

Anyangwe, Tony; Vanroose, Annabel; Fanta, Ashenafi Beyene

## Article

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\*Corresponding author: Tony  
Anyangwe, Stellenbosch Business  
School, Cape Town, South Africa  
E-mail: [tndakoh@gmail.com](mailto:tndakoh@gmail.com)

Reviewing editor:  
Numan Ulku, Institute of Economic  
Studies, Charles University:  
Univerzita Karlova, Czech Republic

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## DEVELOPMENT ECONOMICS | RESEARCH ARTICLE

# Determinants of financial inclusion: does culture matter?

Tony Anyangwe<sup>1\*</sup>, Annabel Vanroose<sup>1,2</sup> and Ashenafi Fanta<sup>1</sup>

**Abstract:** This study aims to assess the role of culture as a determinant of financial inclusion, defined with respect to formal account ownership, saving and credit in/ from formal financial institutions. A sample of 85 countries, comprising 50 developing and 35 developed countries from the World Bank's Global Findex database is used to perform probit estimations. Hofstede's cultural dimensions, namely power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, short/long-term orientation, and indulgence/restraint are used as culture measures. Our findings indicate that living in high power distance, more masculine, and high uncertainty avoidance cultures reduces the likelihood for financial inclusion. Meanwhile, living in more individualistic, long-term oriented, and more indulgent cultures increases the likelihood for financial inclusion. These findings are relevant for the design of policies to foster financial inclusion across the developing world, especially as financial inclusion affects poverty levels and reduction strategies, and economic development as a whole. We provide evidence which dismisses the global "one size fits all" strategy applied to development-related initiatives like the global

### ABOUT THE AUTHORS

*Tony Anyangwe* is a finance consultant and lecturer in Cameroon. He holds a PhD in Development Finance from Stellenbosch University, South Africa. Prior to engaging in research, he worked as a corporate banker in Cameroon. His research interests include institutions and development, financial market integration, and SME/digital finance.

*Annabel Vanroose* is part time associate professor at Université libre de Bruxelles and full time policy advisor. Before, she worked as associate professor at Stellenbosch Business School, South Africa and Universidad de Piura in Peru. She obtained her PhD from the Vrije Universiteit Brussel and Université libre de Bruxelles, Belgium.

*Ashenafi Fanta* is a Senior Lecturer of Development Finance at Stellenbosch Business School. Prior to this, he worked as Data Analysis and Segmentation Expert at FinMark Trust. His research interests include financial development, SME finance, financial inclusion, and corporate governance of financial institutions. This study highlights the role informal institutions play in determining country-level development outcomes. We explore the effects of informal institutions on firm performance.

### PUBLIC INTEREST STATEMENT

Across the world, public and private actors have financed initiatives aimed at expanding access to, and use of formal financial services like saving, credit, and insurance, otherwise dubbed financial inclusion. Based on past research, better access to financial services is beneficial for households and society as a whole. Notable differences have been observed at regional and country levels on financial inclusion measures like access to, and use of financial services like saving and credit. Macroeconomic differences between countries have largely been held accountable for these financial inclusion differences. In our study, we hypothesize that culture has a key role to play. We test this hypothesis using a global sample of 85 countries. Our findings indicate that culture does determine financial inclusion, with people in some cultures more likely to access and use financial services than people in others.

provision of funds towards financial inclusion, and argue for a more customised approach given country-level differences conditioned by different cultural frameworks.

**Subjects:** Culture & Development; Economics and Development; Finance

**Keywords:** credit; culture; financial inclusion; Hofstede; (In)formal institutions; saving

## 1. Introduction

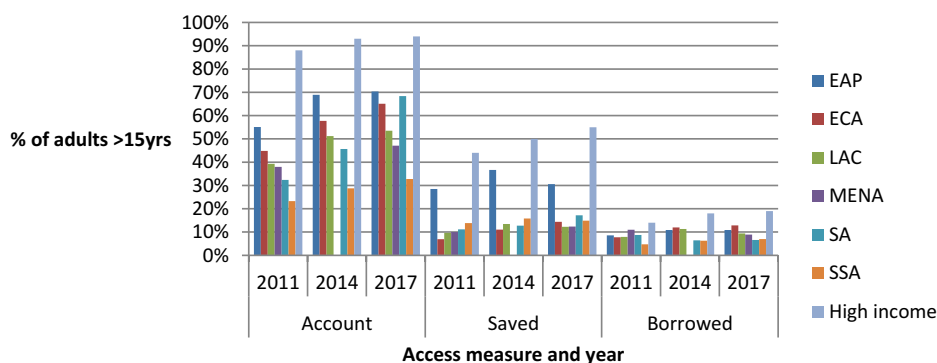
Access to financial services represents a major driver in the quest for sustainable socio-economic development across the world. Growing evidence suggests that financial inclusion is a key facilitator of poverty reduction and development as it fosters and promotes female empowerment (Ashraf et al., 2010; Cicchiello et al., 2021); leads to higher savings for onward use in education, healthcare, and household/productive assets acquisition (Dupas & Robinson, 2009; Steinert et al., 2017); and results in better financial risk management (Demirgüç-Kunt et al., 2018; Naceur et al., 2015; Swamy, 2014). Claessens and Perotti (2007) and Aslan et al. (2017) provide further evidence linking access to financial services with lower income inequality, and higher economic growth.

Despite the importance of financial inclusion, billions of people across the developing world still remain unbanked and heavily reliant on informal finance mechanisms. In sub-Saharan Africa (SSA) for example, the percentage of persons who use informal saving facilities like saving clubs and people outside the family witnessed a 6% increase from 19% in 2011 to 25% in 2017. The average figure for informal finance use across low-income countries is much higher, rising from 8% in 2011 to 23% in 2017. Nevertheless, significant progress has been made in boosting financial inclusion globally. As of 2017, 69% of adults globally had an account at a financial institution, representing an 18% increase between 2011 and 2017. Majority of the unbanked reside in the developing world. A regional comparison across the developing world reveals stark differences as indicated in Figure 1. SSA has the lowest percentage of adult account holders, 33% as of 2017, up from 23% in 2011.<sup>1</sup> South Asia (SA) remains the fastest growing region with respect to account ownership, rising from 32% to 68% over the same period.

Progress on financial inclusion across parts of the developing world and in particular the SSA region, though commendable has not been commensurate with the funding provided by both public and private actors towards this end. Financial inclusion for example, is lowest in the SSA region. This region has over time, however, received relatively higher financial inclusion funding than other developing regions (Tomilova & Dashi, 2017<sup>2</sup>). In assessing the determinants of such inclusion, mainstream empirical research continues to focus on necessity-based determinants like 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 among others (Cicchiello et al., 2021; Demirgüç-Kunt & Klapper, 2013). While such variables have been vital in

**Figure 1. Formal financial services access/use between 2011 and 2017.**

Source: *Global Findex*, 2018.



explaining financial outcomes on country-specific bases, they have not explained the cross-country and cross-region variation in financial inclusion across the world, or even the popularity of informal finance in countries with relatively better developed financial systems like Kenya.

In an attempt to explain cross-country and cross-regional variation in financial inclusion, empirical research has focused on variables which Naceur et al. (2015) describe as structural and policy-based, namely macroeconomic and formal institutional differences relating to population density, the level of bank competition, and property rights. Of these two variable categories, institutions have received far less attention, due partly to their ubiquitous nature and measurement difficulty. North (1990) describes institutions as “the rules of the game in a society”, essentially encompassing formal institutions that protect and enforce the various rights like property and creditor rights; and informal institutions, which define a society’s underlying norms of conduct.

Both formal and informal aspects of institutions can affect the incentives and costs associated with financial intermediation. Osili and Paulson (2006) illustrate 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 a bank or other financial institution will abscond with his/her funds or the likelihood of expropriation by firm managers. Institutional quality 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. This theoretically implies institutions influence the expected costs of participation in financial markets. From a supply perspective, higher institutional quality will lower the costs that financial institutions incur in providing services to individuals and households.

The focus on institutions in mainstream empirical research has largely been limited to the formal aspects. The informal institutional environment relating to variables rooted in the culture of a people like trust, respect for hierarchy, term-orientation, the treatment of women, and religion among others has largely been ignored. 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. Geertz (1962) explains why informality remains significantly important, especially in developing contexts. Informality, he explains, may facilitate the reduction of information and transaction costs in an economy, by providing an avenue for socialising and amassing social capital. Higher social capital then reduces information, transaction, and by implication the cost of accessing and using financial services.

In this study, we hypothesise that culture is a determinant of financial inclusion. We thus assess the effect of culture on financial inclusion using a global cross-section sample of 85 countries, comprising 50 developing and 35 developed countries from the Global Findex database of 2017, and culture data from Hofstede’s cultural dimensions.<sup>3</sup> Over 90,000 individual observations are used in the sample. Only a few empirical studies have taken this route. Most of these have focused on a narrow set of culture measures, like individualism (Lu et al., 2021), masculinity and term-orientation (Muntin, 2020), uncertainty avoidance and term orientation (Cuéllar & Isabel, 2018), and power distance, uncertainty avoidance, masculinity, and individualism (Korynski & Pytkowska, 2016). By using a broader range of culture measures—six variables from Hofstede’s database, we paint a clearer and more complete picture on culture and financial inclusion than do past studies which only use a few measures. We also use a large cross-section of countries across all world regions, and discuss our findings in relation to respective regions which further projects our findings and tailors them accordingly. Our

empirical analysis using a probit model indicates that culture does matter. 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. Thus, due to its relatively more collectivist, more masculine, and shorter-term oriented cultural framework, financial inclusion is lower in the LAC region than it is across all other developing regions, with the exception of SSA. Interestingly, the SSA region has a cultural framework supportive of financial inclusion but still lags behind the other developing regions. We believe future studies jointly considering both formal and informal institutions will present a better explanation for this observation.

The remainder of the paper is structured as follows: in the next section, we present a conceptual framework and related literature on financial inclusion and culture. Section 3 deals with the methodology applied, followed by a presentation and discussion of empirical findings, and a conclusion.

## 2. Literature review

### 2.1. Culture, institutional quality and finance

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 (Guiso et al., 2006; North, 1990). Culture falls within a country’s institutional framework, precisely its informal institutions.

An example of the 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 p. 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* (Hofstede et al., 2010 p. 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 p. 140). Uncertainty Avoidance measures “the extent to which the members of a culture feel threatened by uncertain or unknown situations” (Hofstede et al., 2010 p. 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”. 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).

Due to its foundation on values and beliefs, culture may directly influence the decision to participate in formal finance markets as explained by 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, and contract enforcement. Depending on the strength of institutions, these costs may be high and 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 people, which derives from societal values. Interestingly, a country's formal institutions derive from these informal institutions as depicted in Figure 2.

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.

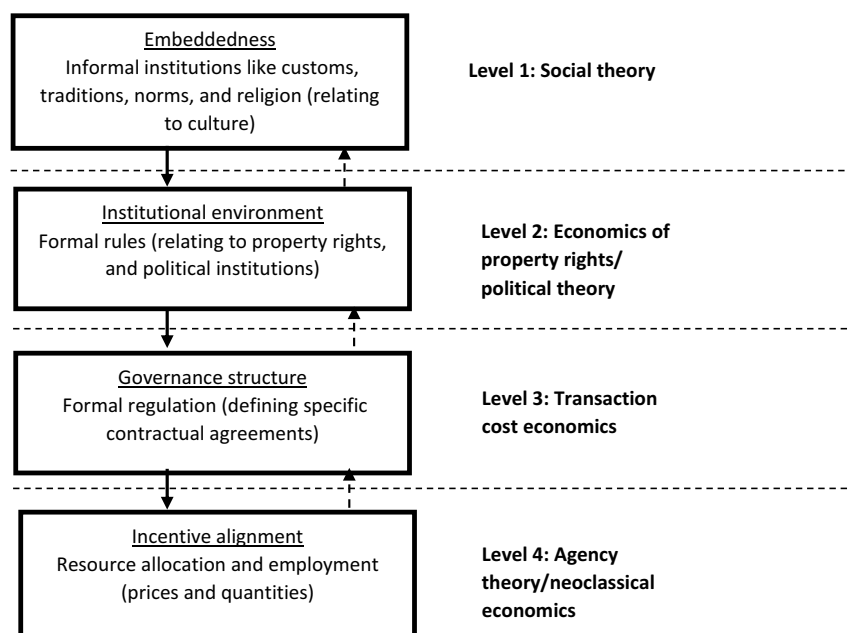
## 2.2. Empirical evidence: cultural determinants of financial inclusion

Existing empirical literature on culture and financial outcomes has dwelled on a broad range of variables among which are individualism, uncertainty avoidance, term orientation, trust, and religion.

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

**Figure 2. Levels of social analysis.**

**Source:** Authors' adaptation from Williamson (2000).





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 and 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 and 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 and 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 and 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 and 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. The definition of financial inclusion with respect to efficiency by Korynski and Pytkowska (2016), and the application of DEA in their analysis is an interesting idea. Their choice of inputs, however, presents a major controversy, as the authors do not advance any concrete theoretical or other rationale for their choice of inputs—financial inclusion policy—from the myriad of possible inputs available.

Cicchello et al. (2021) assess the effect of a host of variables, among which is religion on female financial inclusion across the MENA region. Findings following a probit estimation using a sample of approximately 20,817 indicate that women in predominantly Muslim countries which have



Sharia-compliant financial institutions are less likely to be financially included. The authors, however, fall short of providing any theoretical or practical explanation for the observed result.

### 3. 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 and Zheng (2016), Korynski and Pytkowska (2016), Cuéllar and Isabel (2018), Ang (2019), Ahunov and Hove (2020), Osei-Tutu and 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 15 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 and Weill (2016), Lanie (2017), Muntin (2020), Osei-Tutu and Weill (2020), and Lu et al. (2021). All three measures are used to capture financial inclusion in this study.

Hofstede and Bond (1984) posit 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 (Demirgüç-Kunt et al., 2018; Zins & Weill, 2016), we expect a negative relation between power distance and financial inclusion, with respect to all three measures. Similar findings are made by Korynski and Pytkowska (2016), Osei-Tutu and 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. We thus expect a positive relation between individualism and financial inclusion. Korynski and 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. We thus expect a negative relationship between masculinity and financial inclusion. Similar findings of a negative relationship between masculinity and financial inclusion are made by Korynski and 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 p. 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 potential negative relationship between uncertainty avoidance and financial inclusion. Cuéllar and Isabel (2018) and Ahunov and 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). We thus expect a positive relationship between long-term orientation and financial inclusion. Cuéllar and Isabel (2018) and Muntin (2020) equally find financial inclusion to be higher in longer-term oriented countries. Korynski and 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. We thus expect a positive relationship *indulgence* and financial inclusion.

These hypotheses are summarised in Table 1 below.

## 4. Methodology

### 4.1. Datasets

#### 4.1.1. Measuring financial inclusion

We extract financial inclusion data 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, with sample sizes per country of approximately 1000 inhabitants. Across the database, only a few countries like China, India, Pakistan, Morocco and Russia have over 1000 survey respondents, ranging from 1600 in Pakistan to 4500 in Morocco. Launched by the World Bank in 2011, data on these measures is published every 3 years, with over 100 indicators on financial inclusion, including by gender, age group, and income. The database has widely been used in research related to financial inclusion as seen among others in Allen et al. (2016), Zins and Weill (2016), and Deléchat et al. (2018).

#### 4.2. 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. The database has six cultural value dimensions. All six, namely power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, term-orientation, and indulgence/restraint are used in this study. Country scores on the respective variables range between 0 and 100, with higher scores implying a higher measure in each category.

#### 4.3. Sample selection

This is a global study, involving both developed and developing countries. One hundred and forty-two 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. This region and country representation is presented in Table 2 below.

## 5. Model, variables, and estimation

### 5.1. Model and estimation

We use a probit model in this study to find out the role of culture in determining 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 p. 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

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

As Brooks (2008, p. 518) explains, results obtained using either the probit or logit models tend to be very similar. The choice thus often boils down to a personal one. Our 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.

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,  $\beta$  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,  $\beta$ , to obtain information on  $y_i^*$ .

$$\text{Prob}_i = \text{Prob}(y_i = 1|x') = \text{Prob}(y_i \leq y_i^*) = \text{Prob}(Z_i \leq \beta x_i') = F(\beta x_i')$$

where  $Z$  is a standard normal variable,  $Z \sim N(0, \sigma^2)$  and  $F(z_i) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{z_i^2}{\sigma^2}\right)}$  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,  $\text{Prob}(Y_{ij}) = 1$ , given an underlying set of exogenous variables  $x$ :

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

where the coefficients  $\delta$ ,  $\gamma$ ,  $\lambda$ , and  $\theta$  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);  $\alpha$  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.

## 5.2. Variables

Following Zins and Weill (2016) and Osei-Tutu and 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 survey.<sup>4</sup>

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, partly in line with Korynski and Pytkowska (2016).

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

### 5.3. 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 (Cámara & Tuesta, 2014; Osili & Paulson, 2006; Tuesta et al., 2015; Zins & Weill, 2016). We control for each of these individual characteristics. Gender is a dummy variable equal to one if the individual is *Female* and zero otherwise. We use three dummy variables 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%. Finally, we control for the employment status of individuals via a dummy emp\_stat, with one indicating the individual is employed and zero otherwise.

### 5.4. Country macroeconomic environment and related characteristics

To account for macroeconomic differences at country level which may potentially influence the results, we control for the level of wealth, population density, and financial sector development. This follows research studies of Olaniyi and Adeoye (2016), Rajput (2017), and Cicchiello, et al. (2021). Following Hanedar et al. (2014), El Ghoul and Zheng (2016), and Levine et al. (2018), we control for the level of financial sector development in respective countries using the percentage of private credit by banks to GDP. In line with Deléchat et al. (2018), we control for the level of wealth of a country measured by GDP per capita.

### 5.5. 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 and Paulson (2006) and Neba and Mbotta (2018), we control for the legal origin of countries. 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).

in Table 3 above, we present the variables used in this study, as well as their respective sources.

**Table 1. Hypotheses relating to culture and account ownership**

Hypothesis	Culture measure	Account ownership	Formal saving	Formal credit
1	Power distance	-	-	-
2	Individualism/Collectivism	+	+	+
3	Masculinity/Femininity	-	-	-
4	Uncertainty avoidance	-	-	-
5	Long/short term orientation	+	+	+
6	Indulgence/Restraint	+	+	+

Source: **Author, 2019.**

**Table 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 (SA)*	3	Bangladesh, India, Pakistan
Sub-Saharan Africa (SSA)*	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>	<i>85</i>	

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

**Table 3. Variables, description, and data sources**

<b>Variable</b>	<b>Symbol</b>	<b>Description/ Computation where applicable</b>	<b>Data source</b>
<i>A. Dependent variables</i>			
Account ownership	acc_own	% of persons aged 15 and over who own an account at a financial institution	Global Findex
Saved at a financial institution	sav_fi	% of persons aged 15 and over who saved any money in a financial institution in the past 12 months	Global Findex
Borrowed from a financial institution	brw_fi	% of persons aged 15 and over who borrowed any money from a financial institution in the past 12 months	Global Findex
<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	ua	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	idg	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. Demographic controls</i>			
Gender	female	Dummy variable indicating gender of individual: male or female	Global Findex
Age	age	Age of individual	Global Findex
Education level	educ	Dummy variable indicating educational attainment of individual up to primary, secondary, and tertiary levels	Global Findex

(Continued)

Variable	Symbol	Description/ Computation where applicable	Data source
Income level	inc	Dummy variable indicating income level of individual	Global Findex
Employment status	emp_stat	Dummy variable indicating whether or not an individual is employed	Global Findex
<i>II. Macroeconomic</i>			
National wealth	gdppc	Gross domestic product per capita	World Development Indicators
Population density	pdens	% of people per square kilometre of land area	World Development Indicators
Financial sector development	pvtcgdp	Private credit to banks/ GDP (%)	World Development Indicators
<i>III. Formal institutions</i>			
Legal origin	legor	Dummy variable indicating the legal origin of a country (equal to 1 if a country's legal origin is English Common Law)	Djankov et al. 2007
Property rights	propr	Composite index ranging from 0 to 100, higher score meaning a stronger property rights	Heritage Foundation
Creditor rights	credr	Index ranging from 0 (weak) to 4 (strong) aggregating the strength of creditor rights per country	Djankov et al. 2007

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

## 6. Estimation results and discussion

### 6.1. Descriptive statistics

Summary statistics for all the variables included in the model are presented in Table 4. 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. Twenty-nine percent 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 4. Summary statistics**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<i>Dependent variables</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>Culture measures: Hofstede</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>Demographic controls</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>Macroeconomic controls</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

(Continued)

Variable	Obs	Mean	Std. Dev.	Min	Max
Private credit by banks as % of GDP	97,028	67.280	43.740	9.162	223.391
<i>Formal institution controls</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 5, the sampled regions are further summarised with respect to their financial inclusion and culture scores. 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 Asia (SA) 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%).

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 (SA) region with a score of 15.

## 7. Regression analysis

### 7.1. Results

Table 6 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 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.

## 8. Discussion of findings

### 8.1. Power distance

Our 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

**Table 5. 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
SA	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
Sample	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.

**Table 6. Effect of culture on financial inclusion**

	(1)	(2)	(1)	(2)	(1)	(2)
Variables	acc_own	acc_own	sav_fi	sav_fi	brw_fi	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>						

(Continued)

**Table6. (Continued)**

	(1)	(2)	(1)	(2)	(1)	(2)
Variables	acc_own	acc_own	sav_fi	sav_fi	brw_fi	brw_fi
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)
<b>Statistics</b>						
Observations	97,028	95,736	97,028	95,736	97,028	95,736
Pseudo R <sup>2</sup>	0.1803	0.3073	0.1288	0.2153	0.0093	0.0554
Log likelihood	-49,036.014	-40,761.04	-50,895.058	-45,349.701	-37,232.343	-35,118.088
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 financial inclusion. 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.

account by approximately 0.17%. This finding is in line with those of Korynski and Pytkowska (2016), Osei-Tutu and Weill (2020), and Lu et al. (2021), and satisfies hypothesis 1 in this study relating to power distance. Fogel 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%.

## 8.2. 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 and Pytkowska (2016), and Lu et al. (2021), and confirms hypothesis 2 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 and 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%.

### **8.3. 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 and Pytkowska (2016), Muntin (2020), and Lu et al. (2021) who find financial inclusion to be higher in more feminine societies, and confirms hypothesis 3 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 et al. (2010, p. 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%.

### **8.4. 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 and Isabel (2018), and Ahunov and Hove (2020). A similar though statistically insignificant relationship is found by Korynski and 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 p. 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%.

### **8.5. 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 and Isabel (2018) and Muntin (2020), and confirms hypothesis 5 above. The findings, however, contradict those of Korynski and 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.

### **8.6. 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 and Pytkowska (2016). With respect to 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 and 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.

## 9. Summary and 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 significantly low. In assessing the determinants of financial inclusion, empirical literature has failed to consider the informal institutional makeup of respective countries. We prove empirically in this study that culture has an effect on financial inclusion. We find that 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. We also find that 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. Based on this finding, 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.

Our findings provide evidence which dismisses the global “one size fits all” strategy applied to development-related initiatives, like the global provision of funds towards financial inclusion. As the evidence herein indicates, there is a need to customize such strategies to local realities in the beneficiary countries. This theoretically will be necessitated by the fact that the cost and strategies of information asymmetry reduction vary in different countries by virtue of their different cultural and related informal institutional frameworks. We, however, still remain perplexed as to why informal finance still thrives in a region like SSA which has a favourable cultural framework for financial inclusion—low uncertainty avoidance, high indulgence, and relatively lower masculinity. Further research on the determinants of informal finance may help answer this question.

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## Author details

Tony Anyangwe<sup>1</sup>  
E-mail: [tndakoh@gmail.com](mailto:tndakoh@gmail.com)  
ORCID ID: <http://orcid.org/0000-0003-0649-9167>  
Annabel Vanroose<sup>1,2</sup>  
Ashenafi Fanta<sup>1</sup>  
ORCID ID: <http://orcid.org/0000-0001-9154-3518>

<sup>1</sup> Department of Development Finance Stellenbosch Business School, Cape Town, South Africa.

<sup>2</sup> Centre for Research in Microfinance, Université Libre de Bruxelles, Belgium, Cape Town, South Africa.

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## Notes

1. Global Index 2017, <https://datacatalog.worldbank.org/dataset/global-financial-inclusion-global-index-database>
2. CGAP Brief available at <https://openknowledge.worldbank.org/handle/10986/30111>
3. <https://www.hofstede-insights.com/country-comparison>

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

#### Disclosure statement

No potential conflict of interest was reported by the authors.

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