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Aleksandra Nagańska,  
Stanisław Cichocki

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Aleksandra Nagańska 

University of Warsaw, Faculty of Economic Sciences, Długa 44/50, 00-241 Warsaw, Poland

Stanisław Cichocki 

University of Warsaw, Faculty of Economic Sciences, Długa 44/50, 00-241 Warsaw, Poland  
corresponding author: scichocki@wne.uw.edu.pl

## Can People Trust What They Don't Understand? Role of Language and Trust for Financial Inclusion

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### Abstract

The aim of this paper is to look at determinants of financial inclusion through the lens of comprehension of financial concepts and financial language. Specifically, we are interested in which factors are important should this comprehension be absent. We show that, in the context of finance, communication is an important transmission channel through which individuals are encouraged or discouraged to participate in the financial system. We argue that the unfamiliarity with products and the complexity of language used in the banking sector tend to limit trust granted to financial institutions. We test the hypothesis that linguistic diversity is a strong instrument for the impact of the lack of communication on trust.

Applying Ordinary Least Squares and probit regression, quantile regression, and instrumental variables to cross country and individual-level data, we show the importance of individual and cultural characteristics and demonstrate the role of trust and communication for financial inclusion. The outcome is consistent for different model specifications.

### Keywords

Financial inclusion | financial literacy | trust | linguistic diversity

### JEL Codes

O12, G29

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## 1. Introduction

Financial inclusion (FI), understood as access to financial products and services, is a widely discussed topic in both academia and international debate. Providing access to at least basic financial services is high on the agenda of public and private organisations. FI has long been associated with prosperity (Levine, 2005), ability to accumulate wealth, decrease in income inequality (Aslan, Deléchat & Newiak, 2017; Karpowicz, 2016), and is believed to significantly contribute to achieving sustainability development goals from Agenda 2030 (Klapper, El-Zoghbi & Hess, 2016). From an individual's perspective, having access to formal financial services means access to affordable credit and a possibility to effectively save money or invest in education. Therefore, it seems vital to

ensure that people have a chance to participate in the financial system according to their needs. However, as demonstrated in the literature, increasing the share of those financially included does not seem to be a straightforward task, as there are numerous obstacles and barriers to overcome, some of which have already been identified in the literature (Demirgüç-Kunt & Klapper, 2013; Hayashi & Minhas, 2018; Grohmann, Klühs & Menkhoff, 2018; Rengert & Rhine, 2016). We believe there is still room for further research in this area, as the topic of drivers of FI has not yet been exhausted, and the number of financially excluded (unbanked) or insufficiently included (underbanked) people is still substantial.

The most recent Global Findex Report (2017) announced that 69% of the world population has access to formal financial services. Comparing with the 2014

data, a significant improvement has been observed—the proportion of the financially included population has increased by seven percentage points, which accounts for around 515 million people worldwide. Though a seven percentage point rise in the share of banked adults is meaningful, there still is a large fraction of the world's population yet to be included in the financial system. Therefore, the following question arises: What else has to be done to bring finance to the broader public? Numerous studies highlighted the importance of financial education and providing sound infrastructure as crucial prerequisites (Grohmann et al., 2018; Lusardi, 2015; Lusardi, Mitchell & Curto, 2010). Other have stressed the influence of cultural or sociological factors (Knell & Stix, 2015; Rengert & Rhine, 2016; Xu, 2020). In this study, we try to broaden the current framework and aim at capturing the effect of communication, or rather the opposite—a communication gap. We define the communication gap as an inability to fully comprehend the conditions of a financial contract and not being able to ask explanatory questions due to specific language barriers, which are the language-related factors disturbing mutual understanding in communication. Language barriers can stem simply from differences in the language spoken; however, those differences are obvious, and are not specific to the field of finance. What we try to capture in this study are the barriers to understanding, which are created by a complicated finance-specific language—for many individuals deemed an incomprehensible language. Thus, this paper is organised around the hypothesis that linguistic incomprehension leads to lower FI, as not being able to understand the information itself or the information's provider impedes trust, which has been found to effectively facilitate FI (Xu, 2020). We aim at representing the consequences of the communication gap for the level of trust, understood as reliability and confidence in the banking system by employing an instrumental variable—linguistic diversity. We use the Linguistic Diversity Index, which is one of the measures of how linguistically complex, mixed, and different a given society is and which reflects the way people communicate with each other. To our best knowledge, the suitability of linguistic diversity as an instrument in the area of FI has not yet been tested.

In this study, we aim to build on the observation made by Lusardi (2015) that improper communication of inclusion policies may lead to their lower effectiveness. Therefore, we try to first establish the role communication plays for the unbanked and to empirically test the impact of the prevalence of such

a role. We distinguish between country-specific factors and individual factors, which, based on the current literature, both have an impact on individual financial decisions. Among the key factors are age, gender, level of education, income, residency (Allen, Demirguc-Kunt, Klapper & Peria, 2016) and financial literacy (FL), which in simplest terms is understanding of financial concepts (Lusardi, 2015). Therefore, the following study examines three components of FI: FL, level of trust, and the role of the communication gap, prevalent due to lack of understanding and comprehension. The major contribution of this paper is to highlight an important characteristic of an informed consumer, i.e. his linguistic preparedness to understand complex financial terms, which we argue is highly correlated with the level of trust he or she has towards the representatives of the financial system, specifically banks. We show that language has a meaningful impact on the decisions made by individuals and that it serves as a valid instrument for the level of trust in the financial sector. Accounting for a variety of control factors, we demonstrate robust results of the significance of trust and well-arranged communication that may contribute to the success of FI policies.

The rest of this paper is structured as follows: First, we review the current literature on FI, FL, the role of trust for economic behaviour and discuss the implications of the prevalence of linguistic barriers on making well-informed, rational decisions. Next, we describe our empirical strategy and construct two measures of FI: one reflecting the willingness to access the formal financial system and the other capturing the willingness to relatively frequently use it. Later, we perform a number of regressions to evaluate the relationship between the before mentioned indices and a set of controls, with a particular focus on the role of trust, linguistic diversity, and FL. We construct a cross-country model and a model based on individual responses. Finally, we discuss the results and the limitations of our study, as well as suggest how they might be mitigated in further studies.

## 2. Literature review

### 2.1. Financial inclusion

The topic of FI has been given a lot of attention by researchers and policymakers in the last decades. The efforts to provide as many people as possible

with the means to conduct financial transactions, to transfer, save, or borrow funds have strong practical foundations.

According to the definition proposed by the World Bank (2018), FI can be described as access to useful and affordable financial products for both individuals and businesses. The definition also mentions the suitability of such services for various consumer needs and the sustainable way in which they should be delivered. For the purpose of quantitative research, we need to operate on some numeric measures of the level of FI. A number of studies have used the fraction of population over 15 years old having a banking account, having saved or borrowed in the past given months (Allen et al., 2016; Demir, Pesqué-Cela, Altunbas & Murinde, 2020; Grohmann et al., 2018; Xu, 2020), or the number of bank branches/ATMs per 100,000 adults (Xu, 2020) as a measure of FI. To ensure the robustness of the outcomes, usually results for a few measures are compared. A similar approach has been followed in this paper.

The studies on the determinants of FI usually focus either on the supply or on the demand side of the market. From the supply perspective, physical access to facilities such as bank agencies, ATMs, or cash points is key. The proximity to financial intermediaries, among others, has also been reported as a reason for owning an account (Allen et al., 2016; Faber, 2019). However, the number of bank branches, etc., per capita or per square kilometre does not take into account an uneven population density within a given territory. People living in remote areas remain physically excluded from convenient and effective access to financial services. Even in densely inhabited areas, spatial distribution of different financial service points has an impact on customers' choices, as shown by Faber (2019). Faber (2019) documented the prevalence of areas in the United States with little or no formal financial facilities and linked them to the racial and ethnic distribution of neighbourhoods. It happens that one reason behind the lower formal FI among certain social groups is the insufficiency of bank entities in their area. Faber (2019) raises an argument that it may be banks' attitude and preference towards a certain type of clients that makes their services not universally accessible. Physical distance may also create a metaphorical distance between certain groups of customers and financial providers, a sense of "not belonging", which could have an impact on how they perceive financial industry in general (Rengert & Rhine, 2016).

Speaking about FI, we should also note that there is a huge disproportion between developed and developing countries in terms of availability and use of even basic products. Currently, much attention is put to further improve mobile money services, as there has been evidence of their successful adoption and potential in developing countries (Demirgüç-Kunt & Klapper, 2013; Malaquias & Hwang, 2016; Sanderson, Mutandwa & Le Roux, 2018) and their usefulness for people living in remote areas and for women (World Bank, 2017). Shifting to online delivery of financial services could surely improve the availability of financial services; however, in the case of online services, different barriers could emerge, for example, a technological barrier, like having access to the Internet (Hayashi & Minhas, 2018) or a computer literacy barrier. Also, concerns about data privacy or the threat of cybercrime are likely to influence the level of trust people have towards electronic banking products (Png & Tan, 2020). It seems impossible to distinguish this kind of trust from the level of trust in a bank as an institution, given the available data. That is why we did not include online financial services separately in our study. Instead, we focus on financial services as a whole.

The literature on the demand for financial services reveals that characteristics such as gender, age, income, education, and place of residency are important determinants (Africa, Zins & Weill, 2016; cross-country, Allen et al., 2016). Younger, less well-off individuals, those living in rural areas, with lower levels of education, are most likely to be excluded from the financial system. Low-income households with less-educated, minority, and unemployed members are most likely to be unbanked (Hayashi & Minhas, 2018). Across poorest households, sociodemographic factors such as age, race, homeownership, or Internet access matter more than for the average income household. Also, there is a disproportion in account ownership between women and men. Worldwide, 56% of the unbanked are women; this disproportion is observed across most economies. Especially vulnerable are women coming from the least developed countries and often those unemployed (World Bank, 2017). Women are also less likely to open an account themselves if another person in the household already has one (Demirgüç-Kunt & Klapper, 2013).

Another aspect of FI is the type of services people decide to use, by which we mean more than just different types of products. In this study, we focus only on formal financial services and mobile

money services and do not consider the market for alternative financing. The reason for this is quite simple—the data in the *Global Findex Database*, based on which we construct our data set, does not clearly define informal institutions. Payday lenders, pawn shops, family loans, etc., all constitute the shadow financing sector. Their common characteristics are that they operate outside the regulated banking sector and lack formal intermediation (Allen, Qian & Xie, 2019). Another issue is that the market for alternative finance is not at all homogeneous. In the most general manner, Allen et al. (2019) distinguish between constructive and derogatory informal financing. They argue that constructive alternative services are vital for small and medium enterprises (SMEs), which often do not qualify for formal financing. Also, a high concentration of banks' assets creates an ineffective system for small, riskier enterprises, as they are likely to be denied credit (Karpowicz, 2016; Tsai, 2004). Using informal sources is a way for SMEs to obtain necessary funds. On the other side, predatory lending entities charge their customers extremely high fees, offer inflexible repayment schedules, and due to that, are used for managing temporary liquidity problems (Allen et al., 2019). Gathergood, Guttman-Kenney, and Hunt (2019) report that customers in the United Kingdom who take payday loans are often struggling to repay their overall debt. A reason why individuals may still choose to satisfy their financial needs outside the banking system may be, on the one hand, familiarity, trust, or language compatibility with local financial entrepreneurs, and on the other hand, a lack of the documentation that is required by banks (Faber, 2019; Rengert & Rhine, 2016). The nature of informal financing is different from that of the regulated sector; hence, we have decided to focus only on formal services. Also, other studies adopt a definition of FI as being the use of just formal services (Allen et al., 2016).

## 2.2. Financial Literacy

The financial system needs both the right infrastructure and well-informed customers (Grohmann et al., 2018). Since people are more responsible for managing their personal finances and securing retirement funds than ever before (Lusardi, 2015; Lusardi & Mitchell, 2014), it is crucial to ensure that they are capable of making reasonable decisions. The literature indicates that to act reasonably, one should be familiar with the concept of interest compounding, inflation, risk, etc., at least on

a basic level (Lusardi, 2015). Individuals having such knowledge can be deemed financially literate. This naturally calls for proper early education on how to deal with money (Lusardi, 2015; Lusardi et al., 2010), apart from just assuming consumers are rational and prepared to successfully plan their consumption and savings over a lifetime (Lusardi & Mitchell, 2014). Young adults and women were found to be generally less financially literate and less likely to effectively plan for their retirement (Lusardi & Mitchell, 2008).

In this study, we use the data from Klapper, Lusardi, and Oudheusden (2015), who describe FL rather generally as an understanding of basic financial concepts. They construct their measures based on four FL questions (discussed in detail in the Data section). A more detailed definition was proposed by Lusardi and Mitchell (2014). It names FL as 'peoples' ability to process economic information and make informed decisions about financial planning, wealth accumulation, pensions, and debt'. We adopt this definition in our study and aim at expanding the rationale behind the crucial role of processing not only economic or financial information, but information in general. We argue that failing to do so impedes fully informed decisions. The willingness to engage in a relationship with a financial institution also depends on how much an individual knows about the industry (Allen et al., 2016). Later in this paper, we empirically investigate the importance of comprehensible information, which determines how much an individual knows.

It has been shown that a higher level of FL is associated with greater FI, both at the country level (Grohmann et al., 2018) and the individual level (Aslan et al., 2017). The effect is most profound in countries with lower gross domestic product (GDP) per capita. Also, more financially inclusive societies perform better on FL scores, meaning that the relationship between FI and FL can be reciprocal (Klapper et al., 2015). Historical encounters with financial products or phenomena such as inflation make consumers aware of what those phenomena mean for their personal money and savings. To avoid causality issues in our analysis, we follow the understanding of Lusardi and Mitchell (2017), who established a basic causal relationship; it is FL that enables retirement planning, and consequently FI. There is no doubt that factors such as historic background, religion, or language have important roles in the success of economic policies and should be included in studies on policy effectiveness. The importance of cultural factors for

economic behaviour has been documented in the literature (Alesina, Devleeschauwer, Easterly, Kurlat & Wacziarg, 2003; Desmet, Weber & Ortuño-Ortín, 2009). Indeed, some behaviours are so deeply rooted in culture that they are profound even if a person changes their living environment. To give an example, Davoli and Rodriguez-Planas (2020) investigated the role of country of ancestry for FL of the population of immigrants in the USA. They found a significant relationship between financial knowledge, risk taking, and patience in the country of ancestry and individual's FL.

Following an extensive study on FL, Lusardi (2015) noted that the effectiveness of current inclusion policies could be undermined by the very language used by industry and policymakers in their communication. It seems hardly questionable that technical and financial jargon is not well suited for those who lack the understanding of the concepts being described. In our study, we want to address the impact that communication has on FI—first, by distinguishing between the comprehension of financial concepts (measured by FL) and understanding of the real-life contracts, and second, by showing that the lack of this understanding is mediated via trust granted to the financial system in general, and represented by trust in banks in this study.

### 2.3. Trust and Linguistic Barriers

Among reasons for not having an account, 16% of respondents of the Global Financial Survey 2017 declared 'a lack of trust'. The aim of this paper is to understand if and how the quality and clarity of information are related to the lack of trust. We argue that the relationship between a financial institution and its client requires a certain level of confidence towards one another. Plato-Shinar (2014) even names this relationship a relationship of trust and Guiso, Sapienza, and Zingales (2004) talk about the trust-intensiveness of financial contracts. Turning to individual determinants of trust in banks, we refer to a qualitative study by Rengert and Rhine (2016). Across several focus groups, they find that the second most common reason for not engaging in a relationship with a bank is the lack of trust and unfamiliarity with services. Financial entities are considered irrelevant for some consumers or are too conceptually distant to reach out to. Once again, the importance of creating an environment of mutual

understanding emerges. Within our study, we argue that well-informed customers would be the ones willing to participate in the financial system, and the ones participating in it do so in the most optimal way. However, the effect created by the communication gap is intangible—there is no measure that captures how well the information is delivered and how well it is understood. The effectiveness of communication is unobservable, but the impact it has on the level of trust in banks, and consequently, on the level of FI, seems to be of great importance. The uncertainty stemming from limited understanding can be considered as a cost of a contract with a financial institution. Trust and confidence in a financial institution, on the other hand, can act as facilitators of such a contract. Together with country-level and individual characteristics, we try to incorporate the means of facilitation, i.e. trust in the concept of FI. Our study aims at adding the 'understanding' component to the analysis of the demand-side determinants of FI.

To address the concern of endogeneity caused by the omission of a variable reflecting the understanding, the lack of which underlies the prevalence of the communication gap, we follow the instrumental variable approach. As discussed, the component reflecting the understanding and comprehension of financial communication (in various means, starting from documentation through media advertisements to personal encounter) seems likely to be correlated with the level of trust exercised towards the banking system. Indeed, the starting point of our study is the observation that incomprehensible financial language impedes trust towards banks, making communication inefficient. That is why we start by looking at the influence of cultural differences on the level of trust to establish theoretical foundations for considering linguistic diversity as an instrument. In an experimental study, Glaeser, Laibson, Scheinkman, and Soutter (2000) have shown that the level of trust is lower between participants of different nationalities. Similar results have been reported by Tenzer, Pudelko, and Harzing (2014), who found language barriers to be significant trust resistors in multinational teams. Barcellos, Smith, Yoong, and Carvalho (2012) found that Hispanic immigrants to the USA experience lower trust towards financial institutions than natives, probably partly due to incorporating beliefs about their countries of origin onto their new reality. Bjørnskov (2007) finds that income inequality, religion, and communist history impact generalised trust on national level. Fungáčová, Hasan, and Weill (2019) observe that different social and cultural factors specifically impact

the formation of trust in banks, which leads us to a belief that linguistic diversification may influence trust in banks as well. To our best knowledge, whether such influence is meaningful has not been studied before. The transmission channel would be communication facilitating mutual understanding of a contract between the two parties—in the case of finance, i.e. a financial institution and its customer.

Taking into account just the aspect of communication, from the perspective of a bank, the relationship is relatively less complicated. There are particular procedures that bank representatives have to follow to ensure the identity and needs of a client, follow know-your-customer guidelines, and assess the risk of engaging in a relationship with a given individual or entity. However, the consumer's perspective is far more complex. First, by putting personal funds in a banking account or a mobile money account, in some sense one loses control over those funds. People may worry about unauthorised transfers from their accounts. Hence, establishing trust between parties is crucial. Second, some clients experience concerns regarding data privacy and vulnerability of banks to cyberattacks (Png & Tan, 2020). Finally, consumers often have little or no familiarity with products and procedures and may have no experience with documentation. As noted by Cole, Sampson, and Zia (2011), people tend to not use products they are not comfortable or familiar with, and, given the length and complexity of the language used, banks' contracts can be difficult to navigate.

The problem of language barriers is not limited only to those less financially savvy. FL is key to understanding the essence of the transaction, but the 'language' aspect enables understanding of terms and conditions, allows asking clarification questions, etc.—not to mention the fact that FL measuring questions cover rather simple aspects of finance. Their simplicity is accurate for the purpose they serve—they provide a framework for quantifying financial knowledge. However, what banks expect their clients to sign is much more complicated in a sense of transaction circumstances. Just by looking at papers to be signed, a person can feel overwhelmed. Documents are long, sentences are often written in the passive voice (less common in day-to-day conversations), the font is small, and the text contains a lot of finance-specific terminology. Such documents can be difficult to comprehend even by some bankers, should they not have a legal background (Plato-Shinar, 2014). Additionally, the impact of language may be different, depending on the complexity of the financial product.

The language barriers are also not limited to non-native speakers in a given society. The contracts are long and difficult to navigate, even for native speakers, simply because of the specific terms used in legal or banking language. The problem of language complexity has been stressed in previous research as potentially undermining the effectiveness of inclusion policies (Lusardi, 2015). An even broader issue of limited understanding of certain official texts has been addressed by The Plain Language initiative, which calls for simplicity and readability in all official documents. In some countries, providing parts of contracts in plain language is required by law, for example in the USA. Text in plain language should clearly communicate its purpose, allow for easy identification of key messages, and be fully understandable to the user (plainlanguage.gov, accessed 1 June 2021). On the other hand, whether the language of legally binding contracts should be simplified is questionable. Financial institutions operate under strict regulations and also aim at securing their position should any legal action be taken. Simplicity often comes at the cost of precision, which can be harmful to a bank's interest. In professional legal language, there is no place for ambiguity.

Having identified universal difficulties, it should be stressed that non-native speakers may experience yet another barrier when stepping into a legal relationship with a financial institution. Golding, Goodman, and Strochak (2018) show that limited English proficiency is a significant obstacle to homeownership and advocate distributing information materials in Spanish among Hispanic citizens in the United States to eliminate language barriers. Indeed, language homophily between the customer and service provider was found to increase intentions to use the service (Pezzuti, Pierce & Leonhardt, 2018). Bilingual customers also prefer to be offered service in their native language, especially when what they receive is personally involving (Holmqvist & Vaerenbergh, 2013). The majority, if not all, of transactions regarding one's finances can be treated as engaging personal experience. Providing high quality services in multiple languages would surely come at a cost to a financial institution, but may be a way to establish its competitive advantage by targeting a specific market niche. In terms of understanding, for some individuals the financial jargon may be similarly difficult to comprehend, just as a non-native language may be.

The theoretical reflection on language's role in finance puts us at an impasse. On one end is a consumer, who—in the most extreme case—understands very

little of the transaction he is engaging himself in, and on the other end is a supplier—a financial institution securing its interest through a legal contract. The question remains: how to establish a viable communication channel that serves mutual interests? We argue that the indirect impact of language on FI is mediated through trust. Struggling to understand the nature of a transaction reduces trust because of unfamiliarity and lack of comprehension. It is worth emphasising that language diversity itself is not believed to be the reason for lower FI. As discussed before, financial documents and legal language are unreadable for the majority of consumers, even native speakers. What matters, however, is the possibility of meaningful communication between the financial institution and its customers. This communication happens via media advertisements, website content, informational materials, and finally, via personal contact in a bank's offices. This relation can be different should we consider a group of people moving to a foreign country. Barcellos et al. (2012) find that lack of language proficiency is a significant barrier to the use of finance and retirement planning. Financial participation of immigrants is yet another aspect of FI, which we do not cover in our analysis. Should immigrants be included in such a study, the methodology ought to be different, especially because immigrants tend to remember and stick to the characteristics of their country of origin, even after moving to a different country (Barcellos et al., 2012; Davoli & Rodriguez-Planas, 2020).

### 3. Research Hypotheses

We put together all four components of our analysis, i.e. FI, FL, trust, and linguistic diversification to formulate the following research hypotheses:

**H1:** Linguistic diversity does not have a direct impact on FI.

Financial services are deemed a necessity, that is why so much effort is put into developing efficient inclusion policies. We consider access to finance as a prerequisite to effectively operate in the modern world, and this characteristic is universal for members of various societies. Also, in today's globalised world, people change their place of living or place of doing business. Such individuals sooner or later open bank accounts in foreign countries to efficiently participate

in their new environment and/or send remittances to their families, even though they often conduct these transactions in their non-native language. We consider language differences among citizens not important for their desire to conveniently transfer, save, or borrow money—simply not important for satisfying their basic needs. We also argue that the language of legal banking contract is generally not understandable, even in linguistically uniform countries.

**H2:** Linguistic diversity correlates with trust people have towards banks and serves as a valid instrument for the level of people's trust in banks.

Linguistic diversity does influence everyday interactions between speakers of different languages. Even when accounting for the knowledge of a second language, some concepts may not be straightforward to translate, or some of the vocabulary may be beyond one's scope. In postcolonial countries, the official language often is a language of the former oppressor, which may lead to associations of 'not belonging' for some individuals. Finally, several researchers documented the impact of linguistic and ethnic heterogeneity on the level of trust (Tenzer et al., 2014; Wang & Steiner, 2015). Trust in banks, though more narrow than general trust, is likely to be influenced by the linguistic differences for the very same reasons as general trust. Since we assume trust in banks to be correlated with comprehension of financial information (or in absence of such—a communication gap), it is likely that we will observe the impact of linguistic diversity on trust in banks, moderated through the level of accessibility of financial language. In the case of trust in banks, the parties involved would be different – an institution versus a customer, and the language would refer to financial jargon, not the language per se. The recent study by Dar and Sahu (2022), investigates the direct role of language on FI; however, their study focuses on certain grammatical aspects of different languages and their influence on financial behaviour, not the impact of linguistic diversity directly on FI.

For an instrument to be valid, two conditions must be satisfied: correlation with explanatory variables and no correlation with an error term (Wooldridge, 2015). From a theoretical point of view, we expect linguistic diversity to be correlated with trust. We have also provided an explanation of why linguistic diversity itself does not influence FI directly: problems with comprehension of documents are prevalent among customers. We later evaluate the validity of the



linguistic diversity instrument using formal statistical tests.

Employing various language-based measures as a determinant is not new in economic literature. Language as part of cultural heritage has long been known to have an impact on various aspects of economic activity. Linguistic fractionalisation is significantly and negatively related to long-run economic growth (Alesina et al., 2003). Desmet et al. (2009) found a robust significance of linguistic distances on redistribution. Laitin and Ramachandran (2016) empirically demonstrated the socio-economic consequences of the distance from and exposure to official language. One of the cultural determinants of limited trust towards banks is avoidance of uncertainty, i.e. feeling uncomfortable with ambiguity. Individuals from high uncertainty-avoidant countries are, for example, less likely to take on debt (Ahunov & Van Hove, 2020). Baronchelli, Foresta & Ricciuti (2020) find average distance from the official language to be a valid instrument for accountability and an influential factor for governmental fiscal capacity.

**H3:** Availability of information is significant for the level of FI.

When market information approaches perfect information, the decisions made by market participants approach the optimum. To test this hypothesis, we include the Credit Information Index and easy language dummy in the analysis. We aim to reflect the importance of information for consumers (easy language) and for financial institutions (depth of credit information).

**H4:** Macroeconomic factors have an influence on FI.

We hypothesise that the more stable the economic environment is, the more willing people are to engage in financial transactions. In turn, when the economic situation is unstable, people postpone important financial decisions. We include the measure of the bank Z-score to account for the stability of the financial system and inflation expectations (lagged values of inflation rate) to capture economic predictability. Following previous studies on FI, we also incorporate the GDP in logarithmic form.

**H5:** Individual characteristics such as age, gender, and education will have an impact on the ownership and the use of financial products.

Individual characteristics have been found to be significant determinants of financial behaviour. As shown by Lusardi et al. in multiple studies, FL is also a significant factor for one's financial behaviour, so we incorporate a country FL index into the models. Since our data set does not include individual FL scores, we cannot control for the impact of individual FL on personal financial activity. By including country FL levels, we aim to reduce the bias caused by an omitted significant variable in our model.

## 4. Data

In this study, two types of data were used: country-level and individual-level (microdata). Microdata were retrieved from the *Global Findex Database 2017* and merged with corresponding country characteristics. It means that for each individual observation containing a selected respondent's characteristics, various country characteristics (obtained from other sources; see Table A1 in the Appendix) were added. Consequently, for each individual it was possible to observe the effect of his personal features as well as the effect of the environment he or she functions in. In total, 148,923 observations for 138 different countries were available. However, many were excluded from the analysis later on due to missing country data. The exact number of observations used is provided in the result tables, as the number was different depending on model specification. Also, entries from countries under- or overrepresented in the sample were excluded to maintain a comparable set for each analysed country. As in the later stage, some additional indices were constructed based on individual responses, it was important to ensure the data underlying those indices would provide representative as well as comparable results. Therefore, we deleted observations for countries with fewer than 900 or more than 1,100 individual observations available in the *Global Findex Database 2017*. It effectively means we did not include Morocco, Haiti, or India on top of the countries excluded due to other missing indicators. The final sample in our study contained 120 countries or a maximum of 110,660 individuals from these countries. Depending on the model specification, the number of observations varied, as there were occasional missing answers in the sample. Since the methodology of the Global Findex Survey assumes questioning a representative group for each country, the same can

be assumed about our sample. The list of countries included our analysis can be found in the Appendix.

To control for the impact of the quality of the financial climate, we employ a set of country-level controls in our models. To measure the stability of the economic environment, we include the measure of the bank Z-score, which is a measure reflecting the probability of a banking system's default, and a lagged inflation rate. Taking inflation values for 2016 allows us to include inflation expectations and mitigate a potential endogeneity problem. The availability of information is reflected by the depth of credit information index and a binary indicator for the plain or local language requirement in a given country. This variable is based on the Financial Inclusion Consumer Protection Survey 2017 and is equal to one if in a given country parts of contracts must be provided in plain language by law, and is equal to zero otherwise. We also include the logarithm of GDP in all model specifications, as there were significant variations in the use of financial services between high- and low-income countries (Demirgüç-Kunt & Klapper, 2013). The common framework questions used for assessing the level of FL are those developed by Lusardi and Mitchel (2008). Their assessment measures three dimensions: [1] numeracy and understanding of interest rates, [2] inflation, and [3] risk diversification and the concept of stocks and mutual funds. We utilise the data from a 2015 study where the [1] question was split into two separate questions—one regarding numeracy and the second one regarding interest rates. The participant in the survey was classified as financially literate if he was able to answer at least three out of four questions. This methodological framework is still based on *just* hypothetical questions sensitive to the hypothetical bias. Also simply manipulating the order of the alternatives<sup>1</sup> has an impact on a respondent's choice, indicating that some respondents have little or no idea what the questions are really about and guess their answer (Lusardi & Mitchell, 2017). Country-level indicators were downloaded from the *World Bank Database*, *Global Findex Database*, *World Values Survey* (wave 7), Klapper et al. (2015), Summer Institute of Linguistics (SIL), and the Financial Inclusion Consumer Protection Survey. The complete list of indicators and their sources can be found in Table A1 in the Appendix.

<sup>1</sup> Lusardi and Mitchel (2017) manipulated the order of alternatives in the risk question: 'Buying a company stock/stock mutual fund usually provides safer return than a stock mutual fund/company stock. True or false?'

## 4.1. Linguistic Diversity

In this study, we use the Linguistic Diversity Index published by the Summer Institute of Linguistics. The measure is based on the language typology by Joseph H. Greenberg and reflects the probability of two people randomly chosen from the population to have different mother tongues (Ethnologue). An alternative may be the index proposed by Alesina et al. (2003); however it is based on older data, obtained from different sources and collected between 1979 and 2001. Cultural characteristics are considered to be generally stable across time, so these values can still be treated as relatively recent ones. The factors that may undermine their validity are mass migrations, which cause movement of large groups of people speaking their local languages into territories dominated by another language's speakers. However, studies have shown that immigrants tend to chose their destination countries minding the language proximity to their mother tongue, meaning how similar the languages are, as language proficiency significantly influences their chances of getting a well-paid job (Adsera & Pytlikova, 2015; Chiswick & Miller, 2015).

Quantifying cultural characteristics has always been a puzzle for researchers and policymakers. The serious concern is that measures of linguistic heterogeneity do not account for the knowledge of foreign languages. Also, the differences between different indices are very subtle, and in some cases, the classification of a given language (or in fact a dialect) is ambiguous, as argued by Desmet et al. (2009). Depending on the social problem analysed, sometimes the concept of diversity is more accurate and sometimes it is the distance that plays an important role. We argue that in the context of our analysis, it is the diversity that matters. Trust is a social phenomenon, which is stronger between a unified group of people. Language barriers negatively influence trust formation in multilingual teams (Tenzer et al., 2014). A society, in fact, can be understood as an extremely large, multicultural, and multilingual 'team'.

## 4.2. FI Scores

The variable of interest—FI—can be represented by different measures. Usually, a binary variable is employed, and the probability of a given person having an account, a credit card, etc., is estimated. Such an approach is limited by the fact that there are numerous financial services on offer, and someone may simply

favour one type of product over another. It is also important to distinguish between having an account and making actual use of it. Simply being an account owner changes little or nothing but the national statistics; there is no benefit to its holder, especially because maintenance costs are quickly imposed. To give an example, as reported by Karpowicz (2016), less than 13% of account holders (or 5% in rural areas) in Colombia made at least three deposits per month in 2011, yet a steady growth of the number of financially included citizens has been observed. However, people who hold an account are more likely to use other services, like saving or investment accounts or insurance products (World Bank, 2018). The difference in access and use is accounted for in our study by developing separate measures for either activity.

Following Aslan et al. (2017), individual FI scores were constructed by performing multiple correspondence analyses on answers to chosen categorical questions. Two indices were calculated: an access score and a use score, related to access to various products and use of each of them in the past 12 months, respectively. Table 1 summarises components of each index, values for which were initially taken from the Global Findex 2017 Microdata Repository.

Before calculating the scores, we delete answers: 'don't know' and 'refuse' and unify answers' values (1=yes, 0=no). The results indicate that in both cases, much more of the variation is explained by the  $x$  axis than by the  $y$  axis. Hence,  $x$  coordinates were used as predicted FI scores. The bigger the distance from the (0, 0) point, the further from an 'average' response of the whole observed population.

In the case of the both scores, positive values were assigned to negative responses ('no' or 'not possible') and negative to the positive ones ('yes' or 'possible'). For example, a person who answered 'yes' to all four (or six) component questions scored -0.56 (-0.81), while the one who answered 'no' got a value of 9.24 (3.57). In other words, a person who owns an account, has a debit and credit card, and has access to some kind of emergency funds got an access score value equal to -0.56. An individual who regularly uses credit and debit cards, uses a mobile money account for checking their balance and transferring money, and has both saved and borrowed in the past 12 months achieved -0.81 in value of the use score. In an opposite scenario, he or she would have scored 9.24 in the access score and 3.57 in the use score. The scores will be later included as alternative measures of FI on the microlevel. To incorporate the aforementioned indices in the cross-country analysis,

**Table 1.** Financial Inclusion Scores Breakdown

Variable name	Survey question
<b>Access score</b>	
fin3	if has debit card: card in own name
fin7	has credit card
fin24	possibility of coming up with emergency funds
Account	has an account
<b>Use score</b>	
fin5	used mobile phone or internet to access account at a financial institution
fin6	used mobile phone or internet to check account balance
fin8	if has credit card: used card in past 12 months
fin4	if has debit card: used card in past 12 months
Borrowed	borrowed in the past year
Saved	saved in the past year

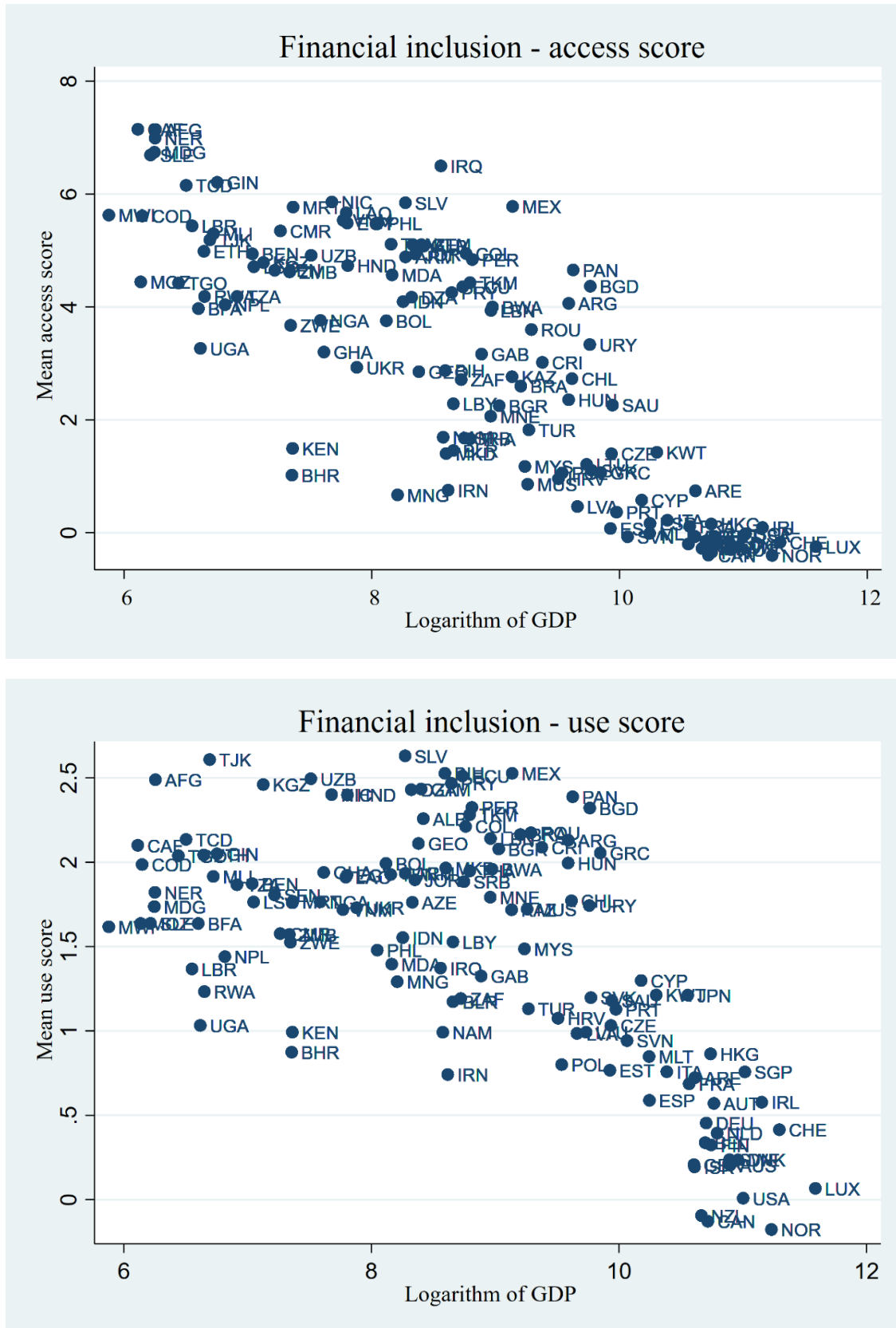
*Note.* All variables were taken from the Global Findex Database 2017. Variable names included in Table 1 correspond to variable names in the original data set.

we calculate the mean access score and mean use score for every country included in our study.

Figure 1 presents the distribution of mean access and use scores against the GDP's logarithm. Clearly the values follow an expected trend. In the upper left corner, countries such as Afghanistan, Tajikistan, Chad, and other less-developed countries are located. In such countries, due to noticeable inequalities in the society, huge differences can be found also in terms of access to and use of financial products between citizens. Also, both indices are significantly and negatively correlated with the country-level FI variable (*inclusion\_inst*) and therefore can be used as appropriately constructed measures.

## 5. Empirical Strategy and Results

In order to test the hypotheses about the impact of language and trust on different measures of FI, we run a set of regressions. First, we focus on country-level



**Figure 1.** Mean financial inclusion scores vs GDP – access (upper figure) and use (lower figure)  
 Source: Own calculations

indices and later carry out an analysis of individual responses as outcome variables. We incorporate three measures of FI to the models: [1] percentage of adult population having an account at a financial institution, i.e. variable *inclusion\_inst* (or, in the case of individual level data, binary variable *account\_fin* if the respondent owns an account); [2] country access score calculated as average access score of its citizens (or, in the case of individual level data, individual access score); and [3] country use score calculated as average use score of its citizens (or in the case of individual level data, individual use score) to ensure the robustness of our results. The statistical model used in country-level analysis includes OLS regression and probit model. It was not possible to evaluate the prevalence of the communication gap on the national level; due to data shortage, the sample would be very limited. In the next step of the analysis, we formulate models where we treat individual responses as observations. We expect that the effect of the communication gap would be visible here, thanks to disaggregation of data and availability of trust measures. To evaluate the impact, we follow an instrumental variables approach, by employing a two-step least squares (2SLS) procedure. The number of observations varies between different model specifications because of the different explanatory variables included in each equation. The observations with a missing entry for any of the variables included were dropped. It should be noted that, for each model specification, there was a substantial number of observations included, so excluding some entries did not come at a cost with regard to the quality of results.

## 5.1. Model for Country Data

We performed the first step of our analysis on a sample of 120 countries observed in 2017. The following model was formulated:

$$inclusion\_inst_i = b_{0i} + b_{1i} credit\_info_i + b_{2i} fin\_literacy_i + b_{3i} lang\_div_i + b_{4i} bank\_zscore_i + b_{5i} lgdp_i + b_{6i} inflation_i + b_{7i} easy\_lang_i + e_i \quad (1)$$

where

- *inclusion\_inst* is the percentage of people above 15 years old who hold an account at a formal financial institution;

- *credit\_info* is the measure of depth of credit information index (from 0=low to 8=high);
- *fin\_literacy* is the percentage of people from a representative sample for each country who correctly answered at least three of four financial questions (index from Klapper et al., 2015);
- *lang\_div* is the Language Diversity Index from the SIL report 2017;
- *bank\_zscore* captures the probability of default of a country's banking system, data from the World Bank;
- *lgdp* is the logarithm of GDP per capita (current USD) from the World Bank;
- *inflation* is the inflation rate in 2016 (annual prices, %);
- *easy\_lang* is a binary variable where 1 marks countries with either plain or local language requirement imposed on commercial banks, 0 otherwise;
- $b_{0i}$  is a constant component and  $e_i$  is an error term.

The model specification made it impossible to observe the impact of trust in FI; there were only 42 observations with all relevant information provided. Due to infrequent publication of indicators (stemming from the institutional character of cultural traits) it was not possible to construct a panel model.

### 5.1.1 OLS Regression: Country Level

First, we analysed country level determinants by running an OLS regression. The results are presented in Table 2.

As indicated by the results for the benchmark model, which estimates the percentage of people aged 15+ having an account at a formal institution, both GDP and availability of credit information are significant determinants of inclusion. In highly developed countries, the fraction of citizens having an account is greater. Also, access to information makes lending decisions less risky for the lenders and boosts financial activity. FL was also found significant on 10% significance level and, expectedly, has a positive impact on FI. Similarly, *bank\_zscore* is associated with lower FI, meaning that when the banking system is not stable, there are fewer individuals using banking services.

**Table 2.** Linear Regression: Country Level

	Percentage of people aged 15+ having an account at a formal institution		Mean access score		Mean use score	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
credit_info	0.018***	0.005	-0.100**	0.046	-0.003	0.018
fin_literacy	0.002*	0.001	-0.036***	0.011	-0.026***	0.004
lang_div	0.068	0.476	-0.059	0.399	-0.096	0.156
bank_zscore	-0.003*	0.001	0.021*	0.012	-0.001	0.005
Lgdp	0.157***	0.015	-1.029***	0.123	-0.177***	0.048
Inflation	0.000	0.004	0.000	0.029	-0.014	0.012
easy_lang	-0.023	0.029	0.296	0.244	0.186**	0.095
_cons	-0.941***	0.110	13.51***	0.923	4.03***	0.360
Number of observations	120		120		120	
Mean dependent variable	0.611		2.719		1.455	
Standard deviation of the dependent variable	0.294		2.213		0.704	
R-squared	0.79		0.74		0.58	
F-test	60.05		45.26		24.65	
p-value	0.000		0.000		0.000	
RESET test	0.047		0.1356		0.0041	
Breusch-Pagan test	0.0345		0.0272		0.2180	
Jarque-Bera test	0.0646		0.923		0.7997	

Note. \*\*\*, \*\*, \* indicate statistical significance on 1%, 5%, and 10% level, respectively

Source: Own calculations

Next, we compare the results for benchmark FI measure with the scores we have constructed. The results for the mean access score are parallel to those for the percentage of financially included adult population. This confirms the robustness of our results. As far as the usage of financial products is concerned, the impact of *credit\_info* and *bank\_zscore* is no longer significant. This implies that once people decide to enter into a relationship with a bank, they feel more comfortable staying in it and using financial products regularly. Probably, they also develop new habits in terms of, for example, payments that are insensitive to the economic circumstances (*bank\_zscore*). The information about the clients (*credit\_info*) may be less valuable for the banks once they engage in a relation with an entity they have screened before. We also find no statistical importance of language diversity (H1).

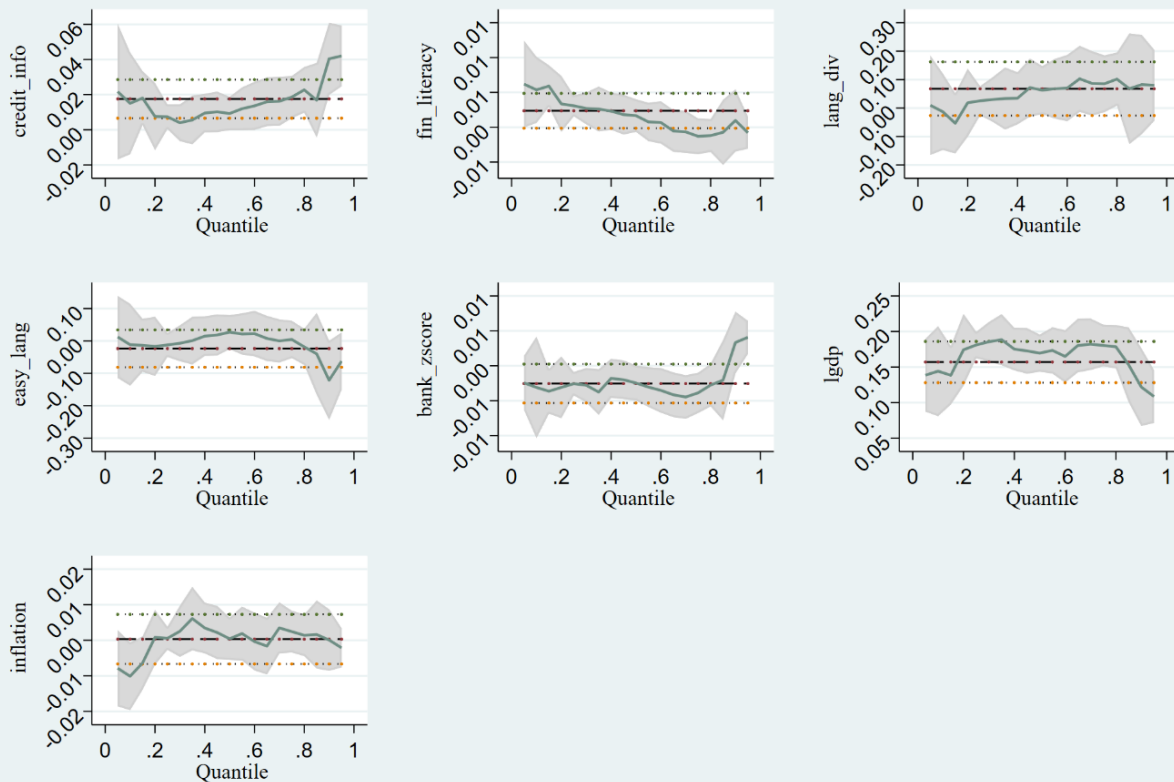
Postestimation tests report the following results: on a 1% significance level, there is no reason to reject

the null hypothesis that the model is correctly specified (RESET test), the null hypothesis that there is no heteroscedasticity (Breusch-Pagan test), and the null hypothesis that the residuals are normally distributed (Jarque-Bera test). Same outcomes were observed for both the model with FI percentage as a dependent variable as well as for the model with mean access score. On the 1% significance level, the functional form in the case of the model with mean use score as the dependent variable is not correct; the RESET test *p*-value equals 0.0041, which questions the accuracy of the obtained results in the case of that model.

### 5.1.2 Quantile Regression: Country Level

Next, quantile regression was carried out to capture the distribution of the dependent variable rather than to estimate its mean value. Hypothetically, in countries with higher FI, the influence of information

## Quantile regression: financial inclusion on country level



**Figure 2.** Quantile regression results – country level  
Source: Own calculations.

factors and the general economy's stability may be more significant than in countries with lower FI, as the demand for such information is likely greater (variables *bank\_zscore*, *inflation*, *credit\_info*). On the other hand, in countries with lower FI nonfinancial aspects may play a role in encouraging or discouraging people to use banks' services (for example, issues with understanding the procedures (variable *easy\_lang*)).

Specification of the quantile regression model was identical to the OLS model; however, this time the parameters were estimated with regard to FI quantiles. The results of our estimation are presented in Figure 2.

As expected, in higher quantiles the impact of *bank\_zscore* and *credit\_info* is rising, but the differences between quantiles in case of this variables, though visible, are not big in size. In case of *lgdp*, starting at the 0.8 quantile, the prediction values decrease, meaning that the impact of GDP is declining and other factors are important among countries with high FI. No

significant effect of *easy\_lang* was found. Considering inflation, people may spend their money faster, and, in order to maintain asset value, store it rather in durable goods, without bothering to keep it in an account. This effect is visible in countries within 0.2 quantile of FI, which are consequently more reliant on cash.

Next, the difference in FL significance between 0.2 and 0.8 quantile was tested. On the 5% significance level, this difference cannot be rejected ( $p = 0,0104$ ). On the graph, the negative slope across subsequent quantiles is noticeable, yet the size of the difference was too small to be precisely captured.

## 5.2. Model for Individual Data

As a second step of our analysis, we observe individuals and their financial decisions. In models with individual-level data, two categories of right-hand side variables are included. The first group contains

personal features (age, gender, level of education, income quantile), while the second one consists of country characteristics. The latter were divided into: information availability and understanding (FL, depth of credit information, easy language), trust (confidence in banks), and controls (GDP, inflation, bank Z-score). Unfortunately, the microdata data set does not include information on individual FL scores. In this case, aggregated values were assigned to each individual from a given country.

To compare results across different measures of FI, the following dependent variables were employed: access score, use score, and simply having an account at a financial institution (binary variable, 1=yes, 0=no). Later we tested the possible explanation of lack of trust and the binary value 'if does not have an account: because of lack of trust' (1=yes, 0=no) served as left hand-side variable. We estimated the following models:

$$\text{Model (I): } \text{financial inclusion measure}_{ij} = b_{0i} + b_{1i} \text{age}_i + b_{2i} \text{female}_i + b_{3i} \text{education level}_s + b_{4i} \text{income quantile}_i + b_{5i} \text{country characteristics}_i \quad (2)$$

$$\text{Model (II): } \text{Model (I)} + b_{6i} \text{financial literacy}_i + b_{7i} \text{credit information index}_i + b_{8i} \text{easy language}_i \quad (3)$$

$$\text{Model (III): } \text{Model (I)} + b_{6i} \text{bank trust}_i \quad (4)$$

$$\text{Model (IV): } \text{Model (I)} + b_{6i} \text{financial literacy}_i + b_{7i} \text{credit information index}_i + b_{8i} \text{easy language}_i + b_{9i} \text{bank trust}_i \quad (5)$$

where  $i$  identifies an individual,  $j = \{\text{access score}, \text{use score}_i, \text{account dummy}\}$  and  $b_0$  is a constant component. Model (I) is a basic specification and includes individual and country controls. The model is later extended by gradually adding variables of interest.

In total, twelve models were estimated – four specifications for each out of three FI measures. The first model (I) contains only control variables: characteristics of an individual and those of macroeconomic environment (*country characteristics*), i.e. GDP, inflation, and bank Z-score. In the second model (II), the influence of information—its availability and comprehension—was captured together with control variables. FL reflects the general level of understanding financial concepts and is treated as the

consumer-side knowledge factor, while depth of credit information provides information for suppliers—the financial institutions. Easy language possibly makes the exchange of information (and products) easier and more transparent. Availability of credit information is a source of additional knowledge for financial institutions. The third model (III) focuses on the importance of trust in making financial decisions. Only variable *bank\_trust* was added to the initial, control equation, so that the effect of trust and only trust is estimated. However, we hypothesise that trust can complement the knowledge or substitute for the lack of it, and this idea is captured in the last model (IV), where both information and trust variables are included.

### 5.2.1. OLS Regression: Individual Level

The results of OLS estimation are provided in Table 3a (Model I and Model II) and Table 3b (Model III and Model IV). All variables included in the analysis are statistically significant, except for two instances of variable *inflation* and one instance of *easy\_lang* being insignificant. It means that both individual characteristics and environmental (country) factors are important determinants of one's daily financial decisions (H4 and H5).

Before interpreting the results, it should be emphasised that in the case of access score and use score, the lower the values, the higher the access to or the use of financial products (that derives from construction of the indices). The counterintuitive relation between confidence in banks and the probability of having an account at a financial institution in models may be due to many other variables affecting trust in general, which did not allow us to capture the real impact of *bank\_trust* variable (addressed later in instrumental approach). Another plausible explanation is, that owning a bank account in many situations is a necessity (for example to receive salary, so such a basic and standard product is not influenced by an individual's trust.) Regardless of the dependent variable used, the variable *easy\_lang* is associated with lower scores and lower probability of owning an account, which seems difficult to reason. As suggested by Allen et al. (2016), it is possible that awareness of the costs and requirements may discourage people from using the product. If so, when people understand more about a financial contract, they become aware of the associated costs.



**Table 3a.** Linear Regression: Individual Level—Model I and Model II

	Access score				Use score				Probit: has an account at financial institution			
	Model I		Model II		Model I		Model II		Model I		Model II	
	Coef- ficient	Stan- dard Error	Coef- ficient	Stan- dard Error	Coef- ficient	Stan- dard Error	Coef- ficient	Stan- dard Error	Mar- ginal Effect	Stan- dard Error	Mar- ginal Effect	Stan- dard Error
Age	-0.014***	0.000	-0.013***	0.000	0.012***	0.000	0.012***	0.000	0.002***	0.000	0.002***	0.000
Female	0.474***	0.021	0.474***	0.021	0.181***	0.009	0.164***	0.009	-0.045***	0.002	-0.043***	0.002
Education level												
Secondary	-1.637***	0.026	-1.574***	0.026	-0.295***	0.012	-0.306***	0.012	0.157***	0.003	0.146***	0.003
Tertiary or more	-2.603***	0.035	-2.500***	0.035	-0.903***	0.016	-0.898***	0.016	0.312***	0.004	0.301***	0.004
Income quantile												
Second 20%	-0.433***	0.035	-0.426***	0.035	-0.143***	0.016	-0.142***	0.016	0.034***	0.004	0.034***	0.004
Middle 20%	-0.681***	0.035	-0.665***	0.035	-0.227***	0.016	-0.227***	0.016	0.056***	0.004	0.056***	0.004
Fourth 20%	-1.001***	0.034	-0.998***	0.034	-0.325***	0.016	-0.323***	0.015	0.090***	0.004	0.090***	0.004
Richest 20%	-1.598***	0.034	-1.578***	0.034	-0.465***	0.015	-0.464***	0.015	0.151***	0.004	0.149***	0.004
bank_zscore	0.031***	0.001	0.025***	0.001	0.006***	0.001	0.002***	0.000	-0.002***	0.000	-0.002***	0.000
Lgdp	-1.006***	0.009	-0.725***	0.012	-0.296***	0.004	-0.134***	0.005	0.123***	0.001	0.097***	0.001
Inflation	-0.004*	0.003	0.016***	0.003	-0.017***	0.001	-0.013***	0.001	0.002***	0.000	0.000***	0.000
<b>fin literacy</b>			<b>-0.041***</b>	<b>0.001</b>			<b>-0.029***</b>	<b>0.000</b>			<b>0.005***</b>	<b>0.000</b>
credit_info			-0.067***	0.005			0.006***	0.002			0.007***	0.001
<b>easy_lang</b>			<b>0.272***</b>	<b>0.026</b>			<b>0.128***</b>	<b>0.011</b>			<b>-0.040***</b>	<b>0.003</b>
<b>bank_trust</b>												
_cons	12.906***	0.083	12.905***	0.083	4.092***	0.037	3.633***	0.038				
Number of observations	110 660		106 021		110 660		106 021		110 660		106 021	
Adjusted R-squared	0.2958		0.3110		0.1412		0.1845		0.2901		0.3071	
F-statistic or LR chi2 for probit	4226.15		3418.81		1654.39		174.29		42084.85		42171.33	

Note. \*\*\*, \*\*, \* indicate statistical significance on 1%, 5%, and 10% level, respectively.

Source: Own calculations.

Being in a higher income quantile results in higher probability of owning an account as well as bigger intensity of the use of financial products compared to the base level, the lowest 0.2 quantile. Women are less likely to hold an account than men, and when they do, they use financial services less often. As noted in a study by Bucher-Koenen et al. (2021), women are less confident about their financial knowledge and

as much as one-third of the gender difference in FL can be explained by limited confidence. The education level above the primary level increases the probability of having an account as well as the frequency of use of financial products. When both FL and trust are included in the model, the effect of *easy\_lang* is smaller for the use score and probability measure. The results support our hypothesis of the importance of

**Table 3b.** *Linear Regression: Individual Level—Model III and Model IV*

	Access score				Use score				Probit: has an account at financial institution			
	Model III		Model IV		Model III		Model IV		Model III		Model IV	
	Coef-ficient	Stan-dard Error	Coef-ficient	Stan-dard Error	Coef-ficient	Stan-dard Error	Coef-ficient	Stan-dard Error	Mar-ginal Effect	Stan-dard Error	Mar-ginal Effect	Stan-dard Error
Age	-0.016***	0.000	-0.014***	0.000	0.012***	0.000	0.012***	0.000	0.002***	0.000	0.002***	0.000
Female	0.434***	0.033	0.465***	0.034	0.151***	0.015	0.154***	0.015	-0.042***	0.004	-0.046***	0.004
Education level												
Secondary	-1.341***	0.044	-1.268***	0.044	-0.358***	0.019	-0.328***	0.019	0.132***	0.005	0.119***	0.005
Tertiary or more	-2.411***	0.056	-2.285***	0.056	-0.924***	0.025	-0.860***	0.025	0.279***	0.007	0.268***	0.006
Income quantile												
Second 20%	-0.340***	0.057	-0.405***	0.056	-0.150***	0.025	-0.150***	0.025	0.033***	0.007	0.034***	0.006
Middle 20%	-0.707***	0.056	-0.722***	0.056	-0.268***	0.025	-0.274***	0.025	0.061***	0.007	0.064***	0.006
Fourth 20%	-1.057***	0.056	-1.089***	0.055	-0.360***	0.025	-0.377***	0.024	0.094***	0.007	0.099***	0.006
Richest 20%	-1.633***	0.055	-1.676***	0.054	-0.536***	0.024	-0.557***	0.024	0.157***	0.006	0.162***	0.006
bank_zscore	0.036***	0.002	0.035***	0.002	0.003***	0.000	0.004***	0.001	-0.008***	0.000	-0.002***	0.000
Lgdp	-1.289***	0.018	-0.729***	0.026	-0.425***	0.008	-0.129***	0.012	0.155***	0.002	0.101***	0.003
Inflation	-0.013***	0.004	0.016***	0.004	-0.010***	0.002	-0.002	0.002	0.003***	0.000	0.000	0.000
<b>fin literacy</b>			<b>-0.056***</b>	<b>0.002</b>			<b>-0.033***</b>	<b>0.000</b>			<b>0.006***</b>	<b>0.000</b>
credit_info			-0.136***	0.010			0.021***	0.005			0.015***	0.001
<b>easy_lang</b>			<b>0.304***</b>	<b>0.042</b>			<b>0.023</b>	<b>0.019</b>			<b>-0.017***</b>	<b>0.005</b>
<b>bank_trust</b>	<b>0.074***</b>	<b>0.010</b>	<b>0.148***</b>	<b>0.010</b>	<b>0.009*</b>	<b>0.005</b>	<b>0.034***</b>	<b>0.005</b>	<b>-0.008***</b>	<b>0.001</b>	<b>-0.013***</b>	<b>0.001</b>
_cons	16.216***	0.168	13.502***	0.208	5.394***	0.075	3.883***	0.092				
Number of observations	41 455		41 455		41 455		41 455		41 455		41 455	
Adjusted R-squared	0.2695		0.2850		0.1668		0.1942		0.2521		0.2682	
F-statistic or LR chi2 for probit	1275.31		1102.48		691.25		667.06		13088		13923.93	

Note. \*\*\*, \*\*, \* indicate statistical significance on 1%, 5%, and 10% level, respectively.

Source: Own calculations.

individual characteristics (H5); however, they imply that the relation between trust and language is not straightforward and may not be possible to capture using OLS methods.

### 5.2.2. IV Regression: Individual Level

The aim of this study is to investigate the relationship between FI, understanding of finance, and trust in the banking system. So far, the obligation to provide some

information in plain and/or local language was found statistically significant (even though the impact was counterintuitive) for different inclusion measures, specifically in the absence of a trust control variable. However, there are other factors that influence trust and do not have direct impact on financial decisions. Hypothetically, in a linguistically diverse society, communication is much harder than in uniform groups, which may lead to more conflicts, but in the context of finance, it would make the process of obtaining the information more difficult and prone

**Table 4.** Instrumental Approach: Determinants of Financial Inclusion

	bank_trust	Access score		Use score		Probit: having an account	
		Coefficient	Standard Error	Coefficient	Standard Error	Marginal Effect	Standard Error
lang_div	-0.257***						
<b>First stage F statistic</b>	<b>138.955</b>						
bank_trust		-0.921***	0.052	0.093***	0.021	0.297***	0.014
Age		-0.012***	0.001	0.012***	0.000	0.006***	0.000
Female		0.487***	0.037	0.147***	0.015	-0.155***	0.014
Education level							
Secondary		-1.067***	0.050	-0.348***	0.020	0.284***	0.019
Tertiary or more		-2.292***	0.063	-0.867***	0.025	0.863***	0.028
Income quantile							
Second 20%		-0.367***	0.063	-0.149***	0.025	0.091***	0.022
Middle 20%		-0.651***	0.062	-0.276***	0.025	0.170***	0.022
Fourth 20%		-1.006***	0.061	-0.380***	0.025	0.278***	0.023
Richest 20%		-1.539***	0.061	-0.561***	0.024	0.474***	0.024
easy_lang		0.724***	0.053	-0.026	0.022	-0.160***	0.019
fin_literacy		-0.031***	0.002	-0.034***	0.001	0.012***	0.001
Lgdp		-0.526***	0.032	-0.156***	0.013	0.265***	0.014
Inflation		0.081***	0.006	-0.009***	0.002	-0.019***	0.002
bank_zscore		0.047***	0.002	0.004***	0.001	-0.012***	0.001
_cons		12.288***	0.238	3.929***	0.095		
Number of observations		41,455		41,455		41,455	
Hausman-Wu test:		$p = 0,000$		$p = 0,006$		Wald test: $p = 0,000$	
Weak instruments test:		$p = 0,000$		$p = 0,000$			

Note. \*\*\*, \*\*, \* indicate statistical significance on 1%, 5%, and 10% level, respectively.

Source: Own calculations.

to misunderstandings. As discussed (in Section 2.3), the problem with the trust variable stems from its likely correlation with an unobserved component reflecting the understanding of a financial contract, or financial communication. Should that be the case, then the trust variable and an error term would be correlated, and the obtained estimator would be inconsistent. To deal with this issue, we employ an instrumental variable—linguistic diversity, which, on theoretical ground, is not likely to be a direct determinant of FI, but seems to be correlated with the level of social capital, with trust being one of the main components of social capital (Wang & Steiner, 2015).

The method of estimation is 2SLS. Linguistic diversity was chosen as a potential instrument of trust—in this case, trust in banks. The literature documents other valid instruments for trust in reference to finance. Xu (2020) equated trust with population density and share of Protestants and shows the accuracy of such instruments for accurately predicting influence of trust on FI for various measures of FI. Baronchelli et al. (2020) analysed the importance of linguistic distance between the official language and an ordinary language spoken in a given country on fiscal accountability. Following an instrumental variable approach, they estimated the significance of communication gap between the state

**Table 5.** Probit Model: Determinants of the Lack of Trust

	<b>Probit: No account because of lack of trust</b>	
	<b>Marginal Effect</b>	<b>Standard Error</b>
Age	0.001***	0.000
Female	-0.029***	0.004
Education level		
Secondary	0.001	0.005
Tertiary or more	-0.016	0.010
Income quantile		
Second 20%	-0.001	0.007
Middle 20%	0.004	0.007
Fourth 20%	-0.002	0.007
Richest 20%	0.020***	0.007
fin_literacy	0.00038*	0.000
easy_lang	0.005	0.005
lang_div	-0.003	0.009
Lgdp	0.017***	0.002
Inflation	-0.006***	0.000
bank_zscore	0.001***	0.000
Number of observations	35,150	
Mean dependent variable	0.213	
Standard deviation of the dependent variable	0.409	
Pseudo R-squared	0.013	
Chi-square	490.479	
p-value	0.000	

Note. \*\*\*, \*\*, \* indicate statistical significance on 1%, 5%, and 10% level, respectively.

Source: Own calculations.

and its citizens. They instrumented accountability with average linguistic difference from the official language (ADOL) and have found negative relationship of linguistic distance on accountability. Employing linguistic diversity as an instrument, to the best of our knowledge, has not been studied so far. Table 4 presents the results of instrumental regression.

The effect of instrumented trust on financial access score is equal to -0.921, which is very different from the effect in a simple OLS regression (0.148). A negative relationship is observed, which implies a positive effect on the access to the financial system.

For the use score and probit model, the impact of *bank\_trust* was also greater than in OLS model (0.093 versus 0.034, and 0.297 versus -0.013). This outcome suggests that without an instrumental approach, the impact of trust on FI is underestimated. Once we account for the influence of linguistic diversity on trust formation, the importance of trust for FI is more profound. The variable *easy\_lang* is not significant for use score and has a negative impact in access and probit models. This implies the effect cannot be clearly established using the current methodology. First stage F-statistic is equal to 138.955 and is higher than the commonly used threshold of 10, indicating that the instrument is not weak. In all three model specifications, endogeneity in the sample was confirmed by the Hausman–Wu test. The hypothesis that linguistic diversity is a strong instrument for trust (H2) should not be rejected.

Finally, there is a question whether the absence of trust can be caused by the lack of understanding in terms of finance comprehension or language. One of the questions from the Global Findex Survey addressed ‘lack of trust’ as a reason for not using financial services. To verify the relationship, we estimated a probit model. Table 5 reports the results.

The results indicate that there is no significant influence of language diversity on the lack of trust towards banks. It suggests that there are different drivers to the lack of trust in banks. On the other hand, the level of FL is found slightly positive and significant on a 10% significance level. A possible explanation is that financially literate people are likely to understand ‘shady’ practices should they happen in financial institutions—probably in countries with fewer oversight bodies. On the other hand, financially literate people should be more confident with their money decisions and immune to advertising of malefic services. Hence, it is difficult to point out an unambiguous interpretation.

## 6. Discussion and Conclusions

The aim of this paper was to investigate the relationship between FI, trust, and communication. Our results indicate that there is a significant influence of the level of trust towards financial institutions on FI; however, the level of trust is underestimated should we not account for the impact of communication, instrumented by linguistic diversity on trust. We argue that the influence of language on trust is transferred via two transmission channels. First,

linguistic barriers in understanding contract-specific banking and juristic terms are persistent among the general group of customers and impede efficient communication between a financial institution and its customers. The lack of comprehension is likely to lower trust, no matter the language. Second, linguistic differences have been associated with hampering trust formation, across individuals coming from different 'groups'. Additionally, we confirm the observations made by other researchers that both individual and country-level characteristics have an impact on FI (Allen et al., 2016; Demirgüç-Kunt & Klapper, 2013; Grohmann et al., 2018; Hayashi & Minhas, 2018; Xu, 2020).

We discuss why trust is a vital facilitator of FI, as it may encourage reluctant individuals to use services that best meet their needs, even if they do not fully understand the suitability of those services at first. On the contrary, a lack of trust discourages people from engaging in a relation with financial institution even if a person could benefit from it. The results of our analysis indicate that there is a strong and robust relationship between communication, instrumented by a measure of linguistic diversity and the level of trust granted to banks. Hence, in order to enable and encourage people to use official financial services, inclusion policies ought to consider the importance of proper communication. We also note that limited trust caused by the lack of linguistic comprehension appears to be only one of many factors that influence trust in banks in general (see, for example, Fungáčová et al. (2019) or Ahunov & Van Hove (2020)), although it appears to be a promising way for bridging the distance between financial institutions and society.

As demonstrated in the literature, there are various reasons for distrust in banks, which are difficult to overcome in the short term. Demirgüç-Kunt and Klapper (2013), among cultural reasons or discrimination, point out the influence of past bank failures or historical distrust towards official institutions. Although nothing can be done about history, there are plenty of opportunities to act upon. What we suggest, and what has been empirically evaluated, is, in the case of highly linguistically diverse societies, to first develop trust towards financial institutions in order to effectively implement inclusion policies and overcome the distrust issues with effective communication. Our results confirm the argument previously raised in the literature: policymakers must

bear in mind the importance of social capital when planning future FI policies.

The role of communication and comprehensible information in building trust can be perceived as both a long-term and a short-term solution. By effectively communicating with their clients, financial institutions have an opportunity to create their image as trustworthy entities and attract individuals with whom they can build sound relationships. Fungáčová et al. (2019) empirically evaluate the impact of availability of public information on trust in banks and find the importance of certain communication channels. The effect of communication on trust was also found by Ball et al. (2004), who additionally argued that the level of trust is associated with consumer loyalty, meaning it may contribute to the long-term benefit for the financial institution. The authors note that the effect found for communication and trust may be somewhat specific for the banking sector, as they utilised data regarding this sector only; however, they expect to see similar results in other areas, possibly of different magnitude.

Communication between the customer and financial institution occurs on many levels: through media, bank websites, advertising materials, and finally, through personal contact. The objectives of this communication include informing the customer about available products and encouraging him to use it. There is a rationale for both banks and customers to have an interest in ensuring mutual understanding of the contract they engage in, yet it must be remembered that financial institutions are there to make a profit. As discussed earlier in this paper, FI is considered to be a background for understanding financial concepts. However, as argued by Willis (2008), increasing financial education of the society is costly and resource-consuming, and for different reasons, such as information overload, the time passed since financial training or the assumption that each customer will be able to master the complexity of the ever-changing financial markets, fails to address the problem. In light of this argument, we consider simple and accessible information as a promising solution. Providing customers with comprehensible resources when they need it, i.e. when they seek information on available financial products, decide on the type of product that suits their needs, or sign the contract, would help consumers navigate the complex world of finance. At the same time, assuring customers of the quality of the information they receive and ensuring they stay willing to engage in a relation with financial

entities could be achieved through an ongoing focus on building long-term trust between banks as institutions and society.

In our study, we focus mainly on communication as a mean for building sound relations between financial institutions and customers. We perceive open communication as a starting point for establishing and maintaining trust, and it seems that this observation can be easily translated to other areas of peoples' economic activity. As an example, Thiede (2005) analysed the importance of information and trust formation with regard to the health-care system, and noted the significance of trust for information effectiveness in this sector. Another sector in which information availability and usefulness influence trust formation is government communication, specifically communication available on governmental websites. Analysing perceived usefulness of open governmental websites, Lee, Lee, and Lee-Geiller (2020) found information overload to have a negative impact on the usefulness of such information, and link the usefulness to the level of trust exercised towards given websites. These findings stress the observation that the effectiveness of open communication in different sectors is important and depends on how it is delivered.

The goal of FI policies is to ensure globally equitable access to finance. This naturally raises a question: Can there be 'too much' finance? When speaking about universal access to financing, it has to be kept in mind that it is impossible to achieve coverage of the whole population with all financial products, nor is there really demand for it (Allen et al., 2016; Barajas, Beck, Belhaj, Naceur, Cerra & Qureshi, 2020). Among others, concerns about the stability of the financial system are often raised. Financial education could be one way to address the problem of undesired and excessive use of some financial products because maintaining financial ignorance would come at a cost. Financially ignorant individuals are likely to spend too much on additional fees, accumulate more debt, and lack retirement funds (Lusardi, 2008; Lusardi, 2015; Lusardi & Tufano, 2015). That clearly is a concern of the whole society because having failed to support themselves, people would likely look for social benefits, funded jointly by taxpayers.

The limitations in this study mostly derive from the limited availability of the data of our interest. Though comprehensive, the Global Findex Survey lacks information on individual FL scores, yet FL varies significantly both between countries and among citizens of a given society (Lusardi & Mitchell,

2011). To account for the role of FL for FI, we used mean country scores and assigned them to each individual observation. This approach is far from perfect; the literature documents significant variation of the level of FL across gender, age, or income level (Davoli & Rodriguez-Planas, 2020; Lusardi & Mitchell 2014; Lusardi et al., 2010). On the other hand, the index provided by Klapper et al. (2015) is by far the most comprehensive measure of FL with worldwide coverage. Although differences among societies are undoubtedly evident, Klapper et al. (2015) argue that a more financially advanced climate impacts its participants (for example, by bigger exposure to financial products in media). We also include individual education level, age, gender, and income quantile in the regression equation to capture individual variations of the willingness to participate in the formal financial system. We find them statistically significant across all model specifications.

To further investigate the role of language, financial jargon and terminology on different levels of complexity, following an experimental approach could prove to be insightful. Although studies with limited availability of individual controls have already indicated the prevalence of a communication gap and the importance of linguistic simplification, surely there is a lot more to investigate in terms of personal preferences (for example, towards risk or confidence). Also, the methodology employed in this study does not seem to capture the full nature of the discussed phenomenon, as there were numerous counterintuitive results observed. Our study aimed at establishing a framework for the role of comprehension and communication for FI; however, as demonstrated, the accuracy of the results can be questioned. We believe that the area needs to be further researched, as the topic of FI is of great importance.

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# Appendix

## List of countries

Afghanistan, Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Belarus, Belgium, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Democratic Republic of Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Haiti, Honduras, Hong Kong, Hungary, India, Indonesia, Iran, , Iraq, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyz Republic, Lao PDR, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovak Republic, Slovenia, South Africa, South Sudan, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, Vietnam, Zambia, Zimbabwe.

**Table A1.** Variables and Data Sources

Variable name	Indicator	Year	Data source
Access score	Measure of willingness to own one or many financial products. Lower values indicate higher willingness.	2017	Own calculations, Global Findex Database 2017
Use score	Measure of willingness to use one or many financial products in the past 12 months. Lower values indicate higher willingness.	2017	
inclusion_inst	Percentage of population over the age of 15 having an account at a formal financial institution.	2017	Global Findex Database 2017
fin_literacy	Percentage of adults who are financially literate.	2015*	Klapper et al. (2015)
bank_trust	Percentage of adults who have a “great deal” or “quite a lot” of trust towards banks.	2017-2020	World Values Survey (wave 7)
credit_info	Index measures the availability and quality of credit information. Scores range from 0 to 8, with higher values indicating better access to information.	2017	World Bank
bank_zscore	Bank's Z-score; probability of country's banking system default.	2017	
Lgdp	Logarithm of gross domestic product per capita, current USD.	2017	
Iflation	Inflation rate, consumer prices (annual, %).	2016**	
lang_div	Language diversity; probability of two people – randomly chosen from the population – to have different mother tongues.	2017	SIL
easy_lang	Binary variable; takes 1 if banks are required by law to provide parts of information in plain and/or local language and 0 in other cases.	2017	Financial Inclusion Consumer Protection Survey
Female	Binary variable; takes 1 if respondent is female and 0 if male.	2017	Global Findex Database 2017
Age	Respondent's age.	2017	
Education level	Respondent's highest level of education; 1= completed primary or less, 2= secondary, 3 = completed tertiary or more.	2017	
Income quantile	Indicates the income quantile to which given respondent belongs.	2017	

\* The most accurate cross-country measures.

\*\* Lagged values allow to capture inflation expectations.