expresses how much a MFI earns for each dollar invested in the MFI's assets. *OSS* measures the ability of an MFI to finance its operating expenses (including financing costs) from revenues generated from its lending and investment activities. Higher *OSS* implies better self-sufficiency.

For social performance measurement, Number of Active Borrowers (*NAB*), Number of female borrowers (*NFB*), and Average Loan Balance (*ALB*) are used in this study. This is consistent with social performance measures used in previous studies like Hartarska & Nadolnyak (2007), Tchakoute-Tchuigoua (2010), Manos & Tsytrinbaum (2014), and Postelnicu & Hermes (2018). *NAB* measures the breadth of outreach. Breadth covers the extent of an MFI's coverage. The higher the *NAB*, the better as it indicates an MFI is reaching out to larger proportions of the population. *NFB* and *ALB* measure the Depth of outreach. Depth is an indicator of the level of poverty or vulnerable groups being reached. The lower the *ALB*, the better a MFI is meeting its social mission as it implies it is targeting poorer clients. Meanwhile the higher the *NFB*, the better as the MFI is attending to more vulnerable groups like women.

Main explanatory variable: Culture

Culture, the main explanatory variable in this research is depicted by Hofstede's cultural dimensions. There are six dimensions in all, described in Section 1.3 above. Table 4.2, Section 4.2.3 above indicates some of the expected relations between culture and performance of MFI's.

Control variables

Formal institutions

Empirical evidence suggests that formal institutions like legal rights, information sharing, legal origin, the rule of law should affect the performance of financial institutions. Ahlin et al. (2011) find that better legal rights protection extends the reach of the formal, commercial credit sector downward, leading to more and earlier graduation of MFI customers in order to access bigger loans. Thus *ALB* grows relatively slowly as well as *NAB*, as MFI's may not be motivated to target group customers who often demand smaller loans implying less social performance. However, MFI's should perform better financially as they

can increase their interest rates through higher premiums on the most risky borrowers. Additionally, the direct reduction in information collection costs, and apparent efficiency resulting from head-on competition with commercial banks will lead to better financial performance.

As noted by Ahlin et al. (2011), formal institutions which may affect the operation of microenterprises are likely to affect MFIs. These include the variables relevant to the business environment of a country, like those included in the Doing Business Report, as reported in notably: *procedure and time start a business*, *procedure and time to register property*, and *time required for contract enforcement*. Start-up capital requirements, number of procedures, amount of time needed, amount of money needed as a percent of GDP/capita to name a few affect MFI performance. Number of procedures, cost, and time to start a business are all significantly and negatively related to self-sufficiency (Ahlin et al., 2011). This is because more people will prefer to operate in the informal sector if starting a formal business proves more complex. Informality then implies smaller loan balances, and higher likelihood for default. Social performance is thus favoured when there are higher barriers to start a business, while there is a negative impact on financial performance. Meanwhile contract enforcement time is positively associated with loan delinquency and negatively associated with interest rates and markup implying a negative impact on financial performance as it raises monitoring costs significantly. A positive impact has been found in some cases, suggesting that MFIs may have other contract enforcement techniques which reduce costs, like the joint liability methodology. Overall, barriers to efficient, formal firm operation create a larger pool of customers for MFI services, but limit micro-enterprises' initial size and growth prospects, suggestive of higher NAB and lower ALB in Ahlin et al. (2011), implying mixed results on social performance too. This is because MFIs will look for innovative techniques to enforce contracts while lending to a large number of borrowers as with group lending, but only on very small loan balances to reduce their risk of loss.

MFI-specific controls

These include *age*, *size*, *asset quality*, *management quality*, and *the asset structure*. Older MFIs should in theory perform better than younger ones due to higher technical efficiency acquired over the years (Wijesiria et al., 2017). Bigger MFIs should perform better than smaller ones due to economies of scale (Hartarska & Nadolnyak, 2007; Cull et al., 2011; Wijesiria et al., 2017; Liñares-Zegarra & Wilson, 2018). Higher PAR values typically reflect inefficiency in loan collection, hence, deterioration of the loan portfolio quality. A negative relationship is expected between PAR 30 and MFI financial and social performance (Abdulai & Tewari, 2017). *Management efficiency* is measured by Operating expenses to assets ratio (OEA) calculated as the ratio of adjusted operating expenses to the adjusted average GLP. It is a cost side variable and captures the cost implications associated with reaching out to the poor. OEA is expected to be negatively related both to financial and social performance (Abdulai & Tewari, 2017).

Gross loans portfolio/Total assets is used to proxy an MFI's asset structure. In some countries, regulated MFIs have other investing instruments like government bonds and may choose to target their funds into such low risk investments. Thus while the MFI may report a huge value for its total assets, only a small fraction of this goes into loan provision. A smaller GLP/TA is expected to lead to a decline in microfinance outreach to the poor, but to better financial performance.

Macroeconomic variables

Controls here include *GDP per capita*, *Manufacturing to GDP ratio* (proxy for structure of the economy), *Inflation*, *Domestic credit to the private sector as a percentage of GDP* (proxy for financial structure), *Foreign Direct Investment (FDI) to GDP* (proxy for trade openness), and *Account ownership at a formal financial institution* (proxy for financial access). Wealthier economies theoretically should provide more opportunities for microenterprises to grow, implying a bigger market for MFIs. However, poorer economies may provide MFIs a larger customer base as they tailor their products and services to meet the needs of the poor. Ahlin et al. (2011) find empirical evidence of higher financial performance in bigger and growing economies, as MFIs report lower operating costs in these economies and can charge higher interest rates. MFIs however should perform poorly socially in such economies. Additionally, Ahlin et al. (2011) control for the proportions of key GDP components of manufacturing, services, and agriculture. The idea is to assess whether people become entrepreneurs by choice (where there is alternative employment in manufacturing) or whether they are forced into it due to a shortage of wage employment. This gives an indication of the MFI's potential market with respect to size, quality (poverty levels), and risk. Ahlin et al. for example suggest that microenterprises have more opportunities in larger service economies, and can grant smaller loans (implying higher depth of outreach or social performance) in agriculture-oriented societies. Vanroose & D'Espallier (2009) suggest that a bank-based economy should in principle have higher competition in lending, which should result in more efficiency and overall lower operating costs for MFIs. By controlling for the *financial structure* (*Private credit/GDP*), we expect more bank-based economies to have a positive relation with MFI OSS, but not with social performance, as higher competition may push MFIs to transform. Ahlin et al. (2011) find that greater FDI inflows may raise wage employment, and thus have a similar effect like manufacturing/GDP ratio. It also gives more room for foreign ownership of MFIs, like through Microfinance Investment Vehicles, which may push for higher efficiency in the industry, but lead to a higher focus on financial performance if foreign owners are strictly profit-oriented. A positive relation is expected between openness and financial performance, and a negative relation with social performance. Higher *inflation* may lead to higher loan delinquency and defaults, in addition to higher cost of funds for MFIs, and thus to lower MFI financial performance. MFIs perform better both financially and socially when *financial access* is low (Vanroose & D'Espallier, 2009). A negative relation is thus expected between financial access and MFI performance.

4.3.3. Estimation results and discussion

4.3.3.1. Descriptive statistics

Table 4.5 below presents descriptive statistics for the variables in the model. Based on the sample, Power distance is lowest in Argentina (49) and highest in the Iraq (95). Individualism is lowest in Bolivia (10) and highest in South Africa (65); Masculinity is lowest in Angola (20) and highest in Albania (80); Uncertainty avoidance is lowest in China (30) and highest in Moldova (95); the shortest and longest term oriented societies respectively are Ghana (4) and China (87); and the least and most indulgent societies are Pakistan (0) and Mexico (97). The youngest MFI in the sample is one year old, while the oldest is 107. The size of the MFIs range from US\$85,375 to US\$7,867,458,375, with the smallest and biggest located respectively in the India and Vietnam. Return on assets averaged 1.65% over the period with a minimum of -99.18% and maximum of 56.45%. Most of the MFIs in the sample are operationally self-sufficient, as reflected by the mean OSS value which is greater than one (1.15). The highest and lowest numbers of active borrowers are respectively found in Bangladesh (8,934,874) and Bulgaria (13), with an average across the sample of 25,681. For female borrowers, the highest (8,635,961) and lowest (2) are respectively found in Bangladesh and Romania, with a sample mean of 15,496. Most of the MFIs in the sample target women, reflected by the observation that on average 60.34% (15496/25681) of all active borrowers are women. Average loan balances range from US\$42.07 (Pakistan) to US\$51,129 (Bolivia) and average US\$613.64 across the sample. Thus the sample comprises mostly of MFIs that provide relatively small loans, and a few others which provide larger loans. For formal institutions, the least and most politically stable countries respectively are Pakistan (-2.677) and Zambia (0.66). Regulatory quality is strongest in Chile (1.539) and weakest in Iraq (-1.254). The richest and poorest countries in the sample are Chile (GDPpc of US\$15,941.4) and Mozambique (GDPpc of US\$428.93) respectively.

Table 4.5: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Dependent variable</i>					
Return on assets	3,496	0.017	0.078	-0.992	0.565
Operational self-sufficiency	3,510	1.151	0.330	-1.823	4.490
Number of active borrowers (Ln)	3,483	10.153	1.974	2.565	16.005
Number of female borrowers (Ln)	3,176	9.648	2.272	0.693	15.971
Average loan balance (Ln)	3,486	6.421	1.346	3.738	12.052
<i>Culture measures: Hofstede</i>					
Power distance	3,521	75.775	10.414	49	95
Individualism/Collectivism	3,521	27.423	12.335	10	65
Masculinity/Femininity	3,521	51.934	9.774	20	80
Uncertainty avoidance	3,521	67.223	20.158	30	95
Long/Short-term orientation	3,521	40.125	20.090	4	87

Indulgence/Restraint	3,521	40.473	25.801	0	97
<i><u>MFI-specific controls</u></i>					
Age	3,521	18.812	10.687	1	107
Shareholder firm (dummy)	3,521	0.507	0.500	0	1
Cooperative (dummy)	3,521	0.070	0.254	0	1
NGO (dummy)	3,521	0.424	0.494	0	1
Portfolio at risk over 30 days	3,511	0.060	0.153	0	7.114
Assets	3,521	16.822	1.998	11.355	22.786
Debt/Equity ratio	3,521	4.337	10.678	-122.650	364.670
Operating efficiency	3,521	0.253	0.351	-0.433	13.459
Gross loan portfolio/Total assets	3,521	0.840	0.674	0.004	20.503
<i><u>Formal institution controls</u></i>					
Political stability	3,521	-0.735	0.677	-2.677	0.661
Regulatory quality	3,521	-0.172	0.483	-1.254	1.539
Voice & Accountability	3,521	-0.148	0.578	-1.661	1.106
Legal origin (dummy)	3,521	0.344	0.475	0	1
Time to start a business (days)	3,521	24.750	17.726	2	86.6
Time to enforce contracts (days)	3,521	804.663	414.250	237	1445
<i><u>Macroeconomic controls</u></i>					
GDP per capita (Ln)	3,521	8.138	0.794	6.061	9.679
Manufacturing/GDP ratio	3,521	0.135	0.043	0.018	0.315
Inflation (consumer prices)	3,521	0.051	0.041	-0.215	0.487
Domestic credit as a % of GDP	3,521	0.446	0.238	0.059	1.611
FDI/GDP ratio	3,521	0.033	0.035	-0.064	0.395
Formal account ownership	3,521	0.407	0.175	0.1	0.831

In this table, summary statistics for the variables used in this study are presented. The dependent variables relate to the financial and social performance of MFIs. The main explanatory variable is Culture, and relates to Hofstede's culture dimensions. There are six in all.

4.3.3.2. Regression analysis: Results

Table IV.1, Appendix III presents the pair-wise correlation matrix test results of all explanatory variables. Closer observation at the correlation coefficients suggests that there is no perfect linear relationship among these explanatory variables, or multicollinearity. In fact all the correlation coefficients are below 0.55. While no clear-cut benchmark exists for multicollinearity, Hsiao (2003) suggests that multicollinearity only becomes a concern if correlation coefficients go above 0.70.

Table 4.6 reports the regression results for the effect of culture on both financial and social performances of MFIs, using the random effects estimator. The specified regression models control for MFI-specific characteristics, the formal institutional and macroeconomic environments. Despite being particularly more advantageous over the fixed effects model especially in studies dealing with time-invariant variables, the random effects model has a number of shortcomings the main one being that its results are only valid when the composite error term ϵ_{ijt} is uncorrelated with all of the explanatory

variables. This arises mainly from the assumption in the random effects model of zero correlation between the regressors and the unobserved individual-specific characteristics, v_{it} . There is a high possibility however that an unobserved variable may be correlated with the regressors. A typical unobserved characteristic here could be the number of loan officers in an MFI, which may very well be related to the MFI's operating efficiency. Omitting such a variable from the analysis will result in v_{it} being correlated with the regressors, a key cause of endogeneity. Endogeneity arises when the error term contains unobserved characteristics which may correlate with some of the regressors in a regression model. It could also arise from reverse causality, wherein the dependent variable has a similar explanatory effect on one or more of the explanatory variables in a regression. High MFI performance could for example affect culture by influencing loan repayment and building a culture of deliberate loan delinquency. The effect of this will be biased estimates and overall faulty results. Regressions aimed at resolving this endogeneity problem are conducted further below via an Instrumental variable technique.

A more immediate problem relates to potential heteroskedasticity. Heteroskedasticity arises whenever the variance of the error from a regression analysis is not constant. This may lead to biased standard errors and result in misleading inferences, even if the resulting regression coefficients are unbiased. A key cause of heteroskedasticity is the presence of extreme observations in a sample. Consider for example the number of active borrowers (NAB) in this research which has a minimum of 13 borrowers, a maximum of 8,934,874 and a mean of 25,681. There is a high likelihood for the errors resulting from regressions using data with such extreme observations to be non-constant. A possible solution for this is to re-scale the data by transforming the variables into logarithms (Brooks, 2008 pp. 138). A number of variables in this research have been transformed using natural logarithms to cater for potential heteroskedasticity. These include the number of active and female borrowers, average loan balance, size of MFIs (total assets), and wealth of nations (GDP per capita). An alternative approach to the heteroskedasticity problem is to use robust standard errors. Robust standard errors are applied here as an added solution to the potential heteroskedasticity problem.

Table 4.6: Effects of culture on financial and social performance of MFIs

VARIABLES	(1) roa	(2) oss	(3) ln_nab	(4) ln_nfb	(5) ln_alb
<i>Main variable: Culture</i>					
pdi	0.000512 (0.000311)	0.00260** (0.00119)	-0.0127*** (0.00482)	-0.0104 (0.00659)	0.0127*** (0.00463)
idv	0.000131 (0.000272)	0.000171 (0.00144)	0.00472 (0.00538)	0.00646 (0.00702)	-0.00148 (0.00504)
mas	0.000229 (0.000330)	-0.000949 (0.00145)	0.0265*** (0.00616)	0.0177** (0.00828)	-0.0251*** (0.00592)
uai	7.83e-05 (0.000235)	-9.26e-05 (0.00102)	-0.0136*** (0.00426)	-0.0229*** (0.00547)	0.0171*** (0.00397)
lto	-0.000290 (0.000192)	-0.00121 (0.000954)	-0.00308 (0.00408)	-0.00220 (0.00519)	0.00227 (0.00396)

idg	0.000152 (0.000158)	-0.000347 (0.000728)	0.00244 (0.00306)	0.00850** (0.00407)	-0.000797 (0.00295)
<i>MFI-specific controls</i>					
age	0.000140 (0.000246)	0.000171 (0.000977)	-0.00523 (0.00451)	-0.00286 (0.00614)	0.00866** (0.00385)
par30	-0.0399 (0.0289)	-0.200 (0.145)	-0.0200 (0.0440)	-0.0380 (0.0552)	-0.0345 (0.0296)
ln_size	0.00415*** (0.00154)	0.0159** (0.00644)	0.763*** (0.0375)	0.772*** (0.0410)	0.179*** (0.0186)
debt_eq	-4.91e-05 (0.000215)	-0.000926 (0.000706)	0.00154 (0.00154)	0.00165 (0.00169)	-0.000689 (0.000955)
op_eff	-0.0465* (0.0256)	-0.141** (0.0710)	-0.206*** (0.0480)	-0.235*** (0.0760)	-0.106** (0.0436)
glp_ta	0.00600** (0.00235)	0.0102 (0.0124)	0.195*** (0.0569)	0.196*** (0.0572)	0.0539* (0.0327)
<i>Formal institution controls</i>					
pol_stab	-0.0120** (0.00484)	-0.0154 (0.0198)	0.0593 (0.0467)	0.0423 (0.0610)	-0.0373 (0.0427)
reg_qual	-0.00671 (0.00811)	-0.0651** (0.0322)	0.0368 (0.107)	0.132 (0.138)	-0.0302 (0.0953)
voice_acc	-0.0150** (0.00622)	-0.0529* (0.0302)	-0.00229 (0.0939)	0.0126 (0.131)	-0.0881 (0.0924)
dumlegor	-0.0134 (0.0129)	0.0228 (0.0469)	0.348* (0.179)	0.479** (0.226)	-0.347** (0.164)
tstart_bus	5.70e-05 (0.000139)	-0.000629 (0.000471)	0.000411 (0.000938)	3.81e-05 (0.00134)	-0.000130 (0.000914)
tc_enforce	2.38e-05*** (9.67e-06)	7.98e-05* (4.16e-05)	0.000395** (0.000175)	0.000651*** (0.000225)	-0.000279* (0.000158)
<i>Macroeconomic controls</i>					
lngdppc	0.0129* (0.00724)	0.0755** (0.0315)	-0.470*** (0.106)	-0.465*** (0.140)	0.433*** (0.0974)
mft_gdp	-0.00530 (0.0681)	-0.0999 (0.286)	0.178 (0.954)	0.384 (1.380)	-0.0523 (0.887)
infl	-0.0172 (0.0515)	-0.175 (0.189)	-0.385 (0.271)	-0.473 (0.340)	0.209 (0.283)
domcrpvt_gdp	-0.00840 (0.0147)	-0.0643 (0.0530)	-0.169 (0.155)	-0.101 (0.216)	0.266* (0.153)
fdi_gdp	-0.00387 (0.0773)	-0.0220 (0.286)	-0.262 (0.542)	-0.426 (0.603)	0.714 (0.539)
acct_own	0.0259* (0.0135)	0.0486 (0.0686)	-0.0686 (0.123)	-0.202 (0.154)	0.286*** (0.0898)
Constant	-0.239*** (0.0638)	0.171 (0.266)	1.214 (0.892)	0.894 (1.164)	-1.063 (0.737)
<i>Statistics</i>					
Observations	3,486	3,500	3,473	3,171	3,476
Groups	503	503	500	467	500
R-squared: within	0.0662	0.0388	0.6015	0.4781	0.2586
between	0.2517	0.1909	0.7829	0.7227	0.5946
overall	0.1618	0.1135	0.7717	0.7099	0.5831
Wald χ^2	94.82	85.41	1778.47	1341.45	1345.38

Notes: Regression results for the effect of culture on financial and social performance of MFIs are reported in this table. The figures in parentheses represent Standard errors (SE). Robust standard errors are used here to cater for heteroskedasticity. The first two models represent financial performance, while the last three represent social performance. In all models, controls are made for MFI-specific, formal institutions, and macroeconomic environment variables. ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

Regression results presented in Table 4.6 above indicate that microfinance achieves better financial performance and is generally more self-sufficient in high power distance cultures. Mixed and overall statistically insignificant results are found for masculinity, uncertainty avoidance, and indulgence on the financial performance of MFIs. Microfinance reaches fewer active and female borrowers in high power distance, and high uncertainty avoidance cultures. Meanwhile, microfinance achieves better social performance in more masculine and indulgent cultures.

Table 4.7 below presents a summary of the results, with respect to the expected relationships put forward in the hypotheses in Table 4.2, and the actual findings which are discussed below.

Table 4.7: Summary of results

<i>Hypothesis</i>	<i>Culture measure</i>	<i>ROA</i>		<i>OSS</i>		<i>NAB</i>		<i>NFB</i>		<i>ALB</i>	
		<i>Expected</i>	<i>Actual</i>	<i>Expected</i>	<i>Actual</i>	<i>Expected</i>	<i>Actual</i>	<i>Expected</i>	<i>Actual</i>	<i>Expected</i>	<i>Actual</i>
H1	Power distance	+	+SI*	+	+	-	-	-	-SI	+	+
H2	Individualism/Collectivism	-	+SI	-	+SI	+	+SI	+	+SI	-	-SI
H3	Masculinity/Femininity	+	+SI	+	-SI	+	+	+	+	+	-
H4	Uncertainty avoidance	-	+SI	-	-SI	+	-	+	-	-	+
H5	Long/short term orientation	+	-SI	+	-SI	+	-SI	+	-SI	+	+SI
H6	Indulgence/Restraint	-	+SI	-	-SI	+	+SI	+	+	-	-

This table summarises the results in this study, firstly indicating the hypothesis, and then the actual findings on the relationship between culture and microfinance performance. SI implies result is statistically insignificant.

With the exception of the social performance results in high uncertainty avoidance cultures and average loan balance results in masculine cultures, the results largely are in line with the hypotheses put forward. Inconclusive results are found for individualism/collectivism and long/short-term orientation across both financial and social performance measures due to statistical insignificance.

4.3.3.3. Discussion of results

Power distance

In high power distance cultures, microfinance is more sustainable, implying it reaches its financial performance objective as the results in Table 4.6 indicate. Similar results are obtained by Banász & Csepregi (2017), Stanton & McCumber (2020), and Zainuddin et al. (2020). Microfinance largely reaches this objective by granting bigger loans on average as the significant coefficient on the Average loan balance indicates. It however reaches fewer active and female borrowers, indicating poorer social performance. This finding confirms earlier results found in Chapters 2 and 3 above on the effect of power distance on financial inclusion, and the use of informal financial services respectively. There, empirical results prove that living in a high power distance culture reduces the likelihood to own and use formal accounts, but increases the likelihood for individuals to rely on informal finance mechanisms. A typical characteristic in high power distance cultures is higher inequality (Hofstede, 1984 pp. 98). Zins & Weill (2016) suggest that formal financial institutions often discriminate on the basis of inequality. Such

discrimination reduces the likelihood for the use of formal financial services. By virtue of the fact that fewer people will use formal financial services in high power distance cultures, microfinance achieves lower social performance in such cultures. The few persons who use these services end up with bigger loans, which increase the financial returns and thus financial performance of the MFI. These results strongly support hypothesis H1 for the power distance measure presented in Table 4.2 above, but sharply contradict those of Manos & Tsytrinbaum (2014), Banász & Csepregi (2017), Kittilaksanawong & Zhao (2018), Stanton & McCumber (2020), and Zainuddin et al. (2020) in relation to social performance. In the SSA sub-sample, power distance figures range from 60 in Zambia through 70 in Tanzania and Burkina Faso, to 80 in Ghana and Nigeria. MFIs in Ghana and Nigeria (West Africa) are thus expected to perform better financially but worse socially than those in Zambia (East Africa). Across the sample, MFIs in the high power distance Philippines (score of 94) are expected to perform better financially than those in low power distance Argentina (score of 49) where better social performance is expected.

Masculinity/Femininity

Microfinance achieves better social performance in more masculine cultures. This finding supports hypothesis H3 in Table 4.2 above in relation to masculinity and social performance. Similar results are obtained by Fogel et al. (2011), Stanton & McCumber (2020), and Zainuddin et al. (2020). Mixed and statistically insignificant results are found for financial performance. Masculine cultures are by virtue of their emphasis on material success generally very assertive, competitive and risk-tolerant. More people will be willing to take the risks of doing business in such cultures, and of using formal financial services like credit in this regard (Fogel et al., 2011). However, going by the theoretical framework discussed earlier in Section 4.2.2, social capital in masculine cultures will be lower due to more competition and potentially more self aggrandised individual actions. MFIs will find it difficult to leverage the advantages of social capital to reduce information asymmetry and related costs of financial services provision, the direct result of this being lower financial performance. Microfinance will thus reach more clients in masculine cultures like Mexico (score of 69) than it will in more feminist Chile (score of 28), and in Nigeria and Burkina Faso with respective masculinity scores of 60 and 50 than Mozambique and Ghana with respective masculinity scores of 38 and 40. However, given the potential for a trade-off here, microfinance will be more sustainable in more feminist Mozambique and Ghana than it will in more masculine Nigeria and Burkina Faso.

Uncertainty avoidance

Based on the findings in this research, microfinance will perform poorly in high uncertainty avoidance cultures on both financial and social performance measures. Manos & Tsytrinbaum (2014) and Stanton & McCumber (2020) obtain similar results, though only in relation to financial performance. These findings

are contrary to those proposed in hypothesis H4 (see Table 4.2). With respect to social performance, microfinance reaches fewer active and female borrowers, and grants bigger loans on average. Such bigger loans should in principle result in higher financial returns to MFIs. However, the financial performance will depend on the possibility to leverage social capital to reduce information and related lending costs in such cultures. The results are in line with earlier findings in Chapters 2 and 3 where a negative relation is found between uncertainty avoidance and the use of formal financial services. Korynski & Pytkowska (2016) and Cuéllar (2018) prove a similar negative relationship. One of the direct results of high uncertainty avoidance put forth by Ashraf et al. (2016) is the avoidance of unknown risks, and contracting only of known risks. In such cultures, the costs of shouldering known, talk less of unknown risks – information, monitoring, contracting, transaction and related intermediation costs – are elevated due to increased prudence in business operations. Such costs will affect both the supply and demand of financial services. Microfinance by these findings will achieve lower social but potentially higher (depending on cost levels) financial performance in high uncertainty avoidance El Salvador (94), Russia (95) and Moldova (95), than it will in low uncertainty avoidance China (30), Vietnam (30), and India (40).

Indulgence/restraint

Based on the results in Table 4.6 above, microfinance achieves better social performance in more indulgent cultures. Mixed and statistically insignificant results are found for financial performance. Similar findings are made by Stanton & McCumber (2020), and confirm hypothesis H6 above on social performance. The findings are also in line with earlier findings in Chapters 2 and 3, wherein people in indulgent cultures are more likely to use formal financial services. Korynski & Pytkowska (2016) find financial systems to be more efficient in countries where the population's lifestyle drives higher spending, thus prompting higher demand for financial services. With respective indulgence scores of 97 and 84, MFIs in Mexico and Nigeria where people are less restricted or more happiness-driven will achieve better social performance than MFIs in Pakistan (indulgence score of 0), and Egypt (4).

Regional analysis

An observation worth noting from Hofstede's cultural dimensions is countries generally record similar scores across the same region, though a few notable exceptions like the Indulgence index for Burkina Faso are observable. It is thus possible for a regional performance analysis of MFIs to be done based on these cultural values. Average cultural values for the respective regions are presented in Table 4.8 below. The SSA and LAC regions present favourable cultural qualities for better social performing MFIs. In particular, both regions are highly indulgent and relatively low on power distance in relation to the average sample score. With a lower uncertainty avoidance score however, the SSA region is even more adapted to social performing MFIs than the LAC region. Being slightly more masculine than the SSA

Table 4.8: Hofstede's cultural dimension: average scores per region

Region	Cultural dimensions					
	<i>PDI</i>	<i>IDV</i>	<i>MAS</i>	<i>UAI</i>	<i>LTO</i>	<i>IND</i>
EAP	81	22	54	38	59	35
ECA	85	27	47	88	65	25
LAC	67	25	51	80	24	67
MENA	76	34	56	70	15	23
SAS	71	27	54	57	49	15
SSA	72	27	44	54	21	60
Mean	75	27	51	64	39	38

This table indicates Hofstede's cultural dimensions for each region in the study: PDI for Power distance; IDV for Individualism/Collectivism; MAS for Masculinity/Femininity; UAI for Uncertainty avoidance; LTO for Long term orientation; and IND for Indulgence/Restraint index.

region, MFIs in the LAC region will still meet their social objective. With the exception of its low indulgence score, the SAS region has similar cultural qualities to the SSA and LAC regions. Socially-inclined MFIs will do well in the SAS region too. With the exception of their respective uncertainty avoidance scores, the EAP and ECA regions provide the most favourable environment for better financially performing MFIs. In particular, both regions are relatively low on indulgence, and high on power distance. Being a more masculine culture, and with a low uncertainty avoidance score, the EAP region is also in a better position to meet its social objectives than the ECA region. Similar to the ECA region is the MENA region whose cultural values, with the exception of its relatively high masculinity score, support financially-inclined MFIs. Overall, the EAP region presents the most favourable cultural values for microfinance success on both financial and social measures; the LAC, SAS and SSA regions are more favourable for socially-inclined MFIs; and the ECA and MENA regions are more favourable for financially-inclined MFIs.

4.3.4. Robustness

A wide range of controls have been used in this study, providing a first step to robustness checks for the resultant effects of culture on microfinance performance. A common worry in empirical research applying Hofstede's cultural dimensions is the age of the dataset and validity to today's setting. Certainly, making use of a database dating back to the 1970's should be of reasonable concern, as time and events may have warranted some cultural changes in different societies. Inglehart (1990), developer of the WVS dataset suggests that cultural values may change over time due to economic and development outcomes. Such a view is based on societal value change and modernization theories which consider cultural values as time variant, arguing they can change as countries develop economically, modernize, or transform structurally (Ashraf & Arshad, 2017). The data however remains highly relevant for two reasons: firstly culture is a highly time-invariant variable, changing only in the order of centuries as depicted in Level 1 of the cultural levels of Williamson (2000) seen earlier. In fact Huntington (1996) argues that cultural values are

deeply rooted in history and transmit from generation to generation, again reflecting this time-invariant nature of culture. Secondly, recent research has attempted to prove the applicability of Hofstede's dimensions. One of these is Beugelsdijk et al. (2015) who replicate Hofstede's first four measures using two birth cohorts, an older corresponding to Hofstede's 1960s – 1970s study period workforce, and a younger corresponding to the current workforce. Findings indicate that cultural change is absolute and not relative, implying country scores on Hofstede's dimensions relative to other countries have not changed much. Thus cultural distances between country pairs has not changed much, justifying the continuing use of these dimensions for comparative cultural studies.

Endogeneity: results using an Instrumental variable technique

Endogeneity discussed earlier could arise from a number of causes, among which are omitted variables causing the error to correlate with the regressors, and reverse causality in which case firm performance may influence culture. High returns to MFIs resulting from excessively high interest and fee charges may prompt clients to delay or even refuse repayment of their loans. Meanwhile, microfinance failures due to low returns and non-sustainability may breed a culture of mistrust for financial institutions in a society. While reverse causality may not be much of a concern here due to a low likelihood for performance to influence culture, omitted variables present more of an urgent problem especially with the use of the random effects estimator. One way to cater for this endogeneity is via the use Instrumental variables. A good instrument should affect the dependent variable, but should only do so indirectly through its effect on the endogenous variable. In other words, valid instruments should be strongly correlated with the endogenous variable, culture in this case (relevance restriction), and only affect microfinance performance indirectly through culture (exogeneity restriction). In line with previous research studies, a number of instruments are used for the culture measures in this study. These include language, country latitude, prevalence of infectious diseases, genetic distance, ethnic fractionalization, and religion.

Language

Kashima & Kashima (1998) and Licht et al. (2007) suggest that language can provide an effective instrument for power distance and uncertainty avoidance. They find that the number of personal pronouns in different languages is correlated with cultural dimensions. Languages with more than two second person singular pronouns like French with 'tu' and 'vous', Spanish with 'tú' and 'usted', and 'du' and 'Sie' in German are generally indicative of more uncertainty avoidance and high power distance as they signal higher stress. Hofstede (1980) argues that one characteristic of higher uncertainty avoidance cultures is the feeling of higher stress. Speakers of multiple second-person pronoun languages face higher decisional stress in social interactions when choosing between an appropriate second-person pronoun (Kashima & Kashima, 1998). In these cultures therefore, individuals constantly watch their changing

roles and adapt accordingly in relation to their precise communication contexts generally in avoidance of conflict or to show respect or politeness. Individuals in such cultures with multiple personal pronouns for 'you' also have a higher conception of relationships based on social distance. Arabic, French, German, Portuguese and Spanish are among the languages in this category.

Chen (2013) suggests a binary classification for languages: 'futures' and 'futureless' languages. Languages vary by how much they require speakers to grammatically encode temporal differences. While futures languages oblige speakers to distinguish between the present and future tense technically implying a shorter term orientation, futureless languages do not. In fact futureless languages see the future as very similar to the present causing users to discount the future less and support future-oriented policies more. Empirical data actually suggests that futureless language-speaking countries save more on average than futures ones which consider the future as very different from the present. Overall therefore futures language-speaking cultures are more short-term oriented, which futureless language-speaking ones are more long-term oriented.

Country latitude

Culled from La Porta et al. (1999), a country's geographical location with respect to its latitude represents another instrument for the power distance culture measure. An inverse relation exists between power distance and the latitude of a country (Hofstede, 2001; Rivera-Rozo et al., 2018). In colder climates, the major threat to survival was cold temperatures and in order to survive, people had to develop and master technical skills. They thus had to work together to develop these skills to enable them survive in these tough conditions. This close collaboration amongst all persons, including those in leadership positions might have resulted in smaller distances between those in power and the rest. In warmer or tropical climates on the contrary, the major threat to survival was the aggression by other groups. Societies had to be organized in order to deal with the frequent attacks of enemy groups, through for instance creating special groups of warriors for defence purposes. The distinction of roles in these societies and power wielded by such special groups may have prompted higher power distance in tropical countries (Rivera-Rozo et al., 2018).

Historical prevalence of infectious diseases across geopolitical regions

Developed by Murray & Schaller (2010), this index has been used as an instrument for the individualism/collectivism measure by Gorodnichenko & Roland (2010), Boubakri & Saffar (2016), among others. In investigating determinants of cross-cultural differences, one research stream argues that regional variation in the prevalence of infectious diseases may have played an important role in the origin of many different kinds of cross-cultural differences. Fincher et al. (2008) for example suggest that individuals of collectivist cultures are more wary of contact with strangers or out-group members and are

less likely to eat unusual foods. By doing so, collectivism serves as a defence against the spread of infectious diseases, and is more likely to emerge in societies that historically suffered a greater prevalence of different diseases. Similarly, individualism is more likely to emerge in societies that historically suffered a lower prevalence of pathogens, suggesting that disease prevalence may be negatively associated with individualism.

Genetic distance

On the basis of the argument of Gorodnichenko & Roland (2011) that parents transfer both genes and culture to their children and that this intergenerational transmission of genes and culture occurs within countries, Berger et al. (2017) suggest that genetically close countries are likely to exhibit similar cultures. They thus compute the genetic distance between each focal country and the country with the highest masculinity score in their sample, as an instrument for masculinity. A similar approach is applied here, with the genetic distance being the distance between each country and Albania, the most masculine country in the sample. This data comes from the dominant population distance of Spolaore & Wacziarg (2009), where this distance captures the probability that two alleles (form of a gene) at a given locus selected at random from two populations will be different.

Ethnic fractionalisation

This demographic variable from Alesina et al. (2003) describes the probability that two randomly selected individuals from a population belong to different ethnic groups. Homogenous cultures are generally more collectivist as postulated by Tang & Koveos (2008). Additionally, heterogeneous cultures usually have higher power distance as obtains for example in countries with more immigrants. Finally, higher fractionalisation on ethnic grounds results in higher uncertainty avoidance. This measure has been applied as an instrument for culture in research studies of Kwok & Tadesse (2006) and Tang & Koveos (2008) among others.

Religion

The percentage of people in respective countries of different religious denominations, precisely Protestants, Christians, and Muslims has been used in empirical research as an instrument for culture by Tabellini (2008), Dutta & Mukherjee (2011), Ashraf et al. (2016), and Boubakri et al. (2017) among others. Most often, it has been used as an instrument for uncertainty avoidance. In this research, we additionally use it as an instrument for the indulgence/restraint culture measure. Generally, societies in which majority of people accept religion as important in their lives usually rank high on uncertainty avoidance, and are usually more restrained. This is due to the less flexible conduct warranted by religious teachings across most religions. Protestantism compared to Catholicism and Islam presents the most flexible option, as it is not based on the stricter codes that enshrine the latter two religions. Thus countries

with higher proportions of Protestants usually will have lower uncertainty avoidance and will be more indulgent than those with more Catholics and Muslims.

Table 4.9 below reports first stage regressions for the instrumental variables. Second stage regressions are reported in Table 4.10.

Table 4.9: First stage OLS regressions for the instrumental variables

VARIABLES	(1) pdi	(2) idv	(3) mas	(4) uai	(5) lto	(6) idg
age	-0.00245 (0.00996)	-0.0724*** (0.0112)	-0.00798 (0.0120)	0.0129 (0.0152)	0.00753 (0.0144)	-0.151*** (0.0206)
par30	1.631*** (0.613)	-0.838 (0.691)	-0.641 (0.737)	1.588* (0.937)	3.369*** (0.884)	-0.923 (1.267)
ln_size	0.104** (0.0508)	-0.215*** (0.0573)	0.0403 (0.0611)	0.381*** (0.0777)	-0.308*** (0.0733)	-0.475*** (0.105)
debt_eq	0.0154* (0.00873)	-0.0172* (0.00984)	-0.0130 (0.0105)	0.0263** (0.0134)	0.0372*** (0.0126)	-0.0114 (0.0180)
op_eff	-0.219 (0.287)	1.795*** (0.324)	0.820** (0.345)	-1.365*** (0.439)	-0.149 (0.414)	1.808*** (0.594)
glp_ta	-0.124 (0.141)	0.299* (0.159)	-0.189 (0.170)	0.0722 (0.216)	-0.354* (0.204)	-0.360 (0.292)
pol_stab	-1.175*** (0.261)	-0.669** (0.295)	-3.815*** (0.315)	-3.044*** (0.400)	6.204*** (0.377)	-5.259*** (0.541)
reg_qual	-4.532*** (0.442)	-5.616*** (0.498)	-6.270*** (0.532)	9.023*** (0.676)	5.333*** (0.638)	-6.319*** (0.914)
voice_acc	-4.822*** (0.389)	6.109*** (0.438)	3.396*** (0.468)	3.786*** (0.594)	-15.97*** (0.561)	6.971*** (0.803)
dumlegor	-17.31*** (0.585)	-1.794*** (0.660)	-4.822*** (0.704)	11.80*** (0.895)	3.776*** (0.845)	13.55*** (1.210)
tstart_bus	-0.00137 (0.00956)	-0.190*** (0.0108)	-0.392*** (0.0115)	0.227*** (0.0146)	0.356*** (0.0138)	-0.592*** (0.0198)
tc_enforce	-0.00425*** (0.000653)	-0.0109*** (0.000736)	-0.000907 (0.000786)	-0.000617 (0.000999)	-0.00537*** (0.000942)	0.000882 (0.00135)
lngdppc	4.168*** (0.341)	0.0842 (0.385)	8.212*** (0.411)	1.992*** (0.522)	3.285*** (0.493)	17.30*** (0.706)
mft_gdp	-4.811 (3.676)	21.37*** (4.144)	-0.895 (4.423)	-54.91*** (5.622)	-51.24*** (5.305)	24.52*** (7.601)
infl	-20.57*** (2.875)	4.793 (3.241)	-29.93*** (3.459)	21.01*** (4.396)	-6.341 (4.148)	34.76*** (5.943)
domcrpvt_gdp	-7.662*** (0.669)	17.29*** (0.754)	4.747*** (0.805)	-14.51*** (1.023)	-2.032** (0.966)	2.753** (1.384)
fdi_gdp	30.21*** (3.591)	0.834 (4.048)	18.45*** (4.320)	-80.42*** (5.492)	-15.27*** (5.182)	131.5*** (7.424)
acct_own	6.556*** (0.854)	-0.868 (0.963)	-5.796*** (1.027)	-4.890*** (1.306)	13.27*** (1.232)	-0.812 (1.765)
lang_pro	-22.54*** (0.615)	-14.40*** (0.694)	-13.24*** (0.740)	29.55*** (0.941)	-23.26*** (0.888)	13.68*** (1.272)
ctry_latitude	7.068*** (1.864)	31.35*** (2.101)	1.345 (2.243)	31.15*** (2.851)	38.46*** (2.690)	-40.63*** (3.854)
disease_prev	1.503*** (0.482)	16.78*** (0.543)	13.43*** (0.580)	-14.50*** (0.737)	-4.978*** (0.695)	14.41*** (0.996)
ethnic_frac	-9.745*** (0.815)	10.73*** (0.918)	0.818 (0.980)	-5.555*** (1.246)	2.358** (1.175)	-4.632*** (1.684)
gen_dist	296.5***	-749.8***	-189.6***	225.9***	-201.0***	434.9***

	(20.55)	(23.17)	(24.73)	(31.43)	(29.65)	(42.49)
rel_prot	-0.468***	0.217***	-0.325***	0.297***	-1.385***	0.436***
	(0.0315)	(0.0356)	(0.0380)	(0.0482)	(0.0455)	(0.0652)
rel_cath	-0.141***	0.0973***	0.0930***	0.0707***	-0.209***	0.246***
	(0.00660)	(0.00744)	(0.00794)	(0.0101)	(0.00952)	(0.0136)
rel_musl	-0.117***	-0.118***	-0.0319***	0.193***	-0.247***	-0.0368***
	(0.00529)	(0.00596)	(0.00636)	(0.00809)	(0.00763)	(0.0109)
lang_fut	16.96***	6.459***	-1.930***	7.727***	-6.095***	1.368
	(0.492)	(0.555)	(0.592)	(0.753)	(0.710)	(1.017)
Constant	52.98***	28.95***	-1.072	16.91***	50.74***	-115.4***
	(2.866)	(3.231)	(3.448)	(4.383)	(4.136)	(5.926)
Statistics						
Observations	3,385	3,385	3,385	3,385	3,385	3,385
R-squared	0.722	0.762	0.563	0.830	0.843	0.815

Notes: First stage regressions for the instrumental variables are reported in this table. The dependent variables are the respective endogenous culture variables (Hofstede's cultural dimensions). ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

In Table 4.9 above, the instrumental variables respectively explain 72.2%, 76.2%, 56.3%, 83.0%, 84.3%, and 81.5% variation in the endogenous variables power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, long term orientation, and indulgence/restraint. This suggests that these instruments together have strong effects in predicting the cultural values. Additionally, they all satisfy the relevance and exogeneity restrictions due respectively to their correlations with the culture variables and indirect effect on the performance variables through these culture variables as further indicated in the second stage regressions in Table 4.10 below.

Table 4.10: Second stage 2SLS instrumental variable regressions

VARIABLES	(1) roa	(2) oss	(3) ln_nab	(4) ln_nfb	(5) ln_alb
<i>Culture measures</i>					
pdi	-6.03e-05 (0.000223)	0.00165* (0.000953)	-0.00439 (0.00357)	0.00613 (0.00505)	0.00511 (0.00328)
idv	0.000516 (0.000340)	0.00384** (0.00152)	-0.0292*** (0.00566)	-0.0548*** (0.00884)	0.0285*** (0.00521)
mas	0.00161*** (0.000617)	-0.00592** (0.00281)	0.114*** (0.0105)	0.155*** (0.0163)	-0.103*** (0.00962)
uai	0.000346 (0.000258)	-0.00159 (0.00114)	-0.00468 (0.00421)	-0.00533 (0.00575)	0.0105*** (0.00390)
lto	-0.000207 (0.000229)	-0.000427 (0.000979)	-0.0186*** (0.00364)	-0.0161*** (0.00516)	0.0206*** (0.00338)
idg	-2.46e-05 (0.000218)	0.000724 (0.000939)	-0.0223*** (0.00348)	-0.0247*** (0.00533)	0.0247*** (0.00322)
<i>Demographic controls</i>					
age	0.000203 (0.000142)	0.00106* (0.000609)	-0.0161*** (0.00228)	-0.0177*** (0.00360)	0.0139*** (0.00209)
par30	-0.0648*** (0.00816)	-0.289*** (0.0349)	-0.496*** (0.131)	-0.823*** (0.181)	0.392*** (0.120)
ln_size	0.00213*** (0.000727)	0.0111*** (0.00314)	0.746*** (0.0118)	0.728*** (0.0179)	0.235*** (0.0109)
debt_eq	-0.000254** (0.000117)	-0.00273*** (0.000502)	-0.00267 (0.00188)	-0.00261 (0.00265)	0.00283 (0.00173)
op_eff	-0.0677*** (0.00384)	-0.231*** (0.0165)	-0.0488 (0.0616)	-0.0747 (0.0861)	-0.341*** (0.0567)

glp_ta	0.00316* (0.00187)	0.00249 (0.00802)	0.310*** (0.0300)	0.312*** (0.0415)	-0.00746 (0.0276)
<i>Formal institutions</i>					
pol_stab	-0.00766* (0.00431)	-0.0528*** (0.0189)	0.387*** (0.0704)	0.599*** (0.104)	-0.326*** (0.0646)
reg_qual	0.00277 (0.00573)	-0.0397 (0.0246)	0.488*** (0.0921)	0.450*** (0.132)	-0.503*** (0.0847)
voice_acc	-0.0227*** (0.00595)	-0.0805*** (0.0252)	-0.148 (0.0941)	0.194 (0.141)	0.109 (0.0866)
Dumlegor	-0.0227*** (0.00727)	-0.0305 (0.0318)	0.890*** (0.118)	1.202*** (0.175)	-0.873*** (0.109)
tstart_bus	0.000549*** (0.000170)	-0.00116 (0.000732)	0.0199*** (0.00272)	0.0231*** (0.00378)	-0.0168*** (0.00251)
tc_enforce	7.69e-06 (6.46e-06)	8.20e-05*** (2.79e-05)	-0.000111 (0.000104)	-0.000108 (0.000150)	0.000162* (9.57e-05)
<i>Macroeconomic controls</i>					
lngdppc	-0.00324 (0.00743)	0.0860*** (0.0319)	-0.567*** (0.118)	-0.727*** (0.161)	0.462*** (0.110)
mft_gdp	0.0654 (0.0443)	-0.00504 (0.188)	2.359*** (0.702)	2.385** (1.013)	-2.341*** (0.649)
infl	0.0538 (0.0482)	-0.145 (0.213)	6.438*** (0.793)	10.04*** (1.213)	-6.331*** (0.731)
domcrpvt_gdp	-0.0294*** (0.0102)	-0.139*** (0.0444)	0.302* (0.166)	0.993*** (0.244)	-0.147 (0.152)
fdi_gdp	0.0855 (0.0521)	-0.0759 (0.224)	0.437 (0.837)	-0.0142 (1.247)	-0.0965 (0.770)
acct_own	0.0383*** (0.0127)	-0.0366 (0.0549)	0.0540 (0.205)	0.0218 (0.296)	0.112 (0.189)
Constant	-0.122*** (0.0387)	0.504*** (0.165)	-1.713*** (0.613)	-3.119*** (0.905)	1.104* (0.566)
<i>Statistics</i>					
Observations	3,360	3,374	3,347	3,059	3,350
R-squared	0.164	0.116	0.662	0.515	0.377

Notes: This table reports the IV 2SLS estimates of regressing Microfinance financial and social performance variables on culture variables and other controls, with robust standard errors in parentheses. The dependent variables respectively are return on assets and operational self-sufficiency for financial performance, and number of active borrowers, number of female borrowers, and average loan balance for social performance. The main explanatory variable, suspected to be endogenous here is culture measured by Hofstede's cultural dimensions namely power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, long term orientation, and indulgence/restraint. The instruments used for culture are Number of personal pronouns for the second person in respective languages, Country latitude, Historical prevalence of infectious diseases, Ethnic fractionalisation, Religion, Genetic diversity, and Futuristic languages. Controls are made for MFI-specific characteristics, Formal institutional and Macroeconomic environments. The Wu-Hausman endogeneity test results reject the null hypothesis that the culture variables are exogenous. ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

Table 4.10 shows the results from the second-stage regressions using predicted culture values from the first stage regressions as the main explanatory variable. With the exception of the effect of the individualism, long-term orientation, and indulgence measures on social performance, the results from the instrumental variable regressions are largely consistent with the results in Table 4.6 above. This suggests that the results relating to the effect of culture on microfinance performance are not driven by omitted variable bias. Results on individualism/collectivism and long/short-term orientation which earlier were statistically insignificant and thus inconclusive have come up statistically significant here. Precisely, microfinance will achieve better financial but poorer social performance in more individualistic cultures. This finding sharply contradicts those of Fogel et al. (2011), Burzynska & Berggren (2015), Scanlon et al.

(2017), Postelnicu & Hermes (2018), and Stanton & McCumber (2020) who all find a positive relationship between individualism and the social performance of MFIs. The argument advanced in these studies is people in individualistic cultures are less likely to rely on informal than they are on formal financial services due to higher generalised trust. Microfinance thus has a potentially larger client base in individualistic cultures. We however argue here that the inability of MFIs to harness social capital in these cultures in the delivery of their services may however jeopardize their ability to meet more clients as the results here indicate. In long-term oriented cultures, microfinance will also not reach its social objectives. Stanton & McCumber (2020) make similar findings of a negative relationship between long-term orientation and microfinance performance, and thus argue that microfinance is not meant for long-term oriented societies. Kwok & Tadesse (2006) provide an explanation for these observed relationships, arguing that people in long term oriented cultures plan for the long term, and are thus more likely to take upon bigger risks and invest or create more sustainable enterprises. Such enterprises may be bigger than microfinance's traditional micro and small enterprises clientele, and be more attractive to banks with whom MFIs in long term oriented cultures compete head-on. The size of enterprises and their longer-term outlook is directly reflected in higher average loan balances in long-term oriented cultures as the results indicate. Depending however on information asymmetry and related costs of financial services provision, microfinance may not achieve its financial objectives despite granting bigger loans. Microfinance by these findings will thus be more successful in short-term oriented Ghana (score of 4) than it will be in long-term oriented China (score of 87). Overall thus, the potential size of microfinance's traditional client base is severely reduced in long-term oriented cultures. This hampers the performance of MFIs here.

On indulgence, earlier results indicated MFIs perform socially better in more indulgent cultures. Indulgence drives higher spending and thus higher demand for financial services (Korynski & Pytkowska, 2016). Microfinance will thus reach more clients in indulgent cultures. However the level of trust in indulgent cultures may become an important factor in determining whether or not MFIs will meet this demand for financial services. Trust has key implications on the information, monitoring, and related costs of financial services provision (Guiso et al., 2006). In indulgent cultures where trust is lower, financial intermediation costs are higher and microfinance will meet fewer clients. Also, people in indulgent cultures will have shorter time preferences, and may thus have a higher preference for informal finance services which often are faster in making funds available. Finally, some microfinance products require people to save in order to borrow. People in indulgent cultures are less likely to save and will thus not be able to access microfinance services. Microfinance may thus find it difficult to achieve its social objectives in indulgent cultures.

4.4. Conclusion

This paper argues that culture has an effect on the financial and social performance of MFIs. As the microfinance industry continues to diversify across national borders, the question on its effectiveness in sustainably meeting its development-related objectives becomes more frequently raised. The industry has been more successful in meeting its objectives in some countries and regions than it has in others. Culture is hypothesised in this study to account for observed differences in microfinance's performance in different countries and regions. Theoretically, culture affects the cost of financial services provision both on the demand and supply sides, with respect to information asymmetry levels, and strategies and costs of reducing this asymmetry. Using all six of Hofstede's cultural dimensions to proxy for country level cultural values, and financial ratios relating to the financial and social performance of MFIs, the study empirically assesses the effect of culture on this performance using a random effects estimator. Findings reveal that culture has an effect on microfinance performance, with high power distance cultures being more favourable for financial performance, and masculine and indulgent cultures being more favourable for social performance.

The results above are of particular importance to investors and global development finance partners, as they give an indication of countries and regions where microfinance will be most successful in meeting its objectives. This indication is provided empirically on the basis of cultural differences between countries. Investors more interested in the financial aspects of microfinance should target MFIs in countries with high power distance cultures. Meanwhile, investors more interested in the social aspects of microfinance should target MFIs in countries with more masculine and indulgent cultures. The size of the potential client base, the costs and related cost-reduction strategies applicable in providing financial services in different cultures explains the effects of these cultural variables. The next chapter in this thesis provides further indication on the particular MFI legal forms in which investors should put their funds for the maximum financial and/or social impact depending on their broad objectives. The differences between financially- and socially-inclined MFIs are highlighted therein, and the effect of culture on these respective MFI forms.

Chapter 5

EFFICIENCY OF MICROFINANCE INSTITUTIONS: DOES CULTURE MATTER?

5.1. Introduction

Access to financial services has been crucial in the fight against poverty and in efforts to enhance economic development across the developing world. Occupying a pivotal position in efforts to expand access to financial services is the microfinance industry, whose traditional clientele has been poor and low income earners, and small enterprises. To provide financial services to this client base, the industry has historically relied on support from public actors in the development domain like governments, development finance institutions, multilateral development agencies, foundations, and Non-Governmental Organisations (NGOs) among others (Yaron & Manos, 2007). Such support has been provided through subsidies, donations, and soft loans. Although the poverty-reduction objective has remained central in the industry's operations over time, growing concerns among the industry's financiers since the early 2000s, firstly about its efficiency in utilizing provided funds to meet its poverty-reduction and related social objectives, and secondly about the financial sustainability of the industry have pushed for increased commercialization of its operations, with profit-making now a central theme in microfinance practice (Hermes & Hudon, 2018). The direct result of this has been a transformation of previously strictly socially-oriented MFIs into more commercially-oriented entities, which quite often are subject to higher regulation and may entail different management and governance practices that may not serve the best interests of the poor. In fact as justification perhaps for the push towards commercialization, empirical evidence suggests that transformed MFIs show marked improvements in their efficiency and self-sufficiency (Fernando, 2004; Servin et al., 2012; D'Espallier et al., 2017).

Irrespective of the orientation of the microfinance service provider notably the dichotomy between the social and commercial, the goal of alleviating poverty does not eliminate the search for efficiency. Heightened interest has been shown towards efficiency and sustainability of MFIs recently as a result of regulatory concerns and the need for financial sector stability following the fallouts of financial liberalisation efforts across the developing world, increased donor accountability, and increased investor interest in the financial performance of MFIs. With the exception of a few empirical studies like Gregoire & Tuya (2006), Hermes et al. (2009), and Aiello & Bonanno (2015), which consider the role of environmental factors in determining the efficiency of MFIs, a greater portion of the debate so far has only considered the role of institution-specific variables like an MFI's age, size, capital structure and portfolio quality as efficiency determinants in the microfinance industry. Evidence of this can be seen among others in the empirical studies of Abdullai & Tewari (2016), Gutierrez-Goiria et al. (2016), and Wijesiria et al. (2015, 2017). As Hermes & Hudon (2018) explain, the relationship between MFI-specific

characteristics and financial and social performance may not be unidirectional, but may actually depend on contextual variables, like macroeconomic conditions and formal and informal institutions. Interestingly, the little available empirical evidence on the institutional determinants of MFI efficiency has often dwelled on the formal aspects of institutions like laws relating to creditor and property rights among others, and almost entirely omitted the informal aspects of these institutions, namely underlying culture and related variables in the societies in which MFIs operate. Informal institutions like culture, which specifically relates to customary beliefs and values and depicts the process via which these values are transmitted fairly unchanged across generations both through conscious learning and observation by ethnic, religious, and social groups (North, 1990; Guiso et al., 2006) constitute the base of a society's formal institutions like its laws as Williamson (2000) explains. The author precisely classifies such informal institutions as Level 1 institutions, clearly illustrating the dependence on these informal institutions of a society's formal institutions and governance structures.

Curiosity about culture and its effect on economic and finance outcomes has only recently peaked in empirical research. Zeller (2006) highlights the importance of culture to microfinance performance, by conditioning the performance of MFIs on two elements, firstly the underlying culture of the society in which the MFI operates, and secondly its legal form. Specifically, the author posits that for MFIs to be successful, they must find ways to tap into the indigenous trust of communities and exploit this through the formation of member-based institutions (Cooperatives). Both culture and legal form may hold several advantages relating to how an MFI handles the information asymmetry problem common in microfinance.

This paper underscores the effect of an environmental variable, namely culture on the efficiency of MFIs. Adding the culture variable as recognition of differences in risk taking, governance and monitoring costs, and the need for cultural intelligence presents a new research perspective. Further analysis is made with respect to the legal form of the MFI, and region of its operation. Despite the novelty of culture, the effect of ownership or legal form on the other hand is not as clear as it appears. Empirical evidence in microfinance suggests there is a trade-off between financial and social performance of MFIs. More precisely, microfinance cannot simultaneously attain both profitability and outreach, and must settle on the attainment of either at the expense of the other (Morduch, 2000; Cull et al., 2009). The argument of a trade-off between outreach and sustainability in microfinance recurs endlessly in empirical research and extends to specific legal forms (discussed in Section 5.2.1.2 below). Mersland & Strøm (2008), Quayes (2012), Gutierrez-Goiria et al. (2016) and Lam et al. (2020) argue that MFIs, irrespective of the legal form can concurrently pursue and achieve both outreach and sustainability in the provision of microfinance services. Cull et al. (2009, 2011), Hermes et al. (2011), Serrano-Cinca & Gutiérrez-Nieto (2014), Abate et al. (2014), Mia & Lee (2017), and Kittilaksanawong & Zhao (2018) argue to the contrary that there is a trade-off between outreach and sustainability implying both objectives cannot be dually

pursued and achieved efficiently by MFIs irrespective of the legal form. Arrassen (2014) confirms the existence of a trade-off, but suggests that this is a bigger problem for microfinance banks (SHFs) and cooperatives, and not for NGO type MFIs. Reichert (2018) takes the analysis further, arguing that trade-offs do exist, but the severity of these trade-offs depends on the particular variables used in the performance measurement, as well as the data used. When depth and cost of outreach, and efficiency indicators are used for social performance measurement, the observed trade-off is more severe or pronounced. Meanwhile when risk indicators are used, trade-offs are fewer and less severe.

Irrespective of the (non)existence of a trade-off in microfinance, whether or not the trade-off argument holds for ownership types in all contexts including different cultural settings is yet to be fully discerned. This research is premised on the grounds that different MFI ownership types or legal forms may be more efficient in particular cultures and societies, and must thus be given priority in policy formulation. This position arises from the difference in objectives of different owners, which necessitate a different mix of products and services in their achievement. Some products like group loans may perform well in more collectivist and higher trust societies implying a higher preference for socially-oriented MFIs. Some MFIs prioritize individual lending, since bigger loans can be granted through this mechanism. Such a strategy is more feasible in individualistic cultures. Positing that cooperatives could actually be the most successful MFI form due to their potentially higher embeddedness in local cultures as Zeller (2006) suggests remains largely unproven.

We thus hypothesise in this research that culture has an effect on the efficiency of MFIs, and that this effect varies with different ownership forms. Using efficiency scores estimated via a nonparametric approach – Data Envelopment Analysis (DEA) – on a sample of 468 MFIs selected from 44 countries from 2012 – 2018 and culture data from Hofstede’s dimensions, the hypothesis is proven empirically using a Tobit model. Findings from the analysis indicate that MFIs in the Europe & Central Asia (ECA) and Latin America & Caribbean (LAC) regions are the most financially efficient, while those in the South Asia (SAS) region are the most socially efficient. With respect to legal form, Shareholder Firms (SHFs) are the most financially efficient, while Non Governmental Organisations (NGOs) are the most socially efficient. Cooperatives (COOPs) are found to be the ideal microfinance form, as they report relatively high scores on both financial and social efficiency. Microfinance overall is found to be more efficient in individualistic and long-term oriented cultures.

The rest of this paper is divided into three sections. The first of these reviews the literature on microfinance efficiency with respect to its measurement and determinants. The second dwells on the methodology, notably defining the variables used in the efficiency analysis and tobit regressions. The third and final chapter presents the results of the efficiency measurement and regression analysis on the determinants of the estimated efficiency, and discusses the findings.

5.2. Concepts, evidence, and hypothesis

5.2.1. Concepts

5.2.1.1. Microfinance: objectives

Microfinance loosely translates to the provision of financial services to low-income persons, who for several reasons including their low income levels do not have access to formal financial services. The industry's existence is justified by its ability to foster economic development through concurrent efforts reflected in its products and services to alleviate poverty and generate employment via the promotion of microenterprises in developing countries. Microfinance thus has a dual mandate, often dubbed the double bottom line, which relates to pursuing a financial and social objective (Gutiérrez-Nieto et al., 2009; Hartarska et al., 2012). This implies serving as many poor clients as possible while remaining financially sustainable. The dynamics which have led to the pursuit of both objectives have on a practical and policymaking level been quite interesting, and relate mainly to the differences in the views of institutionalists and welfarists. Basically, the implied costs of providing microfinance services comprising transaction and information costs in most cases are often quite high. Most MFIs thus still depend on donations and grants to successfully implement microfinance programmes. While institutionalists assert that MFIs should be able to cover their operating and financing costs with internally-generated revenues implying a need for financial self-sustainability, welfarists argue that MFIs can still be sustainable through their dependence on donor and related funds (Morduch, 2000). To them, donations serve as a form of equity, implying donors can be viewed as social investors willing to accept a lower expected financial return. Welfarists thus prioritise poverty alleviation in microfinance service provision, while institutionalists dwell on wealth maximization. Interestingly too, the microfinance industry has come under scrutiny following studies that empirically prove a limited impact of microfinance on development outcomes. One of these is Bhatt & Tang (2001) who find an overreliance on grants and subsidies by microfinance programmes. As a signal of inefficiency in their operations, microfinance programmes find it difficult to sustain their operations in the absence of grants, external funding, and subsidies as Bhatt & Tang (2001) prove. An important question thus is whether microfinance can really make a significant and long-term contribution to reducing world-wide poverty in a sustainable way. This question is particularly relevant given that most MFIs are still heavily dependent on governments and donors for funds, and such 'soft' funds have in recent times been less readily available.

5.2.1.2. MFI legal forms

Hartarska (2005), Mersland (2009), and Tchakoute-Tchuigoua (2010) broadly classify MFIs according to their commercial orientation (Non-Profit Organisations or NPOs and For-Profit Organisations or FPOs), or ownership (Non-Governmental Organisations or NGOs, Member-Owned Firms or MOFs, and

Shareholder firms or SHFs). Hartarska (2005) and Araújo da Costa (2017) further classify SHFs into two categories, namely banks and nonbank financial institutions (NBFIs). Duqi & Torluccio (2015) identify six common MFI owners for the different categories above, namely banks, development finance institutions (DFIs), NGOs, Microfinance Investment Vehicles (MIVs), governments, and local investors.

With respect to ownership, each constituent form between the three broad categories – NGOs, MOFs, and SHFs – varies in its requirements in terms of governance structure, operating mechanisms, and level of regulation. Up until the introduction of savings and microinsurance products, traditional microfinance revolved around the provision of microcredit – small often uncollateralized loans to poor and low income earners. Due however to the diverse needs of the poor and opportunities offered by savings and microinsurance products on the supply side, their introduction into the range of microfinance services has been rapid. Not every microfinance service provider has however been able to take advantage of these innovative services. As a result of added complexities like regulation and information technology needs relating to the mobilization of savings or the offering of microinsurance products, the legal form of MFIs which could offer this full range of microfinance services varies in different countries (Cull et al., 2011). This legal form and thus ownership structure has direct bearings on the MFI's objectives, governance, range of products and services, funding mechanism, and even performance. While NGOs for example often operate as non-profit organizations which are partly or wholly funded by donors, Shareholder firms, including NBFIs are more profit-oriented (Servin et al., 2012).

This study focuses on commercial- and social-oriented MFIs broadly classified by Hartarska (2005), Mersland (2009), and Tchakoute-Tchuigoua (2010) above, and which respectively include for-profit MFIs like Shareholder-owned firms at one end and non-profit MFIs like NGO-owned MFIs at the other end. As Stanton & McCumber (2020) explain, a non-profit MFI may be financially profitable. They thus argue that the distinction between for-profit and non-profit MFIs lies not necessarily in the objective pursued by the service provider – financial with respect to profit-making or social with respect to poverty alleviation –, but in the ownership of the MFI and mode of distributing profits. A for-profit firm for instance may choose to distribute a portion of the profits to shareholders or to retain and reinvest them in the firm. A non-profit firm will not have outside shareholders or investors expecting a return on their investment implying the firm will have a weaker focus on profit. However, any surpluses made will not be distributed to anyone, but will be reinvested in the firm to enable it pursue its social mission. Stanton & McCumber (2020) go further to identify microfinance banks, defined in this study as Shareholder firms (SHFs) as the main for-profit MFIs, and Credit Unions/Cooperatives and NGOs as the main non-profit MFIs. This study focuses on all three of these MFI legal forms – SHFs, Cooperatives, and NGOs.

5.2.1.3. Microfinance performance assessment: Efficiency analysis

Due to their important role in channelling and effectively allocating funds in every economy, the viability and sustainability of financial intermediaries is a prime concern. A stable financial system ensures the continual flow of funds to investment projects, which is essential for economic development. The performance of financial intermediaries must thus be ensured. Such performance has traditionally been measured using two key approaches, namely the structural approach which applies linear programming and regression techniques to assess efficiency, and the non-structural approach which mostly uses ratios (Hughes & Mester, 2008). This research focuses on the structural approach, and assesses efficiency.

In using the term ‘efficiency’, economists seek to evaluate how well an organisational unit performs relative to its peers in optimizing production in view of maximizing certain goals, usually profit or scale. One of the earliest non ratio-based approaches to measuring efficiency was proposed by Farrell (1957) via an efficiency measure which he decomposed into two elements namely technical efficiency (TE), which measures the firm’s success in producing maximal output with a given set of inputs; and allocative (price) efficiency, which estimates the firm’s success in choosing an optimum combination of inputs, given their respective prices. Balkenhol (2007) extends these efficiency definitions to microfinance, depicting technical efficiency as the optimal combination of staff time, assets and subsidies (inputs) to produce a maximum number of loans, attain financial self-sufficiency and poverty outreach (outputs). In efficiency analysis, firms must maximize their output or minimize their production or operating costs subject to some constraints (Banker et al., 1984). Practically, the use of frontier models is dominant in theoretical and empirical literature evaluating such efficiency. These frontier models are of two main forms, namely parametric and nonparametric models. Parametric models are regression-based and provide for consideration of other random and potentially significant uncorrelated variables in the measurement of efficiency, by generating parameters in this regard. The key parametric models include Stochastic Frontier Analysis (SFA), Thick Frontier Analysis (TFA), and the Distributional Free Approach (DFA) (Berger & Humphrey 1997). SFA remains the most widely used of these parametric methods in empirical studies on efficiency assessment. SFA assumes the specific production function which is then used to map the relationship between the inputs and outputs in the estimation of efficiency. The advantage of this approach is its ability to control for the generated parameter, namely the stochastic error component in its econometric estimation. As a drawback however, SFA and other parametric models impose and require specification of a functional form for the efficient frontier. The possibility of misspecification of this functional function and the actual probability distribution of the random component may lead to biased results. SFA is used in MFI efficiency analysis in Hermes et al. (2009), Oteng-Abayie et al. (2011), Servin et al. (2012), Singh et al. (2013), Riaz & Gopal (2014), Aeillo & Bonano (2015), Abdulai & Tewari (2016), and Fall et al. (2018).

Nonparametric models on the other hand are linear programming-based, and do not generate any parameters. The main nonparametric method is Data Envelopment Analysis (DEA). As an advantage over parametric models, nonparametric models do not require specification of a functional form making them much easier to use and interpret. As a weakness however, all deviations from the frontier in nonparametric models are attributed to inefficiency with no allowance for other potentially significant variables. The main difference between both methods thus lies in the construction of the efficient frontier. DEA is used in MFI efficiency analysis in Gutiérrez-Nieto et al. (2007), Haq et al. (2009), Pal (2010), Ferdousi (2013), Piot-Lepetit & Nzongang (2014), Efendic & Hadziahmetovic (2017), Kar & Deb (2017), Wijesiri et al. (2017), and Bibi et al. (2018). As Silva et al. (2017) explain, there is no specific rule guiding the choice between these two widely used efficiency assessment models, DEA and SFA. Because their main difference lies in the specification of the functional form and treatment of the error term or statistical noise, the choice boils down to the convenience of the user. Additionally however, DEA permits for the consideration of multiple inputs and outputs, while SFA only permits one output variable irrespective of the number of inputs. With multiple outputs in this study relating to both financial and social performance of MFIs, DEA is more appropriate for this study. Also, as it specifies no functional form and is thus less restrictive in this sense, DEA is easier to use both with respect to computing and interpreting results, and is thus preferred in this study.

5.2.1.4. Data Envelopment Analysis (DEA)

Data Envelopment Analysis (DEA) is one of the most widely used nonparametric efficiency assessment methods in empirical research. Using DEA, the relative efficiency of peer Decision Making Units (DMUs) – the entities responsible for converting inputs into outputs and whose performances are to be evaluated can then be estimated. Farrell (1957) presents a single input-output productive efficiency model, which Charnes, Cooper & Rhodes extend in 1978 to incorporate multiple inputs and outputs in what has come to be known as the CCR model (Charnes et al., 1978). CCR depicts technical efficiency, under an assumption of Constant Returns to Scale (CRS). The efficiency measure obtained here is the Overall Technical Efficiency (OTE). The direct implication of the CRS assumption is institutions are analyzed assuming they operate on the most productive scale or under optimal conditions. Because most firms or DMUs as applies in DEA will not operate under optimal conditions due for example to imperfect markets and different institution-specific contexts and their respective effects like age, size, and management quality as CRS requires, the need for a model which caters for sub optimality, namely firms operating under Variable Returns to Scale (VRS) is necessary. The Banker, Charnes & Cooper (BCC) model modifies the CCR model by applying this more realistic assumption of VRS wherein each DMU is allowed to exhibit different returns to scale (Banker et al., 1978). By estimating efficiency under the VRS

assumption (termed here the Pure Technical Efficiency PTE), each DMU will be compared to similarly-sized DMUs that have a similar return to scale. Technical efficiency scores from the BCC model (PTE) are thus greater than or equal to technical efficiency (OTE) scores from the CCR model, since the efficiency scores of respective DMUs are computed relative to an often smaller number of DMUs (Thanassoulis, 2001). The ratio of OTE and PTE which shows the institution's ability to choose the optimum scale of its operations gives the Scale efficiency (Coelli et al., 2005).

Two important considerations usually are made in applying DEA for efficiency analysis. Both influence the choice of inputs and outputs and thus the results of the analysis with respect to computing the efficiency of respective DMUs. These include the choice between the production and intermediation approaches, and the input and output orientations. Literature on efficiency studies relating to financial intermediation has often differentiated between two main approaches - the production and intermediation approaches, the difference between the two premised on conceptual interpretations on what a financial institution does (Berger and Mester, 1997). When financial institutions are viewed as production units utilizing relevant factors of production like labour and capital to produce outputs like deposits and loans, the result is the production approach (Haq et al., 2009). When financial institutions are viewed on the other hand as intermediaries transferring financial assets like deposits and other loanable funds from surplus- to deficit-spending units via outputs like loans, the result is the intermediation approach (Athanasopoulos, 1997). A standout example of the influence of the approach on the choice of inputs and outputs is deposits, which represent an output in the production approach, but an input in the intermediation approach.

A final consideration in the application of DEA in efficiency analysis relates to the orientation, a choice between cost minimization with respect to inputs, or outcome maximization with respect to outputs. These respectively give rise to the input and output orientations. In the input oriented model, outputs are kept constant while the DMU proportionally reduces its inputs to find the combination that best minimizes its input costs to attain the set level of outputs. In the output orientation on the other hand, inputs are kept constant while the level of outputs or output combinations is proportionally increased to find the maximum possible level of these outputs. More explicitly, a DMU is efficient in the output-oriented approach if no other observed DMU can provide a better productive bundle, while a DMU is efficient in the input-oriented approach if no other observed DMU can operate on lower input costs.

5.2.2. Theoretical framework on culture and Microfinance efficiency

Different microfinance legal forms have different commercial orientations and may thus be subject to different regulation. NPOs and are generally more socially oriented, while FPOs usually have a clear financial mandate. Therefore as suggested by literature, NPOs should attain higher levels of social

performance in comparison to FPOs (Amin et al., 2018). Given this different focus, product/service offerings and strategies applied in reducing information asymmetry may differ with the different ownership forms (Tchakoute-Tchuigoua, 2010; Servin et al., 2012). Consequently their risk-taking propensity, funding, operating and related transaction costs may be different. Culture has a direct effect on financial intermediaries as a whole through its effect on the cost of information asymmetry reduction. It may thus be more logical to argue that the effects of culture on MFI performance may differ from one ownership form to another. By owning firms for example as in the case of MOFs, Hansmann (1988) suggests that customers have an influence over firm operations. The cost of reducing asymmetry in MOFs should then be lower than with NPOs and SHFs which are externally owned. This makes even more of a case when regulation, governance and related monitoring costs of the different forms are concerned. Culture determines how much risk both management and clients can take. How much risk they actually take depends on the ownership form of the MFI and this determines the level of monitoring. Empirical literature suggests that SHFs are better governed and thus perform better than MOFs and NGOs (Tchakoute-Tchuigoua, 2010). Better governed MFIs will achieve higher outreach, as they will operate in keeping with the dual mandate of Microfinance, or its specific social objective. As Merritt (2000) says, national culture impacts the behaviour of senior-level workers beyond the level of professional factors. Due to lower governance, managerial discretion is higher in NGOs (Galema et al., 2012), and employees have higher bargaining power in big MOFs (Desrochers & Fischer, 2005). NGOs and MOFs will thus take higher risks, while SHFs will take much lower risk. Where there is higher social capital, such risk taking is facilitated, since there are more cost-effective monitoring, control and enforcement mechanisms through different social groups in such societies. The effect of culture on performance of MFIs will thus differ with respect to ownership form, given all these differences highlighted, including that of governance quality and managerial discretion.

5.2.3. Evidence: Microfinance efficiency and its determinants

Studies on efficiency assessment and determinants abound in the financial industry, especially in relation to financial institutions. A lot of such studies have related to the efficiency of commercial banks. Microfinance efficiency only recently peaked in interest among researchers. Variables hypothesised so far to determine Microfinance efficiency relate mainly to MFI-specific characteristics like age, size, portfolio quality, funding structure, loan sizes, and governance with respect to board composition (Pal, 2010; Oteng-Abayie et al., 2011; Ferdousi, 2013; Abdulai & Tewari, 2016; Efendic & Hadziahmetovic, 2017; Kar & Deb, 2017; Wijesiri et al., 2017; Bibi et al., 2018; Adusei, 2019); and macroeconomic environment like the wealth and financial sector development of the country of operation (Hermes et al., 2009; Bibi et al., 2018; Adusei, 2019). Though literature on culture as a potential determinant of performance and

efficiency in the finance industry is scarce, culture has in fact been proven to explain a number of financial and economic outcomes in empirical research. The relationship between trust – a culture measure – and economic and financial outcomes is clearly depicted by Knack & Keefer (1997), who find trust to be associated with higher economic performance. Additionally, Knack & Keefer (1997) find trust to be higher in countries with strong formal institutions which effectively protect property rights, and in countries with lower inequality or polarization along class or ethnic lines. On the subject of ethnic diversity, Easterly & Levine (1997) blame high ethnic diversity for the underdeveloped nature of financial sectors in Sub-Saharan Africa, relating this again to trust. Renneboog & Spaenjers (2012) contend that religion influences financing decisions like the individual decisions to save in formal financial institutions. Due overall to lower risk aversion, less religious countries are found to have higher levels of banking sector development than more religious ones (Beck et al., 2003a). A similar finding on individual financing decisions like the decision to save is made by Stulz & Williamson (2003) who empirically prove that culture as depicted by uncertainty avoidance affects resource allocation by individuals, including the decision to save. Still in relation to uncertainty avoidance, Kwok & Tadesse (2006) find financial systems in countries with higher uncertainty avoidance to generally be more bank-based; while Dutta & Mukherjee (2011) find countries with high uncertainty avoidance to have generally poorer developed financial systems.

Institution-specific determinants

Using MFI data of 2010, Wijesiri et al. (2015) assess the technical efficiency of 36 MFIs in Sri Lanka using a two-stage DEA approach, namely a Bootstrap DEA to estimate efficiency in the first stage followed by the use of double bootstrap truncated regression approach. Three inputs and two outputs are used in the DEA estimations, namely total assets, number of credit officers, and cost per borrower; and financial revenue and number of female borrowers respectively. Findings indicate that most MFIs in Sri Lanka are financially and socially inefficient, and that age, and capital-to-assets ratio are crucial determinants of efficiency. Precisely, a positive relationship is found between age and efficiency, but only with respect to financial efficiency however. In other words, while older MFIs perform better than younger ones on achieving financial objectives, these same older MFIs are relatively inefficient in achieving social objectives. This may be because some MFIs transform into different legal forms as they age, a process which comes with added pressures relating to the needs of often more diversified product and service offerings, and even owners. Similar results relating to age are found by Wijesiri et al. (2017). Oteng-Abayie et al. (2011) focus on the economic efficiency of Ghanaian MFIs, and use a Cobb-Douglas stochastic frontier model on a sample of 135 MFIs between 2007 and 2010, followed by a Tobit regression to identify the determinants of efficiency. Findings indicate an average efficiency of 56.29%, with age, cost per borrower, and savings all significantly affecting this efficiency. The finding of a

positive relationship between age and economic efficiency seen in Oteng-Abayie et al. (2011) and Wijesiri et al. (2015, 2017) is sharply contrasted in Hermes et al. (2009) and Widiarto & Emrouznejad (2015) who find older MFIs to be generally less efficient. This may be because younger MFIs may benefit from more recent knowledge on Microfinance practice, or even a successful proven business model from their older counterparts. On the other hand however, the effect of experience and existence of a learning curve effects cannot be downplayed in the Microfinance sector. The effect of age on efficiency thus remains inconclusive.

Using a Cobb-Douglas stochastic cost frontier model, Abdullai & Tewari (2016) assess the cost efficiency of MFIs operating in 10 Sub-Saharan Africa (SSA) countries from 2003-2013 and the factors that drive this efficiency. A total of 619 observations are used. Following an intermediation approach under input orientation, the authors find a high level of inefficiency among sampled MFIs in SSA. Much of this inefficiency relates to the high personnel and related operating costs of MFIs in the region. The main determinants of the resulting computed efficiencies are total assets (relating to economies of scale), operating expense to assets ratio, average loan balance per saver, the percentage of female borrowers, and borrowers per staff member. Using SFA, Aiello & Bonanno (2015) assess the cost efficiency of mutual cooperatives in Italy from 2006-2011 and their determinants. Findings indicate a positive relationship between size, income diversification, and cost efficiency; and a negative relationship between loan diversification, the amount of leverage or indebtedness with respect to the capital structure, and cost efficiency. Similar positive results relating to size and efficiency are found by Hartarska et al.(2012), again in the specific case of cooperatives using data on 216 cooperative MFIs from 41 countries for the period 2003-2010, and estimations via a system of equations; and by Wijesiri et al. (2017) using 2013 data on 420 MFIs operating in different developing regions, and estimations via DEA with two inputs and four outputs respectively, namely Operating expenses, Total number of employees; and Gross loan portfolio, Financial revenue, Standardized average loan balance (inverse value), and Number of active borrowers. Using Operating expenses and Number of staff as inputs, and Gross loan portfolio and Number of active borrowers as output measures, Ferdousi (2013) uses DEA to assess the efficiency of MFIs in Bangladesh, China, and India. Findings indicate that efficiency results depend on the method used – CRS or VRS, with Bangladesh for example being more efficient under VRS but less efficient than India and China under CRS. A positive relationship is equally found between the size and efficiency of MFIs. Similar results relating to size and efficiency of MFIs are found by Adusei (2019), using 2010–2014 data on 418 MFIs located in 64 countries. Equity, borrowings, and number of loan officers are used as inputs in thus study, while Number of loans outstanding, Gross loan portfolio, and Number of active borrowers serve as outputs. DEA is used for the efficiency measurement. Adusei (2019) equally finds MFI efficiency to be influenced by the gender diversity of boards. A negative relationship is found,

implying boards with more women are less efficient. Sharply contrasting results relating to efficiency and MFI size are however found in Efendic & Hadziahmetovic (2017), who analyze the efficiency of MFIs in Bosnia and Herzegovina via DEA using secondary data for the period 2008 – 2015. Precisely, smaller MFIs prove to be more efficient than larger ones. Two inputs and four outputs are used in this input-oriented CRS and VRS study, namely number of employees and total assets for the inputs, and financial revenue, Gross loan portfolio (Financial efficiency) and Number of Active borrowers (Social efficiency) for outputs. Findings also indicate that MFIs in the country obtain better financial efficiency than they do social efficiency.

Using data on 41 Indian MFIs from 2005-2009, Singh et al. (2013) assess the efficiency of MFIs in the country. As inputs, the authors use the number of personnel as a proxy for labour and cost per borrower as a proxy for expenditures. Gross Loan Portfolio serves as the only output. A financial intermediation approach is applied under both CRS and VRS assumptions, and both input- and output-oriented orientations. Findings indicate that MFIs in the study group are relatively inefficient, with such efficiency determined by size (positive under all assumptions but only significant under CRS), borrowers per staff (positive and significant under CRS and VRS), capital structure proxied by the debt-equity ratio (negative on all assumptions but only significant under SE), and financial performance proxied by ROA and OSS (positive under all assumptions but only significant under SE). An earlier study by Pal (2010) on MFI efficiency in different regions of India reveals similar efficiency determinants, namely the Borrowers per staff, Size of the MFI, and Capital structure. While a positive relationship is found between the former two variables and efficiency under both CRS (TE) and VRS (PTE) assumptions and Scale efficiency, the results are mixed for the latter variable with a positive relationship found only for Scale efficiency suggesting that bigger MFIs will only achieve scale efficiency, but less (pure)technical efficiency. Inputs utilized in this joint input- and output-oriented production approach study include credit officers as a proxy for labour and the cost per borrower as a proxy for expenses; and three year average portfolio outstanding for financial years ending 2007, 2008 and 2009 respectively. Findings similar to those of Singh et al. (2013) relating to the sustainability of an MFI, proxied by Operational Self-Sufficiency (OSS) are reported in Kar & Deb (2017), who use data on 31 Indian MFIs from 2009 – 2015, and both an input-oriented BCC model and output oriented-Undesirable Measure Model (UMM) to assess the technical efficiency of Indian MFIs. Inputs here include Operating expenses and Number of employees; while outputs include Gross Loan Portfolio, Number of Active Borrowers, and Portfolio at risk over 30 days.

Macroeconomic determinants

Hermes et al. (2009) measure the efficiency of MFIs using data on 435 MFIs over the period 1997-2007, and applying SFA. The authors hypothesise that such efficiency will depend on the extent of financial market development in respective countries. While well developed financial markets could provide an

environment wherein MFIs can flourish and thus increase their efficiency, such markets may also provide substitutes for Microfinance services which then reduces their demand and thus their efficiency. Four measures of financial market development are used in the study, namely total liquid liabilities to GDP ratio, lending minus borrowing interest rate (Spread), total domestic credit provided by banks to GDP ratio; and total domestic credit to the private sector to GDP ratio. Findings indicate that MFIs are more efficient in countries with more developed financial systems. This the authors explain may be due to higher competition in the microfinance sector, including with established commercial banks which induces MFIs to become more cost efficient. Upon assessing the cost efficiency of cooperatives in Italy, Aiello & Bonanno (2015) find a positive relationship between market concentration, demand density, and cost efficiency; while a negative relationship is found between credit quality expressed as the ratio of bad loans to total loans, the level of economic development proxied by income per capita, and cost efficiency.

MFI legal form and efficiency

Empirical evidence reveals the importance of an MFI's legal form or ownership type on its efficiency. Mersland & Strom (2009) for example show, upon comparing the ownership-cost of shareholders firms (SHFs), non-profit organizations (NPOs), and cooperatives (COOPs) involved in microfinance that NGOs and COOPS have better cost efficiency due to their potentially higher use of innovative lending methodologies like group lending which greatly facilitate the reduction of information asymmetry. Using a sample of 315 MFIs operating in 18 Latin American countries over the period 2003 - 2009, Servin et al. (2012) assess the technical efficiency of different MFI legal forms using SFA. Findings indicate that NGOs and COOPS are less efficient than their commercially-oriented counterparts (Banks and NBFIs), and are thus more wasteful in their use of resources. This as the authors explain may be due to a lower use of technology by socially-oriented MFIs than the commercially-oriented ones, due partly to their social focus implying the targeting of poor clients who often are uneducated and in rural areas, and funding constraints. In sharp contrast to the findings of Servin et al. (2012), cooperatives are found to be more financially and socially efficient by Tchakoute-Tchuigoua (2010), Abate et al. (2014), and Marwa and Aziakpono (2015). Tchakoute-Tchuigoua (2011), analyzing a sample of 94 MFIs in SSA from 2001 to 2005, finds cooperatives to be more financially-efficient than private MFIs and NGOs but shows no significant difference among the MFI ownership types in terms of profitability. These findings indicate the importance of ownership type for technical efficiency. Meanwhile Hassan & Sanchez (2009) find higher technical efficiency with formal MFIs, namely SHFs and Cooperatives than non-formal MFIs, namely NPOs. Using DEA on a sample of 403 MFIs from 80 medium and low income countries in six different geographical areas, namely Sub-Saharan Africa (SSA), Latin America and the Caribbean (LAC), Eastern Europe and Central Asia (ECA), the Middle East and North Africa (MENA), East Asia and the Pacific (EAP), and South Asia (SAS), Gutierrez-Goiria et al. (2016) assess the social efficiency of MFIs

of different legal forms in 2012. Findings here indicate NGOs and NBFIs achieve higher social efficiency than other MFI forms. Additionally, no trade-off is found between social and economic efficiency suggesting MFIs can pursue both objectives concurrently. MFI Banks are proven to achieve the least social and economic efficiency among all MFI forms. Legal status, size, age, and average loan balance are found to affect this efficiency. Interestingly, smaller and younger MFIs achieve better efficiency measures than larger and older ones. Using 2004 data on 39 MFIs consisting 13 bank MFIs, 8 NBFIs, 6 cooperatives/credit unions MFIs and 11 NGO-MFIs, and 1 other non classified MFI from the Mix Market, Haq et al. (2009) estimate the efficiency of MFIs operating in Africa, Asia and Latin America. Their study cuts across both production and intermediation approaches to efficiency measurement as is commonly applied in financial intermediation using both input and output orientations. In the production approach, utilized inputs and outputs respectively include labour, cost per borrower and cost per saver; and savers per staff member and borrowers per staff member. Meanwhile in the intermediation approach, number of personnel and operating expenses are considered as inputs while gross loan portfolio and total savings make up the outputs. Estimated efficiency results from both the CRS and VRS assumptions in the intermediation approach suggests that COOPS are the most efficient MFI form followed by bank-MFIs and then NGO-MFIs. Banks however are just slightly more efficient than COOPs in an output-oriented intermediation approach. As further evidence that the orientation may be important in efficiency analysis, NGOs become the most efficient MFI form when the production approach is concerned, followed by COOPs. Bank MFIs are least efficient under this approach. In their conclusion, the authors suggest that NGO-MFIs should be promoted in developing regions. Meanwhile, Bank MFIs should be promoted under an intermediation approach, especially under output-orientation as they could be most efficient under these circumstances. Using data between 2009 and 2010 on 231 MFIs in three regions, namely MENA, EAP and SAS, Widiarto & Emrouznejad (2015) assess the efficiency of Islamic MFIs using DEA. The authors find that conventional MFIs outperform their Islamic counterparts on both financial and social efficiency estimates. Additionally, not-for-profit MFIs are found to be more socially efficient than their for-profit counterparts. The results for financial efficiency however are inconclusive, and do not necessarily support the popular hypothesis that for-profit MFIs achieve better financial performance. A total of four inputs and four outputs are used in this study – Assets, Operating expenses, Portfolio at risk over 30 days, and Employees; and Financial revenue, Average loan balance per Borrower over GNI per capita (in Inverse form), and Number of borrowers.

5.2.4. Hypothesis

From the literature reviewed so far, we would expect socially-oriented MFIs like NGOs and cooperatives to be more socially efficient than for-profit, commercial organizations like Banks and NBFIs since the

social objective is at the core of their existence and mission (Morduch, 1999). In contrast, NGOs will have lower financial efficiency as compared to commercially driven organizations who base their operations on how much profits they can generate (Hermes & Hudon, 2018). Two clear schools of thought emerge however – the first which considers Cooperatives as the ideal MFI form (Tchakoute-Tchuigoua, 2011; Bezboruah & Pillai, 2015; Araújo da Costa, 2017), and the second which considers for-profit MFIs as the ideal or most effective and efficient MFI form (Fernando, 2004; Servin et al., 2012). We however hypothesise that the validity of either of these claims lies in the specific culture in which the MFI operates. Using Hofstede’s cultural dimensions, the following hypotheses are developed:

Hypothesis 1: Socially-oriented MFIs (Non-Profit Organisations or NPOs) will be more efficient than their commercially-oriented counterparts (For-Profit Organisations or FPOs) on both financial and social measures in high power distance cultures

Hofstede (1984, pp. 98) posits that high power distance cultures are characterized by higher inequality, conformity with rules, and respect for hierarchy. The direct effect of this is innovation may be stifled, and social trust may be reduced through increased fractionalization of society (Bjornskov, 2008; Mihet, 2013). Hofstede (1984, pp. 98) further observes that “inequality in power and inequality in wealth go hand in hand”. As opined in Zins & Weill (2016) and Demirgüç-Kunt et al.(2018), formal financial services often discriminate on the bases of income. Such discrimination on income basis is likely to be heightened in commercially-oriented MFIs given their profit incentive. A larger population of poor and financially excluded individuals results in such cultures, a client base which social MFIs are best positioned to serve, and more cost effectively too using advantages of better embeddedness like social capital.

Hypothesis 2: Both FPOs and NPOs will be financially efficient in individualistic cultures. However, FPOs will achieve better social efficiency than NPOs in these cultures.

In *more individualistic cultures*, individual achievements are prioritized. Thus innovative lending methodologies applied in microfinance like group lending are less likely to succeed due generally to lower social capital. MFI forms which rely on methodologies like group lending are less likely to succeed in such cultures. In cases where MFIs in individualistic cultures employ the group lending methodology, Fogel et al. (2011) and Postelnicu & Hermes (2018) argue that better quality groups can be formed as people in such cultures trust strangers more and will be more willing to join groups on strict economic as opposed to social considerations. The cost of reducing information asymmetry will thus be lower as a result of high trust and higher quality groups in these cultures. Both MFI forms will thus be financially efficient as a result of these lower costs. Despite this lower cost, commercially-oriented MFIs can still charge higher rates and fees. They can thus operate more profitably than social MFIs. Due to the higher

quality of groups, group sizes may be smaller and again favour commercially-oriented MFIs, as higher trust in strangers makes social capital less important in individualistic contexts.

Hypothesis 3: NPOMFIs will be more efficient than their financially-oriented FPO counterparts on both financial and social aspects in masculine cultures.

People in masculine cultures tend to exhibit opportunistic tendencies (Zheng, 2012). Due to this opportunism reflected in the prioritization of personal achievement and success, masculine cultures promote more risk-taking as opposed to feminine cultures which cater more for society. Bigger loans can thus be granted in masculine cultures, typically suiting commercial entities with their profit incentives. However, higher risk taking may necessitate more prudence on the part of the service provider. Information and monitoring costs may thus be higher, and as commercial MFIs are often less embedded in local contexts, they may not be able to use innovative cost-reduction strategies like those provided for in social capital.

Hypothesis 4: NPO MFIs will be more financially and socially efficient than their commercially-oriented counterparts in high uncertainty avoidance cultures. NPOs will however be less socially efficient than FPOs here.

Fogel et al. (2011) argue that people in high uncertainty avoidance cultures prefer rules, and more formality in financial contracts. More formal or less embedded MFI forms like SHFs will thus be preferred over their more embedded or less formal counterparts, namely socially-oriented MFIs. Also, Zainuddin et al. (2020) posit that high uncertainty avoidance will result in better business planning and lower risk-taking on the demand side implying better quality (micro)enterprises to whom MFIs can extend bigger and more profitable loans. Theoretically however, the cost of reducing information asymmetry will be higher in such cultures as MFIs will be more prudent in the provision of services like credit. While NPOs may not meet many clients in such cultures, they will be better placed to reduce information asymmetry and related transaction costs using social capital.

Hypothesis 5: Both FPO and NPO MFIs will be financially efficient in long term-oriented cultures. Social MFIs will however be less socially efficient than their financial counterparts.

Manos & Tsytrinbaum (2014) posit that long-term oriented cultures are characterised by higher trust, and are more inclusive in their policies. People in high trust cultures will also be more willing to interact with strangers, resulting in higher social capital. The cost of reducing information asymmetry will be reduced as a result of higher trust, and this will be favourable for both commercially- and socially-oriented MFIs. However, Kwok & Tadesse (2006) argue that people in long-term oriented cultures create more sustainable enterprises and think longer term, and may thus have bigger loan needs. Commercially-oriented MFIs will be more suited to serving such clients, and at relatively low costs due to a lower risk of

loss resulting from higher trust. Such MFIs may as a result of this bigger client base and lower costs operate with higher social efficiency.

Hypothesis 6: Both FPOs and NPO MFIs will be financially efficient in indulgent cultures. However, FPOs will be more socially efficient than their social counterparts in these cultures.

In more indulgent cultures, people will be more willing to contract credit due to more impatience or a higher present-bias which Meier & Sprenger (2007) argue favours credit use. The risk of non-repayment may however be higher here as the likelihood for misuse of funds is elevated. Socially-oriented will find it less costly to reduce these costs, as they can rely on social capital due to their higher level of embeddedness in local contexts. However, where credit needs are bigger, commercially-oriented MFIs will be preferred. Where the cost of providing financial services can be passed on to clients through higher interest, commercially-oriented MFIs will operate with a relatively high level of financial and social efficiency.

The hypotheses discussed above are summarised in Table 5.1 below.

Table 5.1: Summary of hypotheses

<i>Culture measure</i>	<i>*FE and Orientation</i>		<i>*SF and Orientation</i>	
	<i>Commercial (FPO)</i>	<i>Social (NPO)</i>	<i>Commercial (FPO)</i>	<i>Social (NPO)</i>
Power distance	-	+	-	+
Individualism/Collectivism	+	+	+	-
Masculinity/Femininity	-	+	-	+
Uncertainty avoidance	-	+	+	-
Long/short term orientation	+	+	+	-
Indulgence/Restraint	+	+	+	-

This table summarises the hypotheses on culture and efficiency discussed above. *FE represents Financial efficiency, and SE represents Social efficiency.

5.3. Methodology

5.3.1. Datasets

Data relating to inputs and outputs for the efficiency analysis of the MFIs under study is obtained from the Mix Market database, currently available in the data catalogue of the World Bank. Founded in 2002, the Mix Market contains data on over 2000 Financial Service Providers (FSPs) operating in over 100 countries across the world. FSPs are rated through a 'diamond' system from 1 – 5 to indicate their frequencies of reporting and levels of disclosure. 4 and 5 diamond FSPs have more complete and audited financial statements over a period of at least two consecutive years, and thus the most reliably reported information. Mix Market data has been widely used in Microfinance research as seen in Wijesirira et al. (2015, 2017), and Elkhuizen et al. (2018) among others. The study covers the period 2012 to 2018, a total of 7yrs. This study period is chosen firstly to fully isolate the effects of the global financial crisis of 2008

–2010 on risk-taking in the financial services industry, and secondly due to the availability of more complete MFI data on the MIX database, considering that a lot of MFIs in the earlier years of the MIX database’s creation only reported partial performance figures. Sampled MFIs in this study represent those with at least 5yrs data over the study period. In countries like India where data on MFIs abound, only 4 and 5-diamond MFIs were retained. With respect to the countries under study, the choice is made on the basis of availability of culture data on all six of Hofstede’s cultural dimensions, the culture database used in this study. A number of datasets on cultural measures exist, most of which are survey-based. Among these are the Hofstede (1983) and Schwartz (1994) cultural dimensions, GLOBE project of House et al. (2004), and the World Values Survey (1980 – 2014). Hofstede’s database is used in this study, as more countries are represented therein than in other databases, especially developing countries, and the database has a well-defined and comprehensible set of culture measures. On a whole, the final dataset comprises 468 MFIs from 44 countries. Table 5.2 presents the countries and regions under study.

Table 5.2: Regions and countries under study, and number of MFIs in each

Country	Region	MFIs	Country	Region	MFIs
Albania	ECA	4	Jordan	MENA	4
Angola	SSA	1	Kazakhstan	ECA	9
Argentina	LAC	5	Lebanon	MENA	1
Armenia	ECA	9	Macedonia	ECA	4
Azerbaijan	ECA	16	Mexico	LAC	32
Bangladesh	SAS	30	Moldova	ECA	3
Bolivia	LAC	18	Montenegro	ECA	2
Bosnia & Herzegovina	ECA	13	Morocco	MENA	7
Brazil	LAC	12	Mozambique	SSA	6
Bulgaria	ECA	10	Nigeria	SSA	11
Burkina Faso	SSA	7	Pakistan	SAS	27
Chile	LAC	2	Peru	LAC	18
China	EAP	6	Philippines	EAP	24
Colombia	LAC	14	Romania	ECA	6
Dominica Republic	LAC	8	Russia	ECA	8
Egypt	MENA	6	Serbia	ECA	4
El Salvador	LAC	6	South Africa	SSA	2
Georgia	ECA	9	Tanzania	SSA	7
Ghana	SSA	9	Turkey	ECA	1
India	SAS	77	Ukraine	ECA	2
Indonesia	EAP	6	Vietnam	EAP	14
Iraq	MENA	3	Zambia	SSA	5

Notes: This table indicates countries represented in the study and the number of MFIs in each. The LAC and SAS regions have the highest number of MFIs in the sample.

5.3.2. Model, variables and estimation

DEA is applied in this study for the measurement of efficiency. DEA sketches a production possibilities frontier (data envelope or efficient frontier) using combinations of inputs and outputs from production or decision making units (DMUs). The "best practice frontier" DMUs are assigned an efficiency score of one and are deemed technically efficient compared to their peers. The distance of each 'inefficient' DMU from the frontier indicates its efficiency. This usually will be between 0 and 1, with larger scores (closer to 1) indicating higher efficiency. The choice of DEA is based on several reasons. First, the DEA model is able to incorporate multiple inputs and outputs easily. Thus, DEA is particularly well-suited for efficiency analysis of MFIs as it considers multiple inputs and produces multiple outputs such as alleviating poverty and achieving sustainability. Second a parametric functional form does not have to be specified for the production function, thus making DEA less complex to use.

As indicated earlier in Section 5.2, the efficiency of a firm in simple terms translates to the ratio of its outputs to inputs. If we denote inputs and outputs for respective DMUs as x and y , then mathematically, the efficiency of an MFI can be written as:

$$\theta_k = \frac{\sum_{r=1}^s u_r y_{rk}}{\sum_{i=1}^m v_i x_{ik}}$$

where y_{rk} is the quantity of the r -th output produced by the k -th DMU, x_{ik} is the quantity of i -th input used by the k -th DMU, and u_r and v_i are the output and input weights respectively. The DMU maximises the Technical efficiency θ_k , subject to

$$\theta_k = \frac{\sum_{r=1}^s u_r y_{rk}}{\sum_{j=1}^n v_j x_{jk}} \leq 1, \text{ where } u_r \text{ and } v_i \geq 0$$

Based on this equation, the technical efficiency of a DMU cannot exceed 1. Additionally, the output and input weights are positive. By using the linear programming specification below as explained by Coelli (1998), the optimal weights u_r and v_i can be selected:

$$\theta_k^* = \text{Max } \theta_k$$

Subject to

$$\sum_{k=1}^n \lambda_k y_{rk} \leq \theta y_{rk} \quad r = 1, \dots, s$$

$$\sum_{k=1}^n \lambda_k x_{ik} \geq x_{ik} \quad i = 1, \dots, m$$

$$\sum_{k=1}^n \lambda_k = 1$$

$$\lambda_k \geq 0 \quad k = 1, \dots, n$$

where θ is the output efficiency score of k -th DMU, x_{ik} represents input vectors for DMU _{k} , y_{rk} represents output vectors for DMU _{r} , and $\sum_k^n \lambda_k = 1$ is the convexity constraint for λ_k under the VRS assumption, which ensures that a DMU is only compared to similarly-sized DMUs with similar return to scale. Again as explained by Coelli (1998), the input-oriented model can be expressed mathematically as:

$$\phi_k^* = \text{Min } \phi_k$$

subject to

$$\sum_{j=1}^n \lambda_j x_{ij} \leq \phi_k x_{ik} \quad i = 1, \dots, m$$

$$\sum_{j=1}^n \lambda_j y_{rj} \geq y_{rk} \quad r = 1, \dots, s$$

$$\sum_{k=1}^n \lambda_k = 1$$

$$\lambda_k \geq 0 \quad k = 1, \dots, n$$

where ϕ is the cost efficiency score of k -th DMU. Efficiency computations under the Constant Returns to Scale (CRS) assumption yield Overall Technical efficiency (OTE), often simply referred to as Technical efficiency (TE), while those under the assumption of Variable Returns to Scale (VRS) result in Pure technical efficiency (PTE). Farrell (1957) defines OTE (or simply TE) as the ability of a producer to eliminate waste of resources by producing as much output as input usage allows, or by using as little inputs as output production allows. OTE embodies two elements. These include PTE, which exclusively indicates the firm's input/output configuration, not taking the firm's size into consideration; and SE which indicates the size of the firm, essentially relating to economies of scale and its benefits.

Irrespective of the choice of assumption between CRS and VRS, computed DMU efficiency scores can be heavily influenced by the number and choice of inputs and outputs, the choice of approach between production and intermediation approaches, and the choice of orientation between input and output orientations. Marwa & Aziakpono (2015) for example support the use of an input-oriented approach in their efficiency study on the grounds that an MFI has better control over its inputs than it has over outputs which are greatly determined by external environmental factors. Hartarska et al. (2007) equally justify using the input orientation on the grounds that all MFIs irrespective of form strive to minimize cost, but not all MFIs seek to maximize profit or some related outcome. An input-oriented approach is thus applied in this study. The efficiency of 468 MFIs is estimated by assuming both CRS and VRS under an intermediation approach. The computed technical efficiency of each DMU is the distance of the DMU to the efficient 'frontier'.

Inputs and outputs

Following previous literature on efficiency measures in microfinance, three inputs and five outputs are used in this study. Table 5.3 below indicates the respective inputs and outputs. We construct two DEA models using the same inputs but different output measures to estimate the financial and social efficiency of MFIs. Commonly used in efficiency analysis studies, Operating expenses, Total assets, and Number of loan officers feature prominently as some of the inputs in the studies of Gutiérrez-Nieto et al. (2007), Wijesiri et al. (2015, 2017). The output variables on the other hand capture the MFI's dual objectives of financial sustainability and poverty outreach, with Gross loan portfolio and Financial revenue representing financial outputs, and Number of active borrowers (NAB), Number of loans outstanding (NLOUT), and Average loan balance (ALB) representing social outputs. NAB and NLOUT are proxies for breadth of poverty outreach, while ALB is a measure of depth of outreach. The choice of NAB, NLOUT, and ALB as outputs is in line with efficiency studies of Ferdousi (2013), Efendic & Hadziahmetovic (2017), Widiarto & Emrouznejad (2015), Wijesiri et al. (2017), and Adusei (2019); while gross loan portfolio and financial revenue as output measures used here to construct the financial model follows the approaches of Gutierrez-Niétó et al. (2007), Piot-Lepetit & Nzongang (2014), and Wijesiri et al. (2015). All financial variables are measured in US Dollars (US\$).

Table 5.3: DEA Inputs and Outputs

<i>Variable</i>	<i>Notation</i>	<i>Description/Computation where applicable</i>	<i>Data source</i>
<i>A. DEA Inputs and Outputs</i>			
Number of loan officers	NLO	Headcount of the number of loan officers	MIX
Operating expenses	OPEXP	Financial revenue/(Financial expense + Operating expense)	MIX
Total assets	TA	Total assets of the institution (current and fixed)	MIX
Gross loan portfolio	GLP	Total value of loans generated by activities	MIX
Financial revenue	FREV	Revenue from lending activities (interest and fee income)	MIX
Number of active borrowers	NAB	Headcount of the number of active borrowers	MIX
Number of loans outstanding	NLOUT	Total number of loans to be repaid	MIX
Average Loan Balance	ALB	Gross loan portfolio/Number of borrowers	MIX

Notes: This table indicates input and outputs used in the DEA efficiency analysis. A total of three inputs and outputs each is used, with two outputs relating to financial performance and two being social.

In line with Pal (2010), seven year averages are used for respective inputs and outputs, precisely covering the period 2012 – 2018 in computing the efficiency scores. Because DEA results are often influenced by the size of the sample, two rules provided in DEA literature are used to ensure the statistical power of DEA models on the basis of the sample size. These can be jointly expressed as:

$$n \geq \max\{m * s; 3(m + s)\}$$

where n is the number of DMUs, m is the number of inputs and s is the number of outputs (Cooper et al., 2007). In other words, the sample size should be greater than or equal to product of inputs and outputs; and the number of observations in the data set should be at least thrice the sum of the number of input and

output variables. Given $m = 3$ and $s = 3$, the sample size $n = 468$ used in the present study exceeds the desirable size as suggested by the above mentioned guidance to obtain sufficient discriminatory power.

Computed DEA efficiency scores are used as the dependent variable in the second stage analysis wherein the determinants of efficiency in the microfinance industry is assessed using a Tobit model of the following specification:

$$y_i = \begin{cases} y_i^* & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases}$$

$$y_i^* = \beta x_i + u_i, \quad u_i \sim N(0, \sigma^2)$$

where:

y is the computed DMU efficiency score from the DEA efficiency analysis (financial or social)

y^* is the latent (unobservable) variable

β is the vector of unknown parameters which determines the relationship between independent variables and the latent variable

x_i is the vector of explanatory variables

u_i is the normally distributed error term

The distribution of the efficiency scores is confined to the interval (0, 1). In the presence of this censored range of the efficiency scores obtained through DEA, the OLS regression method may yield biased and inconsistent estimates of the regression parameters, in comparison to a Tobit model, thus making the latter preferable for this study.

To understand the differences in the financial and social efficiency scores for DMUs of different forms, Culture is used. Other variables which have been found to correlate with microfinance efficiency include MFI-specific characteristics, domicile country's macroeconomic environment, and the formal institutional environment. DEA efficiency and Tobit regression results are presented in the next section.

5.3.3. Estimation results

Efficiency analysis by region and legal form

Average output-oriented financial and social efficiencies per region under both CRS and VRS assumptions are reported in Table 5.4 and Table 5.5 below. Complete DEA estimates per DMU are reported in Appendix IV, Table V.2 and Table V.3.

Table 5.4: Financial efficiency input-oriented DEA average scores per region and by legal form

<i>Region</i>	<i>N</i>	TE				PTE				SE			
		<i>mean</i>	<i>s.d.</i>	<i>min</i>	<i>Max</i>	<i>Mean</i>	<i>s.d.</i>	<i>Min</i>	<i>Max</i>	<i>mean</i>	<i>s.d.</i>	<i>min</i>	<i>max</i>
EAP	50	0.625	0.131	0.366	1.000	0.685	0.154	0.402	1.000	0.922	0.106	0.507	1.000
ECA	100	0.768	0.146	0.188	1.000	0.812	0.149	0.288	1.000	0.946	0.079	0.570	1.000
LAC	115	0.786	0.132	0.146	1.000	0.817	0.137	0.154	1.000	0.963	0.042	0.804	1.000

MENA	21	0.684	0.073	0.552	0.802	0.707	0.080	0.559	0.837	0.968	0.027	0.887	0.999
SAS	134	0.660	0.135	0.192	1.000	0.724	0.154	0.192	1.000	0.919	0.089	0.443	1.000
SSA	48	0.626	0.133	0.256	0.911	0.655	0.139	0.298	0.994	0.956	0.050	0.787	1.000
<i>Sample</i>	468	<i>0.708</i>	<i>0.149</i>	<i>0.146</i>	<i>1.000</i>	<i>0.753</i>	<i>0.156</i>	<i>0.154</i>	<i>1.000</i>	<i>0.942</i>	<i>0.076</i>	<i>0.443</i>	<i>1.000</i>
<i>Legal form</i>													
COOP	33	0.727	0.172	0.380	1.000	0.783	0.191	0.455	1.000	0.935	0.096	0.570	1.000
NGO	207	0.676	0.144	0.146	1.000	0.723	0.151	0.154	1.000	0.939	0.089	0.443	1.000
SHF	228	0.734	0.145	0.213	1.000	0.777	0.151	0.298	1.000	0.946	0.059	0.648	1.000
<i>Sample</i>	468	<i>0.708</i>	<i>0.149</i>	<i>0.146</i>	<i>1.000</i>	<i>0.753</i>	<i>0.156</i>	<i>0.154</i>	<i>1.000</i>	<i>0.942</i>	<i>0.076</i>	<i>0.443</i>	<i>1.000</i>

Notes: This table presents average DEA Financial efficiency scores under both CRS and VRS assumptions for all regions in the study, and by legal status or ownership form. An input-oriented model is used.

Based on the summary results in Table 5.4 above, MFIs in the LAC and ECA regions are the most financially efficient, while those in the EAP and SSA regions are the least financially efficient. These results hold under both CRS and VRS assumptions. Meanwhile, MFIs in South Asia are the most socially efficient based on efficiency results in Table 5.5 below, while those in the LAC and ECA regions are the least socially efficient on both CRS and VRS assumptions. The high financial and low social efficiency scores for MFIs in the LAC and ECA regions is suggestive of a trade-off between financial and social efficiency in microfinance, a subject on which prior research has yielded inconclusive results.

Table 5.5: Social efficiency output-oriented DEA average scores per region and by legal form

<i>Region</i>	<i>N</i>	TE				PTE				SE			
		<i>Mean</i>	<i>s.d.</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>s.d.</i>	<i>Min</i>	<i>Max</i>	<i>mean</i>	<i>s.d.</i>	<i>min</i>	<i>max</i>
EAP	50	0.347	0.234	0.049	1.000	0.416	0.269	0.057	1.000	0.861	0.157	0.322	1.000
ECA	100	0.238	0.225	0.053	1.000	0.270	0.257	0.055	1.000	0.909	0.118	0.492	1.000
LAC	115	0.209	0.100	0.034	0.611	0.247	0.134	0.035	1.000	0.886	0.164	0.075	1.000
MENA	21	0.271	0.185	0.065	0.956	0.279	0.185	0.068	0.962	0.963	0.038	0.842	1.000
SAS	134	0.486	0.201	0.136	1.000	0.551	0.230	0.139	1.000	0.898	0.116	0.427	1.000
SSA	48	0.322	0.237	0.066	0.988	0.362	0.266	0.068	1.000	0.903	0.076	0.664	0.997
<i>Sample</i>	468	<i>0.324</i>	<i>0.224</i>	<i>0.034</i>	<i>1.000</i>	<i>0.370</i>	<i>0.256</i>	<i>0.035</i>	<i>1.000</i>	<i>0.897</i>	<i>0.130</i>	<i>0.075</i>	<i>1.000</i>
<i>Legal form</i>													
COOP	33	0.347	0.263	0.083	1.000	0.403	0.309	0.083	1.000	0.893	0.133	0.492	1.000
NGO	207	0.362	0.228	0.049	1.000	0.415	0.254	0.068	1.000	0.885	0.128	0.322	1.000
SHF	228	0.288	0.210	0.034	1.000	0.327	0.242	0.035	1.000	0.909	0.131	0.075	1.000
<i>Sample</i>	468	<i>0.324</i>	<i>0.224</i>	<i>0.034</i>	<i>1.000</i>	<i>0.370</i>	<i>0.256</i>	<i>0.035</i>	<i>1.000</i>	<i>0.897</i>	<i>0.130</i>	<i>0.075</i>	<i>1.000</i>

Notes: This table presents average DEA Social efficiency scores under both CRS and VRS assumptions for all regions in the study, and by legal or ownership form. An input-oriented model is used.

With relatively low efficiency scores on both financial and social measures, the SSA region portrays relatively high levels of inefficiency in Microfinance practice as a whole, leaving a lot of room for improvement. As Hermes et al. (2009) suggest, MFIs located in Africa are less efficient because their macroeconomic, political and institutional characteristics are less supportive to building efficient MFIs. Across all regions, MFIs enjoy relatively high economies of scale. Much of the resulting technical inefficiency can thus firmly be attributed to pure technical inefficiency rather than to aspects of scale.

With respect to the legal form, SHFs are the most financially efficient MFI form based on results presented in Table 5.4 above. COOPs however are almost as financially efficient as SHFs, with only a slight difference recorded in the respective financial efficiencies of SHFs and COOPs. NGOs are the least financially efficient MFIs. NGOs however are the most socially efficient MFIs, followed by COOPs. SHFs are the least socially efficient MFIs, again providing evidence of a trade-off between financial and social performance of MFIs. Overall, SHFs perform better on financial efficiency measures than they do on social efficiency measures, perhaps in keeping with their more commercial orientation. The reverse is true for NGOs, which achieve far better social efficiency than they do financial efficiency, broadly in line with their more social orientation. At the crossroads lie COOPs whose ability to efficiently reach both financial and social objectives is proven in this paper. COOPs thus represent the ideal MFI form when the dual financial and social objectives of microfinance are considered. As hypothesised in this research, there is a need for MFIs to be embedded in local socio-cultural contexts to enable them reduce information asymmetry and related transaction costs which typically characterize financial contracts. By relying on a client base made up of members who usually have some common interests or relationships, COOPs are the best positioned to make use of this embeddedness which they then exploit through the resulting higher social capital. Consequently COOPs have a significantly higher ability to minimize information asymmetry, and cost of input in order to achieve their financial and social objectives.

5.3.4. Model 2: Culture and efficiency of MFIs

In this section, the potential role of culture as a determinant of MFI efficiency is explored. Table 5.6 below presents the cultural measures used in this study.

Table 5.6: Culture measures and definitions

<i>B. Explanatory variable: Culture</i>			
Power distance	PDI	Composite index ranging from 0 to 100, higher score meaning more authoritarian and bureaucratic structures	Hofstede's dimensions
Individualism/Collectivism	IDV	Composite index ranging from 0 to 100, higher score meaning more individualistic societies	Hofstede's dimensions
Uncertainty avoidance	UAI	Composite index ranging from 0 to 100, higher score meaning a higher preference for certainty	Hofstede's dimensions
Masculinity/Femininity	MAS	Composite index ranging from 0 to 100, higher score meaning a more masculine society	Hofstede's dimensions
Long term orientation	LTO	Composite index ranging from 0 to 100, higher score meaning a more future-oriented society	Hofstede's dimensions
Indulgence/Restraint	IND	Composite index ranging from 0 to 100, higher score meaning a freer or less socially restricted society	Hofstede's dimensions

Notes: This table presents Hofstede's cultural dimensions (6 in all), and their respective meanings.

Theoretically, culture should affect the level, strategies and costs of information asymmetry reduction and consequently the efficiency of MFIs. All culture measures are extracted from Hofstede's cultural dimensions database. In Table 5.7 and Table 5.8 below, respective results for the effects of culture on financial and social efficiency of MFIs, following tobit estimations are presented.

Table 5.7: Effect of culture on financial efficiency of MFIs

VARIABLES	ALL MFIs		COOPs		NGOs		SHFs	
	te_crs	te_vrs	te_crs	te_vrs	te_crs	te_vrs	te_crs	te_vrs
pdi	0.000177 (0.000628)	-0.000520 (0.000689)	-0.00612** (0.00240)	-0.00953*** (0.00245)	0.00173* (0.000928)	0.00112 (0.00102)	-0.000511 (0.000907)	-0.000813 (0.000980)
idv	0.00283*** (0.000561)	0.00255*** (0.000615)	0.00142 (0.00227)	0.00167 (0.00232)	0.00327*** (0.000836)	0.00239** (0.000921)	0.00248*** (0.000818)	0.00269*** (0.000884)
mas	0.000564 (0.000698)	0.000496 (0.000765)	0.00278 (0.00202)	0.00141 (0.00206)	-0.00119 (0.00118)	-0.00144 (0.00129)	0.00123 (0.000952)	0.00140 (0.00103)
uai	0.00269*** (0.000341)	0.00217*** (0.000374)	0.00324*** (0.00116)	0.00341*** (0.00118)	0.00196*** (0.000519)	0.000928 (0.000572)	0.00296*** (0.000512)	0.00276*** (0.000553)
lto	0.00159*** (0.000410)	0.00212*** (0.000449)	0.00613*** (0.00162)	0.00749*** (0.00165)	0.000990* (0.000550)	0.00148** (0.000606)	0.00151** (0.000706)	0.00155** (0.000764)
idg	0.00188*** (0.000317)	0.00178*** (0.000347)	0.00650*** (0.00145)	0.00657*** (0.00148)	0.00141*** (0.000475)	0.00112** (0.000523)	0.00165*** (0.000507)	0.00142** (0.000548)
Constant	0.267*** (0.0591)	0.394*** (0.0648)	0.271 (0.212)	0.571** (0.217)	0.304*** (0.0944)	0.489*** (0.104)	0.298*** (0.0837)	0.372*** (0.0905)
sigma	0.130*** (0.00424)	0.142*** (0.00465)	0.111*** (0.0137)	0.144*** (0.0140)	0.130*** (0.00641)	0.144*** (0.00706)	0.125*** (0.00584)	0.135*** (0.00632)
Observations	468	468	33	33	207	207	228	228

Notes: Tobit regression results for the effect of culture on the financial efficiency of MFIs under both CRS and VRS assumptions are presented in this table. ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

MFIs are significantly more financially efficient in individualistic, high uncertainty avoidance, long-term oriented, and more indulgent cultures. Meanwhile, MFIs are more socially efficient in individualistic and long-term oriented cultures. MFIs overall are less socially efficient in high power distance, more masculine, high uncertainty avoidance and more indulgent cultures.

Table 5.8: Effect of culture on social efficiency of MFIs

VARIABLES	ALL MFIs		COOPs		NGOs		SHFs	
	te_crs	te_vrs	te_crs	te_vrs	te_crs	te_vrs	te_crs	te_vrs
pdi	-0.00298*** (0.000922)	-0.00305*** (0.00107)	-0.00865* (0.00496)	-0.0101* (0.00572)	-0.00285** (0.00138)	-0.00269* (0.00155)	-0.00177 (0.00122)	-0.00186 (0.00145)
idv	0.00302*** (0.000824)	0.00270*** (0.000955)	0.00511 (0.00470)	0.00486 (0.00541)	0.00247** (0.00125)	0.00160 (0.00140)	0.00369*** (0.00110)	0.00387*** (0.00131)
mas	-0.00133 (0.00102)	-0.00149 (0.00119)	-0.00290 (0.00417)	-0.00532 (0.00480)	-0.00367** (0.00175)	-0.00365* (0.00196)	-9.05e-05 (0.00128)	-0.000175 (0.00153)
uai	-0.00410*** (0.000501)	-0.00476*** (0.000580)	0.00156 (0.00239)	0.00168 (0.00275)	-0.00463*** (0.000775)	-0.00553*** (0.000867)	-0.00425*** (0.000687)	-0.00478*** (0.000820)
lto	0.000940 (0.000602)	0.00127* (0.000697)	-0.000112 (0.00334)	-0.000131 (0.00385)	0.000568 (0.000821)	0.000882 (0.000919)	0.000942 (0.000948)	0.00114 (0.00113)
idg	-0.000935** (0.000465)	-0.000918* (0.000539)	-0.00211 (0.00301)	-0.00304 (0.00346)	-0.00150** (0.000709)	-0.00162** (0.000793)	-0.000439 (0.000680)	-0.000282 (0.000811)
Constant	0.804*** (0.0868)	0.902*** (0.101)	1.003** (0.439)	1.323** (0.506)	1.023*** (0.141)	1.134*** (0.158)	0.589*** (0.112)	0.656*** (0.134)
Sigma	0.191*** (0.00623)	0.221*** (0.00722)	0.230*** (0.0283)	0.265*** (0.0326)	0.195*** (0.00956)	0.218*** (0.0107)	0.168*** (0.00784)	0.200*** (0.00936)
Observations	468	468	33	33	207	207	228	228

Notes: Tobit regression results for the effect of culture on the social efficiency of MFIs under both CRS and VRS assumptions are presented in this table. ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

The results obtained above are summarised in Table 5.9 below. As the table indicates, the results largely hold for the effect of culture on both financial and social efficiency of commercially-oriented MFIs (FPOs), with the exception of those on uncertainty avoidance. For socially-oriented MFIs however, the results mostly depend on the form of the organisation, with significant differences obtained between NGOs and Cooperatives especially for the effect of culture on social efficiency. The results on socially-oriented MFIs suggest that classifying MFIs broadly on the basis of profit-orientation may be misleading, as Cooperatives have characteristics common to both for-profit and non-profit microfinance forms. In some settings, Cooperatives are even considered as semi-formal finance. Thus the level of embeddedness of different MFI forms in local socio-cultural environmental contexts is important, as this influences their ability to reduce information asymmetry and overall reduce their operating costs.

Table 5.9: Summary of results

<i>Culture measure</i>	<i>Financial efficiency</i>				<i>Social efficiency</i>			
	<i>Commercial (FPO)</i>		<i>Social (NPO)</i>		<i>Commercial (FPO)</i>		<i>Social (NPO)</i>	
	<i>Expected</i>	<i>Actual</i>	<i>Expected</i>	<i>Actual</i>	<i>Expected</i>	<i>Actual</i>	<i>Expected</i>	<i>Actual</i>
Power distance	-	-SI	+	+/-	-	-SI	+	-
Individualism/Collectivism	+	+	-	+	+	+	-	+
Masculinity/Femininity	-	+SI	+	+/-	-	-SI	+	-
Uncertainty avoidance	-	+	+	+	+	-	-	+/-
Long/short term orientation	+	+	-	+	+	+SI	-	+/-
Indulgence/Restraint	+	+	+	+	+	-SI	-	-

This table summarises the hypotheses and results on culture and efficiency of MFIs. SI represents statistical insignificance. +/- indicates the result depends on the form of the socially-oriented MFI or NPO, with clear demarcations between NGOs and Cooperatives.

Overall, MFIs irrespective of orientation will be more financially efficient in individualistic, high uncertainty avoidance, long-term oriented, and more indulgent cultures. MFIs are only socially efficient in individualistic cultures, and depending on the legal form, in long-term oriented cultures implying these two cultures present fertile grounds for efficient and sustainable microfinance operations. High power distance and masculine cultures are unfavourable for efficient microfinance operations. Depending on the form however, socially-oriented MFIs may operate more efficiently and be more suitable in these cultures. In high uncertainty avoidance and indulgent cultures, microfinance will operate with better financial but lower social efficiency, though the results on social efficiency of socially-oriented MFIs depend on the legal form (NGOs versus Cooperatives).

Power distance

Findings indicate that microfinance is inefficient in high power distance cultures. Based on the theoretical provisions in this study, microfinance will find it more difficult to harness the benefits of embeddedness in local socio-cultural contexts like soft information to reduce information asymmetry and related costs of

financial services extension. This is due to a wider gap between often strong and more formal MFI staff like loan officers and their (potential) clients, and in group contracts, between strong group leaders and group members. Soft information use will be stifled under such circumstances of hierarchical structures. Earlier findings in Chapter 2 of this thesis relating to a negative relationship between power distance and financial inclusion corroborate the present finding. Zainuddin et al. (2020) posit that high power distance results in stronger field supervision, and ensures strict credit discipline. On the grounds of better credit discipline, microfinance will find it easier to be financially than socially efficient.

With respect to legal forms, COOPs are the most financially and socially inefficient MFI form in high power distance cultures. NGOs are the most financially efficient MFIs, and equally more socially efficient than COOPs here. NGOs are more embedded in local socio-cultural environments where they operate. Thus in high power distance cultures, NGOs will be the ideal microfinance form, as higher embeddedness will permit them harness the benefits of soft information and social capital and thus reduce information asymmetry more cost effectively. Negative coefficients for SHFs imply SHFs will be financially and socially inefficient in high power distance cultures. These results on SHFs are however statistically insignificant. Hypothesis 1 on higher efficiency for socially-oriented MFIs in high power distance cultures is confirmed by these findings.

Individualism/Collectivism

Based on the results presented in the preceding tables, microfinance is both financially and socially efficient in more individualistic cultures, and will operate with less efficiency in more collectivist ones. Earlier results in Chapter 2 of this thesis indicated a positive relationship between individualism and the likelihood to be financially included. As Postelnicu & Hermes (2018) explain, individualism is characterized by higher generalised trust (trust in strangers), implying both MFIs and people in such cultures are more likely to trust and work with each other. Where group lending is permitted, people will form groups of better quality, based on conditions unrelated to their proximity to one another like the repayment potential of members or viability of their projects. Microfinance will thus meet more ready clients in these cultures, and on the basis of higher trust and higher quality groups in cases where group lending is possible, give out potentially bigger and more lucrative loans. Theoretically, information asymmetry reduction and related costs like those of client monitoring will however be higher in these cultures as the benefits of soft information and social capital will be lost. This may reduce the financial efficiency of MFIs. Where higher interest can be charged however, these higher costs can be covered easily and thus contribute to higher financial efficiency. FPOs are more likely to benefit here.

With respect to legal forms, NGOs are more financially efficient than SHFs in more individualistic cultures, though only under the CRS assumption, implying scale matters. Group lending is

more adaptable to NGOs as they target the poorest clients. In individualistic cultures, people trust strangers more, implying they will form groups of higher quality on the basis of elements like repayment potential and not personal acquaintance. This will ensure better repayment. Where loans sizes are bigger, SHFs will be more efficient in these cultures, as they will use the advantages of scale to serve this bigger clientele at reduced costs on average. Meanwhile, SHFs are more socially efficient than NGOs in more individualistic cultures. In addition to better quality groups in individualistic cultures, SHFs are more adapted to providing individual loans. Thus by utilising both lending methodologies, SHFs will reach more clients and have more loans outstanding. The cost of serving these clients and ensuring repayment will also be lowered by higher trust in individualistic cultures. Positive but insignificant results are obtained for COOPs. These findings only partially confirm hypothesis 2 on higher efficiency of commercially-oriented MFIs in individualistic cultures.

Masculinity/Femininity

Results on the efficiency of MFIs in more masculine cultures are mostly statistically insignificant, but do indicate some interesting results. Though statistically insignificant, MFIs in masculine cultures will more likely be financially than socially efficient. As Manos & Tsytrinbaum (2014) and Kittilaksanawong & Zhao (2018) argue, bigger loans may be sought by clients in masculine cultures due to the assertive nature and higher risk-taking propensity of people therein. MFIs will find it more costly to extend loans of the sizes required, especially as this will imply higher repayment risk as these cultures do not value cooperation and relationships that may lead to more effective group participation, or the amassment of social capital as a whole. Where such costs, like those of information collection and client monitoring cannot be reduced reasonably using for example the benefits of social capital, microfinance will be less efficient in meeting its objectives. On the financial side however, higher interest rates will help cover these costs where such an option is available, resulting in better financial efficiency.

With respect to legal forms, NGOs are the least financially and socially efficient MFIs in more masculine cultures. Though statistically insignificant, COOPs will be more financially efficient, but more socially inefficient than SHFs in masculine cultures. SHFs will be more adapted to masculine cultures due to the need for bigger loans. However, the ability for SHFs to use social capital in reducing information asymmetry and the risk of non-repayment is curtailed in masculine cultures by virtue of their client base – the public. COOPs however work with members who often have common interests implying higher social capital and lower information asymmetry reduction costs. COOPs will thus be more financially efficient than SHFs. By having a defined client base however, COOPs will meet fewer clients, grant fewer loans than SHFs, and overall be less socially efficient despite using similar inputs. Hypothesis 3 on higher efficiency for commercially-oriented MFIs in masculine cultures yields inconclusive results overall.

Uncertainty avoidance

Based on the findings presented above, MFIs will operate with higher financial than social efficiency in high uncertainty avoidance cultures. As such cultures lay emphasis on rules, beliefs, and institutions that provide certainty, conformity and predictability (Hofstede et al., 2010 pp. 191), people therein will seek the most formality possible in financial transactions. Thus it will be difficult for MFIs to use informal mechanisms like those related to social capital to reduce information asymmetry in such cultures. The costs of extending financial services will thus be higher, and exclude a lot of people from the use of financial services. Social efficiency will be impaired. The few clients who access these services however will be ready and willing to pay whatever price is necessary for less ambiguity in their transactions. Because of the desire for higher formality, both MFIs and their clients will take necessary action to reduce the likelihood of failing one another. Even though the costs of reducing information asymmetry will be elevated in such cultures, loan repayment will be better. MFIs will thus meet their financial objectives more efficiently in these cultures.

With respect to the legal forms, COOPs are the most financially efficient MFIs in high uncertainty avoidance cultures followed by SHFs. NGOs are the least financially efficient MFIs. These findings largely confirm hypothesis 4 on higher efficiency for commercially-oriented MFIs, though cooperatives seem to stand out here. Meanwhile, SHFs will be less socially inefficient than NGOs in high uncertainty avoidance cultures. As people prefer more formality in financial transactions in high uncertainty avoidance cultures, SHFs will be the most preferred MFI form. However, though with a slightly less commercial focus, COOPs offer higher certainty than SHFs due to higher social capital among members. Information asymmetry reduction costs will thus be lower in COOPs than they will be in SHFs leading to better financial efficiency for COOPs. For social performance, while SHFs have a higher potential to serve more clients in cultures of high uncertainty avoidance, a preference for more formality in contracts and higher prudence will imply higher costs, like those of monitoring. For NGOs, this high preference for formality puts them at a disadvantage on the number of potential clients to be served. NGOs may thus spend far more than SHFs to get and keep a few clients, implying lower social efficiency.

Long/short-term orientation

Findings indicate that MFIs in long-term oriented cultures will be both financially and socially efficient. Due to a more futuristic view, people in long-term oriented cultures will create more sustainable enterprises, whose financial needs will be bigger. More affluent clients can thus be met under such contexts, and served more profitably. What matters however for efficiency is the cost of serving these clients. A typical quality of long-term oriented cultures identified by Korynski & Pytkowska (2016) is

higher trust. Better repayment will thus ensue in such cultures, often even without the MFI spending heavily to reduce information asymmetry and related costs of financial services provision. With a positive relationship also advanced between trust and social capital by Postelnicu & Hermes (2018), MFIs will find it less costly to provide financial services to clients in long-term oriented cultures, by harnessing the benefits of strong social networks. Where such cultures have inclusive policies as often will be the case as Manos & Tsytrinbaum (2014) argue, more clients will be met at relatively low cost to the MFI implying better social efficiency.

With respect to legal forms, COOPs are the most financially efficient MFIs in long-term oriented cultures, followed by SHFs. NGOs are the least financially efficient. Bigger loans can be granted in long-term oriented cultures. This puts NGOs at a disadvantage with respect to potential number of borrowers and loan amounts, though cost reduction will be easier in these cultures. SHFs will find it more difficult than COOPs to reduce the cost of granting these loans using social capital and its cost reduction benefits in financial transactions. Again, COOPs stand out here. The results largely confirm hypothesis 5 in this study of higher efficiency among commercially-oriented MFIs in long-term oriented cultures. Though statistically insignificant, the results on social efficiency are also interesting. SHFs and NGOs are almost equally socially efficient in long-term oriented cultures.

Indulgence/Restraint

Findings indicate that microfinance will operate with higher financial than social efficiency in more indulgent cultures. Earlier findings in Chapter 2 of this thesis indicated a higher likelihood to use formal financial services in indulgent cultures. More clients can thus be reached in such cultures. Due to higher indulgence however, the risk of non-repayment is elevated, and MFIs must take action to reduce the risk of loss under such circumstances. Where the cost of taking such action like client monitoring cannot be reduced sufficiently using social capital and related advantages, MFIs will resort to charging higher interest and fees. Higher costs will exclude lots of potential clients from the use of MFI services, but will be more profitable for MFIs. Such higher income will cover incurred costs, ensuring MFIs stay financially efficient. This efficiency is increased even further where social capital is high.

With respect to legal forms, COOPs are the most financially efficient MFIs in indulgent cultures, followed by SHFs. NGOs are the least financially efficient MFIs here. Being the most embedded MFI form, people will find it easier and faster to obtain loans from NGOs. Due to potentially higher and more urgent demand for credit, MFIs cannot rely solely on social capital for cost reduction needs. Higher interest and fees will serve here. NGOs are not adapted to charging higher rates, and will end up operating with less financial efficiency as they rely more social capital to reduce the cost and risk of non-repayment. Also, NGOs will be socially inefficient in indulgent cultures. Social efficiency results for COOPs and

SHFs in indulgent cultures are negative implying higher social inefficiency in these cultures. The coefficients are however statistically insignificant, but indicate that SHFs will be less socially inefficient than COOPs. The findings here largely confirm the provisions of hypothesis 6 on higher efficiency for commercially-oriented MFIs in indulgent cultures.

5.4. Conclusion

The basic tenet of this study, namely the efficiency of MFIs emanates from growing criticism over the past decade on the exact efficiency of the microfinance movement as a poverty reduction vehicle. Despite its popularization over three decades ago as a potential driver of development outcomes relating in a large part to poverty reduction, the rate at which the industry has achieved this outcome has been slow. While microfinance has made considerable progress in reducing poverty and related outcomes in some countries, the reverse has been true for others. We hypothesise that these differential outcomes on microfinance performance result from cultural differences across regions. Applying an often utilised nonparametric approach to efficiency analysis (DEA), precisely following an input-oriented intermediation approach, this study set out to estimate the efficiency of MFIs across the developing world, followed by an investigation of the role of culture in determining this efficiency. Findings from the efficiency analysis indicate that MFIs in the ECA and LAC regions are the most financially, but least socially efficient MFIs, suggesting a trade-off between financial and social performance of MFIs. MFIs in the SSA and EAP regions achieve the least financial efficiency scores. MFIs in the South Asia (SAS) region are most socially efficient. Majority of the financially efficient MFIs from the study are shareholder-owned, while majority of the socially efficient MFIs are of the NGO form suggesting that the efficiency of MFIs is aligned with their broad mission or commercial orientation. With relatively high efficiency scores on both financial and social measures, Cooperatives are the ideal MFI form. Policies that promote the development and resilience of Cooperatives will thus be necessitated by policymakers across the world given their potential to be both financially and socially more efficient than other MFI forms. Further proof on this important role of cooperatives may necessitate a bigger cooperatives dataset however. A small cooperative dataset represents one of the limitations of this study.

Using efficiency scores computed in the first part of this study, Tobit regressions were conducted to find out the determinants of microfinance efficiency. Culture was hypothesised to be a determinant of this efficiency, due to its potential to influence the level of information asymmetry as well as reduction strategies and costs. Six culture variables were used in the regressions – power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, long/short-term orientation, and indulgence/restraint, from Hofstede's database. Findings indicate that MFIs are significantly more financially efficient in individualistic, high uncertainty avoidance, long-term oriented, and more indulgent

cultures. Meanwhile, MFIs are more socially efficient in individualistic and long-term oriented cultures. The dual financial and social efficiency of MFIs in individualistic and long-term oriented cultures makes these two cultures ideal sustainable microfinance operations. MFIs are less socially efficient in high power distance, high uncertainty avoidance, and more indulgent cultures. NGOs are the most financially and socially efficient MFIs in high power distance cultures. In individualistic cultures, NGOs are more financially but less socially efficient than SHFs. Across all other cultures, COOPs are more efficient than both NGOs and SHFs, suggesting COOPs are the ideal microfinance form with respect to efficiency across most cultures.

Theoretically, NGOs embed themselves deeper in local socio-cultural contexts, wherein they leverage the higher social capital in such contexts to reduce information asymmetry and related lending costs. Such embeddedness increases trust in NGOs, especially in more individualistic cultures where people are more likely to trust strangers (Postelnicu & Hermes, 2018), and thus be more willing to form groups with strangers in the process. COOPs have similar embeddedness and cost reduction advantages as NGOs due mainly to the composition of their client base – members who often have similar binding interests. Additionally, COOPs have a similar advantage like SHFs relating to the bigger size of their loans relative to NGOs, which coupled with their cost reduction advantages gives them the ability to make huge financial gains. SHFs on the other hand lack the information advantages of NGOs and COOPs and often will depend mostly on more discrimination, and fewer more affluent clients to whom they can grant bigger loans to reach their financial objectives. Thus at both ends of the spectrum lie NGOs and SHFs. COOPs lie in-between. Higher efficiency of COOPs across most cultures thus suggests the categorisation of MFIs on grounds of non-profit and for-profit may leave out a whole part of the story. Cooperatives present information and cost reduction advantages similar to NGOs, but additionally present financial advantages like bigger loans and higher interest similar to SHFs. A lot more can thus be discerned about microfinance just by focusing on cooperatives. In relation to previous studies, cooperatives may play a vital role in boosting financial inclusion as they bridge the gap between formal and informal finance in an effective and sustainable way, using the dual cost reduction advantages of social capital and relatively bigger loans to meet clients with varying financial needs in different cultures.

Chapter 6

SUMMARY, DISCUSSION OF KEY FINDINGS, AND CONCLUSION

6.1. Summary

A number of strategies have been applied across the world over time with the aim of combating poverty and enhancing global development. Notable among these is the provision of financial services to poor and low income earners. Theoretically, better access to financial services should help poor and low income earners smooth their consumption and incomes, borrowing in times of need and saving in times of plenty (Morduch, 1995). Access to savings and credit services has thus played a great role in enhancing development globally, and the finance industry has been pivotal in this regard. While such services have been provided by formal financial service providers in some countries, informal finance service providers have been more important in others. That the use of informal finance services has been more pronounced in some countries does not directly imply that formal finance service providers are absent or nonexistent. A plethora of reasons have been advanced for the higher use of informal finance services even in countries with developed financial sectors. Key among these is high costs of using formal financial services, like those relating to distance to service providers, complex documentation, collateral requirements, and high account opening costs and interest rates among others. In the past, commercial banks were to blame for institutionalising a lot of these costs, most of which were necessary for risk reduction reasons in banking. The popularization of microfinance in the mid to late 1980s ushered in a new wave of optimism among national governments and global development partners in relation to the reduction of these costs, and thus the combating of poverty. Microfinance successfully broke down the main barriers that excluded poor and low-income earners from accessing formal financial services prior to its popularization like the lack of collateral, transaction costs of using formal financial services like distance to the service provider, lack of documentation, and socio-cultural factors like low trust in financial services, and prohibitions prompted by religious beliefs (Beck et al., 2009; Demirgüç-Kunt & Klapper, 2013).

One of the key innovations brought in by microfinance was the Joint Liability concept which facilitated the development of Group lending. Group lending significantly reduced information collection and monitoring costs through its use of social capital. Additionally, group lending, through the application of Joint liability made use of social collateral wherein each group member became liable for repayment of outstanding loan balances of defaulting members. This ensured a relatively steady and low-cost income stream to the service provider. The popularization of microfinance and the hype relating to its poverty-reduction potential at the time coincided with growing criticism of aid, following decades of failures by recipient governments to properly utilize or even account for the use of such funds in meeting their

development needs. With the hope of better utilization of their funds, governments and global development partners channelled significant amounts of money into microfinance initiatives. Such funds and by implication the microfinance initiatives funded were successful in expanding access to financial services in some countries and regions. In others however, the results were poor. A commonly used measure of such access to financial services is account ownership at a financial institution. As of 2017, only 33% of people aged 15 and over in Sub-Saharan Africa (SSA) owned an account at a financial institution up from 23% in 2011, as opposed to 68% in South Asia (SAS) in 2017 up from 32% in 2011 (see Figure 2.1). Interestingly, both regions have respectively received nearly equal amounts of about US\$15 billion between 2011 and 2017 towards financial inclusion promotion (see Figure 1.2). While one region has made significant progress upon utilising a similar amount of funds, the other is yet to match the funding outlay through its results. Macroeconomic and formal institution variables relating to factors like governance have been hypothesised in the literature to account for these differences. However, socio-cultural factors like trust and religion as earlier indicated have been documented as a key reason for exclusion from the use of formal financial services on the demand-side. Why empirical research does not consider the role of these socio-cultural factors in explaining differential financial inclusion figures across countries and regions remains perplexing. Additionally, formal institutions like laws derive from the underlying informal institutional context of respective societies as explained by Williamson (2000). There thus arises a direct need to consider the effect of informal institutions, an example being the culture of a people in empirical research explaining differential outcomes like financial inclusion, and the performance of financial service providers. This study set out to examine the extent to which differences in cultural contexts or environments at national level affect individual finance choices and decisions like those relating to the use of formal financial services, and the performance of MFIs which have played a key role in poverty reduction over the past few decades. In reaching this objective, this research was partitioned into four studies.

The first study, Chapter 2 in this thesis, assessed the effect of culture on financial inclusion. Culture was measured using Hofstede's cultural dimensions, a survey-based culture dataset with a total of six cultural dimensions or indices, namely Power distance, Individualism/Collectivism, Masculinity/Femininity, Uncertainty avoidance, Long/Short-term orientation, and Indulgence/Restraint. Each dimension has a score ranging from 0 – 100. The dependent variable, financial inclusion comprised of the decision to own a formal account, and to use the account for saving and credit purposes. This data was extracted from the Global Findex database. Studies relating to financial inclusion and its determinants abound. The novelty of this study lies firstly in its hypothesizing of culture, a rarely applied variable in empirical studies relating to economic and finance outcomes, as a determinant of financial inclusion; and secondly in the use of a global dataset encompassing all key regions of the world. A total

of 85 countries, 35 high income and 50 developing countries were used in the study. From an initial sample of 142 countries, this final sample arose from the availability of culture data on Hofstede's database. The study built on the work of Korynski & Pytkowska (2016) whose study sample related to financial inclusion in the European Union (EU), and who used Hofstede's cultural dimensions in their culture regressions. A probit model was used in the empirical analysis due to the binary nature of the dependent variables.

In Chapter 3, the effect of culture on saving and credit decisions was empirically assessed. A dual route was followed for this, the first dwelling on the use of formal saving and credit sources, and the second on informal saving and credit sources. Individual decisions to save and borrow from both formal and informal sources from the Global Findex database made up the dependent variable. In line with available literature, culture was measured using four of Hofstede's cultural dimensions, namely power distance, individualism/collectivism, masculinity/femininity, and uncertainty avoidance; and trust, religion, and religiosity from the World Values Survey. A total of 65 countries were used in the study, 25 of which were high income, and 40 developing countries. From an initial sample of 142 countries, this final sample arose from the availability of culture data on both Hofstede's database and the World values Survey. The study built on the work of El Ghouli & Zheng (2016) whose global study related to the effect of culture on informal credit provision, and Campos & Muysken (2013) and Masella et al. (2017), whose respective studies focused on culture and savings in the EU, and Germany. The study made use of a probit model in the regression analysis due to the binary nature of the dependent variables.

Chapters 4 and 5 relating to the third and fourth studies in this thesis respectively took the analysis away from individual financial choices which made up the focus in chapters 2 and 3 to the level of MFIs and their performance in different cultural contexts. Performance in Chapter 4 was measured using the more conventional financial ratios approach, and in Chapter 5 using the increasingly popular efficiency approach. Both chapters contributed to research investigating the financial sustainability of the microfinance industry, and its ability to meet the poverty reduction objective on which it was popularized in the 1980s. In Chapter 4, evidence on the effect of culture on the financial and social performance of MFIs was provided. The dual objective of microfinance was considered in selecting the dependent variables: Return on assets and Operational Self-sufficiency made up the financial performance measures; and Number of active borrowers, Number of female borrowers, and the Average loan balance made up the social performance measures. Data on the dependent variables was extracted from the MIX Market database. Hofstede's cultural dimensions were used as the main explanatory variable. A global sample comprising a total of 503 MFIs from 44 countries was used in the study. The study built upon recent work expounding the effect of institutions on the performance of microfinance initiatives across the world, and related closely to the studies of Berggren & Burzynska (2014), Manos & Tsytrinbaum (2014), and

Postelnicu & Hermes (2018). The random effects estimator was used in the empirical analysis in this study, as this approach does not partial out the culture variable, which is time-invariant through first differencing as does the Fixed effects estimator. In Chapter 5, a nonparametric technique – Data Envelopment Analysis (DEA) – was used to measure the efficiency of MFIs. Three inputs and five outputs were used in the efficiency measurements. The inputs included Number of Loan Officers, Operating expenses, and Total Assets; while the outputs included Gross Loans Portfolio, and Financial revenues for financial efficiency, and Number of active borrowers, Number of loans outstanding, and the Average loan balance for social efficiency. The dual financial and social objective of microfinance was again recognised here. A total of 468 MFIs selected from 44 countries made up the final sample. MFIs were further classified into their respective legal forms, a categorization which included three broad categories namely Cooperatives (COOPs), Non-Governmental Organisations (NGOs), and Shareholder Firms (SHFs). The efficiencies of MFIs in each legal form were averaged, and compared following the DEA efficiency measurements. This was followed by an analysis of the determinants of this efficiency. Culture was hypothesised here as a major determinant, on the theoretical basis that applicable strategies in reducing information asymmetry and of minimizing the cost of inputs as a whole may not be the same across all legal forms due to different levels of embeddedness in local socio-cultural environments. Hofstede’s cultural dimensions were again used here, and a Tobit model was used in the regression analysis of the efficiency determinants.

In the next part of this chapter, key findings of the study are presented and discussed. This is closely followed by policy implications of the findings, contribution of the study, and routes for formal research. The chapter ends with a conclusion relating to the entire thesis.

6.2. Key findings and discussion

This section summarizes and discusses key findings regarding the effects of culture on individual finance choices and the performance of MFIs.

6.2.1. Culture as a determinant of financial inclusion

Evidence from probit regressions in this study indicates that culture determines financial inclusion. Financial inclusion based on the results will be higher in more individualistic, longer-term oriented, and more indulgent cultures. These results imply that individuals are more likely to own and use formal accounts in the aforementioned cultures. Meanwhile, financial inclusion will be lower in high power distance, more masculine, and high uncertainty avoidance cultures. In these cultures, individuals are less likely to own and use formal accounts. With the exception of the power distance measure, these results are robust to controls for demographic characteristics, macroeconomic, and formal institution variables and hold firmly across the developed world on the basis of stylized facts on financial inclusion in the

Global index. Across the developing world however, the differences in formal institutional environments become evident. With respect to power distance for instance, financial inclusion should on the basis of the results be lower in the EAP and ECA regions by virtue of their high power distance scores, in comparison to the LAC, MENA, SAS, and SSA regions. Financial inclusion is however highest in the EAP and ECA regions as stylized facts indicate. Both regions have on average the strongest formal institutions, defined on the basis of property and creditor rights, across the developing countries sample. As North (1990) argues, where formal institutions are stronger, transaction and related costs of doing business are low. Thus despite having some cultural characteristics which are not supportive of financial inclusion, strong formal institutions in the EAP and ECA regions reverse the effects of these cultural characteristics by reducing transaction costs of using formal financial services.

Financial inclusion is lowest in the SSA region. Three reasons are advanced for this in this research. The first two are respectively based on empirical evidence provided in this chapter relating to cultural characteristics of the SSA region, and its formal institutional environment. The region is low on individualism, short-term oriented, and has relatively high power distance and masculinity scores. Theoretically, the costs of financial intermediation are affected by the culture of a people (Williamson, 2000). Higher information asymmetry, high contracting, monitoring, and related transaction costs of engaging in financial contracts are typically characteristic of cultures with the aforementioned qualities like the SSA's. To further heighten such costs, formal institutions in the SSA region are weak. Resolving disputes relating to financial contracts will prove costly. Though Sub-Saharan Africans with respect to the sample are more indulgent (second highest indulgence score, 57), and take upon bigger risks in comparison to the other regions (second lowest uncertainty avoidance score, 53), formal institutions provide little protection for the consequences of such choices or decisions. The third reason relates to the popularity of informal finance in the SSA region. This third factor is merely hypothesised in this chapter, and further empirical evidence relating to informal finance and cultural values which support its resilience is provided in the proceeding chapter.

6.2.2. Culture and the choice between formal and informal saving and credit mechanisms

Findings in this study indicate that culture affects the use of saving and credit services, as well as the choice of instrument between formal and informal service providers. People in individualistic cultures are more likely to rely on formal financial services. Meanwhile, people in high trust and more religious cultures are more likely to rely on informal over formal financial services. Finally, people in high uncertainty avoidance cultures are more likely to borrow than they are to save. Such credit will be formal.

Being the most individualistic and least religious region in the sample, the developed regions or world (OECD and NOECD) present the least favourable cultural environments for informal finance.

Among the developing regions, informal finance is least likely to flourish in the ECA and LAC regions based on their cultural characteristics. Despite being low on individualism or relatively collectivist just like all the other developing regions, the LAC and EAP regions represent high uncertainty avoidance, low trust, and relatively less religious cultures. Meanwhile, informal finance will flourish in the EAP, SAS, and SSA regions, three regions which typically are characterized by higher collectivism, relatively low uncertainty avoidance, relatively high trust (though much lower in the SSA region), and high religiosity. In the latter cultures, individuals have the opportunity to amass large amounts of social capital. High social capital enhances informality in transactions by reducing information, monitoring and other transaction costs related to financial contracts. Lin (2001, pp. 20) explains the importance of social capital and networks in facilitating economic transactions especially in contexts of weak institutions. In doing so, the author points to four distinct advantages offered by higher social capital, namely information, influence, social credentials, and reinforcement. These advantages influence an individual's array, access to, and claim on resources, as well his/her decision-making powers. As a follow-up to the previous section with respect to the case of the SSA region where the popularity of informal finance was hypothesised to be a reason for low financial inclusion in the region, findings in this chapter justify this result. By virtue of higher social capital and its advantages, cultural values in the SSA region are supportive of successful informal finance operations.

6.2.3. Culture and the performance of Microfinance Institutions (MFIs)

Results from a random effects estimation of the effects of culture on microfinance performance reveal that MFIs achieve better financial performance and are generally more self-sufficient in high power distance and more individualistic cultures. The ability of microfinance to meet its financial objectives in more masculine, high uncertainty avoidance and more indulgent cultures depends on a number of other factors like the macroeconomic and formal institutional environment in which it operates. These environmental factors determine the MFI's cost reduction ability, average loan sizes, and the pricing of loans. Where formal institutions are stronger, the costs and risks of financial intermediation are lower. In richer countries, MFIs can give out bigger loans, and additionally charge higher rates and fees on these loans (Ahlin et al., 2011). MFIs achieve better social performance in more masculine and more indulgent cultures. In high power distance, high uncertainty avoidance and long-term oriented cultures, Microfinance achieves its lowest social performance. High power distance favours higher informality in financial transactions as findings in the chapter on culture and financial inclusion revealed. In high uncertainty avoidance and long-term oriented cultures, higher formality is preferred. In these cultures, bigger and more organized enterprises will flourish, a client group which is beyond microfinance's traditional client scope. Microfinance is thus not built for long-term oriented cultures and will meet

neither its financial nor social objectives in these cultures. Bigger MFIs however have a higher ability of meeting their financial than their social objectives in long-term oriented cultures, courtesy of the potential to compete with banks and offer bigger loans to bigger clients. Overall, culture has a stronger explanatory power on social performance than it does on financial performance. With the exception of the individualism and indulgence results for social performance, the results are robust to the use of instrumental variables for the culture measures.

The number, capital, and needs of investors in the microfinance industry has increased greatly. Depending on their specific needs, where they invest will determine to a large extent their ability to meet their main objective – financial or social, or both. Investors seeking the achievement of financial goals should consider investing in MFIs operating in high power distance and more individualistic cultures. In these cultures, microfinance can discriminate more on the basis of income (Zins & Weill, 2016), and thus end up serving more affluent clients using bigger loans. If countries with such cultural characteristics are richer, then the costs of financial intermediation can be transferred to the clients through higher interest rates and fees. Additionally, if formal institutions in such countries are stronger, then financial intermediation and related contracting and transaction costs will consequently be lower, which enables the MFI meet its financial objectives with relative ease. The ECA region stands out in this category. Also, big MFIs will survive in long-term oriented cultures, and they will do so by competing head-on with the banks to serve bigger enterprises through bigger loans. With the longest term orientation in the sample, MFIs in the ECA region will achieve the highest financial performance. On the basis of its high power distance score and long term orientation, MFIs in the EAP region will also achieve high financial performance. Operating in a less individualistic culture, MFIs in the EAP will have an information advantage over those in the ECA, and will thus reach their objectives at a relatively lower cost.

Investors seeking the achievement of social goals should consider investing in MFIs operating in more masculine cultures. The MENA, SAS and EAP regions stand out in this category. Masculine cultures are characterized by higher inequality. A larger pool of microfinance's traditional microentrepreneur clients results in such cultures, including more women. Targeting women as a client base in microfinance is common practice due to their higher perceived trustworthiness and thus repayment potential (Aggarwal et al., 2015). Also, given the region's low uncertainty avoidance score which favours social performance, MFIs in the EAP region are most suited to achieving both financial and social objectives, implying microfinance will thrive in this region.

6.2.4. Culture and the efficiency of MFIs

Results from the Data Envelopment Analysis (DEA) efficiency analysis using an input-oriented intermediation approach under both CRS and VRS assumptions indicate that MFIs achieve better

financial than social efficiency. Evidence of a trade-off is however found between financial and social objectives, in line with Cull et al. (2009), and in contradiction of the findings of Mersland & Strøm (2008). While SHFs achieve the highest financial but lowest social efficiency in keeping with their higher commercial orientation, NGOs achieve the worse financial but best social efficiency of all MFIs in the sample in keeping with their higher social orientation. Hermes et al. (2011) suggest that MFIs which prioritise social over financial performance are less efficient than those which do not. The authors however do not clearly distinguish between financial and social efficiency in their analysis, but provide strong support for the commercialization of microfinance. With the findings of a trade-off in microfinance, this research proves the opposite and argues for the continual existence of socially-oriented MFIs, mainly NGOs. However, with relatively high average scores on both financial and social efficiency, Cooperatives prove to be the ideal microfinance form. Due to the composition of their client base (members), Cooperatives are well-suited to reduce information, monitoring, transaction and other operating costs of providing formal financial services. In doing so, cooperatives rely on the close relationship between the MFI and its members and even between the members, relationships through which stronger social networks and higher social capital can be built. Because members additionally have a direct hand in the decisions of the cooperative through the board and related board committees through which powers are delegated, they have a prerogative to ensure its efficiency and sustainability. Mersland (2009) provides further support against commercialization of microfinance, arguing that NGOs and cooperatives are very essential particularly in imperfect markets which characterize much of the developing world. The empirical evidence provided here supports this argument, but advocates for more emphasis on cooperatives as they are able to reach both financial and social objectives simultaneously.

With respect to the effect of culture on MFIs, NGOs achieve better financial efficiency than COOPs and SHFs in high power distance and more individualistic cultures. A larger pool of microfinance's traditional clientele – microentrepreneurs – abound in high power distance cultures, who can be served at relatively low cost using group loans. NGOs embed themselves deeper in local socio-cultural contexts due to their higher social orientation, and are most suited to leveraging the social capital in such contexts to reduce information asymmetry and related lending costs. In more masculine, high uncertainty avoidance, long-term oriented, and more indulgent cultures, cooperatives are the most efficient MFIs. Like with NGOs, cooperatives have similar embeddedness, information and cost reduction advantages due mainly to the composition of their client base – members who often have common backgrounds and binding interests. The level of embeddedness of cooperatives makes them best suited to reduce information and monitoring costs in high uncertainty avoidance and more indulgent cultures while concurrently granting the bigger loans often required in masculine and long-term oriented cultures, again at relatively low cost. SHFs will do well in the same cultures as cooperatives, but will be less efficient and

operate with higher costs since they are less embedded and thus lack the information advantages of NGOs and COOPs. Cooperatives are more socially efficient than the other MFI forms across all cultures, with the exception of long-term oriented cultures where NGOs and SHFs are more efficient, and high power distance, more masculine and more indulgent cultures where MFIs overall achieve low social efficiency. Long-term oriented cultures by being more inclusive in their policies favour NGOs, and by being more supportive of innovation favour bigger enterprises and thus SHFs. Cooperatives use their embeddedness – implying higher social capital – and information advantages to attract more members, and serve them at relatively lower cost than other MFI forms.

Finally, MFIs are most financially efficient in the ECA and LAC regions, and most socially efficient in the SAS region. A cultural similarity between the former regions is their high uncertainty avoidance, which will lead to higher financial intermediation costs as service providers make more concerted efforts to shield themselves from potential losses or minimize potential risks. Stronger formal institutions in the ECA have helped MFIs reduce these costs. In the weaker formal institution LAC region, these costs have most often been transferred to clients via higher interest rates and fee charges as seen in the Compartamos case (Rosenberg, 2007). This transfer of intermediation costs to clients is additionally compounded by the high indulgence of people in the LAC region, which coupled with high uncertainty avoidance makes intermediation risky and expensive. In the longer-term oriented relatively richer ECA region, MFIs compete with the banks to finance big businesses, and thus provide bigger loans, which goes counter to their social objectives. The SAS region by virtue of its high population density will have the highest social capital across the sample. More clients will thus be reached in this region at relatively low cost to the institution. This efficiency is facilitated by the long-term orientation of the SAS region, whose implication is more inclusive policies and thus a potentially larger client base. With relatively low efficiency scores on both financial and social measures, MFIs in the SSA region are very inefficient. Hermes et al. (2009) argue that MFIs located in Africa are less efficient because their macroeconomic, political and institutional characteristics are less supportive to building efficient MFIs. The argument of Hermes et al. (2009) is supplemented in the current research study by dwelling on the SSA's cultural environment. In particular, the region is short-term oriented implying it will achieve lower social performance since it will be less inclusive in its policies. The region also has a low uncertainty avoidance score which coupled with a poor but highly indulgent population results in higher intermediation costs and risks. Such costs and risks are further compounded by the region's weak formal institutions. Passing on these costs to borrowers through higher interest rates and fees will prove difficult due to low incomes and high poverty rates across the region. Informal finance provides a better mechanism of handling the high costs and risks of intermediation in the SSA region given its cultural attributes, which explains the popularity of informal finance mechanisms across the region.

6.3. Contribution of the current study

This research contributes to research on the debate around the role of institutions in explaining observed differences in economic and related outcomes across the world's regions. Precisely, attention is paid to informal institutions like the cultural contexts of respective countries. Research on informal institutions has only recently peaked in the finance industry, with much of this centring around the global financial crisis and its effect on firms in different societies. Based on empirical evidence presented in Chapters 2 through 5, the extant literature has been added upon in two ways. Firstly, this research contributes to the thin empirical research base on the effect of informal institutions on microfinance practice and the industry's performance on a developing world scale. This gives an added understanding on the dynamics surrounding differences in observed patterns of poverty reduction across the developing world in relation to the finance-growth nexus. Secondly, the study broadens the store of knowledge on financial inclusion and its determinant, by precisely taking the debate away from the regularly over-hypothesised determinants, namely individual-specific characteristics and macroeconomic environments, to the institutional framework of respective countries. Only a handful of studies have considered taking this route, and for the few which have, a relatively small set of culture-related variables is used. Finally, this research provides evidence which dismisses the global 'one size fits all' strategy applied to development-related initiatives, like the global provision of aid from the richer to the poorer nations. As the evidence herein indicates, there is a need to customize development-related strategies to the local realities in the beneficiary countries.

While the current study has filled some gaps in the literature and opened up new avenues for research, this does not make it void of limitations. By considering all six of Hofstede dimensions, the number of countries in the study has been limited. A lot of research in the past using Hofstede's dimensions only dwells on the first four variables for which data is available for many more countries. Using all six variables was done due to the increased use of the long-term orientation and indulgence variables lately though on a stand-alone basis in empirical research, which necessitated its consideration in a broader and more complete database as applied in this research.

From a theoretical perspective, the present research provides further understanding on individual finance choices in different cultural contexts and how these choices go on to affect the performance of financial institutions, MFIs in this case. It is a first-hand attempt to link individual choices, firm performance, and culture. The research provides novel insights firstly on the use of the Technology acceptance model (TAM) which has been narrowed mostly to subjects relating to technology. By applying this model to finance inclusion in general and not limiting it to mobile money or digital finance use as has been the case in a few studies on financial inclusion, the argument put forth is TAM can be applied to novel introductions in general or simply procedures aimed at facilitating business transactions,

irrespective of the industry. Secondly, we argue theoretically that the impact of development and poverty reduction interventions is moderated by cultural influences. Although this is not new, the approach applied here considers this moderating impact of culture on two sides, namely the demand and supply sides. Research on institutions has focused almost exclusively on market imperfections like information asymmetry and their theoretical effect on the supply side only. We argue on the demand side that culture determines the level or severity of information asymmetry, and on the supply side, the strategies and costs of reducing this asymmetry. Thirdly, by linking social capital to factors like cultural measures like individualism and generalised trust, deeper insight is provided on the quality of this capital and its effect on financial choices. While it has been easier to assume higher social capital in collectivist societies for example, the quality of social capital becomes an issue as this study theoretically explains. This social capital quality is appraised with respect to its effect not only on individual finance choices, but on the performance of financial intermediaries like MFIs. Finally, the importance of informal institutions in determining financial outcomes is further emphasized theoretically, by arguing that country's formal institutions derive from its informal institutions. A deeper theoretical insight on the link between formal and informal institutions is provided in this study.

6.4. Policy implications and recommendations

For several decades, billions of dollars have been pumped into initiatives aimed at boosting access and use of financial services across the globe. While such funding actions are laudable, the resulting access and use of financial services or sustainability of financial institutions through which these funds flow – mainly Microfinance Institutions – has been uneven across nations and regions. Such funding initiatives still continue today, with support coming from both public and private actors. However, the low impact such funds have had over the years in some countries and regions ushers in a questioning of the funding strategy of global development partners. Are financial inclusion and related financial sector development funds directed to countries and regions where they will potentially have the highest impact, or are they merely directed on the bases of considerations not exactly related to the need for such funds? This research highlights the importance of considering socio-cultural contexts of recipient countries and regions prior to financing initiatives related to financial inclusion and financial sector development, and prior to designing a regulatory framework at respective national levels. In high power distance, more masculine, high uncertainty avoidance, high trust and more religious cultures where informality is deemed more desirable by local populations (see chapter 3), financial services with an element of informality will work best and should be promoted. A typical example of this is mobile money, which has recorded significant success across the Sub-Saharan African region, with its wide uptake partly due to the level of informality it offers. Where informality is more desirable, efforts must be made to bring informal

finance services closer to formal financial services, and not necessarily to fully transform these informal financial service providers to formal entities. One way to go about this is through encouraging informal finance service providers to open special accounts backed by public actors in formal financial institutions. The benefits of this will transcend to individuals, including through ensuring they too get personal accounts which overall will increase access to financial services. Though a considerable amount of order is needed in the finance industry to protect the public, regulation must not be too expansive in its scope, or go too deep into informal financial settings in cultures where such informality is deemed desirable.

The question on whether formal and informal finance services can and should coexist in the developing world or whether there is a need for policymakers to try and crowd out informal service providers through their policies has been tackled in this research. Acknowledgement is made of the fact that poor people do need savings as well as credit and related financial services. But the preference for these services differs in different cultures. This research further proves that the narrow focus on credit in financial service provision misleads with respect to spelling out the real financial needs of populations across the developing world. Saving services for instance have proven more popular than credit in more individualistic, higher trust, and cultures of higher religiosity. Though credit will still be desired given consumption-smoothing needs of people across the world and particularly in the developing world where poverty rates are higher, credit services must be provided concurrently with saving services in cultures where saving is deemed more desirable.

A useful insight from this research is that microfinance performs better and more efficiently in some countries than it does in others with similar macroeconomic and formal institutional environments. Cultural factors account for these performance and efficiency differences, wherein culture determines the costs of financial services provision, and applicable strategies in reducing such costs. In emulating microfinance strategies and practices in countries where microfinance is more successful as a development driver, practitioners, governments, policymakers and related development partners must consider the local cultural context of the recipient country. Two actions are applicable here in ensuring better microfinance performance: either the cultural environment is changed and made adaptable to the successful strategies being 'imported', or the strategies or practices are adapted to the local cultural context. The latter action is a more practical one, as culture cannot easily be changed or altered. Thus active strategies must be sought to adapt microfinance interventions to local cultural contexts, even at the level of funding. Countries need to take into account their cultural contexts as this influences both the cost of providing and using financial services, and thus financial inclusion as a whole. Though culture cannot be changed easily, strategies aimed at boosting financial inclusion must be developed with cultural influences in mind with respect to how these strategies facilitate the reduction of financial intermediation costs in respective cultures.

Overall, customisation of financial inclusion and microfinance strategies is very necessary and could be done in a number of domains. Product and service design, operating practices, and even regulatory frameworks are some of these domains. In granting operating licenses to MFIs for example, regulators must consider the legal form of the service provider which performs best and most efficiently in their local cultural context. Cooperatives for example have been proven to be relatively more financially and socially efficient than Shareholder-owned MFIs and NGOs in the provision of financial services. However, this must not be taken as a given to grants licenses for the creation only of Cooperatives, or to reduce regulation on some microfinance form in favour of some other. Profit-oriented MFIs (SHFs) meet financial objectives better than cooperatives, while non-profit MFIs (NGOs) meet social objectives better. The advantage of the cooperatives lies in their ability to dually meet financial and social objectives.

Finally, the formal institutional framework of a country must not be ignored in the push for better and more inclusive financial systems. As indicated earlier and as found in the differences in microfinance performance and financial inclusion between the SSA and SAS regions, two regions with quite similar macroeconomic characteristics, the strength of formal institutions has a huge role to play in determining the success of development-related interventions across the developing world. While governments and policymakers may find it difficult to alter cultural traits at national level, formal institutions can be altered more easily to make development-related interventions more successful. The ultimate objective of these institutional alterations with respect to the finance industry is to reduce the costs of financial services provision, and improve the performance and efficiency of the service providers in meeting their development-enhancing potentials.

6.5. Routes for further research

A number of avenues for further research arise from this study. Data has a role to play here however.

Firstly, financial inclusion measures today are no longer limited to formal financial institutions, but now cut across to include digital finance services like mobile money. Mobile money has had a great impact in broadening the sphere of financial inclusion across some regions of the developing world like the SSA region. Despite the impact mobile money has had on financial inclusion, its development, use and popularity has been limited to some regions only. The determinants of mobile money development and use has become an interesting subject of late. An interesting variable which could potentially explain the uneven development and use of mobile money is culture. For countries on which culture data is available, this is an interesting research route to take.

Secondly, a major problem with the culture variable is that data on culture is severely limited, especially in relation to the SSA region. Thus studies relating for example to digital finance and its

development which hypothesise the determining role of culture will omit large parts of the SSA region including countries like Kenya, one of the rocks of global digital finance development. Where possible, surveys need to be conducted, and a culture dataset specific to the SSA region built. This will open a big avenue for research on differential economic and financial outcomes relating to the region, with respect to differences in culture.

Thirdly and still in relation to culture, different regions of the same country often have different cultural setups prompted by factors like history, geography, language, and religion. Typical examples across the developing world include South Africa, a nation with stark cultural differences across its ethnic populations; Nigeria, a nation with at least four main ethnic groups with different languages and cultures; and Cameroon, a nation with a bicultural heritage relating to its linguistic and legal backgrounds. Canada, Belgium, Switzerland and the US stand out in the developed world. There is a need to consider such differences in the population's setup in building culture datasets at national level.

Fourthly, data on cooperatives is severely limited. A key finding in this research is the idealness of the cooperative microfinance form, due to its ability to dually achieve financial and social efficiency. This conclusion can be tested using a bigger dataset of cooperatives where such data is available.

Finally, this study is a global one. It however makes to respective regions in explaining its findings, which represents one empirical contribution of the study. However, specific country-based case studies may paint a clearer picture of subjects like that relating to microfinance performance and efficiency, and where possible, on cultural differences in the regions of microfinance operation.

6.6. Concluding remarks

A key take away from this research is a recognition of the need to reconsider the application and implementation of global sets of standard development-related strategies across often unrelated countries and regions. The expectation of some trend of results in one region or country for example upon applying such strategies on the grounds that they yielded positive results in another region or country may lead to faulty conclusions about the effectiveness of such strategies. The slow penetration rate of mobile money services in South Asia and their rapid propagation across Sub-Saharan Africa is evidence of the fact that not all strategies are applicable to all contexts. Regulators, policymakers, and global development agencies must consider the customization of hitherto successful practices or strategies in different contexts prior to implanting them in others due to cultural differences. Culture has a significant effect on the costs of financial services provision, and use. Strategies aimed at making financial systems more inclusive or financial institutions more efficient must thus be developed with the cost-reduction abilities of such strategies in mind on both the demand and supply sides, given the cultural contexts in which the strategies are to be implemented.

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APPENDIX I

Table II.1: Country-level summary statistics on financial inclusion and culture data

FINANCIAL INCLUSION MEASURES (SOURCE: GLOBAL FINDEX)					CULTURE MEASURES (SOURCE: HOFSTEDE)					
Country	Region	Account ownership at a financial institution (% aged 15+)	Saved at a financial institution (% aged 15+)	Borrowed from a financial institution (% aged 15+)	Power distance	Individualism/Collectivism	Masculinity/Femininity	Uncertainty avoidance	Long/Short-term orientation	Indulgence/Restraint
China	EAP	80%	35%	9%	80	20	66	30	87	24
Indonesia	EAP	48%	22%	17%	78	14	46	48	62	38
Malaysia	EAP	85%	38%	12%	104	26	50	36	41	57
Philippines	EAP	32%	12%	10%	94	32	64	44	27	42
Thailand	EAP	81%	39%	15%	64	20	34	64	32	45
Vietnam	EAP	30%	14%	21%	70	20	40	30	57	35
Average	EAP	59%	27%	14%	82	22	50	42	51	40
Albania	ECA	39%	9%	9%	90	20	80	70	61	15
Armenia	ECA	45%	10%	28%	85	22	50	88	61	25
Azerbaijan	ECA	29%	5%	13%	85	22	50	88	61	22
Belarus	ECA	81%	22%	15%	95	25	20	95	81	20
Bosnia & Herz.	ECA	59%	10%	9%	90	22	48	87	70	44
Bulgaria	ECA	72%	28%	12%	70	30	40	85	69	16
Bulgaria	ECA	86%	36%	13%	73	33	40	80	58	33
Croatia	ECA	61%	5%	24%	65	41	55	85	38	32
Georgia	ECA	59%	14%	20%	88	20	50	88	85	22
Kazakhstan	ECA	77%	17%	13%	90	22	45	87	62	35
Macedonia	ECA	44%	9%	9%	90	27	39	95	71	19
Moldova	ECA	68%	10%	15%	88	24	48	90	75	20
Montenegro	ECA	58%	14%	15%	90	30	42	90	52	20
Romania	ECA	76%	14%	14%	93	39	36	95	81	20
Russia	ECA	71%	12%	12%	86	25	43	92	52	28
Serbia	ECA	68%	23%	14%	66	37	45	85	46	49
Turkey	ECA	63%	13%	11%	92	25	27	95	86	14
Ukraine	ECA	62%	15%	14%	84	27	45	88	65	26
Average										
	LAC	48%	7%	7%	49	46	56	86	20	62
Argentina	LAC	51%	16%	16%	78	10	42	87	25	46
Bolivia	LAC	70%	14%	9%	69	38	49	76	44	59
Brazil	LAC	45%	9%	14%	67	13	64	80	13	83
Colombia	LAC	55%	19%	23%	65	30	65	45	13	54
Dominica Rep.	LAC	29%	11%	9%	66	19	40	94	20	89
El Salvador	LAC	35%	10%	6%	81	30	69	82	24	97
Mexico	LAC	31%	6%	13%	70	12	40	85	20	56
Paraguay	LAC	42%	8%	15%	64	16	42	87	25	46
Peru	LAC	45%	11%	12%	68	24	52	80	23	66
Average										
	MENA	43%	11%	3%	85	35	35	70	26	22
Algeria	MENA	32%	6%	6%	70	25	45	80	7	4
Egypt	MENA	93%	26%	24%	58	41	43	59	14	40
Iran	MENA	20%	2%	3%	95	30	70	85	25	17
Iraq	MENA	42%	10%	17%	70	30	45	65	16	43
Jordan	MENA	45%	21%	17%	75	40	65	50	14	25
Lebanon	MENA	66%	17%	5%	80	38	52	68	23	34
Libya	MENA	28%	6%	3%	70	46	53	68	14	25
Morocco	MENA	46%	12%	10%	75	36	51	68	17	26
Average										
	SAS	41%	10%	9%	80	20	55	60	47	20
Bangladesh	SAS	80%	20%	7%	77	48	56	40	51	26
India	SAS	18%	6%	2%	55	14	50	70	50	0
Pakistan	SAS	46%	12%	6%	71	27	54	57	49	15
Average										
	SSA	23%	12%	9%	70	15	50	55	27	18

Burkina Faso	SSA	42%	16%	10%	80	15	40	65	4	72
Ghana	SSA	33%	11%	5%	85	15	38	44	11	80
Mozambique	SSA	39%	21%	4%	80	30	60	55	13	84
Nigeria	SSA	67%	22%	9%	49	65	63	49	34	63
South Africa	SSA	21%	6%	5%	70	25	40	50	34	38
Tanzania	SSA	36%	14%	9%	60	35	40	50	30	42
Zambia	SSA	37%	15%	7%	71	29	47	53	22	57
Average										
	OECD	100%	62%	20%	38	90	61	51	21	71
Australia	OECD	98%	56%	14%	11	55	79	70	60	63
Austria	OECD	99%	56%	16%	65	75	54	94	82	57
Belgium	OECD	100%	68%	26%	39	80	52	48	36	68
Canada	OECD	74%	21%	13%	63	23	28	86	31	68
Chile	OECD	81%	45%	15%	57	58	57	74	70	29
Czech Rep.	OECD	100%	63%	21%	18	74	16	23	35	70
Denmark	OECD	98%	47%	14%	40	60	30	60	82	16
Estonia	OECD	100%	55%	20%	33	63	26	59	38	57
Finland	OECD	94%	48%	18%	68	71	43	86	63	48
France	OECD	99%	55%	20%	35	67	66	65	83	40
Germany	OECD	85%	13%	2%	60	35	57	112	45	50
Greece	OECD	95%	48%	17%	28	70	68	35	24	65
Ireland	OECD	94%	45%	16%	50	76	70	75	61	30
Italy	OECD	98%	64%	6%	54	46	95	92	88	42
Japan	OECD	93%	28%	10%	44	70	9	63	69	13
Latvia	OECD	99%	62%	21%	40	60	50	70	64	56
Luxembourg	OECD	100%	59%	12%	38	80	14	53	67	68
Netherlands	OECD	99%	69%	29%	22	79	58	49	33	75
New Zealand	OECD	100%	79%	35%	31	69	8	50	35	55
Norway	OECD	87%	33%	23%	68	60	64	93	38	29
Poland	OECD	92%	32%	9%	63	27	31	104	28	33
Portugal	OECD	84%	50%	20%	104	52	110	51	77	28
Slovak Rep.	OECD	94%	51%	18%	57	51	42	86	48	44
Spain	OECD	100%	75%	21%	31	71	5	29	53	78
Sweden	OECD	98%	60%	10%	34	68	70	58	74	66
Switzerland	OECD	96%	64%	18%	35	89	66	35	51	69
UK	OECD	93%	62%	29%	40	91	62	46	26	68
USA	OECD	95%	53%	18%	45	65	50	65	53	52
Average										
	NOECD	95%	51%	9%	68	25	57	29	61	17
Hong Kong	NOECD	75%	24%	7%	46	80	88	82	58	31
Hungary	NOECD	83%	34%	13%	42	60	19	65	82	16
Lithuania	NOECD	97%	47%	9%	56	59	47	96	47	66
Malta	NOECD	72%	14%	11%	95	25	60	80	36	52
Saudi Arabia	NOECD	98%	67%	16%	74	20	48	8	72	46
Singapore	NOECD	64%	12%	18%	61	36	38	100	26	53
Uruguay	NOECD	83%	36%	12%	63	44	51	66	55	40

Notes: In this table, metadata on financial inclusion measures from the Global Findex 2017 database, and the main explanatory variable (culture) from Hofstede's cultural dimensions is presented for each country. With the exception of High Income countries (Organisation for Economic Cooperation & Development – OECD; and Non OECD High income), all countries in the study are classified on the basis of their respective geographical regions, namely East Asia & Pacific (EAP), Europe & Central Asia (ECA), Latin America & Caribbean (LAC), Middle East & North Africa (MENA), South Asia (SAS), and Sub-Saharan Africa (SSA). The average scores for the respective variables are equally presented per region.

APPENDIX II

Table III.1: Statistics on saving participation and culture per country in each region

SAVING MEASURES (SOURCE: GLOBAL FINDEX 2017)					CULTURE MEASURES (SOURCE: HOFSTEDE)						
Country	Region	Saved any money in the past year (% aged 15+)	Saved at a financial institution (% aged 15+)	Saved at a saving club or person outside the family (% aged 15+)	Power distance	Individualism/Collectivism	Masculinity/Femininity	Uncertainty avoidance	Trust	Religion	Religiosity
China	EAP	51%	35%	4%	80	20	66	30	60.3	2.6	1.2
Indonesia	EAP	62%	22%	30%	78	14	46	48	37.5	94.0	36.2
Malaysia	EAP	63%	38%	10%	104	26	50	36	8.5	84.8	18.0
Philippines	EAP	59%	12%	8%	94	32	64	44	3.2	85.9	41.1
Thailand	EAP	62%	39%	17%	64	20	34	64	32.1	56.6	15.1
Vietnam	EAP	57%	14%	14%	70	20	40	30	50.9	7.1	6.0
Average	EAP	59%	27%	14%	81.7	22.0	50.0	42.0	32.1	55.2	19.6
Armenia	ECA	31%	10%	5%	85	22	50	88	10.9	57.9	5.5
Azerbaijan	ECA	27%	5%	2%	85	22	50	88	14.8	35.9	2.1
Belarus	ECA	50%	22%	2%	95	25	20	95	32.6	15.9	6.0
Bulgaria	ECA	41%	28%	1%	70	30	40	85	19.6	18.4	3.8
Georgia	ECA	15%	5%	3%	65	41	55	85	8.8	84.9	11.9
Kazakhstan	ECA	36%	14%	4%	88	20	50	88	38.3	21.5	4.9
Moldova	ECA	55%	9%	19%	90	27	39	95	17.6	31.7	10.6
Romania	ECA	34%	14%	5%	90	30	42	90	7.7	50.5	16.1
Russia	ECA	36%	14%	2%	93	39	36	95	27.8	14.3	2.7
Turkey	ECA	39%	23%	11%	66	37	45	85	11.6	68.1	10.3
Ukraine	ECA	40%	13%	2%	92	25	27	95	23.1	26.3	6.9
Average	ECA	37%	14%	5%	83.5	28.9	41.3	89.9	19.3	38.7	7.3
Argentina	LAC	30%	7%	3%	49	46	56	86	19.2	24.1	14.7
Brazil	LAC	32%	14%	4%	69	38	49	76	7.1	51.5	38.4
Colombia	LAC	39%	9%	5%	67	13	64	80	4.9	58.9	41.1
Ecuador	LAC	34%	12%	5%	78	8	63	37	7.2	67.1	26.4
Mexico	LAC	41%	10%	13%	81	30	69	82	12.4	58.4	35.4
Peru	LAC	40%	8%	8%	64	16	42	87	8.4	49.9	25.8
Average	LAC	36%	10%	6%	68.0	25.2	57.2	74.7	9.9	51.7	30.3
Algeria	MENA	39%	11%	4%	85	35	35	70	17.2	90.7	11.4
Egypt	MENA	31%	6%	16%	70	25	45	80	21.5	94.1	15.3
Iran	MENA	43%	26%	--	58	41	43	59	10.5	78.2	16.7
Iraq	MENA	31%	2%	--	95	30	70	85	30.0	84.7	9.8
Jordan	MENA	45%	10%	19%	70	30	45	65	13.2	93.3	12.3
Lebanon	MENA	52%	21%	10%	75	40	65	50	9.8	52.9	21.3
Libya	MENA	61%	17%	--	80	38	52	68	10.0	94.9	7.1
Morocco	MENA	21%	6%	4%	70	46	53	68	12.3	88.9	3.5
Tunisia	MENA	39%	18%	3%	70	40	40	75	15.5	95.4	3.9
Average	MENA	40%	13%	9%	74.8	36.1	49.8	68.9	15.6	85.9	11.3
India	SAS	34%	20%	8%	77	48	56	40	32.1	44.2	16.6
Pakistan	SAS	35%	6%	21%	55	14	50	70	22.2	89.5	14.4
Average	SAS	35%	13%	15%	66.0	31.0	53.0	55.0	27.2	66.9	15.5
Burkina Faso	SSA	54%	12%	27%	70	15	50	55	13.8	82.8	21.1
Ethiopia	SSA	62%	26%	38%	85	15	38	44	21.4	80.5	34.9
Ghana	SSA	50%	16%	19%	80	15	40	65	5.0	91.1	50.6
Nigeria	SSA	62%	21%	25%	80	30	60	55	15.0	89.8	48.8
South Africa	SSA	59%	22%	30%	49	65	63	49	23.3	55.8	48.2
Zambia	SSA	59%	14%	23%	60	35	40	50	10.8	75.6	47.3
Average	SSA	58%	19%	27%	70.7	29.2	48.5	53.0	14.9	79.3	41.8
Australia	OECD	79%	62%	--	38	90	61	51	51.4	14.1	12.4
Canada	OECD	80%	68%	--	39	80	52	48	41.8	31.8	22.7

Chile	OECD	49%	21%	8%	63	23	28	86	12.4	23.8	20.1
Estonia	OECD	67%	47%	4%	40	60	30	60	39.0	7.6	3.3
Finland	OECD	72%	55%	--	33	63	26	59	58.0	17.6	11.1
France	OECD	63%	48%	--	68	71	43	86	18.7	13.0	5.0
Germany	OECD	76%	55%	--	35	67	66	65	44.8	13.1	11.2
Italy	OECD	62%	45%	--	50	76	70	75	27.5	34.0	16.5
Japan	OECD	78%	64%	--	54	46	95	92	35.9	5.4	2.4
Netherlands	OECD	79%	59%	--	38	80	14	53	66.1	10.7	9.3
New Zealand	OECD	86%	69%	--	22	79	58	49	55.3	18.7	13.7
Norway	OECD	90%	79%	--	31	69	8	50	73.7	10.5	6.0
Poland	OECD	52%	33%	4%	68	60	64	93	22.2	45.7	30.6
Slovenia	OECD	67%	31%	--	71	27	19	88	11.2	43.1	10.2
Spain	OECD	68%	51%	--	57	51	42	86	19.0	10.7	8.8
Sweden	OECD	83%	75%	--	31	71	5	29	60.1	7.9	4.3
Switzerland	OECD	82%	60%	--	34	68	70	58	51.2	17.2	15.8
UK	OECD	74%	64%	--	35	89	66	35	30.0	20.7	14.5
USA	OECD	79%	62%	--	40	91	62	46	34.8	40.4	28.2
Average	OECD	73%	55%	5%	44.6	66.4	46.3	63.6	39.6	20.3	13.0
Hong Kong	NOECD	61%	51%	--	68	25	57	29	48.0	12.1	9.7
Hungary	NOECD	37%	24%	3%	46	80	88	82	28.7	17.1	7.4
Kuwait	NOECD	47%	27%	--	90	25	40	80	28.5	86.5	13.6
Singapore	NOECD	77%	67%	2%	74	20	48	8	37.3	43.1	23.2
Trinidad & Tc	NOECD	71%	36%	21%	47	16	58	55	3.2	78.5	32.2
Uruguay	NOECD	37%	12%	3%	61	36	38	100	13.8	20.3	9.9
Average	NOECD	55%	36%	7%	64.3	33.7	54.8	59.0	26.6	42.9	16.0

Notes: In this table, metadata on saving choices or decisions, namely the decision to *Save any money in the past 12months*, and the decision to *Save formally in a financial institution or informally in a saving club or person outside the family* is presented for each country in the study. Data on culture measures is also presented. A total of 65 countries make up the sample in this study. Data on saving decisions comes from the Global Findex 2017 database, while data on culture is extracted from Hofstede's cultural dimensions (first four measures) and the World Values Survey (last three measures). With the exception of High Income countries (Organisation for Economic Cooperation & Development – OECD; and Non OECD High income), all countries in the study are classified on the basis of their respective geographical regions, namely East Asia & Pacific (EAP), Europe & Central Asia (ECA), Latin America & Caribbean (LAC), Middle East & North Africa (MENA), South Asia (SAS), and Sub-Saharan Africa (SSA). The average scores for the respective variables are equally presented per region.

Table III.2: Statistics on credit participation and culture per country in each region

CREDIT MEASURES (SOURCE: GLOBAL FINDEX 2017)					CULTURE MEASURES (SOURCE: HOFSTEDE)						
Country	Region	Borrowed any money in the past year (% aged 15+)	Borrowed from a financial institution (% aged 15+)	Borrowed from friends and family (% aged 15+)	Power distance	Individualism/Collectivism	Masculinity/Femininity	Uncertainty avoidance	Trust	Religion	Religiosity
China	EAP	45%	9%	28%	80	20	66	30	60.3	2.6	1.2
Indonesia	EAP	55%	17%	36%	78	14	46	48	37.5	94.0	36.2
Malaysia	EAP	40%	12%	15%	104	26	50	36	8.5	84.8	18.0
Philippines	EAP	59%	10%	41%	94	32	64	44	3.2	85.9	41.1
Thailand	EAP	47%	15%	29%	64	20	34	64	32.1	56.6	15.1
Vietnam	EAP	49%	21%	30%	70	20	40	30	50.9	7.1	6.0
Average	EAP	49%	14%	30%	81.7	22.0	50.0	42.0	32.1	55.2	19.6
Armenia	ECA	55%	28%	29%	85	22	50	88	10.9	57.9	5.5
Azerbaijan	ECA	51%	13%	41%	85	22	50	88	14.8	35.9	2.1
Belarus	ECA	49%	15%	34%	95	25	20	95	32.6	15.9	6.0
Bulgaria	ECA	38%	12%	24%	70	30	40	85	19.6	18.4	3.8
Georgia	ECA	45%	24%	21%	65	41	55	85	8.8	84.9	11.9
Kazakhstan	ECA	46%	20%	22%	88	20	50	88	38.3	21.5	4.9
Moldova	ECA	54%	9%	38%	90	27	39	95	17.6	31.7	10.6
Romania	ECA	40%	15%	21%	90	30	42	90	7.7	50.5	16.1
Russia	ECA	41%	14%	23%	93	39	36	95	27.8	14.3	2.7
Turkey	ECA	59%	14%	28%	66	37	45	85	11.6	68.1	10.3
Ukraine	ECA	47%	11%	31%	92	25	27	95	23.1	26.3	6.9
Average	ECA	48%	16%	28%	83.5	28.9	41.3	89.9	19.3	38.7	7.3
Argentina	LAC	37%	7%	16%	49	46	56	86	19.2	24.1	14.7
Brazil	LAC	40%	9%	14%	69	38	49	76	7.1	51.5	38.4
Colombia	LAC	41%	14%	20%	67	13	64	80	4.9	58.9	41.1
Ecuador	LAC	32%	12%	13%	78	8	63	37	7.2	67.1	26.4
Mexico	LAC	32%	6%	14%	81	30	69	82	12.4	58.4	35.4
Peru	LAC	36%	15%	16%	64	16	42	87	8.4	49.9	25.8
Average	LAC	36%	11%	16%	68.0	25.2	57.2	74.7	9.9	51.7	30.3
Algeria	MENA	29%	3%	19%	85	35	35	70	17.2	90.7	11.4
Egypt	MENA	49%	6%	38%	70	25	45	80	21.5	94.1	15.3
Iran	MENA	68%	24%	51%	58	41	43	59	10.5	78.2	16.7
Iraq	MENA	63%	3%	52%	95	30	70	85	30.0	84.7	9.8
Jordan	MENA	48%	17%	31%	70	30	45	65	13.2	93.3	12.3
Lebanon	MENA	36%	17%	13%	75	40	65	50	9.8	52.9	21.3
Libya	MENA	58%	5%	44%	80	38	52	68	10.0	94.9	7.1
Morocco	MENA	26%	3%	18%	70	46	53	68	12.3	88.9	3.5
Tunisia	MENA	45%	9%	32%	70	40	40	75	15.5	95.4	3.9
Average	MENA	47%	10%	33%	74.8	36.1	49.8	68.9	15.6	85.9	11.3
India	SAS	42%	7%	33%	77	48	56	40	32.1	44.2	16.6
Pakistan	SAS	37%	2%	29%	55	14	50	70	22.2	89.5	14.4
Average	SAS	40%	5%	31%	66.0	31.0	53.0	55.0	27.2	66.9	15.5
Burkina Faso	SSA	52%	9%	35%	70	15	50	55	13.8	82.8	21.1
Ethiopia	SSA	41%	11%	31%	85	15	38	44	21.4	80.5	34.9
Ghana	SSA	40%	10%	23%	80	15	40	65	5.0	91.1	50.6
Nigeria	SSA	40%	4%	28%	80	30	60	55	15.0	89.8	48.8
South Africa	SSA	53%	9%	37%	49	65	63	49	23.3	55.8	48.2
Zambia	SSA	49%	9%	31%	60	35	40	50	10.8	75.6	47.3
Average	SSA	46%	9%	31%	70.7	29.2	48.5	53.0	14.9	79.3	41.8
Australia	OECD	72%	20%	13%	38	90	61	51	51.4	14.1	12.4
Canada	OECD	88%	26%	14%	39	80	52	48	41.8	31.8	22.7
Chile	OECD	45%	13%	15%	63	23	28	86	12.4	23.8	20.1

Estonia	OECD	40%	14%	9%	40	60	30	60	39.0	7.6	3.3
Finland	OECD	61%	20%	13%	33	63	26	59	58.0	17.6	11.1
France	OECD	52%	18%	8%	68	71	43	86	18.7	13.0	5.0
Germany	OECD	64%	20%	8%	35	67	66	65	44.8	13.1	11.2
Italy	OECD	56%	16%	16%	50	76	70	75	27.5	34.0	16.5
Japan	OECD	57%	6%	4%	54	46	95	92	35.9	5.4	2.4
Netherlands	OECD	45%	12%	10%	38	80	14	53	66.1	10.7	9.3
New Zealand	OECD	78%	29%	17%	22	79	58	49	55.3	18.7	13.7
Norway	OECD	78%	35%	17%	31	69	8	50	73.7	10.5	6.0
Poland	OECD	50%	23%	25%	68	60	64	93	22.2	45.7	30.6
Slovenia	OECD	48%	16%	12%	71	27	19	88	11.2	43.1	10.2
Spain	OECD	60%	18%	17%	57	51	42	86	19.0	10.7	8.8
Sweden	OECD	54%	21%	14%	31	71	5	29	60.1	7.9	4.3
Switzerland	OECD	67%	10%	5%	34	68	70	58	51.2	17.2	15.8
UK	OECD	75%	18%	14%	35	89	66	35	30.0	20.7	14.5
USA	OECD	77%	29%	15%	40	91	62	46	34.8	40.4	28.2
Average	OECD	61%	19%	13%	44.6	66.4	46.3	63.6	39.6	20.3	13.0
Hong Kong	NOECD	66%	9%	7%	68	25	57	29	48.0	12.1	9.7
Hungary	NOECD	25%	7%	11%	46	80	88	82	28.7	17.1	7.4
Kuwait	NOECD	46%	16%	21%	90	25	40	80	28.5	86.5	13.6
Singapore	NOECD	50%	16%	4%	74	20	48	8	37.3	43.1	23.2
Trinidad & Tc	NOECD	47%	19%	20%	47	16	58	55	3.2	78.5	32.2
Uruguay	NOECD	54%	18%	12%	61	36	38	100	13.8	20.3	9.9
Average	NOECD	48%	14%	13%	64.3	33.7	54.8	59.0	26.6	42.9	16.0

Notes: In this table, metadata on credit choices or decisions, namely the decision to *Borrow any money in the past 12months*, and the decision to *Borrow formally in a financial institution or informally from friends and family* is presented for each country in the study. Data on culture measures is also presented. A total of 65 countries make up the sample in this study. Data on borrowing decisions comes from the Global Findex 2017 database, while data on culture is extracted from Hofstede's cultural dimensions (first four measures) and the World Values Survey (last three measures). With the exception of High Income countries (Organisation for Economic Cooperation & Development – OECD; and Non OECD High income), all countries in the study are classified on the basis of their respective geographical regions, namely East Asia & Pacific (EAP), Europe & Central Asia (ECA), Latin America & Caribbean (LAC), Middle East & North Africa (MENA), South Asia (SAS), and Sub-Saharan Africa (SSA). The average scores for the respective variables are equally presented per region.

APPENDIX III

Table IV.1: Correlation matrix

I. Culture and formal institutional environment

	pdi	idv	mas	Uai	Lto	idg	pol_stab	reg_qual	voice_~c	tstart~s	tc_enf~e
pdi	1										
idv	0.104	1									
mas	0.208	0.334	1								
uai	-0.044	-0.470	-0.284	1							
lto	0.285	0.162	-0.130	-0.054	1						
idg	0.029	-0.089	0.249	0.193	-0.618	1					
pol_stab	0.123	-0.025	-0.296	0.199	0.021	0.261	1				
reg_qual	-0.071	0.008	0.057	0.371	-0.120	0.374	0.434	1			
voice_acc	-0.100	0.392	0.089	-0.107	-0.293	0.300	0.210	0.387	1		
tstart_bus	-0.031	0.025	-0.213	-0.073	0.085	0.002	0.063	-0.148	0.282	1	
tc_enforce	-0.079	0.378	0.224	-0.552	0.044	-0.277	-0.443	-0.382	0.309	0.108	1

II. MFI-specific

	age	par30	ln_size	debt_eq	op_eff	glp_ta
age	1					
par30	0.065	1				
ln_size	0.197	-0.037	1			
debt_eq	0.023	-0.030	0.059	1		
op_eff	-0.113	0.034	-0.221	-0.063	1	
glp_ta	-0.037	-0.009	-0.075	0.029	-0.116	1

III. Macroeconomic

	lngdppc	mft_gdp	Infl	domcrp~p	fdi_gdp	acct_own
Lngdppc	1					
mft_gdp	0.027	1				
Infl	-0.234	-0.084	1			
domcrpvt_gdp	0.128	0.355	-0.252	1		
fdi_gdp	-0.001	-0.312	0.001	-0.008	1	
acct_own	0.212	0.156	-0.070	0.374	-0.098	1

Note: Pair-wise correlations for each group of variables are presented in this table. Three broad groups are included here: Institutional variables comprising of Culture and the formal institutional framework; MFI-specific variables, and Macroeconomic variables. The definition of the variables can be found in Table 3 above.

Table IV.2: Hofstede's cultural dimension per country

Region/country	Cultural dimensions					
	<i>PDI</i>	<i>IDV</i>	<i>MAS</i>	<i>UAI</i>	<i>LTO</i>	<i>IND</i>
<i>EAP</i>						
China	80	20	66	30	87	24
Indonesia	78	14	46	48	62	38
Philippines	94	32	64	44	27	42
Vietnam	70	20	40	30	57	35
	81	22	54	38	59	35
<i>ECA</i>						
Albania	90	20	80	70	61	15
Armenia	85	22	50	88	61	25
Azerbaijan	85	22	50	88	61	22
Bosnia & Herzegovina	90	22	48	87	70	44
Bulgaria	70	30	40	85	69	16
Georgia	65	41	55	85	38	32
Kazakhstan	88	20	50	88	85	22
Macedonia	90	22	45	87	62	35
Moldova	90	27	39	95	71	19
Montenegro	88	24	48	90	75	20
Romania	90	30	42	90	52	20
Russia	93	39	36	95	81	20
Serbia	86	25	43	92	52	28
Turkey	66	37	45	85	46	49
Ukraine	92	25	27	95	86	14
	85	27	47	88	65	25
<i>LAC</i>						
Argentina	49	46	56	86	20	62
Bolivia	78	10	42	87	25	46
Brazil	69	38	49	76	44	59
Chile	63	23	28	86	31	68
Colombia	67	13	64	80	13	83
Dominica Republic	65	30	65	45	13	54
El Salvador	66	19	40	94	20	89
Mexico	81	30	69	82	24	97
Peru	64	16	42	87	25	46
	67	25	51	80	24	67
<i>MENA</i>						
Egypt	70	25	45	80	7	4
Iraq	95	30	70	85	25	17
Jordan	70	30	45	65	16	43
Lebanon	75	40	65	50	14	25

Morocco	70	46	53	68	14	25
	76	34	56	70	15	23
SAS						
Bangladesh	80	20	55	60	47	20
India	77	48	56	40	51	26
Pakistan	55	14	50	70	50	0
	71	27	54	57	49	15
SSA						
Angola	80	18	20	60	15	83
Burkina Faso	70	15	50	55	27	18
Ghana	80	15	40	65	4	72
Mozambique	85	15	38	44	11	80
Nigeria	80	30	60	55	13	84
South Africa	49	65	63	49	34	63
Tanzania	70	25	40	50	34	38
Zambia	60	35	40	50	30	42
	72	27	44	54	21	60

This table indicates Hofstede's cultural dimensions for each country in the sample across the six regions under study. The variables have their usual definitions: PDI for Power distance index; IDV for Individualism/Collectivism index; MAS for Masculinity/Femininity index; UAI for Uncertainty avoidance index; LTO for Long term orientation index; and IND for Indulgence/Restraint index.

APPENDIX IV

Table V.1: Hofstede's cultural dimension: average scores per region

Region	Cultural dimensions					
	<i>PDI</i>	<i>IDV</i>	<i>MAS</i>	<i>UAI</i>	<i>LTO</i>	<i>IND</i>
EAP	81	22	54	38	59	35
ECA	85	27	47	88	65	25
LAC	67	25	51	80	24	67
MENA	76	34	56	70	15	23
SAS	71	27	54	57	49	15
SSA	72	27	44	54	21	60
Mean	75	27	51	64	39	38

This table indicates Hofstede's cultural dimensions for each region in the study. The variables have their usual definitions: PDI for Power distance index; IDV for Individualism/Collectivism index; MAS for Masculinity/Femininity index; UAI for Uncertainty avoidance index; LTO for Long term orientation index; and IND for Indulgence/Restraint index.

Table V.2: Financial efficiency DEA analysis

DMU	Region	Status	TE_CRS	TE_VRS	SE	DMU	Region	Status	TE_CRS	TE_VRS	SE
1	LAC	SHF	1.000	1.000	1.000	42	LAC	SHF	0.845	0.873	0.967
2	LAC	NGO	0.881	0.883	0.998	43	MENA	NGO	0.552	0.559	0.987
3	LAC	SHF	1.000	1.000	1.000	44	MENA	SHF	0.584	0.584	0.999
4	LAC	NGO	0.793	0.886	0.896	45	MENA	NGO	0.753	0.781	0.964
5	LAC	NGO	0.831	0.843	0.986	46	SSA	SHF	0.817	0.828	0.987
6	LAC	NGO	0.911	0.933	0.977	47	SSA	SHF	0.645	0.645	0.999
7	LAC	NGO	0.834	0.839	0.995	48	SSA	NGO	0.726	0.803	0.904
8	LAC	NGO	0.785	0.791	0.992	49	SSA	SHF	0.741	0.825	0.898
9	LAC	NGO	0.991	0.998	0.993	50	SSA	SHF	0.755	0.774	0.976
10	EAP	NGO	0.650	0.724	0.898	51	SSA	SHF	0.598	0.600	0.996
11	EAP	SHF	0.903	0.958	0.943	52	EAP	SHF	0.791	0.866	0.914
12	EAP	SHF	0.760	0.762	0.997	53	EAP	NGO	0.556	0.585	0.951
13	LAC	SHF	0.829	0.889	0.932	54	EAP	NGO	0.705	0.808	0.873
14	LAC	SHF	0.776	0.854	0.908	55	EAP	SHF	0.625	0.711	0.878
15	LAC	COOP	0.873	0.951	0.918	56	EAP	NGO	0.756	1.000	0.756
16	LAC	COOP	1.000	1.000	1.000	57	EAP	NGO	0.647	0.656	0.987
17	LAC	NGO	0.832	0.873	0.953	58	EAP	NGO	0.555	0.570	0.974
18	LAC	SHF	0.845	0.862	0.981	59	SSA	SHF	0.686	0.708	0.969
19	LAC	COOP	1.000	1.000	1.000	60	SSA	NGO	0.911	0.994	0.917
20	MENA	NGO	0.668	0.691	0.966	61	SSA	COOP	0.554	0.554	1.000
21	MENA	NGO	0.608	0.614	0.990	62	SSA	SHF	0.596	0.607	0.983
22	MENA	NGO	0.698	0.745	0.937	63	SSA	SHF	0.431	0.438	0.984
23	MENA	NGO	0.699	0.788	0.887	64	SSA	NGO	0.484	0.516	0.939
24	LAC	SHF	0.815	0.864	0.943	65	LAC	SHF	0.741	0.765	0.968
25	SAS	SHF	0.782	0.804	0.974	66	LAC	SHF	0.793	0.937	0.846
26	SAS	SHF	0.622	0.632	0.985	67	LAC	NGO	0.716	0.719	0.996
27	SAS	COOP	0.652	0.676	0.964	68	LAC	COOP	0.693	0.700	0.990
28	SAS	SHF	0.757	0.865	0.875	69	SSA	NGO	0.693	0.719	0.964
29	SAS	NGO	0.664	0.720	0.923	70	SSA	SHF	0.626	0.643	0.974
30	SAS	SHF	0.675	0.769	0.878	71	SSA	SHF	0.685	0.698	0.982
31	SAS	NGO	0.795	0.857	0.927	72	SSA	SHF	0.671	0.675	0.993
32	SAS	SHF	0.751	0.773	0.971	73	MENA	SHF	0.702	0.715	0.982
33	EAP	SHF	0.597	0.626	0.953	74	MENA	NGO	0.802	0.837	0.958
34	EAP	SHF	0.760	0.838	0.907	75	MENA	SHF	0.629	0.632	0.996
35	EAP	COOP	0.629	0.639	0.985	76	SAS	SHF	0.964	1.000	0.964
36	EAP	SHF	0.569	0.572	0.995	77	SAS	NGO	0.534	0.536	0.997
37	LAC	SHF	0.984	1.000	0.984	78	SAS	SHF	0.504	0.588	0.858
38	LAC	SHF	1.000	1.000	1.000	79	SAS	SHF	0.667	0.822	0.811
39	LAC	SHF	0.927	0.986	0.940	80	SAS	SHF	0.686	0.701	0.979
40	LAC	SHF	1.000	1.000	1.000	81	SAS	SHF	0.593	0.714	0.830
41	LAC	SHF	0.820	0.841	0.975	82	SAS	NGO	0.686	0.722	0.950

Table
cont'd

83	SAS	SHF	0.628	0.690	0.910	124	ECA	SHF	0.924	0.939	0.984
84	SAS	SHF	0.475	0.488	0.972	125	ECA	COOP	0.852	0.893	0.954
85	LAC	SHF	0.835	1.000	0.835	126	ECA	SHF	0.824	0.854	0.965
86	LAC	NGO	0.834	0.838	0.995	127	ECA	SHF	0.807	0.809	0.998
87	LAC	COOP	0.745	0.778	0.957	128	ECA	SHF	0.868	0.868	1.000
88	LAC	NGO	0.678	0.683	0.991	129	ECA	SHF	0.599	0.654	0.916
89	LAC	NGO	0.611	0.615	0.993	130	ECA	SHF	0.853	0.943	0.905
90	SSA	SHF	0.735	0.752	0.977	131	ECA	SHF	0.946	0.968	0.977
91	SSA	NGO	0.654	0.662	0.988	132	ECA	SHF	0.878	0.912	0.963
92	SAS	NGO	0.738	1.000	0.738	133	ECA	SHF	0.860	0.865	0.995
93	SAS	NGO	0.635	0.644	0.986	134	SAS	NGO	0.602	0.604	0.996
94	SAS	NGO	0.610	0.853	0.715	135	SAS	NGO	0.629	0.672	0.936
95	SAS	NGO	0.708	0.832	0.852	136	SAS	NGO	0.717	0.773	0.927
96	SAS	NGO	0.806	0.991	0.813	137	SAS	NGO	0.421	0.474	0.889
97	SAS	NGO	0.614	0.645	0.952	138	SAS	NGO	0.725	0.769	0.943
98	SAS	NGO	0.751	0.773	0.971	139	SAS	NGO	0.664	0.708	0.939
99	SAS	NGO	0.598	0.639	0.936	140	SAS	NGO	0.489	0.690	0.710
100	SAS	NGO	0.672	0.714	0.940	141	SAS	NGO	0.676	0.760	0.889
101	SAS	NGO	0.683	0.748	0.913	142	SAS	NGO	0.707	0.741	0.955
102	ECA	COOP	0.675	0.675	1.000	143	SAS	NGO	0.697	0.710	0.982
103	ECA	SHF	0.775	0.791	0.980	144	SAS	NGO	0.695	0.767	0.906
104	ECA	SHF	0.541	0.598	0.906	145	SAS	NGO	0.623	0.663	0.940
105	ECA	SHF	0.612	0.659	0.929	146	SAS	NGO	0.695	0.727	0.957
106	SSA	SHF	0.711	0.715	0.994	147	SAS	NGO	0.514	0.541	0.951
107	LAC	SHF	0.624	0.638	0.977	148	SAS	NGO	0.673	0.771	0.873
108	LAC	SHF	1.000	1.000	1.000	149	SAS	NGO	0.563	0.586	0.960
109	ECA	SHF	0.750	0.860	0.872	150	SAS	NGO	0.605	0.652	0.928
110	ECA	SHF	0.930	0.996	0.934	151	SAS	NGO	0.605	0.640	0.947
111	ECA	NGO	0.735	0.742	0.990	152	SAS	NGO	0.641	0.682	0.940
112	ECA	NGO	0.797	0.813	0.979	153	SAS	NGO	0.537	0.558	0.963
113	ECA	COOP	1.000	1.000	1.000	154	LAC	SHF	0.683	0.686	0.995
114	ECA	SHF	0.986	1.000	0.986	155	LAC	SHF	0.777	0.854	0.909
115	ECA	NGO	0.798	0.821	0.972	156	LAC	SHF	0.775	0.821	0.944
116	ECA	NGO	0.885	0.887	0.997	157	LAC	SHF	0.777	0.816	0.952
117	ECA	SHF	0.696	0.723	0.963	158	LAC	SHF	0.803	0.836	0.960
118	ECA	SHF	0.829	0.858	0.966	159	LAC	SHF	0.811	0.925	0.876
119	ECA	SHF	0.745	0.849	0.877	160	LAC	NGO	0.826	0.829	0.997
120	ECA	SHF	1.000	1.000	1.000	161	LAC	SHF	0.801	0.845	0.948
121	ECA	NGO	0.793	0.903	0.879	162	LAC	NGO	0.824	0.860	0.959
122	ECA	SHF	0.882	1.000	0.882	163	LAC	NGO	0.555	0.562	0.988
123	ECA	NGO	0.876	1.000	0.876	164	LAC	NGO	0.555	0.582	0.953

Table
cont'd

165	LAC	NGO	0.791	0.793	0.998	206	LAC	SHF	1.000	1.000	1.000
166	LAC	NGO	0.719	0.732	0.982	207	EAP	NGO	0.532	0.698	0.762
167	LAC	NGO	0.825	0.827	0.998	208	EAP	NGO	0.785	0.794	0.988
168	LAC	NGO	0.724	0.746	0.971	209	EAP	NGO	0.545	0.556	0.979
169	LAC	NGO	0.778	0.804	0.968	210	LAC	NGO	0.146	0.154	0.949
170	LAC	SHF	0.685	0.736	0.931	211	LAC	NGO	0.907	0.943	0.962
171	LAC	NGO	0.760	0.763	0.996	212	LAC	NGO	0.951	1.000	0.951
172	ECA	NGO	0.810	0.824	0.983	213	LAC	NGO	0.685	0.696	0.984
173	ECA	NGO	0.614	0.618	0.993	214	LAC	NGO	0.776	0.778	0.997
174	ECA	NGO	0.616	0.617	0.998	215	LAC	NGO	0.736	0.741	0.994
175	ECA	NGO	0.674	0.676	0.997	216	LAC	SHF	0.821	1.000	0.821
176	ECA	NGO	0.667	0.672	0.993	217	LAC	COOP	0.671	0.710	0.945
177	ECA	NGO	0.778	0.779	1.000	218	LAC	NGO	0.545	0.552	0.987
178	ECA	SHF	0.750	0.793	0.945	219	LAC	NGO	0.486	0.503	0.966
179	ECA	NGO	0.714	0.726	0.984	220	LAC	NGO	0.561	0.587	0.955
180	ECA	SHF	0.836	0.850	0.984	221	MENA	NGO	0.723	0.737	0.981
181	ECA	SHF	0.674	0.691	0.976	222	MENA	NGO	0.707	0.718	0.984
182	ECA	SHF	0.839	0.839	1.000	223	LAC	NGO	0.654	0.679	0.963
183	ECA	SHF	0.631	0.639	0.987	224	LAC	NGO	0.708	0.711	0.996
184	ECA	NGO	0.735	0.740	0.993	225	LAC	NGO	0.535	0.593	0.902
185	LAC	SHF	0.917	0.928	0.989	226	LAC	SHF	0.585	0.623	0.940
186	LAC	SHF	0.827	0.959	0.862	227	LAC	SHF	0.767	0.778	0.987
187	LAC	NGO	0.842	0.860	0.979	228	SSA	SHF	0.670	0.671	0.998
188	LAC	NGO	0.843	0.843	1.000	229	SSA	NGO	0.545	0.693	0.787
189	LAC	NGO	0.712	0.782	0.911	230	SSA	SHF	0.541	0.626	0.865
190	LAC	NGO	0.837	0.855	0.979	231	SSA	NGO	0.438	0.459	0.954
191	ECA	COOP	0.915	1.000	0.915	232	SSA	NGO	0.551	0.576	0.957
192	ECA	COOP	0.822	1.000	0.822	233	ECA	SHF	0.780	0.808	0.964
193	ECA	SHF	0.931	0.932	0.998	234	ECA	SHF	0.801	0.819	0.978
194	ECA	COOP	1.000	1.000	1.000	235	ECA	SHF	0.701	0.711	0.987
195	ECA	COOP	0.624	0.625	0.997	236	ECA	SHF	0.765	0.783	0.977
196	ECA	NGO	0.188	0.288	0.653	237	ECA	SHF	0.772	0.809	0.954
197	ECA	COOP	0.570	1.000	0.570	238	ECA	SHF	0.865	0.919	0.942
198	ECA	SHF	0.759	0.818	0.928	239	ECA	NGO	0.686	0.706	0.972
199	ECA	COOP	0.704	1.000	0.704	240	ECA	NGO	0.705	0.931	0.758
200	ECA	SHF	0.400	0.412	0.970	241	ECA	SHF	0.752	0.829	0.907
201	SSA	COOP	0.426	0.455	0.937	242	SAS	SHF	0.535	0.544	0.983
202	SSA	SHF	0.545	0.573	0.951	243	SAS	SHF	0.720	0.828	0.870
203	SSA	COOP	0.380	0.474	0.801	244	SAS	SHF	0.461	0.465	0.992
204	LAC	NGO	0.596	0.605	0.985	245	SAS	SHF	0.793	0.923	0.860
205	LAC	SHF	0.710	0.716	0.992	246	SAS	NGO	0.570	1.000	0.570

Table
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247	SAS	NGO	0.745	0.749	0.995	288	SAS	NGO	0.555	0.559	0.992
248	SAS	SHF	0.822	0.944	0.871	289	SAS	SHF	0.598	0.625	0.956
249	SAS	SHF	0.334	0.516	0.648	290	SAS	SHF	0.776	0.835	0.929
250	SAS	SHF	0.478	0.480	0.995	291	SAS	SHF	0.703	1.000	0.703
251	SAS	NGO	0.699	0.715	0.977	292	SAS	NGO	0.914	0.962	0.951
252	SAS	NGO	0.497	0.523	0.951	293	SAS	SHF	0.711	0.719	0.989
253	SAS	SHF	0.694	0.735	0.945	294	SAS	SHF	0.747	0.911	0.820
254	SAS	NGO	0.839	1.000	0.839	295	SAS	NGO	0.753	0.772	0.975
255	SAS	NGO	0.720	0.770	0.935	296	SAS	SHF	0.726	0.778	0.933
256	SAS	NGO	0.702	0.736	0.953	297	SAS	SHF	0.632	0.637	0.992
257	SAS	SHF	0.669	0.705	0.949	298	SAS	NGO	1.000	1.000	1.000
258	SAS	SHF	0.770	0.858	0.898	299	SAS	NGO	0.634	0.653	0.971
259	SAS	SHF	1.000	1.000	1.000	300	SAS	SHF	0.713	0.792	0.900
260	SAS	SHF	0.698	0.786	0.888	301	SAS	SHF	0.711	0.805	0.884
261	SAS	NGO	0.591	0.620	0.953	302	SAS	SHF	0.849	0.951	0.892
262	SAS	SHF	0.788	0.828	0.952	303	SAS	SHF	0.693	0.818	0.847
263	SAS	SHF	0.713	0.726	0.982	304	SAS	SHF	0.735	0.782	0.939
264	SAS	SHF	0.675	0.696	0.969	305	SAS	SHF	0.672	0.884	0.761
265	SAS	NGO	0.192	0.192	0.998	306	SAS	SHF	0.626	0.728	0.860
266	SAS	NGO	0.881	0.907	0.971	307	SAS	SHF	0.836	0.867	0.965
267	SAS	NGO	0.683	0.691	0.988	308	SAS	NGO	0.814	0.899	0.905
268	SAS	NGO	0.600	0.675	0.889	309	SAS	SHF	0.577	0.620	0.930
269	SAS	SHF	0.743	0.769	0.967	310	SAS	SHF	0.646	0.671	0.963
270	SAS	SHF	0.688	0.882	0.780	311	EAP	SHF	0.388	0.457	0.849
271	SAS	NGO	0.584	0.591	0.989	312	EAP	COOP	0.678	0.685	0.990
272	SAS	SHF	0.868	0.997	0.870	313	MENA	NGO	0.612	0.633	0.966
273	SAS	NGO	0.763	0.801	0.952	314	MENA	NGO	0.714	0.731	0.977
274	SAS	NGO	0.748	0.752	0.995	315	MENA	NGO	0.764	0.799	0.956
275	SAS	NGO	0.701	0.735	0.954	316	MENA	SHF	0.749	0.767	0.977
276	SAS	NGO	0.614	0.832	0.738	317	ECA	NGO	0.799	0.803	0.994
277	SAS	SHF	0.728	0.760	0.958	318	ECA	COOP	0.845	0.972	0.869
278	SAS	SHF	0.856	0.982	0.872	319	ECA	COOP	0.756	0.759	0.996
279	SAS	SHF	0.656	0.671	0.978	320	ECA	SHF	0.650	0.652	0.998
280	SAS	NGO	0.685	0.700	0.978	321	ECA	SHF	0.970	1.000	0.970
281	SAS	SHF	0.752	0.757	0.993	322	ECA	NGO	0.757	1.000	0.757
282	SAS	SHF	0.774	0.809	0.957	323	ECA	COOP	0.809	0.946	0.855
283	SAS	NGO	0.778	0.821	0.948	324	ECA	SHF	0.636	0.656	0.969
284	SAS	NGO	0.665	0.671	0.991	325	ECA	NGO	0.832	0.839	0.991
285	SAS	COOP	0.547	0.552	0.991	326	MENA	NGO	0.792	0.816	0.971
286	SAS	NGO	0.864	0.880	0.982	327	ECA	COOP	0.598	0.605	0.988
287	SAS	SHF	0.808	0.905	0.893	328	ECA	SHF	0.689	0.692	0.996

Table
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329	ECA	SHF	0.716	0.717	0.999	370	SSA	SHF	0.721	0.725	0.995
330	ECA	SHF	0.670	0.713	0.941	371	SSA	COOP	0.563	0.567	0.993
331	LAC	SHF	0.874	0.896	0.976	372	SSA	SHF	0.826	0.898	0.920
332	LAC	SHF	0.654	0.706	0.926	373	SSA	SHF	0.690	0.690	0.999
333	LAC	SHF	0.783	0.795	0.986	374	SSA	NGO	0.651	0.654	0.996
334	LAC	SHF	0.837	0.912	0.918	375	SSA	SHF	0.742	0.844	0.879
335	LAC	SHF	0.758	0.771	0.983	376	SSA	NGO	0.719	0.754	0.953
336	LAC	SHF	0.882	0.883	1.000	377	SAS	NGO	0.609	0.635	0.960
337	LAC	SHF	0.798	0.805	0.992	378	SAS	NGO	0.397	0.457	0.868
338	LAC	SHF	0.846	0.950	0.890	379	SAS	NGO	0.468	0.490	0.956
339	LAC	SHF	0.872	0.881	0.990	380	SAS	NGO	0.688	0.725	0.950
340	LAC	SHF	0.903	0.904	0.998	381	SAS	NGO	0.563	0.566	0.994
341	LAC	SHF	0.919	0.927	0.992	382	SAS	SHF	0.659	0.704	0.936
342	LAC	SHF	1.000	1.000	1.000	383	SAS	NGO	0.663	0.731	0.907
343	LAC	SHF	0.750	0.787	0.952	384	SAS	NGO	0.566	0.615	0.920
344	LAC	NGO	0.738	0.738	1.000	385	SAS	NGO	0.533	0.537	0.992
345	LAC	SHF	0.973	0.989	0.984	386	SAS	SHF	0.734	0.742	0.990
346	LAC	SHF	0.660	0.680	0.969	387	SAS	SHF	0.308	0.309	0.997
347	LAC	SHF	0.780	0.811	0.963	388	SAS	NGO	0.279	0.290	0.960
348	LAC	SHF	0.676	0.683	0.991	389	SAS	SHF	0.551	0.569	0.969
349	LAC	SHF	1.000	1.000	1.000	390	SAS	NGO	0.613	0.635	0.966
350	LAC	SHF	0.787	0.787	1.000	391	SAS	NGO	0.308	0.466	0.660
351	LAC	SHF	0.714	0.794	0.900	392	SAS	SHF	0.517	0.542	0.953
352	LAC	SHF	0.793	0.885	0.896	393	SAS	SHF	0.522	0.581	0.899
353	LAC	SHF	0.670	0.675	0.992	394	SAS	NGO	0.429	0.969	0.443
354	LAC	SHF	0.896	0.916	0.978	395	LAC	SHF	0.697	0.759	0.918
355	LAC	SHF	0.981	1.000	0.981	396	LAC	NGO	0.748	0.765	0.978
356	LAC	NGO	0.775	0.775	1.000	397	LAC	NGO	0.731	0.731	0.999
357	ECA	SHF	0.762	0.835	0.912	398	LAC	SHF	0.804	0.885	0.908
358	ECA	SHF	0.831	0.882	0.942	399	LAC	COOP	0.705	0.712	0.991
359	ECA	SHF	1.000	1.000	1.000	400	LAC	NGO	0.667	0.689	0.968
360	ECA	NGO	0.849	0.856	0.992	401	LAC	SHF	0.794	0.850	0.934
361	ECA	SHF	0.743	0.774	0.960	402	LAC	SHF	0.732	0.746	0.981
362	MENA	NGO	0.635	0.636	0.998	403	LAC	SHF	0.773	0.843	0.916
363	MENA	SHF	0.662	0.703	0.942	404	LAC	SHF	0.772	0.832	0.929
364	MENA	SHF	0.738	0.753	0.981	405	LAC	NGO	0.681	0.689	0.988
365	MENA	NGO	0.570	0.618	0.922	406	LAC	SHF	0.804	1.000	0.804
366	SSA	NGO	0.809	0.843	0.960	407	EAP	NGO	0.564	0.572	0.985
367	SSA	COOP	0.616	0.685	0.899	408	EAP	NGO	0.533	0.536	0.995
368	SSA	NGO	0.763	0.773	0.987	409	EAP	SHF	0.384	0.402	0.955
369	SSA	SHF	0.585	0.589	0.993	410	EAP	SHF	0.668	0.673	0.992

Table
cont'd

411	EAP	NGO	0.579	0.587	0.987	440	ECA	SHF	0.749	0.801	0.935
412	EAP	NGO	0.561	0.565	0.994	441	ECA	SHF	0.659	0.761	0.866
413	EAP	SHF	0.568	0.573	0.991	442	SSA	SHF	0.672	0.697	0.963
414	EAP	NGO	0.451	0.472	0.956	443	SSA	NGO	0.717	0.753	0.953
415	EAP	NGO	0.635	0.650	0.977	444	SSA	SHF	0.568	0.594	0.956
416	EAP	NGO	0.669	0.672	0.995	445	SSA	NGO	0.649	0.674	0.962
417	EAP	SHF	0.459	0.462	0.993	446	SSA	NGO	0.309	0.316	0.978
418	EAP	SHF	0.554	0.562	0.985	447	SSA	NGO	0.646	0.651	0.992
419	EAP	COOP	0.461	0.462	0.997	448	SSA	NGO	0.538	0.546	0.987
420	EAP	SHF	0.601	0.628	0.957	449	ECA	NGO	0.463	0.465	0.998
421	EAP	NGO	0.727	0.781	0.931	450	ECA	NGO	0.604	0.634	0.953
422	EAP	SHF	0.514	0.519	0.990	451	ECA	SHF	0.807	0.868	0.929
423	EAP	NGO	0.630	0.669	0.943	452	EAP	NGO	0.366	0.587	0.623
424	ECA	SHF	0.957	0.962	0.995	453	EAP	NGO	0.737	0.776	0.951
425	ECA	SHF	0.859	0.861	0.997	454	EAP	COOP	0.896	1.000	0.896
426	ECA	SHF	0.902	0.961	0.939	455	EAP	NGO	0.632	0.636	0.993
427	ECA	SHF	0.746	0.813	0.918	456	EAP	NGO	0.572	0.828	0.690
428	ECA	NGO	0.874	0.882	0.991	457	EAP	NGO	0.753	1.000	0.753
429	ECA	SHF	0.785	0.794	0.989	458	EAP	NGO	0.681	0.839	0.811
430	ECA	COOP	0.755	0.768	0.983	459	EAP	NGO	0.471	0.929	0.507
431	ECA	SHF	0.825	0.852	0.968	460	EAP	NGO	0.759	0.767	0.990
432	ECA	SHF	0.787	0.822	0.957	461	EAP	NGO	0.588	0.703	0.837
433	ECA	COOP	0.960	1.000	0.960	462	EAP	NGO	0.581	0.651	0.892
434	ECA	NGO	1.000	1.000	1.000	463	EAP	SHF	0.617	0.620	0.996
435	ECA	NGO	0.929	0.931	0.997	464	EAP	SHF	0.619	0.648	0.954
436	ECA	SHF	0.213	0.315	0.675	465	EAP	NGO	1.000	1.000	1.000
437	ECA	NGO	0.874	0.889	0.983	466	SSA	SHF	0.500	0.500	0.999
438	ECA	SHF	0.596	0.597	0.998	467	SSA	NGO	0.692	0.701	0.988
439	ECA	SHF	0.712	0.747	0.952	468	SSA	SHF	0.256	0.298	0.859

Notes: This table presents financial efficiency scores for 468 DMUs assessed using DEA, under both the CRS (considers operating scale) and VRS assumptions (no consideration of scale). A sample of MFIs of different ownership forms and from six different geographic regions makes up the list of DMUs. On average, MFIs across the sample have a Technical efficiency of 0.70775, and Pure technical efficiency of 0.75343. 18 of the 468 sampled MFIs are financially efficient under the CRS assumption (score of 1) and 42 are financially efficient under the VRS assumption. The most financially efficient MFIs under the CRS assumption are Shareholder-owned firms (SHFs), while Cooperatives are the most financially efficient under the VRS assumption. NGOs on average are the least efficient MFIs. Finally, the most financially efficient MFIs are found in the LAC and ECA regions, while the least financially efficient are found in the EAP and SSA regions.

Table V.3: Social efficiency DEA analysis

DMU	Region	Status	TE_CRSS	TE_VRS	SE	DMU	Region	Status	TE_CRSS	TE_VRS	SE
1	LAC	SHF	0.139	0.200	0.695	42	LAC	SHF	0.127	0.128	0.991
2	LAC	NGO	0.369	0.394	0.936	43	MENA	NGO	0.129	0.153	0.842
3	LAC	SHF	0.161	0.178	0.907	44	MENA	SHF	0.119	0.132	0.907
4	LAC	NGO	0.282	0.501	0.563	45	MENA	NGO	0.248	0.265	0.933
5	LAC	NGO	0.215	0.227	0.949	46	SSA	SHF	0.111	0.114	0.971
6	LAC	NGO	0.176	0.214	0.821	47	SSA	SHF	0.109	0.117	0.933
7	LAC	NGO	0.172	0.183	0.937	48	SSA	NGO	0.378	0.430	0.880
8	LAC	NGO	0.193	0.199	0.970	49	SSA	SHF	0.312	0.348	0.897
9	LAC	NGO	0.215	0.244	0.881	50	SSA	SHF	0.081	0.084	0.971
10	EAP	NGO	0.101	0.106	0.949	51	SSA	SHF	0.072	0.081	0.881
11	EAP	SHF	0.072	0.072	1.000	52	EAP	SHF	0.188	0.190	0.989
12	EAP	SHF	0.056	0.057	0.994	53	EAP	NGO	0.194	0.197	0.986
13	LAC	SHF	0.136	0.136	0.997	54	EAP	NGO	0.374	0.616	0.608
14	LAC	SHF	0.171	0.171	0.998	55	EAP	SHF	0.416	0.416	1.000
15	LAC	COOP	0.113	0.114	0.998	56	EAP	NGO	0.283	0.877	0.322
16	LAC	COOP	0.538	0.541	0.996	57	EAP	NGO	0.317	0.320	0.992
17	LAC	NGO	0.235	0.236	0.995	58	EAP	NGO	0.347	0.454	0.765
18	LAC	SHF	0.165	0.166	0.994	59	SSA	SHF	0.504	0.559	0.901
19	LAC	COOP	0.353	0.358	0.987	60	SSA	NGO	0.427	0.536	0.796
20	MENA	NGO	0.410	0.414	0.991	61	SSA	COOP	0.446	0.459	0.971
21	MENA	NGO	0.307	0.308	0.996	62	SSA	SHF	0.558	0.593	0.941
22	MENA	NGO	0.305	0.325	0.939	63	SSA	SHF	0.668	0.697	0.958
23	MENA	NGO	0.388	0.403	0.961	64	SSA	NGO	0.852	0.944	0.902
24	LAC	SHF	0.099	0.100	0.989	65	LAC	SHF	0.298	0.309	0.966
25	SAS	SHF	0.656	0.717	0.915	66	LAC	SHF	0.273	0.273	1.000
26	SAS	SHF	0.501	0.555	0.902	67	LAC	NGO	0.271	0.290	0.933
27	SAS	COOP	0.493	0.505	0.978	68	LAC	COOP	0.193	0.200	0.967
28	SAS	SHF	0.527	0.658	0.802	69	SSA	NGO	0.366	0.430	0.852
29	SAS	NGO	0.541	0.655	0.827	70	SSA	SHF	0.241	0.243	0.992
30	SAS	SHF	0.511	0.635	0.805	71	SSA	SHF	0.113	0.126	0.900
31	SAS	NGO	0.609	0.750	0.812	72	SSA	SHF	0.581	0.583	0.997
32	SAS	SHF	0.527	0.537	0.981	73	MENA	SHF	0.310	0.310	0.998
33	EAP	SHF	0.273	0.455	0.599	74	MENA	NGO	0.065	0.068	0.951
34	EAP	SHF	0.428	0.576	0.743	75	MENA	SHF	0.956	0.962	0.993
35	EAP	COOP	0.429	0.619	0.693	76	SAS	SHF	0.441	0.543	0.812
36	EAP	SHF	0.231	0.279	0.827	77	SAS	NGO	0.289	0.307	0.942
37	LAC	SHF	0.194	0.218	0.886	78	SAS	SHF	0.238	0.249	0.955
38	LAC	SHF	0.098	0.110	0.897	79	SAS	SHF	0.356	0.386	0.922
39	LAC	SHF	0.327	0.330	0.990	80	SAS	SHF	0.330	0.331	0.997
40	LAC	SHF	0.246	0.260	0.946	81	SAS	SHF	0.224	0.231	0.971
41	LAC	SHF	0.192	0.196	0.979	82	SAS	NGO	0.357	0.401	0.891

Table
cont'd

83	SAS	SHF	0.156	0.156	0.998	124	ECA	SHF	0.157	0.170	0.922
84	SAS	SHF	0.236	0.254	0.927	125	ECA	COOP	0.236	0.340	0.695
85	LAC	SHF	0.112	0.113	0.986	126	ECA	SHF	0.161	0.168	0.954
86	LAC	NGO	0.346	0.361	0.958	127	ECA	SHF	0.185	0.195	0.949
87	LAC	COOP	0.155	0.163	0.951	128	ECA	SHF	0.246	0.300	0.823
88	LAC	NGO	0.276	0.297	0.928	129	ECA	SHF	0.549	0.607	0.903
89	LAC	NGO	0.226	0.242	0.935	130	ECA	SHF	0.071	0.071	0.997
90	SSA	SHF	0.066	0.068	0.984	131	ECA	SHF	0.091	0.091	0.997
91	SSA	NGO	0.199	0.203	0.983	132	ECA	SHF	0.053	0.055	0.967
92	SAS	NGO	0.386	0.857	0.450	133	ECA	SHF	0.300	0.316	0.948
93	SAS	NGO	0.199	0.200	0.996	134	SAS	NGO	0.305	0.306	0.997
94	SAS	NGO	0.302	0.708	0.427	135	SAS	NGO	0.257	0.293	0.878
95	SAS	NGO	0.326	0.378	0.863	136	SAS	NGO	0.269	0.306	0.877
96	SAS	NGO	0.278	0.345	0.806	137	SAS	NGO	0.993	0.998	0.995
97	SAS	NGO	0.333	0.378	0.880	138	SAS	NGO	0.540	0.563	0.958
98	SAS	NGO	0.527	0.537	0.980	139	SAS	NGO	0.292	0.342	0.854
99	SAS	NGO	0.345	0.429	0.804	140	SAS	NGO	0.475	1.000	0.475
100	SAS	NGO	0.389	0.406	0.957	141	SAS	NGO	0.263	0.287	0.918
101	SAS	NGO	0.222	0.238	0.933	142	SAS	NGO	0.366	0.425	0.862
102	ECA	COOP	0.200	0.207	0.964	143	SAS	NGO	0.358	0.372	0.963
103	ECA	SHF	0.107	0.112	0.961	144	SAS	NGO	0.230	0.265	0.867
104	ECA	SHF	0.079	0.079	0.996	145	SAS	NGO	0.296	0.343	0.863
105	ECA	SHF	0.175	0.257	0.683	146	SAS	NGO	0.381	0.409	0.931
106	SSA	SHF	0.140	0.145	0.961	147	SAS	NGO	0.281	0.315	0.892
107	LAC	SHF	0.105	0.131	0.798	148	SAS	NGO	0.273	0.291	0.939
108	LAC	SHF	0.169	0.186	0.908	149	SAS	NGO	0.136	0.139	0.978
109	ECA	SHF	0.209	0.210	0.997	150	SAS	NGO	0.295	0.346	0.853
110	ECA	SHF	0.202	0.206	0.979	151	SAS	NGO	0.316	0.369	0.858
111	ECA	NGO	0.143	0.209	0.684	152	SAS	NGO	0.433	0.585	0.741
112	ECA	NGO	0.181	0.184	0.987	153	SAS	NGO	0.300	0.315	0.950
113	ECA	COOP	0.420	0.483	0.870	154	LAC	SHF	0.034	0.145	0.234
114	ECA	SHF	0.337	0.340	0.991	155	LAC	SHF	0.108	0.108	1.000
115	ECA	NGO	0.153	0.159	0.963	156	LAC	SHF	0.083	0.083	1.000
116	ECA	NGO	0.182	0.211	0.863	157	LAC	SHF	0.075	1.000	0.075
117	ECA	SHF	0.184	0.189	0.973	158	LAC	SHF	0.088	0.088	1.000
118	ECA	SHF	0.213	0.215	0.992	159	LAC	SHF	0.112	0.112	1.000
119	ECA	SHF	0.458	0.656	0.699	160	LAC	NGO	0.088	0.088	0.992
120	ECA	SHF	0.267	0.330	0.808	161	LAC	SHF	0.241	0.241	1.000
121	ECA	NGO	0.243	0.473	0.514	162	LAC	NGO	0.183	0.184	0.995
122	ECA	SHF	0.141	0.141	0.999	163	LAC	NGO	0.147	0.168	0.875
123	ECA	NGO	0.250	0.251	0.997	164	LAC	NGO	0.300	0.381	0.787

Table
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165	LAC	NGO	0.161	0.168	0.959	206	LAC	SHF	0.256	0.257	0.996
166	LAC	NGO	0.202	0.205	0.985	207	EAP	NGO	0.906	0.926	0.978
167	LAC	NGO	0.110	0.112	0.979	208	EAP	NGO	0.223	0.272	0.819
168	LAC	NGO	0.230	0.288	0.798	209	EAP	NGO	0.049	0.107	0.460
169	LAC	NGO	0.325	0.326	0.997	210	LAC	NGO	0.093	0.114	0.811
170	LAC	SHF	0.035	0.035	0.997	211	LAC	NGO	0.225	0.225	0.999
171	LAC	NGO	0.147	0.150	0.978	212	LAC	NGO	0.290	0.294	0.985
172	ECA	NGO	0.192	0.195	0.988	213	LAC	NGO	0.070	0.072	0.973
173	ECA	NGO	0.139	0.160	0.869	214	LAC	NGO	0.251	0.278	0.902
174	ECA	NGO	0.158	0.165	0.960	215	LAC	NGO	0.225	0.254	0.884
175	ECA	NGO	0.172	0.178	0.966	216	LAC	SHF	0.211	0.228	0.926
176	ECA	NGO	0.153	0.164	0.929	217	LAC	COOP	0.118	0.130	0.910
177	ECA	NGO	0.151	0.206	0.733	218	LAC	NGO	0.218	0.241	0.902
178	ECA	SHF	0.182	0.184	0.991	219	LAC	NGO	0.247	0.289	0.856
179	ECA	NGO	0.194	0.196	0.988	220	LAC	NGO	0.189	0.246	0.768
180	ECA	SHF	0.272	0.276	0.986	221	MENA	NGO	0.416	0.426	0.977
181	ECA	SHF	0.114	0.115	0.996	222	MENA	NGO	0.330	0.333	0.992
182	ECA	SHF	0.128	0.136	0.945	223	LAC	NGO	0.250	0.293	0.854
183	ECA	SHF	0.131	0.137	0.958	224	LAC	NGO	0.300	0.309	0.971
184	ECA	NGO	0.185	0.215	0.861	225	LAC	NGO	0.141	0.240	0.590
185	LAC	SHF	0.190	0.214	0.892	226	LAC	SHF	0.132	0.220	0.598
186	LAC	SHF	0.538	0.590	0.911	227	LAC	SHF	0.181	0.206	0.878
187	LAC	NGO	0.198	0.288	0.685	228	SSA	SHF	0.067	0.076	0.881
188	LAC	NGO	0.165	0.193	0.856	229	SSA	NGO	0.988	1.000	0.988
189	LAC	NGO	0.231	0.391	0.591	230	SSA	SHF	0.618	0.718	0.860
190	LAC	NGO	0.385	0.443	0.870	231	SSA	NGO	0.436	0.461	0.946
191	ECA	COOP	1.000	1.000	1.000	232	SSA	NGO	0.353	0.384	0.921
192	ECA	COOP	1.000	1.000	1.000	233	ECA	SHF	0.264	0.265	0.996
193	ECA	SHF	0.928	1.000	0.928	234	ECA	SHF	0.185	0.190	0.971
194	ECA	COOP	0.724	1.000	0.724	235	ECA	SHF	0.157	0.196	0.798
195	ECA	COOP	0.106	0.115	0.924	236	ECA	SHF	0.159	0.161	0.988
196	ECA	NGO	0.123	0.171	0.719	237	ECA	SHF	0.091	0.093	0.979
197	ECA	COOP	0.492	1.000	0.492	238	ECA	SHF	0.086	0.097	0.883
198	ECA	SHF	0.073	0.073	0.999	239	ECA	NGO	0.136	0.147	0.924
199	ECA	COOP	0.885	1.000	0.885	240	ECA	NGO	1.000	1.000	1.000
200	ECA	SHF	0.095	0.145	0.652	241	ECA	SHF	0.096	0.096	0.998
201	SSA	COOP	0.135	0.136	0.995	242	SAS	SHF	0.388	0.437	0.887
202	SSA	SHF	0.813	0.897	0.906	243	SAS	SHF	0.540	0.692	0.781
203	SSA	COOP	0.571	0.780	0.733	244	SAS	SHF	0.334	0.336	0.996
204	LAC	NGO	0.261	0.262	0.994	245	SAS	SHF	0.679	0.753	0.903
205	LAC	SHF	0.160	0.168	0.948	246	SAS	NGO	0.571	1.000	0.571

Table
cont'd

247	SAS	NGO	0.455	0.456	0.998	288	SAS	NGO	0.382	0.463	0.825
248	SAS	SHF	0.497	0.529	0.939	289	SAS	SHF	0.498	0.512	0.972
249	SAS	SHF	0.565	1.000	0.565	290	SAS	SHF	0.465	0.514	0.904
250	SAS	SHF	0.479	0.480	1.000	291	SAS	SHF	0.581	1.000	0.581
251	SAS	NGO	0.687	0.710	0.968	292	SAS	NGO	1.000	1.000	1.000
252	SAS	NGO	0.426	0.431	0.990	293	SAS	SHF	0.750	0.853	0.880
253	SAS	SHF	0.401	0.455	0.883	294	SAS	SHF	0.475	0.598	0.794
254	SAS	NGO	0.918	1.000	0.918	295	SAS	NGO	0.552	0.555	0.994
255	SAS	NGO	1.000	1.000	1.000	296	SAS	SHF	1.000	1.000	1.000
256	SAS	NGO	0.610	0.617	0.988	297	SAS	SHF	0.434	0.448	0.968
257	SAS	SHF	0.562	0.573	0.982	298	SAS	NGO	1.000	1.000	1.000
258	SAS	SHF	0.609	0.639	0.952	299	SAS	NGO	0.485	0.509	0.953
259	SAS	SHF	1.000	1.000	1.000	300	SAS	SHF	0.588	0.594	0.990
260	SAS	SHF	0.615	0.634	0.970	301	SAS	SHF	0.451	0.546	0.825
261	SAS	NGO	0.399	0.425	0.939	302	SAS	SHF	0.923	1.000	0.923
262	SAS	SHF	0.428	0.429	0.998	303	SAS	SHF	0.536	0.586	0.914
263	SAS	SHF	0.499	0.511	0.976	304	SAS	SHF	0.633	0.781	0.810
264	SAS	SHF	0.792	0.793	0.999	305	SAS	SHF	0.570	0.634	0.900
265	SAS	NGO	0.180	0.182	0.993	306	SAS	SHF	0.480	0.608	0.789
266	SAS	NGO	0.996	1.000	0.996	307	SAS	SHF	0.564	0.663	0.851
267	SAS	NGO	0.477	0.515	0.926	308	SAS	NGO	0.499	0.559	0.892
268	SAS	NGO	0.578	0.592	0.978	309	SAS	SHF	0.343	0.425	0.808
269	SAS	SHF	0.745	0.870	0.856	310	SAS	SHF	0.287	0.317	0.906
270	SAS	SHF	0.386	0.429	0.900	311	EAP	SHF	0.410	0.485	0.845
271	SAS	NGO	0.825	0.981	0.841	312	EAP	COOP	0.222	0.223	0.998
272	SAS	SHF	0.553	0.679	0.814	313	MENA	NGO	0.195	0.203	0.962
273	SAS	NGO	0.684	0.739	0.926	314	MENA	NGO	0.208	0.220	0.946
274	SAS	NGO	0.577	0.584	0.987	315	MENA	NGO	0.142	0.144	0.984
275	SAS	NGO	0.506	0.519	0.975	316	MENA	SHF	0.157	0.162	0.970
276	SAS	NGO	0.680	0.772	0.881	317	ECA	NGO	0.160	0.174	0.921
277	SAS	SHF	0.441	0.442	0.997	318	ECA	COOP	0.106	0.111	0.960
278	SAS	SHF	0.525	0.682	0.769	319	ECA	COOP	0.128	0.154	0.831
279	SAS	SHF	0.439	0.440	0.997	320	ECA	SHF	0.117	0.118	0.994
280	SAS	NGO	0.464	0.467	0.995	321	ECA	SHF	0.224	0.225	0.998
281	SAS	SHF	0.709	0.765	0.927	322	ECA	NGO	0.780	1.000	0.780
282	SAS	SHF	0.465	0.485	0.959	323	ECA	COOP	0.084	0.086	0.974
283	SAS	NGO	0.380	0.419	0.908	324	ECA	SHF	0.284	0.291	0.975
284	SAS	NGO	0.529	0.533	0.991	325	ECA	NGO	0.144	0.146	0.988
285	SAS	COOP	0.404	0.406	0.995	326	MENA	NGO	0.219	0.221	0.992
286	SAS	NGO	0.627	0.629	0.997	327	ECA	COOP	0.163	0.205	0.796
287	SAS	SHF	0.687	0.795	0.865	328	ECA	SHF	0.129	0.160	0.802

Table
cont'd

329	ECA	SHF	0.097	0.101	0.965	370	SSA	SHF	0.071	0.076	0.934
330	ECA	SHF	0.071	0.072	0.998	371	SSA	COOP	0.225	0.251	0.897
331	LAC	SHF	0.185	0.187	0.990	372	SSA	SHF	0.820	1.000	0.820
332	LAC	SHF	0.181	0.184	0.983	373	SSA	SHF	0.077	0.084	0.915
333	LAC	SHF	0.461	0.505	0.913	374	SSA	NGO	0.480	0.563	0.853
334	LAC	SHF	0.202	0.205	0.989	375	SSA	SHF	0.112	0.114	0.988
335	LAC	SHF	0.197	0.228	0.864	376	SSA	NGO	0.502	0.615	0.817
336	LAC	SHF	0.331	0.340	0.972	377	SAS	NGO	0.724	0.724	1.000
337	LAC	SHF	0.505	0.512	0.987	378	SAS	NGO	0.650	0.864	0.753
338	LAC	SHF	0.204	0.445	0.458	379	SAS	NGO	0.238	0.247	0.963
339	LAC	SHF	0.228	0.231	0.990	380	SAS	NGO	0.356	0.357	0.998
340	LAC	SHF	0.247	0.255	0.968	381	SAS	NGO	0.336	0.338	0.992
341	LAC	SHF	0.298	0.318	0.937	382	SAS	SHF	0.311	0.387	0.803
342	LAC	SHF	0.264	0.270	0.981	383	SAS	NGO	0.360	0.483	0.745
343	LAC	SHF	0.218	0.292	0.747	384	SAS	NGO	0.310	0.400	0.775
344	LAC	NGO	0.212	0.219	0.966	385	SAS	NGO	0.842	0.843	0.999
345	LAC	SHF	0.224	0.261	0.858	386	SAS	SHF	0.492	0.529	0.929
346	LAC	SHF	0.218	0.282	0.774	387	SAS	SHF	0.153	0.167	0.916
347	LAC	SHF	0.165	0.280	0.590	388	SAS	NGO	0.311	0.315	0.986
348	LAC	SHF	0.196	0.206	0.953	389	SAS	SHF	0.455	0.481	0.947
349	LAC	SHF	0.193	0.200	0.968	390	SAS	NGO	0.787	0.790	0.995
350	LAC	SHF	0.137	0.143	0.958	391	SAS	NGO	0.381	0.538	0.708
351	LAC	SHF	0.139	0.361	0.386	392	SAS	SHF	0.441	0.466	0.945
352	LAC	SHF	0.130	0.382	0.339	393	SAS	SHF	0.260	0.261	0.997
353	LAC	SHF	0.151	0.178	0.848	394	SAS	NGO	0.564	1.000	0.564
354	LAC	SHF	0.101	0.107	0.936	395	LAC	SHF	0.290	0.414	0.702
355	LAC	SHF	0.611	0.679	0.901	396	LAC	NGO	0.212	0.275	0.771
356	LAC	NGO	0.241	0.253	0.952	397	LAC	NGO	0.226	0.275	0.821
357	ECA	SHF	0.188	0.197	0.956	398	LAC	SHF	0.131	0.131	0.997
358	ECA	SHF	0.137	0.140	0.976	399	LAC	COOP	0.165	0.179	0.924
359	ECA	SHF	0.300	0.454	0.659	400	LAC	NGO	0.256	0.307	0.832
360	ECA	NGO	0.168	0.174	0.964	401	LAC	SHF	0.160	0.160	0.997
361	ECA	SHF	0.196	0.212	0.926	402	LAC	SHF	0.133	0.137	0.975
362	MENA	NGO	0.188	0.201	0.938	403	LAC	SHF	0.136	0.136	1.000
363	MENA	SHF	0.157	0.164	0.955	404	LAC	SHF	0.127	0.127	0.994
364	MENA	SHF	0.189	0.189	1.000	405	LAC	NGO	0.338	0.367	0.919
365	MENA	NGO	0.251	0.252	0.996	406	LAC	SHF	0.113	0.119	0.956
366	SSA	NGO	0.249	0.311	0.799	407	EAP	NGO	0.246	0.251	0.977
367	SSA	COOP	0.221	0.333	0.664	408	EAP	NGO	0.127	0.132	0.962
368	SSA	NGO	0.272	0.324	0.838	409	EAP	SHF	0.128	0.139	0.918
369	SSA	SHF	0.157	0.165	0.954	410	EAP	SHF	0.251	0.252	0.993

Table
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411	EAP	NGO	0.260	0.302	0.862	440	ECA	SHF	0.144	0.146	0.987
412	EAP	NGO	0.152	0.165	0.920	441	ECA	SHF	0.090	0.090	1.000
413	EAP	SHF	0.170	0.173	0.983	442	SSA	SHF	0.166	0.209	0.796
414	EAP	NGO	0.518	0.533	0.972	443	SSA	NGO	0.343	0.357	0.960
415	EAP	NGO	0.355	0.371	0.958	444	SSA	SHF	0.110	0.112	0.975
416	EAP	NGO	0.320	0.447	0.717	445	SSA	NGO	0.208	0.257	0.808
417	EAP	SHF	0.127	0.132	0.963	446	SSA	NGO	0.132	0.165	0.797
418	EAP	SHF	0.276	0.374	0.737	447	SSA	NGO	0.282	0.284	0.992
419	EAP	COOP	0.305	0.320	0.954	448	SSA	NGO	0.304	0.328	0.928
420	EAP	SHF	0.220	0.226	0.976	449	ECA	NGO	0.254	0.261	0.974
421	EAP	NGO	0.227	0.284	0.799	450	ECA	NGO	0.112	0.192	0.584
422	EAP	SHF	0.207	0.216	0.956	451	ECA	SHF	0.060	0.060	0.997
423	EAP	NGO	0.241	0.376	0.642	452	EAP	NGO	0.379	0.607	0.624
424	ECA	SHF	0.226	0.228	0.991	453	EAP	NGO	0.574	0.606	0.947
425	ECA	SHF	0.090	0.090	0.998	454	EAP	COOP	0.083	0.083	1.000
426	ECA	SHF	0.099	0.099	0.999	455	EAP	NGO	0.418	0.461	0.907
427	ECA	SHF	0.071	0.071	0.999	456	EAP	NGO	0.732	0.939	0.780
428	ECA	NGO	1.000	1.000	1.000	457	EAP	NGO	0.854	1.000	0.854
429	ECA	SHF	0.091	0.093	0.977	458	EAP	NGO	0.398	0.621	0.641
430	ECA	COOP	0.126	0.137	0.920	459	EAP	NGO	0.953	1.000	0.953
431	ECA	SHF	0.088	0.091	0.964	460	EAP	NGO	0.838	0.888	0.943
432	ECA	SHF	0.077	0.079	0.984	461	EAP	NGO	0.498	0.557	0.894
433	ECA	COOP	0.172	0.265	0.648	462	EAP	NGO	0.320	0.431	0.743
434	ECA	NGO	0.155	0.165	0.937	463	EAP	SHF	0.281	0.301	0.931
435	ECA	NGO	0.580	0.643	0.902	464	EAP	SHF	0.351	0.353	0.994
436	ECA	SHF	0.372	0.384	0.970	465	EAP	NGO	1.000	1.000	1.000
437	ECA	NGO	0.165	0.198	0.832	466	SSA	SHF	0.072	0.080	0.899
438	ECA	SHF	0.186	0.198	0.937	467	SSA	NGO	0.192	0.202	0.951
439	ECA	SHF	0.175	0.227	0.772	468	SSA	SHF	0.270	0.315	0.859

Notes: This table presents social efficiency scores for 468 DMUs assessed using DEA, under both the CRS and VRS assumptions. A sample of MFIs of different ownership forms and from six different geographic regions makes up the list of DMUs. On average, MFIs across the sample have a Technical efficiency of 0.32363, and Pure technical efficiency of 0.37025. Majority of the MFIs are thus socially inefficient, with only 10 of the 468 sampled MFIs being socially efficient under the CRS assumption (score of 1) and 27 efficient under the VRS assumption. The most socially efficient MFIs on average under both assumptions are NGOs, though the difference between the social efficiency of NGOs and Cooperatives is small. Shareholder-owned firms (SHFs) are the least socially efficient MFIs. Finally, the most socially efficient MFIs are found in the SAS and EAP regions, while the least socially efficient are found in the LAC and ECA regions.