Financial inclusion, poverty and income inequality in low- and middle-income countries

A mixed-method investigation

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The candidate confirms that the work submitted is his/her own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

In the mid-2000s, the World Bank and other international institutions endorsed financial inclusion (FI) and microcredit as important development tools for reducing poverty and income inequality in low- and middle-income countries (LMICs). Whereas microcredit programs have been widely criticised as a development strategy, FI lacks similar scrutiny. This thesis aims at closing this gap using mixed methods. Overall, our results suggest that FI is unlikely to reduce poverty and income inequality in LMICs. Instead, it may lead to over-indebtedness, especially of informal workers.

We first undertake a rigorous inquiry into the conceptual basis of FI. Chapter 2 systematically examines 67 studies and offers a new definition of FI, clarifying its objectives, elements and the nature of financial intermediaries. We find that the dominant definitions of FI are based on mainstream hypotheses that neglect the macroeconomic particularities of LMICs.

Chapter 3 aims to overcome this shortcoming by examining the macroeconomic conditions that shape FI in LMICs utilising hypothesis from the Post-Keynesian approach. This chapter develops a model of the relationship between individuals and financial institutions and incorporates power mechanisms, such as social shame, that underlie FI processes in LMICs.

Chapters 4-6 present mixed-method empirical evidence on the relationship between FI, poverty and income inequality. Chapter 4 reports on a case study in Brazil comprising 30 interviews with low-income individuals. Chapter 5 utilises microdata from 451,372 individuals to create a multi-dimensional index of FI using multiple correspondence analysis. Finally, Chapter 6 employs this new index to econometrically estimate the effects of FI, poverty and income inequality, and to investigate causal relationships. Our findings indicate that poverty reduces the level of FI, but that FI presents no robust effects on poverty.

In sum, this thesis provides a rigorous conceptualisation of FI and makes theoretical and empirical contributions that challenge the expected effectiveness of FI in LMICs.

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List of abbreviations

2SLS	Two-stage least square
3SFGLS	Three-stage feasible generalised least squares
ATM	Automated teller machine
BEMGE	Banco do Estado de Minas Gerais (Bank of the State of Minas Gerais)
BF	Bolsa Família (Family Allowance)
BNB	Banco do Nordeste (Bank of the Northeast)
SOB	State-owned bank
CA	Correspondence analysis
CBINT	Central bank interest rate
CDW	Cragg-Donald Wald
CPF	Cadastro de Pessoa Física (Natural Persons Register)
CV	Curriculum Vitae
DIEESE	Departamento Intersindical de Estatística e Estudos Socioeconômicos (Inter-Union Department of Statistics and Socio-Economic Studies)
EAP	East Asia and Pacific
ECA	Europe and Central Asia
FD	Financial development
FI	Financial inclusion
FS	Full sample
G2SLS	Generalised two-stage least squares
GDP	Gross domestic product
GDPPC	Gross domestic product per capita
GLS	Generalised least squares
GMM	Generalised method of moments
GRFI	Global Ranking of Financial Inclusion
HIC	High-income country
IBGE	Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics)
ILO	International Labour Organization
IMF	International Monetary Fund

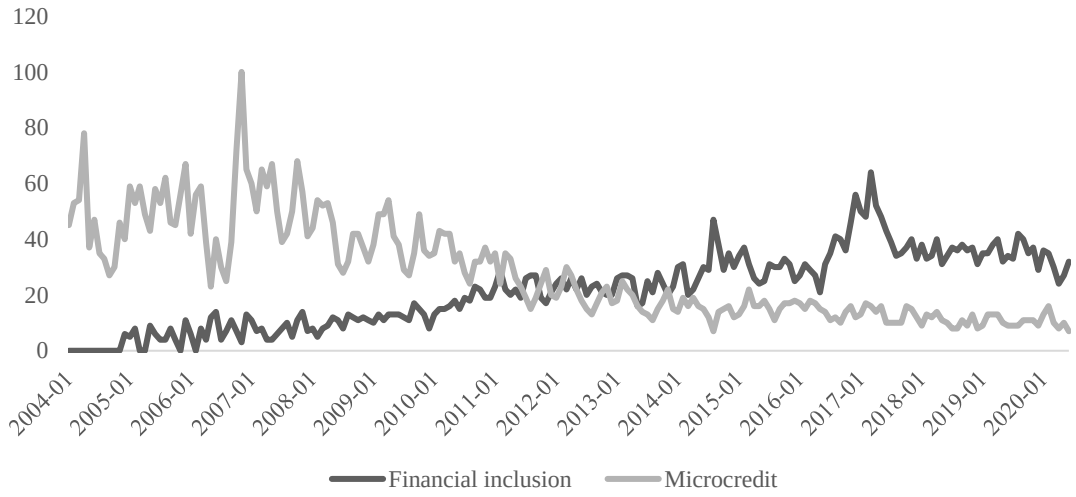
INSS	Instituto Nacional do Seguro Social (National Institute of Social Security)
IV	Instrumental variable
LAC	Latin America and the Caribbean
LMIC	Low- and middle-income country
MCA	Multiple correspondence analysis
MENA	Middle East and North Africa
MFI	Microfinance institution
MW	Minimum wage
NA	Not applicable
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary least squares
PCA	Principal component analysis
PK	Post Keynesian
PPP	Purchasing power parity
SA	South Asia
SPC	Serviço de Proteção ao Crédito (Credit Protection Service)
SSA	Sub-Saharan Africa
UN	United Nations
US	United States

Chapter 1
Introduction

1.1 Introduction and motivation

Financial inclusion (FI) emerged as a crucial component of economic development policy in the economic development literature in the mid-2000s, pushed by initiatives from international institutions, such as the World Bank, the International Monetary Fund (IMF) and the United Nations (UN), as well as by governments and private financial institutions. The idea of reducing poverty by fostering the expansion of formal financial services to the poor had originated with the creation and expansion of microcredit programs some years before. After in-depth studies had confirmed the minimal or even adverse impact of microcredit on poverty reduction (Duvendack et al., 2011; Bateman and Chang, 2012; Roodman and Morduch, 2014; Banerjee, Karlan, et al., 2015), FI emerged as a replacement policy (Bateman, 2014; Mader, 2018). Figure 1.1 illustrates this changing policy focus by recording the shift in the frequency of topic word searches for 'financial inclusion' and 'microcredit' before and after 2011.

Figure 1.1: The popularity of internet searches for topic words 'financial inclusion' and 'microcredit'



Source: Google trends

While the mainstream and heterodox literatures on microcredit have reached consensus on its limits in achieving poverty reduction on the basis of an extensive set of research studies, FI has not been exposed to a similar level of detailed scrutiny. To the contrary, mainstream studies have validated the claim that FI is able to reduce poverty and income inequality despite the absence of a thorough conceptual and theoretical consideration of this process, and of robust evidence about its effectiveness. This thesis therefore challenges these premature conclusions by developing a clear conceptual approach to defining FI, by exploring its theoretical basis, and by presenting empirical evidence about the relationship between FI, poverty and income inequality.

It will be helpful to briefly state some of our key conclusions. First, the concept of FI is not consistently used in the mainstrem literature, which causes different interpretations and policy recommendations. Definitions range from "use of formal accounts" (Allen et al., 2016, p.1) to lengthy ones that include a variety of financial instruments and purposes of FI (Alonso et al., 2013; Roa, 2013; Chakravarty and Pal, 2013; Güngen, 2018).[1] Such studies often define FI based on data availability, not through an exercise on the fundamentals of the policy. Thus, policymaking can become diffused and may not reach its proposed development objectives. In this thesis, we start Chapter 2 by conducting an extended literature review on the concept of FI and discussing the theories that underlie such definitions. We conclude that further discussion must be provided in order to address missing aspects of FI, in particular when addressing low-income individuals.

Second, no theoretical basis has been established for how the different financial instruments of FI can work together to reduce poverty and income inequality. Yet, studies of FI make use of underlying theoretical paradigms that do affect the basis of their investigation and conclusions. Studies grounded on neoclassical and New Keynesian theories claim that FI reduces poverty and income inequality by boosting human capital and transferring the savings from the rich to the income-constrained poor entrepreneur. Focusing on the imperfections of financial markets' supply-side, these studies address how barriers, such as a highly bureaucratic government, can be overcome to include poor individuals into the formal financial system. The demand-side is sometimes addressed but focuses on individuals' lack of financial education, not on the roots of demand for financial services (Camara and Tuesta, 2014; World Bank, 2014; Ulwodi and Muriu, 2017; Klapper and Singer, 2017).

[1] Full definitions in Appendix A (Table A.1).

However, according to the World Bank Findex, reported barriers to FI are mostly related to a lack of income.[2] In Table 1.1, lack of money, followed by the price, are considered the main obstacle to owning a bank account. This outcome is understandable as income-constrained individuals may perceive financial services' fees to be too costly. In turn, they may prefer allocating their income to more essential services and goods, such as food, housing and health care.

Table 1.1. Reasons for not having an account at a financial institution (%)

Reason	2011	2014	2017
Lack of money	68.15	65.96	64.63
Price	26.10	28.50	29.99
No need	N/A	29.34	28.17
Documentation	20.13	19.40	21.63
Distance	19.80	22.07	20.86
Lack of trust	17.25	16.27	18.65
Family member has one	13.93	14.85	18.16
Impossibility	N/A	22.56	N/A
Religion	5.70	7.44	6.87

Source: World Bank Findex database

In order to address such limitations in the mainstream FI literature, this thesis integrates hypothesis from the Post-Keynesian literature and develops a game-theoretical model with the presence of power in Chapter 3. We argue that, in fact, there are some supply constraints to the poor in accessing financial services, but those arise from macroeconomic structures, such as the high interest rates in low- and middle income countries due to their positions in the currency hierarchy and the monopoly power of banks. At the same time, we acknowledge the demand side of FI, which consists on not only having enough income to use such services, but also depends on a constant income source. Thus, in this thesis, we argue that formal employment is indispensable to promote FI, as the unemployed and informal workers have a reduced need for formal financial services. Moreover, because of the irregular income stream, informal workers may avoid financial services to prevent over-indebtedness.

[2] The World Bank Findex dataset surveyed around 500,000 individuals in more than 140 countries for three years. According to the study, 52.70%, 43.82% and 40.02% of the world population were unbanked in 2011, 2014 and 2017 respectively. More on https://globalfindex.worldbank.org/.

The survey also sheds light on the causal relationship between poverty, income inequality and FI. The mainstream literature suggests that FI reduces poverty and income inequality. However, the empirical evidence establishing financial services as important instruments for achieving poverty alleviation and meeting development goals is not solid. Instead, "the effects vary, are often mixed, and appear not to be transformative in scope or scale, as they largely occur in the early stages of the causal chain of effects" (Duvendack and Mader, 2019, p.7).

In turn, we propose a reverse causal relationship:a reduction in poverty and income inequality may boost FI and, depending on certain loan conditions, FI may increase poverty but also income inequality, as the income of the poor may shift to the rentiers through financial expropriation (Lapavitsas, 2009). This thesis contributes to the evaluation of FI policy by using both quantitative and qualitative methods to grasp different aspects of FI. In our qualitative interviews in Chapter 4, we find evidence of the negative effects of FI on income, as well as a lack of demand for financial services for those who are informal workers or unemployed. In our econometrics estimations in Chapter 6, we address such simultaneity bias which is currently overlooked in the literature and find that poverty does reduce the level of FI. However, we are unable to find robust results on the effects of FI on poverty and income inequality. Therefore, we are unable to confirm such claims from mainstream development studies that FI reduces poverty and income inequality.

Overall, this thesis proposes a new perspective on the relationship between FI, poverty and income inequality from a Post-Keynesian theoretical approach. Considering the structural differences between high-income countries (HICs) and low- and middle-income countries (LMICs), the relationship between individuals and financial institutions, the multi-dimensional aspect of FI, and the causal relationship between FI, poverty and income inequality, we aim to clarify this complex policy in order to evaluate its effectiveness.

1.2 Ontology and methodology

The thesis is grounded in critical realist philosophy, an approach that is especially useful in evaluating complex phenomena. This philosophy's ontological perspective, in contrast to the positivist and interpretativist approaches, considers reality to be unique (although perhaps unknown), and potentially subject to multiple interpretations. In fact, reality is understood as having different layers, from the most atomic reality to the most general one (Downward and Mearman, 2007; Zachariadis et al., 2013). Since FI is a complex policy that involves several

layers, critical realism provides a consistent method for uncovering the conflicting layers and interpretations of the effects of financial services on poverty alleviation and income inequality reduction.

To lay the groundwork for our FI study, we start by untangling its definition in order to understand its underlying theories and purposes. Next, we analyse the macro- and microeconomic aspects of FI to relate the general to specific characteristics of the policy. As both levels of analysis are essential to understand the full reality, we first reflect on the macroeconomic structures that may constraint the effectiveness of FI in LMICs using hypothesis from a Post-Keynesian perspective. Second, utilising game theory modelling, we consider social structures and power relations between individuals and financial institutions.

To uncover the different layers of FI, we employ retroduction reasoning. Retroduction moves from the level of the identified phenomenon to higher levels of analysis (Lawson, 1999). To develop a thesis consistent with retroduction, we utilise mixed-methods triangulation to reveal the multiple facets of such stratified ontology. Quantitative analysis can give us an overview of reality by yielding demi-regularities and unfolding mechanisms and tendencies. In turn, qualitative studies are essential to uncover underlying processes and structures that might not be captured by numbers (Fleetwood, 1999; Fleetwood, 2001; Downward and Mearman, 2007; Kaltenbrunner, 2018).

Critical realism also influences our evaluation on the causal relationship between poverty, income inequality and FI. Unlike in the positivist approach, where A causes B, we consider the process and conditions under which A causes B, including why the data appear in a particular way (Olsen, 2007; Zachariadis et al., 2013; Elliot et al., 2016). We also investigate the potential simultaneous relationship between variables. In this context, mixed methods are also necessary as demi-regularities from quantitative analysis may not represent causal mechanisms in an open system. Thus, complementary qualitative research may inform the researcher on such causal relationships (Lawson, 2003; Chick and Dow, 2005; Downward and Mearman, 2007).

Lastly, we consider that the structure of an economy is slowly transformed by economic and social events and its form and organisation depend on its history (Lee, 2002). So, it is expected that LMICs and HICs will have very distinct social and economic structures that will undermine a linear comparison. Therefore, this thesis makes a distinction between these regions, and we analyse FI from a LMIC perspective.

1.3 Research questions

From a Post-Keynesian theoretical approach and a critical realist philosophy, this thesis answers three research questions. The first research question targets the conceptual and theoretical fundamentals of FI, which currently do not address the influence of intra-country power relations when implementing FI policies in LMICs. Whereas we recognize the existence of power relations also between HICs and LMICs, the thesis will focus on the micro-level relationships between financial institutions and low-income individuals in order to answer the first research question, which is addressed in Chapter 3.

RQ1: How do intra-country power relations affect financial inclusion in low and middle-income countries?

The second research question deepens the analysis by trying to establish which processes lead to the causal relationship between FI, poverty and income inequality. From a mainstream perspective, a lack of FI causes poverty and income inequality and, by implementing such policy, those social issues would be overcome. However, we suggest that the inverse relationship could be more dominant. In fact, those who are poor could be excluded from the formal financial system because there is a lack of need for such services, once they do not have the necessary income to demand for financial instruments. Thus, we examine if causality runs (i) from FI to poverty and income inequality, (ii) from poverty and income inequality to FI, or (iii) both. These relationships are investigated through both qualitative and quantitative research in Chapters 4 and 6.

RQ2: What is the causal relationship between poverty, income inequality and financial inclusion?

The final research question focuses on the effects of FI on poverty and income inequality, as we aim to provide sound evidence to contribute to policy design. Whereas the current mainstream literature indicates that FI reduces poverty and income inequality, we investigate such effects through the perception and experiences of our participants in Chapter 4 and an econometric analysis in Chapter 6.

RQ3: What are the effects of financial inclusion on poverty and income inequality?

By answering these three research questions through different methods, we aim understanding in depth the relationship between poverty, income inequality and FI, as well as uncovering mechanisms that explain their causal relation. The results are expected to stimulate a debate for implementation and resource allocation for poverty and income inequality reduction policies in LMICs.

1.4 Contributions and structure of the thesis

The thesis aims to deliver two contributions regarding the conceptualisation of FI and three empirical contributions building on such conceptual work. The two conceptual contributions regard the definition and the connection between the macro- and the microeconomic aspects of FI. First, due to its multi-dimensional characteristic, FI is often defined differently across the literature. Such variety may generate diverse interpretations on the meaning of FI and what it can achieve. To address this issue, Chapter 2 evaluates 67 studies through a systematic review method and discusses the underlying theories and data that led authors to particular definitions.

Second, while FI is directed to individuals, macroeconomic conditions and market structure affect the policy's potential success in LMICs. Grounded on the Post-Keynesian theory, Chapter 3 discusses such conditions and links them to the microeconomic aspects of FI. We focus on three main structural differences between LMICs and HICs. First, LMICs have lower quality currencies, which places them at the bottom of the currency hierarchy. Second, along with this subordinated position, high levels of bank concentration contribute to an increase in loans' interest rate. Third, the high levels of informality in the labour market lead to persistent income shocks in individuals' lives. Thus, in such an environment, FI may aggravate indebtedness among the poorest. Besides macroeconomic conditions, the relationship between individuals and financial institutions also shape the success of FI in LMICs. Through game modelling, we illustrate intra-country power mechanisms that lead individuals to be disadvantaged when entering in a relationship with for-profit financial institutions. In sum, we suggest that such macro- and microeconomic aspects must be acknowledged when designing FI policies in LMICs.

The three further contributions of this thesis are empirical. To address the causality and effects of FI on poverty and income inequality in LMICs, we provide a mixed-methods study divided into three chapters. First, Chapter 4 presents a mixed-method case study in Brazil. By analysing quantitative data and conducting semi-structured interviews, we confirm that employment status and interest rates are essential determinants of demand for formal financial services by the poor. Second, in Chapter 5, we construct the first multi-dimensional index of FI using the World Bank Findex microdata from more than 400,000 individuals worldwide for 2011, 2014 and 2017. The index is then aggregated to establish a global ranking of FI. Finally, employing these country-level FI scores, we use econometric methods to estimate the simultaneous relationship between FI, poverty and income inequality in Chapter 6. This analysis confirms our hypothesis of striking differences between HICs and LMICs, besides the importance of formal employment and bank concentration. Furthermore, we conclude in Chapter 7 that poverty and income inequality are significant determinants of FI, but the policy does not display robust effects on poverty nor income inequality.

Our findings challenge the claims made in the mainstream literature, cited above and in the pages that follow, that FI reduces poverty and income inequality. Furthermore, we suggest that poverty and income inequality are important causal factors of the demand for formal financial services, so that these issues should be addressed before pushing FI policies in LMICs. Finally, the thesis proposes alternative policies to poverty and income inequality, as well as to market-driven FI.

Chapter 2
What is financial inclusion?

Financial inclusion (FI) is a relatively new concept that, despite containing several aspects of microfinance, is supposed to relate to broader mechanisms of inclusion into the financial system. As we research mainstream literature more in-depth , we notice that the plurality of definitions of FI is often under-developed or unclear. This imprecision allows for different interpretations, in particular concerning who should be included in the financial system, who should intermediate this inclusion, and which services should be part of this process.

To illustrate the inconsistency in the existing literature and the strong connection between FI and microcredit, we conduct a systematic literature review of 67 studies on FI definitions. Built on the systematic review approach, we select studies based on inclusion and exclusion criteria, as well as an explicit search strategy, thus providing a reliable outcome. After analysing the studies, we show the relation between the financial inclusion and financial development literature and critically discuss the underlying theoretical implications of selecting certain features to define FI, which has not been provided in the critical FI literature so far. This literature review enables us to understand better FI policies and how they have been designed. Using the mainstream literature, we highlight the key concepts of FI by generating an explicit definition of the policy. However, we notice that the mainstream literature still does not account for certain aspects of FI, in particular power relations, which is further developed in Chapter 3.

2.1 Alternative definitions of financial inclusion

Commonly defined as the access and usage of financial services, the definitions of FI are not uniform in the literature. Those range from very succinct definitions, such as in Allen et al. (2016: 1), where FI is described as "use of formal accounts" to extended ones such as in Chakravarty and Pal (2013), where FI is the act of removing barriers for the poor to access fair and low-cost financial services.[3] The often imprecise and diverse definitions of FI may lead to different interpretations, which in turn creates complications for policy analysis and implementation.

[3] Full definitions in Appendix A (Table A.1).

Research on the exclusion of individuals from the formal financial system dates to the 1990s. "Financial exclusion" was brought into discussion by researchers who detected that individuals in peripheral neighbourhoods in high-income countries (HICs) were deprived of formal credit based on geographic or racial prejudices, despite disposing of collateral and regular income streams. Such studies focused on long-term credit with market rates provided by community development banks or community-based credit unions, so the individuals could invest in housing and businesses[4] in order to generate wealth to themselves and their neighbourhood (Leyshon and Thrift, 1995; Dymski, 1995; Pollard, 1996; Dymski and Veitch, 1996).

In contrast, the current mainstream literature on FI considers a broader range of financial services that are necessary in order to include poor individuals from low- and middle-income countries (LMICs) into the formal financial system. While these studies do not specify through which mechanisms FI as a whole would lift individuals from poverty, most of them focus on (micro)credit. This literature's theoretical background is grounded on the financial development (FD) literature, in which increasing finance leads to economic growth, thus reducing poverty and income inequality in LMICs (Beck et al., 2004; Beck et al., 2007; Demirgüç-Kunt et al., 2008). More specifically, such studies utilise mathematical models, in which through investment in human capital or business, the poor are lifted out of poverty (Galor and Zeira, 1993; Banerjee and Newman, 1993; Aghion and Bolton, 1997). For example, Aghion e Bolton (1997, p.151) argue that "as more capital is accumulated in the economy more funds may be available to the poor for investment purposes. This in turn enable them to grow richer". Furthermore, credit (but also savings and insurance) prevents individuals from falling into poverty during income shocks, thus smoothing consumption overtime (Chakravarty and Pal, 2013; Allen et al., 2016; Demirgüç-Kunt et al., 2017).

This mainstream approach to FI overlooks, however, certain particularities of LMICs that could challenge such mathematical models, as has been pointed out by critical studies. First, the support for the expansion of informal microenterprises in LMICs does not acknowledge the saturation of markets for primary and craft goods, nor services such as hairdresser and clothes repair. This saturation pushes prices down, driving individuals to work longer hours while receiving lower earnings (Bateman and Chang, 2012; Bateman, 2014; Guérin et al., 2015). Second, the claim that the poor are "repressed" entrepreneurs does not take into account that these individuals may lack specialized skills or have insufficient capital to increase low levels

[4] Business in the financial exclusion literature is defined as a formal enterprise, not agricultural or craft goods that are sold in the informal market.

of productivity (Taylor, 2012). Therefore, promoting increasing finance to low-income individuals in LMICs must acknowledge the labour market structure difference between these and HICs.

On the empirical level, there is limited evidence that FI can reduce poverty. A systematic analysis of the impact of FI in LMICs from Duvendack e Mader (2019, p.12) found that "findings across the reviews were heterogenous and often inconsistent, both within and across reviews, and many reviews did not find evidence of expected or presumed impacts", which suggests that positive results are "unreliable and/or context-dependent". In turn, further research has found that FI can have negative effects on income due to over-indebtedness (Dattasharma et al., 2016; Kaffenberger and Totolo, 2018), similarly to evidence on microfinance (Schicks, 2014; Mutsonziwa and Fanta, 2019).

The theoretical and empirical resemblances between microfinance and FI has led to the claim that the latter is a mere rebranding of the former (Bateman, 2014; Mader, 2018). FI, however, is set to be broader than microfinance, which creates hardship in developing a clear concept. Based on the systematic review method, this chapter investigates 162 studies in order to compare the existing definitions of FI and untangle their underlying theoretical foundation. It also scrutinises these definitions in order to answer three questions: (i) Who is the subject of inclusion?; (ii) Who will include them?; and (iii) What are the necessary financial instruments to achieve this inclusion?

2.2 Method

The systematic review method is commonly used to assess the impact evaluation in international development studies. The review should include a clear research question, a reproducible search strategy, inclusion criteria, screening methods, critical appraisal of the quality of included studies and information about that analysis that allows for reproducibility (Krnic Martinic et al., 2019).

In this section, the systematic review method provides a framework to extract and analyse information using a reliable and reproducible process. We reduce the research output bias by providing specifications on (i) wording, (ii) type of study, (iii) period, (iv) selected languages and (v) search platforms. We follow these five criteria using the guidelines from Snilstveit et al. (2014) in order to assess the mainstream literature on FI and its criticisms.

2.2.1 The selection criteria

First, the criteria of inclusion and exclusion of selected studies were established based on the wording they use. We include studies that display the precise expression "financial inclusion", but not its variations, such as "financial exclusion", "financial access" or "banking". This first step is essential as we aim to investigate the specific group of studies that conceptualise FI using FD as a theoretical foundation.

Second, we add criteria based on the type of study. We only review studies that are publicly available and are peer-review journal publications, books, institutional working papers, or institutional reports. Institutional reports and working papers are essential for this investigation, as international institutions, in particular the World Bank, are strong advocates of FI policies.

Third, we only select studies that were published between 2000 and 2018. As we focus on the mainstream literature on FI and its criticisms, this time frame reduces the likelihood of reviewing a definition that does not fit into our framework.

Fourth, we search in four different languages (English, Portuguese, Spanish and French) in order to reduce the language bias. Non-English definitions were translated in order to assure comparability.

Fifth, we select three search platforms in order to reduce the selection bias: Google Scholar, EconLit and Web of Science. Studies have also been added through the snowballing method, as it identifies key studies that may not be considered relevant by the search platforms. Through this method, we review the reference list of the primary studies and include the most common references.

2.2.2 The selection process

To evaluate the selected definitions, we follow the four steps of a systematic review, which includes the *identification* of the literature, *screening* of selected studies, *eligibility* of selected studies based on criteria mentioned above and *inclusion* of studies in the final review (Waddington et al., 2012). Results are displayed in Figure 2.1.

In the first step, we identify 162 studies. These studies were selected as follows: (i) the first 50 results in English in Google Scholar; (ii) the first 10 results in Portuguese, Spanish and French in Google Scholar; (iii) the first 20 outcomes in English EconLit; (iv) the first 20 studies in

English in the Web of Science[5]; and (v) the 42 most relevant studies mentioned in the primary selection that had not been displayed by search engines.[6]

The screening of identified studies reduced their number from 162 to 118. This procedure was conducted in two stages. First, we removed 22 studies classified as duplicates and outdated versions.[7] Second, we followed the above-established criteria according to publication type, publication year and public availability. Sixteen studies were excluded for not being peer-reviewed publications, books, institutional working papers or institutional reports. These were in their majority conference papers or magazine articles. One further study was excluded as it was published in 1998, and it was out of the scope of targeted studies on FI. Lastly, five studies were withdrawn as their full versions were not publicly available.

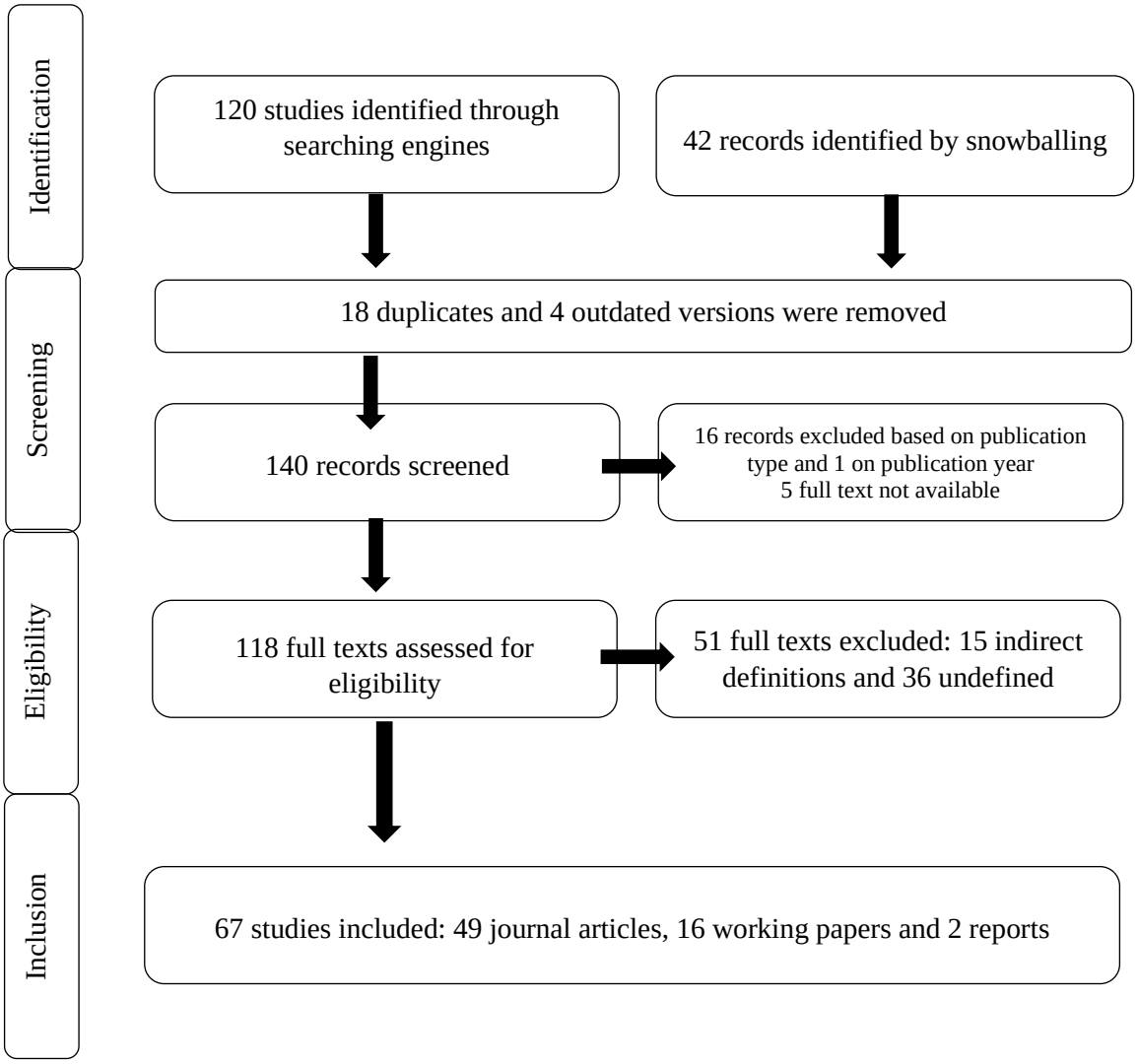
The eligibility step analysed how the selected studies defined FI. Here, 51 studies were disqualified for two reasons. First, 15 of them had indirect definitions, such as in Camara and Tuesta (2014) where the FI is not explicitly defined.[8] Second, 36 studies did not define FI whatsoever, despite analysing some aspect of what is understood to be FI, such as loans or mobile money, as in Allen *et al.* (2014) and World Bank (2012).

Finally, these three steps reduced the research to 67 studies in which FI was clearly defined. These studies included simple definitions, such as "the proportion of individuals and firms that use financial services" (World Bank, 2014, p.1) and "households' access to and use of financial services" (Anzoategui et al., 2014, p.338), to lengthy definitions as

"financial inclusion is defined as a process which brings different sections of people under a single roof of financial system, especially people in very low-income brackets, the poor and the marginalized sections including migrants and makes them access the basic financial services. These services include not only banking products but also other products such as insurance, pension and remittances at an affordable cost" (Sethi and Acharya, 2018, p.369).

[5] Neither EconLit nor Web of Science had results in languages other than English, reason why we only perform research in this language.
[6] When using the search engines, the studies were displayed by relevance.
[7] When papers had both working paper and journal publication versions, only the latter was selected.
[8] The study claims that "the concept of financial inclusion goes beyond single indicators, such as percentage of bank accounts and loans and number of automated teller machines (ATMs) and branches" (Camara and Tuesta 2014: 2) but does not provide an alternative definition.

Figure 2.1: Flow diagram based on the results of the literature review on FI



Note: Diagram based on Waddington et al. (2012).

2.2.3 The data adjustment

In the last step, we adjusted the included definitions. This transformation comprised five stages. First, nine non-English studies were translated (four in Spanish, three in French, and two in Portuguese). Second, only words that were at least four characters were selected, in order to prevent the inclusion of words such as "can" and "etc". Third, we removed stopwords (such as "about", "before" or "could"), as well as other words that did not contribute to understanding the definition of FI.[9] Fourth, stemmed words were clustered, that is, words that had the same

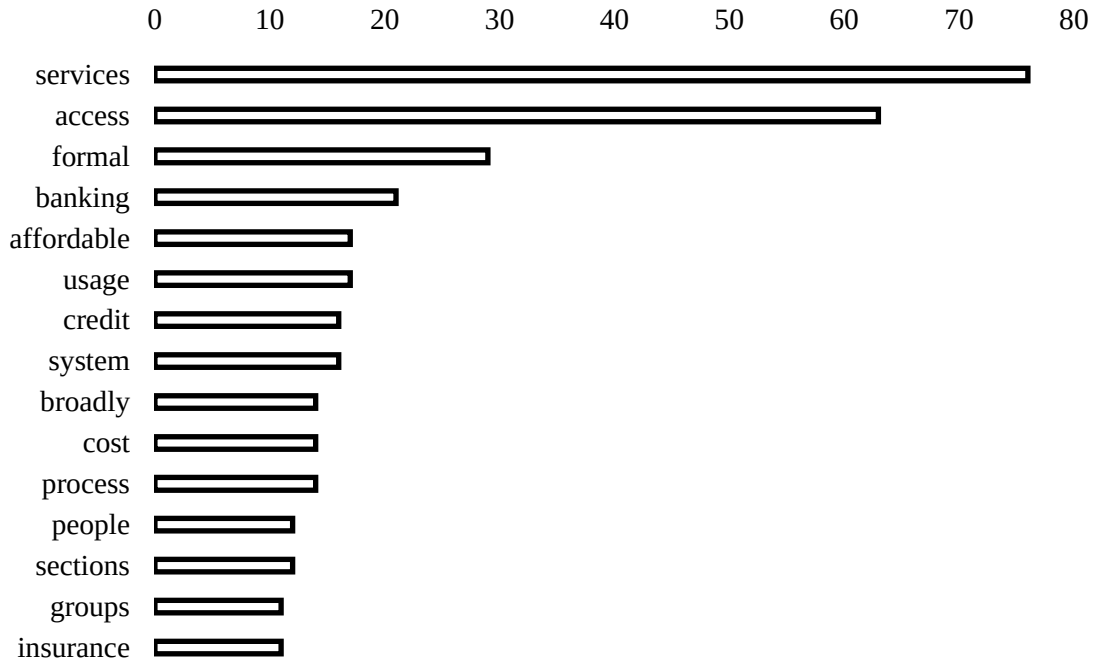
[9] These are: "financial", "inclusion", "defined", "definition", "defines", "define", "describes", "refers", "means", "concept", "provides", etc.

root, such as “banking”, “bank”, “banked” and “banks” were grouped. Lastly, only the top 100 words were selected.

2.3 Results and discussion

After transforming the data, we analyse the word frequency of the 67 studies that define FI. Results are displayed in Figure 2.2. “Service” and its variations[10] have been mentioned 76 times, reaching the highest frequency in our dataset. Next, “access” and related words, such as accessibility and accessible, have been mentioned 63 times. In third place, we find “formal” with 29 references.

Figure 2.2: Frequency of word usage in the definition of financial inclusion in 67 studies[11]



While the word frequency is informative, further analysis must be conducted to understand the underlying meaning of each choice of words. Based on the most commonly used words, we see that a possible general definition of FI could be “the access and usage of affordable formal banking services by people”. This definition, however, does not fully explain our main questions, that is, (i) who is the subject of inclusion?; (ii) who will include them?; and (iii) what

[10] “Service”, “services”, “services’”.

[11] The frequency of top 100 words can be seen in Appendix A (Table A.2). Some studies use more than one definition, so there are more occurrences of certain terms than the number of selected studies.

are the necessary services to achieve this inclusion? To answer these, we scrutinise the terminology to define FI by critically assessing the choice of phrasing. We also relate these to mainstream theoretical foundations, such as the human capital and life-cycle hypothesis.

2.3.1 The subject of financial inclusion

Several studies are not clear about who is the subject of FI: is it the individual, the household, the poor, or small and medium enterprises (SMEs)? The most frequent reference to the financially included is "people", which appears in the 12th position with 12 mentions. Subsequently, we find other terminologies: groups (14th), population (20th), individuals (22nd), poor (23rd), consumer (25th), firms (27th), households (28th), society (29th), members (34th), adults (43rd), clients (44th), disadvantaged (52nd), and customers (68th).

While the top terms are quite broad and prevent a precise understanding of the financially included agent, others enable us to discuss the different approaches to the subject of FI, as we have "individuals" with nine references, followed by "firms" and "households" with eight mentions each.

However, despite narrowing down the main agents, the literature is still not consistent with respect to who should be included. Some studies define FI as the inclusion of only firms (Chauvet and Jacolin, 2017), only individuals (Fan and Zhang, 2017), only households (Dev, 2006; Anzoategui et al., 2014), individuals and firms (Amidžić et al., 2014; World Bank, 2014; Moncayo and Reis, 2016; Rastogi and E., 2018), or households and firms (Morgan and Pontines, 2018; Gopalan and Rajan, 2018). The decision on agency seems, however, mostly related to the empirical research of the study. Based on data availability, the studies define FI as the inclusion of individuals, firms or households. Yet, if we want to understand FI, we must initially assess the implications of selecting a particular FI agent.

Firms are often overlooked on empirical analyses of FI (Karpowicz, 2016; Fan and Zhang, 2017; Morgan and Pontines, 2018). This approach is reasonable as the need of credit by firms for investment has been long discussed in the literature, unlike finance to households (Schumpeter, 1934; King and Levine, 1993; Levine, 1997; Khan and Senhadji, 2000). Firms and households, however, present essential differences that must be highlighted in order to understand the role finance plays in including each agent.

First, firms can be considered creditworthy as they have collateral (physical space, stock, machinery), which distinguish them from households, especially poor ones. In fact, one key

innovation of microfinance institutions (MFIs) was to accept social collateral or non-standard assets (such as cattle) as collateral, which allowed poor households to receive credit (Besley and Coate, 1995; Postelnicu et al., 2014). Therefore, uncollateralized loans to households are riskier and imply worse contract conditions, which may have negative effects on households' well-being.

Second, the use of credit is distinct in firms and households. Firms use credit for investment, which may generate profits and, even with high interest rates, may enable repayment. Households, in turn, often need credit for consumption purposes.[12] Therefore, households may be unable to repay the loan and be forced to make sacrifices, such as cutting on food (Schicks, 2014; Afonso et al., 2017; Kaffenberger and Totolo, 2018). As such, we should not mix firms and households.

According to the mainstream literature on FI, nonetheless, households also act like firms when they "invest" in themselves. Based on the human capital hypothesis (Becker, 1962), it is considered that individuals who invest in education, for instance, will have higher returns in the future, as this investment has high marginal productivity (Demirgüç-Kunt et al., 2008; World Bank, 2014). This hypothesis disregards, however, several aspects of this type of credit. One is that children need several years of education before entering the labour market. Therefore, their parents will be indebted until children are old enough to earn the returns of such "investment". Second, high returns from education require a well-established formal labour market in which education levels may have a positive effect on wages. This is not the case of many LMICs. Informal employment reaches 85.8% in Africa, 68.2% in Asia and the Pacific, 68.6% in the Arab States and 40% in the Americas (ILO, 2018a). Therefore, the pilling debt for education purposes may lead households into over-indebtedness.[13]

The mainstream literature also considers self-employed workers as firms ("entrepreneurs") (World Bank, 2014; Fungáčová and Weill, 2015; Allen et al., 2016). This approach stems from the FD literature, where the entrepreneur is a necessary tool for economic growth (King and Levine, 1993), and even rural self-employed workers are considered entrepreneurs (McKinnon, 1973). This association is particularly important in LMICs, where the labour market is characterised by the strong presence of rural and self-employed labour (ILO, 2018b), but can be harmful to development. By assuming that individuals are potential entrepreneurs that only

[12] We assume that households who purchase houses will live in them, so the final purpose is consumption.
[13] Further criticisms on the human capital theory can be found in Bowles & Gintis (1975) and Fleming (2017).

lack necessary funding, these studies overlook the fact that many do not have specialised skills and face highly competitive markets, which would prevent most businesses to thrive and may push prices down (Kalpana, 2005; Bateman and Chang, 2012; Taylor, 2012). Thus, as credit for consumption, investment loans to self-employed workers may also lead to over-indebtedness, as shown in the microcredit literature (Bateman, 2012; Schicks, 2014).

Stepping aside from the differences between firms and households, we now focus on households and individuals. Whereas "people", "groups" and "population" are the most common agents of FI according to our review, these are not precise enough for economic analysis. Hence, we focus on "individuals" and "households". Nevertheless, choosing between these two needs to be done purposefully as they present distinct characteristics.

The majority of studies that selected households as the unit of analysis did so due to data availability, such as when the national database only displays information on the household level (e.g. Dev, 2006; Anzoategui, Demirgüç-Kunt and Martínez Pería, 2014; Ehrmann and Ampudia, 2017). Meanwhile, other studies explicitly define individuals as the subject of FI (Amidžić et al., 2014; Fan and Zhang, 2017), even when acknowledging the particularities of the household level (Demirgüç-Kunt et al., 2015; dos Santos and Harvold Kvangraven, 2017; Tambunlertchai, 2018).

Choosing individuals over households seems reasonable, as the proclaimed goal of FI is to include everyone into the financial system. Despite household dynamics that could affect the inclusion of specific individuals, FI policy does not target merely a representative of the household. Despite certain critics of how neoclassical economics considers the centrality of individuals, analyses on the individual level remain fundamental. As our social world values individuals, using them as the subject of normative and scientific concern is necessary to economics as a science (Davis, 2003; Davis, 2010). Considering gender disparities within the household as an example, we understand the importance of the individual-level analysis. If a woman within the household does not have access to banking either because her partner already owns an account or he does not allow her to access the formal financial system, she would still be considered financially excluded.

Similarly, services that are used by the household, such as loans for children's education, are still provided to a single individual. Evidence shows that there are more systemic barriers to women than men, despite women's marital status (Agier and Szafarz, 2013; Demirgüç-Kunt et al., 2013; Safavian and Haq, 2013). Therefore, women within the household could still be

considered financially excluded, even if her husband would be able to acquire formal financial services. Therefore, for FI, the individual should be the subject of analysis.

We notice the striking differences between firms, households and individuals. In light of the discussion, this thesis considers that firms, by their distinct nature, should not be considered an subject of FI along with individuals or households. Moreover, we consider that the individual, not the household, should be the subject of FI, as the main objective of the policy is on the individual-level inclusion.

2.3.2 The intermediaries of financial inclusion

The second question relates to what type of institution will include individuals in the financial system. The discussion on the intermediaries is meaningful as for-profit and non-profit financial institutions may lead to different effects. Few of the 67 investigated studies define clearly the nature of financial institutions. Okello Candiya Bongomin, Munene, Ntayi, et al. (2018, p.831), for instance, refers to "responsible and sustainable financial institutions", but do not clarify what is meant by "responsible" and "sustainable". The most specific account is given by Morvant-Roux *et al.* (2010) who includes formal banks, financial cooperatives and MFIs in the definition of FI.

Throughout the studies, it is possible to identify that most studies implicitly consider only the private banking system (and sometimes the so-called *fintech*[14] firms) to be the optimal intermediary of FI. In turn, the state should only have a regulatory role and support FI by providing government transfers through digital payments (Demirgüç-Kunt and Klapper, 2013; Zulkhibri, 2016; Wang and Guan, 2017). Explicitly, the World Bank (2014, p.3) affirms that "the focus of public policy should be on addressing market failures" as "direct government interventions – such as […] lending through state-owned banks – tend to be politicized and less successful, particularly in weak institutional environments".

However, there is a central issue in promoting market-driven FI, which is not addressed in the mainstream literature. For-profit lenders are not driven by development goals, thus will be unlikely to change business from profitable credit for consumption purposes to individuals to

[14] *Fintech* refers to financial products that use technology to distinguish themselves from traditional financial services. For instance, mobile money is seen as a fintech innovation as it uses mobiles to store and transfer money without using the traditional banking system. An interesting critical account on the development of *fintech*-led FI can be found in Gabor and Brooks (2017).

transformative investment projects (dos Santos and Harvold Kvangraven, 2017). In fact, microfinance has been very profitable for private financial institutions, even if it leads the poor into over-indebtedness and wealth destitution (Bateman and Chang, 2012; Guérin et al., 2013; Ghosh, 2013; Güngen, 2018). Thus, for-profit FI may not lead to poverty and income inequality reduction.

Likewise, *fintech* firms are for-profit corporations. Initially focusing on payments, these firms have also developed microloans systems through mobile phones, for instance. Case studies showed their potential harm, including aggravating poverty. In Kenya, for example, money withdrawal fees (around £0.21) can be burdensome to the poor as it costs the same as half of a kilo of corn (Johnson, 2016a). *Fintech* loans have also increase indebtedness both in Kenya and Tanzania, with 20% and 9% of borrowers, respectively, reporting to reduce food consumption in order to repay loans (Kaffenberger and Totolo, 2018). Therefore, both types of financial institutions may have adverse effects on development goals.

This discussion leads us to our final consideration on this topic. Several of the studies define FI as the ability to access affordable financial services (e.g. Gupte, Venkataramani and Gupta, 2012; Mohieldin *et al.*, 2012; Atkinson and Messy, 2013; Kim, 2016). At the same time, financial institutions must maintain a "sustainable" business, which implies the absence of subsidies (Kim, 2016; Demirgüç-Kunt et al., 2017; Okello Candiya Bongomin, Munene, Mpeera Ntayi, et al., 2018). As discussed in Guérin and Kumar (2017: 742), "subsidies have been presented as too limited and uncertain, and as sources of interference, dependency and market 'distortion' […], which in great part explains the market shift that has occurred over the last decade". This means that the financial institution must charge fees and rates compatible with clients' riskiness, besides their profitability goals. Individuals with lack of collateral and irregular income stream, such as informal workers, represent a high risk as they may default on loans or make more frequent insurance claims. Aiming at profit maximisation, private financial institutions will set high prices for these clients and, without subsidies, have no incentives to provide free or low-cost services. Thus, in LMICs, where credit market might not be competitive due to bank concentration and limited financial infra-structure, an affordable FI provided by a sustainable for-profit financial institution seems unlikely.

Bearing these aspects in mind, we consider that mainstream FI policies promote the increase of the importance of for-profit financial institutions. As such, this characteristic must be evident in the definition of FI, as it shapes the goals and prices of financial services.

2.3.3 The elements of financial inclusion

As the subject and the intermediaries of FI, elements in the literature on FI are also not very clearly defined. In the examined definitions, few studies explain which elements are essential or how extensive the use of each element must be for an agent to be considered financially included. The majority of studies use broad terms, such as "banking services" or "financial access". If the research is empirical, the definition may contain one or more explicit elements, such as bank accounts.

The term most often referred to is "banking" with 21 occurrences.[15] However, what do precisely the studies mean by banking? Soederberg (2013) differentiates banking from microcredit and mortgage, while Sethi and Acharya (2018) distinct banking services from other financial services, such as insurance, pensions and remittances. These other services, nevertheless, are usually intermediated by banks as well, which creates confusion on why they would be considered non-banking services. On the other hand, other studies are more explicit when referring to banking services, such as in Garg and Agarwal (2014) who specifically mention bank deposits, and Güngen (2018) who defines FI as bank account ownership. Thus, we conclude that the term "banking" refers to bank accounts.

Owning a bank account allows individuals to use other financial services, but these are not always acknowledged in the literature. "Deposits" has seven references (36th), followed by "payments" (39th) and "remittances" (85th). These examples show that existing definitions might have selected all-encompassing terms in order to be able to include as many elements possible in the discussion. This broadness, however, is problematic as it can lead to different interpretations of FI.

Furthermore, while bank account ownership counts as the first step into FI, evidence shows that owners may not use them frequently. In LMICs, 18% of individuals did not withdraw funds in the previous month, and 58% withdraw once or twice – mainly when receiving their wages (Allen et al., 2016). In South Africa, for instance, six million basic bank accounts were opened in four years, but only 3.5 million remained active (World Bank, 2014). Hence, acknowledging the usage aspect of FI is necessary for an accurate definition as the mere access may not reflect a full inclusion.

[15] Due to the use of stemmed words, 'banking' encompasses also 'bank', 'banks' and 'banked' as demonstrated in Appendix A (Table A.2).

After “banking”, the first specific element discussed in the literature is “credit”, with 16 occurrences (e.g. Chakravarty and Pal, 2013; Wang and Guan, 2017; Kim, Yu and Hassan, 2018). The fact that (micro)credit appears as the leading service of the existing definitions of FI illustrates the importance of this instrument. Credit to low-income individuals in LMICs was considered an effective tool for a mass exit from poverty by the microcredit and financial development literature (e.g. Khandker, 1998; Beck et al., 2007). As previously presented, based on mathematical models, mainstream studies consider that credit can be used for investment in human capital and informal businesses, which boosts the poor’s income and reduce poverty. It also allocates funds from the rich savers to poor borrowers, reducing income inequality (Galor and Zeira, 1993; Banerjee and Newman, 1993; Aghion and Bolton, 1997).

Today, nonetheless, both mainstream and critical studies acknowledge the harmful effects of microcredit, in particular over-indebtedness (Guérin et al., 2015; Afonso et al., 2017; Kaffenberger and Totolo, 2018; Mutsonziwa and Fanta, 2019), or at least consider there is mixed evidence of its effects on development goals (van Rooyen et al., 2012; World Bank, 2014). However, credit still presents itself as a core element of FI.

This evidence supports allegations that FI is a “rebranding” of microcredit (Bateman, 2014; Mader, 2018) after studies showed the insignificant or negative effects of FI on poverty reduction (Duvendack et al., 2011; Banerjee, Karlan, et al., 2015; Banerjee, Duflo, et al., 2015). Therefore, instead of replacing microfinance for a more suitable and evidence-based poverty reduction policy, such as social protection floors, we also consider that international institutions have replaced it by FI.

The third most mentioned financial service is “insurance” with 11 references (Garg and Agarwal, 2014; Kim, 2016; Okello Candiya Bongomin, Munene, Ntayi, et al., 2018). Grounded on the life-cycle hypothesis (Modigliani, 1966), insurance is said to prevent individuals from falling into poverty in times of income shocks (Brau et al., 2011; Demirgüç-Kunt and Klapper, 2012b). While (micro)insurance cannot boost individuals’ income, it could still serve as a palliative solution for cases of financial distress, such as crop loss, medical emergency or unemployment (Asian Development Bank et al., 2008; Churchill and Matul, 2012; World Bank, 2014; Demirgüç-Kunt et al., 2017). Such claims represent a shift of development efforts from poverty alleviation to poverty stabilisation (Taylor, 2012). Therefore, insurance is a mechanism for preventing individuals from becoming poor(er) but would be unable to lift individuals out of poverty.

While preventing individuals from allocating a large part of their income on an emergency, insurance requires payments that can burden the poor. For those who earn less than US$2 a day, payment on premiums can dislocate income from basic needs, such as foods and housing, to financial products. Therefore, it is possible that low-income individuals will prefer affording everyday needs over uncertain future financial distress. Again, for-profit financial institutions are preferred and "it is critical that any insurance products supported by governments should be strictly market-based, including having a design and a rating methodology that are actuarially sound" (World Bank, 2012b). Thus, in order to be sustainable, insurance firms need to charge more for the riskier and more costly clients, such as individuals with chronic diseases or the self-employed. This practice would increase premiums to the poor, preventing them from accessing affordable services.

The promotion of private insurance disregards two further points: social relation and public services. First, it assumes that, in the event of financial distress, individuals have no other borrowing alternative. Particularly in LMICs, social ties in small and rural communities are strong (Guérin, 2014; Johnson, 2016b), and borrowing from friends, community or family usually implies little or no interest rates (in contrast to for-profit financial institutions). As we see in Table 2.1, during an emergency, individuals prefer to either use their savings or borrow from family and friends, confirming the relevance of social networks.

Table 2.1. Primary source of emergency funds[16]

Variable	2014	2017
Savings	35.43	33.90
Family or friends	38.18	29.61
Money from working	15.69	24.88
Borrowing from a bank	3.44	5.63
Informal private lender	1.31	N/A
Selling assets	N/A	3.10
Other	3.73	1.94

Source: World Bank Findex dataset

[16] Answers do not sum up to 100% as some of the interviewees did not answer the question.

Second, the role of the state is often ignored by the mainstream literature of FI. In the case of insurances, public policies such as universal health care and unemployment benefits could also allow for risk sharing, besides preventing individuals from falling into poverty. Lavinas (2018) considers this process as part of financialisation in capitalist economies, in which the privatisation of public goods and services aims to shift the debt burden from the state to individuals. Thus, whereas social safety nets and social networks may prevent individuals from becoming poorer, for-profit and sustainable insurance providers may not have the same effect.

Lastly, we find "savings" as the final key element of FI (56th position). Formal savings are also related to the life-cycle hypothesis as it provides individuals with a cushion for periods of income shocks. This element is less contradictory as these are less risky services to financial institutions and, at the same time, possibly beneficial to individuals, if earned interest rates outweigh incurring costs. In fact, a review of 11 studies showed that savings opportunities might have small, but positive and consistent effects on broader poverty measures (household consumption, income and food security) (Duvendack and Mader, 2019). However, as with insurance, it is unlikely that poor individuals will have enough income to save and benefit from such service in ways of reducing poverty in large scale.

In this sub-section, we saw that four elements are highlighted in the literature but are not always explicitly acknowledged on the definition of FI: banking (usually referring to account ownership), credit, insurance and savings. Most instruments are closely related to the microfinance policy and have shown small to null effects on poverty reduction.

2.4 The definition of financial inclusion

The need for a definition of FI that explicitly includes its subjects, intermediaries and elements is imperative in order to understand the policy and its objectives fully. First, we clarified the agent of FI. FI must focus on individuals as, while it is necessary to account for the household aspect, single individuals within the household may still be financially excluded. Moreover, we disregard firms as the subject of FI as they present different nature with respect to creditworthiness and financial services usage. Lastly, we consider that self-employed workers must be analysed as individuals, not firms, as they often lack collateral, represent low-productivity activities and take place in the informal labour market.

Second, we must highlight that FI is led by for-profit financial intermediaries. Such approach is inherently contradictory to the goal of poverty and income inequality reduction, as

sustainable financial institutions will be unable to both maximise profits and serve free or low-price financial services to the poor.

Third, the necessary elements of FI must be explicit in order to avoid ambiguity. In the review, we noticed that "banking" was the most referred financial service. Instead of using such a broad term, we prefer including deposits and payments. Subsequently, credit was the second key element, indicating strong ties between FI and microcredit. Finally, insurance and savings were also mentioned. Each of these instruments has implications on how we assess FI. Therefore, selecting them purposefully allows us to assess the policy better.

Based on the 67 studies selected through a systematic review, we propose an explicit definition of FI. Therefore, in the mainstream literature, FI can be understood as the

"access and usage of credit, deposits, savings, payments

and insurance by individuals provided through for-profit financial institutions".

Being clear about which services must be included, whom we are researching on and which institutions will promote FI allows us to assess this policy into depth. This conceptual precision is fundamental in order to understand the claims and objectives of FI, in particular the reduction of poverty and income inequality in LMICs.

2.5 Summary

This chapter presented an original analysis of the theoretical foundations, the link between FI and FD, as well as the discussion on the the subjects, intermediaries and elements of FI. Such evaluation contributes to the critical literature on FI that challenges the potential of the policy in reducing poverty and income inequality.

We first presented the existing definitions of FI and concluded they are not always clear and display implicit theoretical foundations. Highlighting the theoretical background is important as it allows us to understand the rationale for FI conceptualisation and implementation. In our following chapter, we suggest different theoretical hypothesis to understand the relationship between FI, poverty and income inequality. Second, with respect to the subject of inclusion, the literature considers a range of units of analysis that ranges from people to firms. Making it

explicit that individuals are the target of FI is necessary to investigate the policy further, as we do in the following two chapters. Third, concerning the intermediaries of FI, we also found that, while usually implicit, most studies refer to for-profit financial institutions. Such approach is deeply rooted in the theoretical framework of market equilibrium of which government intervention distorts economic and social outcomes. At the same time, the mainstream literature overlooks the role of for-profit state-owned banks, as well as the negative role that such "profit-based development" policies can have on the poor. Next, we noticed that the key elements of FI are differently described in the literature. Among these elements, credit is related to the human capital hypothesis, whereas insurance and savings stem from the life-cycle hypothesis. However, those hypothesis were developed for HICs, with a strong formal labour market, and do not resonate with the majority of LMICs, as we discuss in the following chapter. Lastly, we conclude that a clear concept is necessary to fully understand the implications of FI and presented an explicit and concisedefinition of what the mainstream literature considers to be FI.

However, such definition still disregards existing and important aspects of FI in LMICs, such as the high interest rates and a large informal labour market. Moreover, it also disregards the power imbalances that occur between lender and borrower, which are aggravated when FI is led by for-profit financial institutions in LMICs. Thus, in order to answer the first research question, i.e., "How do intra-country power relations affect financial inclusion in low and middle-income countries?", we analyse those relationships in depth in Chapters 3 and 4.

Chapter 3
A theoretical approach to financial inclusion

Despite being a key policy in the economic development literature, there is no theory of FI that explains the machanisms through which the different financial instruments reduce poverty and income inequality. From a heterodox approach, FI is considered to increase income inequality on the aggregate level, particularly making use of Minsky's financial instability hypothesis and the financialisation concept. In turn, mainstream approaches consider that FI acts through individual-level mechanisms, grounded on the human capital and life-cycle hypotheses, to establish a mass exit from poverty and better distributional outcomes. In this chapter, we aim to link Post-Keynesian macroeconomic hypotheses to critical microeconomic modelling to provide a theoretical framework to discuss the potential effects of FI on both levels.

Heterodox theories in the FI literature focus on the effects of household finance on growth and distribution. The Minskyan approach affirms that the increasing indebtedness of households leads to instability in the financial system, thus generating economic crises (Dymski, 2005; Cynamon and Fazzari, 2008; Santanna, 2019; Polillo, 2020). During the subprime crisis in the US, for instance, predatory loans to minorities and low-income households were an essential cause for the housing bubble and its subsequent burst (Wray, 2008; Dymski, 2010; Dymski et al., 2013). Thus, expanding finance may be detrimental to households in the long run.

With respect to the financialisation of the household sector, the literature presents two streams. From an economic geography perspective, the financialisation of everyday life shows how finance has expanded into individuals' socio-economic lives affecting their relations with housing, savings, pensions and insurance instruments (Leyshon and Thrift, 2007; van der Zwan, 2014; Lai, 2018; Hillig, 2019; Montgomerie, 2020; Langley, 2020). From Post-Keynesian and Marxian approaches, financialisation of households is associated to the increasing indebtedness of the working class and a shift from income from wages to profits, which increases income inequality (Lin and Tomaskovic-Devey, 2013; Hein, 2015; Kohler et al., 2019; Godechot, 2020). Moreover, income inequality is also considered a source of financialisation. As households want to maintain their decreasing life standards due to falling real wages and reduction of public services, they incur into debt. This increasing inequality and indebtedness are thus seen as a feature of financialisation (Lapavitsas, 2013; Stockhammer, 2015; Sotiropoulos and Hillig, 2020).

Such heterodox studies on household indebtedness often focus on HICs. In turn, analyses on household indebtedness in LMICs consider microfinance and FI as policies that promote financialisation and potential systemic risks. This expansion of finance is considered a policy to shift the debt burden from governments to households, despite the potential to lead to the over-indebtedness of the poor (Aitken, 2013; Girón, 2015; Santanna, 2019; Correa and Girón, 2019; Lavinas, 2020; González, 2020). While we acknowledge the aspects of financialisation and financial instability as outcomes of FI policies, this thesis emphasises Post-Keynesian hypotheses of currency hierarchy and oligopolistic characteristic of banks to establish the structural basis of FI in LMICs.

In contrast to heterodox approaches, mainstream theoretical justifications for FI are discussed in the micro-level. Based on the life-cycle and human capital hypotheses, individuals are able to improve income through investment in education and informal businesses. Furthermore, banks reduce income inequality by intermediating the transfer of savings from the rich to the expenditures of the poor. However, there is to date no particular model that has been used to explain the relationship between individuals and financial institutions with respect to the different elements of FI. Several studies discuss the microcredit repayment behaviour but do not address account ownership, savings or insurance (Stiglitz, 1990; Armendariz de Aghion and Morduch, 2000; Vogelgesang, 2003; Van Tassel, 2004; Tedeschi, 2006; Brihaye et al., 2018). A more recent attempt to model FI was performed by Dabla-Norris et al. (2020). The study develops a general equilibrium model of heterogeneous agents to assess the effects of FI on growth, productivity and income distribution. However, such model focuses on firms, not on individuals.

As we can notice, heterodox approaches of finance focus on the relevant aggregate aspects, whereas mainstream studies investigate FI purely on the micro-level. We argue that FI in LMICs must address both aspects as, it is indeed a micro-level policy but it is constrained by macro-level characteristics. Therefore, to create a consistent analysis of FI through heterodox lenses, we use game theoretical tools in order to first evaluate the relationship between individuals and financial institutions in using different financial instruments. Whereas game theory is a helpful to clarify the relationship between agents, it has its limitations as it does not provides “solid microfoundations” (Heap and Varoufakis, 2004, chap. 1). Yet, it does allows us to understand the relationship between individuals and financial institutions, in particular in addressing the power aspect embedded in it.

The multi-dimensional aspect of FI needs to be addressed to assess the effectiveness of the policy as a whole. Starting with the mainstream definition from Chapter 2, i.e.,FI as the "*access and usage of credit, deposits, savings, payments and insurance by individuals provided through for-profit financial institutions*", this chapter has two objectives. First, it shows the interactions between individuals and for-profit financial institutions, including state-owned banks, with respect to deposit, savings, credit and insurance instruments. We apply game theory modelling to address these interactions in LMICs, but add the concepts of intra-country power and social relations as they play a fundamental role. Second, we discuss how these new aspects influence the reality of FI in LMICs in order to lay the groundwork for our empirical analysis in Chapter 4.

Our theoretical contribution to the literature on FI is twofold. First, we insert Post-Keynesian theories to assess the macroeconomic structures that distinct LMICs from HICs. Second, we develop game models on four elements of FI (deposit and savings, credit and insurance),, building on the power aspect of these relationships and focusing on LMICs. With that, we aim to answer the first research question on considering the role of power relations in FI policies, besides addressing the role of state-owned banks and the macroeconomic constraints of LMICs, which is currently absent from the mainstream literature.

3.1 Macroeconomic differences between LMICs and HICs

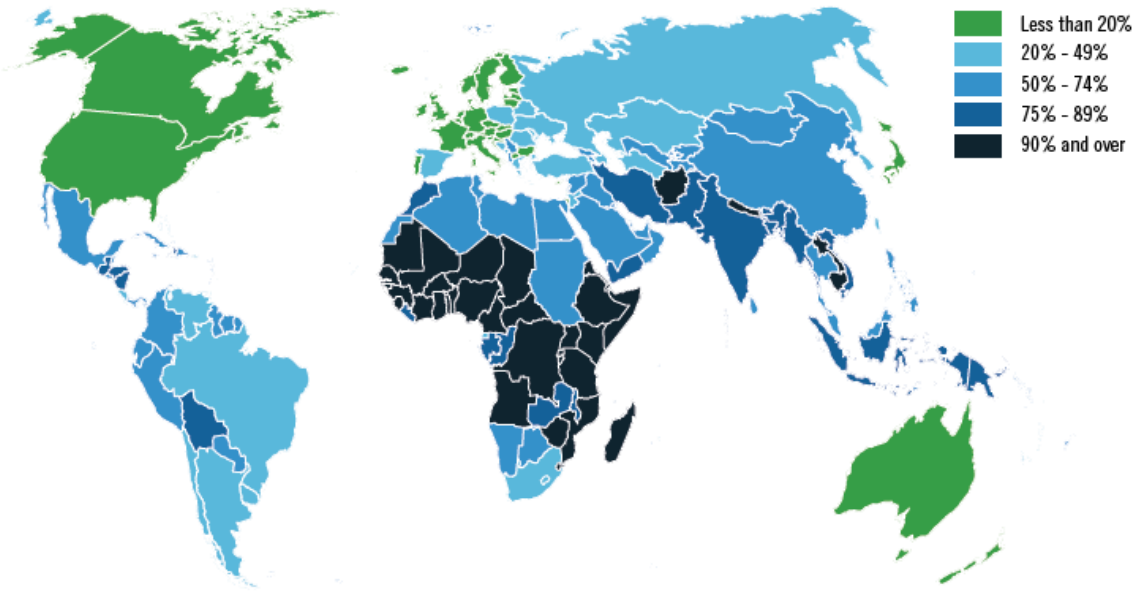
A crucial problem with the mainstream hypotheses on the effects of FI on poverty reduction and income inequality is the lack of acknowledgement of the macroeconomic differences between LMICs and HICs. In this thesis, we discuss three distinct macroeconomic conditions and market structure. In LMICs, there is (i) the prevalence of the informal labour market, (ii) the subordinated position of local currencies in the international monetary system, and (iii) the oligopoly characteristic of the national financial markets. These aspects influence the power of the financial institutions over the individuals and shape their relationship, as we will discuss next.

3.1.1 Macroeconomic conditions and market structure

As discussed in Chapter 2, the labour market in LMICs is characterised by the strong presence of rural and self-employed labour (ILO, 2018b). Unlike in HICs, where wage employment is the norm, workers in LMICs are often in the informal labour market, which influences demand

and regular payment of financial services. Figure 3.1 displays the share of informality by country. As we notice, LMICs have a higher share of informality.[17] In Africa, 85.8% of employment was informal in 2016, followed by Asia and the Pacific (68.2%), Arab States (68.6%) and the Americas (40%) (ILO, 2018a).

Figure 3.1: Share of informal employment in total employment, including agriculture (2016)



Source: ILO (2018a, Fig. 5).

A large informal sector has two implications for FI. From the supply side, increasing credit to informal businesses leads to an expansion of low-productivity micro-enterprises with high failure rates, which pushes prices down and generates over-indebtedness (Bateman and Chang, 2012; Schicks, 2014). From the demand side, informal workers often do not have collateral or regular income. Therefore, they are considered high-risk clients, and banks charge higher premiums to offer them financial services (Lavinas, 2018). These risks are perceived in all elements of FI: bank account may be denied as the individual may not be able to afford the monthly account fees; credit may be declined or incur very high interest rates; and insurance premium increases as pay-outs may occur more often. In sum, under these circumstances, FI as a poverty reduction tool may be constrained.

Informality also means that these workers may have no access to social protection, such as unemployment benefits or employer-sponsored health care, thus making them more vulnerable than formal workers. Due to these particularities, the income of individuals in LMICs, in particular the poor, is irregular and unreliable. The volatility in income affects directly the

[17] ILO's measurement of informality can be found in Appendix B.

access and the usage of financial services in private markets, especially loans (Lavinas, 2018). As demonstrated by the Findex survey, the lack of income is the main reason for not owning an account at a formal financial institution (Table 1.1). This phenomenon could also be associated with the lack of regular income, as the individual may be unable to afford fees periodically.

The income volatility may also lead the individual to borrow in the credit market, in particular for consumption purposes.[18] This action is, however, encouraged by the mainstream literature which considers loans as a consumption smoothing mechanism, thus bringing welfare advantages to the poor (e.g. Ouma, Odongo, & Were, 2017; World Bank, 2014). At the same time, the lack of steady income makes this individual to be considered a risky borrower, as the financial institution has no guarantees that the loan will be repaid. Therefore, interest rates charged by financial institutions will be higher to cover for potential defaults or late repayments.

Finally, while being insured may prevent the individual from reducing consumption levels during financial distress, it is unlikely that poor individuals will be able to afford insurance policies. Therefore, whereas insurance could reduce uncertainty, poor individuals will make use of such financial instrument.

A second macroeconomic condition regards the subordinated position of LMICs in a hierarchic and structured international financial and monetary system (Bortz and Kaltenbrunner, 2018). According to the currency hierarchy hypothesis, the low value of the currencies of LMICs influences the higher base interest rates in comparison to countries with hard currencies, i.e., US dollar, Euro, Yen and Swiss franc, as "international investors demand a premium which takes the form of an increase in the nominal interest rate to compensate for the risk of moving to an unstable currency" (Carneiro and Rossi, 2013, p.6). This argument stems from the Keynesian assumption that assets have a liquidity premium, i.e., value for their convenience and security, which is included in the final rate of return on these assets (Keynes, 1997 [1936]). Considering national currencies as assets, in which "each currency in the world earns a specific non-pecuniary rate of return" (Herr, 2008, p.129), the more convenient and secure the currency, the lower its interest rate. The currency premium then represents its quality in the international market. Such quality gap generates a hierarchy among currencies, in which central banks with low-ranked currencies are forced to offer higher interest rates to maintain demand (Becker et

[18] More on the differences between loans for consumption and investment purposes in sub-section 3.3.2.

al., 2010; Conti et al., 2014; de Paula et al., 2017). Thus, fundamentally higher interest rates in LMICs also push loan interest rates upwards, contributing to over-indebtedness and undermining the efforts of poverty reduction through FI.

Finally, financial market concentration can also influence the access to and usage of financial services by the poor. Bank concentration averaged 75.48% in 91 LMICs in 2017 (World Bank, 2020).[19] The concentration level varied from 18.39% in Nepal to 100% in several countries, including the Gambia, Myanmar and Turkmenistan. Larger economies, such as South Africa and Brazil displayed 76.18% and 69.79% bank concentration, respectively.

In the Kaleckian approach, the bank industry can be considered an oligopolistic market, as banks set lending interest rates in the same way oligopolistic firms set prices, i.e., aiming to maximise profits and not based on demand factors.[20] The interest rate of loans is determined by the mark-up (spread) over the "cost of funds", which in the banking industry is the interest paid on deposits plus the interest paid on borrowed funds. This mark-up is determined, in turn, by the degree of monopoly or the profit margin of the bank (Rousseas, 1985; Khemraj, 2010). In this way, countries in which for-profit financial institutions have a large share of the market will be likely to set a higher mark-up on loans. In 2017, LMICs' commercial banks had a lending-deposit spread of 8.21% on average, in contrast to 4.27% in developed countries (World Bank, 2020).

This mark-up theory can be also be transposed to other financial products, such as bank accounts, debit card replacement and transactions costs, as the oligopoly power of banks enables them to increase the prices of essential services. In this way, we can conclude that the less competitive financial market in LMICs makes access to finance more expensive than in HICs.

If base interest rates are inherently higher in LMICs due to their low-quality currencies, and the high levels of bank concentration increase the mark-up on financial services, it is likely that for-profit financial institutions will offer credit with high interest rates. Adding to this, the poor in LMICs, often part of the informal labour market, will have an added premium in interest rates due to their riskiness. This situation means that the access to and usage of financial

[19] Measured as the assets of three largest commercial banks as a share of total commercial banking assets.
[20] The hypothesis has been also discussed through a standard industrial organisation framework, where the market power of a bank increases interest rates (Moore and Craigwell, 2002).

services by the poor, when done through for-profit financial institutions, will not be a valid instrument to reduce poverty or income inequality.

On the contrary, charging high prices on financial services and loans may increase poverty as individuals may allocate their income from essential consumption needs to financial services. Moreover, as the income stream of for-profit financial institutions arises from the fees and interest rates, higher prices will transfer income from the poor worker to the rich rentier. This financial expropriation may, in turn, fosters income inequality (Lapavitsas, 2009; Moura, 2016).

Finally, it is important to highlight that some LMICs, such as Brazil, have a strong presence of state-owned financial institutions. Whereas these banks might have some differences to private banks, such as offering lower interest rate in certain products, they are still for-profit financial institutions. In fact, Banco do Brasil, a state-owned bank, charges high interest rates that are further redistributed among shareholders (where the government is the majoritary shareholder). Thus, these banks will be addressed as private for-profit financial institutions in this thesis, but some particularities will be highlighted in Chapter 4.

In a nutshell, the thesis advocates that high labour market informality, the low position in the currency hierarchy and the bank concentration in LMICs shapes FI policies. Thus, these aspects must be considered when elaborating a policy that aims reducing poverty and income inequality.

3.1.2 Power

These particularities of LMICs also shape another aspect in our analysis: power. In this thesis, power is defined as a form of coercion that stems from an asymmetric relationship between two agents. This type of coercion is not necessarily physical, but it is still some type of threat. In our analysis between the relationship between an individual and a financial institution, the latter has power over the former in each of the three main elements of FI (deposit/savings, credit and insurance). This power emerges from the financial institution's capacity to accept or decline the request for access to and usage of financial services regardless of the individual's ability to afford them, besides refusing further business with the individual.

Within the game theory approach, Bowles and Gintis (2007) consider power to have four key elements: i) it is interpersonal, i.e., a characteristic of a relationship among people, not single individuals; ii) it involves a threat and use of sanctions; iii) it should be normatively

indeterminate, that is, allowing for Pareto-improving outcomes while also susceptible to abuse; and iv) it must be sustainable as a Nash equilibrium. Thus, "for B to have power over A, it sufficient that, by imposing or threatening to impose sanctions on A, B is capable of affecting A's actions in ways that further B's interests, while A lacks this capacity with respect to B" (Bowles and Gintis, 1992, pp.326–327).

While elements of power between the individual and the financial institution is present in both HICs and LMICs, power is stronger in the latter, in particular due to the vulnerability of informal workers and bank concentration.[21] Unlike in Bowles & Gintis (1992), we do not assume a "competitive capitalist economy", i.e. where financial markets are characterized by free entry and large numbers of buyers and sellers. In turn, we follow Bhaduri's (1977) approach to recognize the particularities of the power relationship between borrower and lenders in LMICs. In his model, borrowers are self-employed agricultural workers, and private lenders have power over the borrower. Because of the monopoly power of the lender, the latter is able to charge very high interest rates as the poor agricultural worker needs the loan for consumption purposes until harvest time. We transpose these ideas to LMICs in general.

Enforcement under power relations is also different in LMICs. In Peru, for instance, lenders would paint red marks or words on the houses of individuals who defaulted. In India, the debt of an individual may be made public, and collectors may sit in front of their homes for up to six hours until the debt is paid, thus causing social shame (Solli, 2015). These public humiliations must be taken into account when discussing power relations in LMICs, as they are connected to more substantial value to social ties and yield further power asymmetries than in HICs.

Therefore, in an environment of labour informality, high interest rates and power relations, the effects of FI on poverty and income inequality will be distinct between LMICs and HICs.[22] First, we propose that unfavourable contract conditions, such as high interest rates, along with unstable income stream, may lead the poor into a debt trap. Second, the income of the rentier, i.e., the interest rate, will be transferred from the poor to the rich saver, exacerbating income inequality. Such effects will be further discussed in Chapters 4 and 6.

[21] For instance, in the US there are evidence of redlining practices in the financial system, as presented in Dymski (1995).

[22] This hypothesis is econometrically tested and confirmed in Chapter 6.

3.2 Game theory and principal-agent approaches to finance

To illustrate the relationship between individuals and financial institutions in a FI environment where power influences the behaviour of the poor in LMICs, we utilise a game theory approach. Game-theoretic reasoning is a useful methodology for analysing social interactions. Its purpose is to understand an agent's action in response to another agent in order to maximise their utility. Within the finance literature, game theory has been widely employed to analyse behaviours in the credit and insurance markets (Boot and Thakor, 1994; Suijs et al., 1998; Cao and Zhang, 2010; Warren et al., 2012; Chao and Zongfang, 2013). More specifically, microcredit has also been modelled through game theory by focusing on incentives mechanisms and investment decisions (Van Tassel, 2004; Tedeschi, 2006; Brihaye et al., 2018).

Social interactions in the financial system have also been widely analysed through the principal-agent approach, in particular the relationship between lender or insurer (principal) and borrowers or insured (agent). An agency problem arises when the actions or attributes of an agent are relevant to the benefits enjoyed by the principal but are unknown or unverifiable (Bowles, 2004, chap. 7). As the payoffs of agent and principal are generally different, the agent does not behave as the principal would like (Stiglitz, 1989).

In the financial market, conflicts between principal and agent are focused on the credit and insurance elements (Harris and Raviv, 1978; Stiglitz and Weiss, 1981; Mookherjee and Png, 1989; Vera-Hernandez, 2003; Janda, 2006; Mensah and Abor, 2012). In these models, the principal (lender or insurer) wants the agent (borrower or insured) to behave responsibly in order not to engage in risky activities that may reduce the likelihood of loan repayment or request an insurance claim. We base our model in such contributions but adapt it to FI in LMICs.

While somewhat diverse, both analyses are complementary: whereas game theory presents the interactions between agents, the agency problem introduces new elements to the discussion, in particular contracts and information issues. Thus, we utilise both approaches to understand the relationship between individuals and financial institutions in LMICs, including the power aspect of this interaction.

3.3 A micro-level model of financial inclusion

Considering the macro and microeconomic differences between LMICs and HICs, we build on existing game models of the financial market and develop models of the four elements of FI: deposit and savings, credit and insurance. For simplicity, we assume that there is only one for-

profit financial institution, which also handles all these four instruments, and that the individual needs to have a deposit account in order to access other financial services, namely savings, credit and insurance.

3.3.1 Deposit and savings

According to the Findex dataset (Table 1.1), most individuals reported not having a bank account due to (i) lack of income, (ii) price and (iii) lack of need. This information guides us through this first model, in which the informal worker considers their possibilities of affording the deposit account and building up savings.

Using an extensive form representation[23], where each node corresponds to the action of a player, we start with a three-period, dynamic and finite model with two agents: Individual (A) and the Financial Institution (B). This game is cooperative, as both A and B have the same preferences and goals. However, B is able to decline the application of A to open a bank account regardless of A's ability to afford it, generating the first power mechanism.

We state the following assumptions:

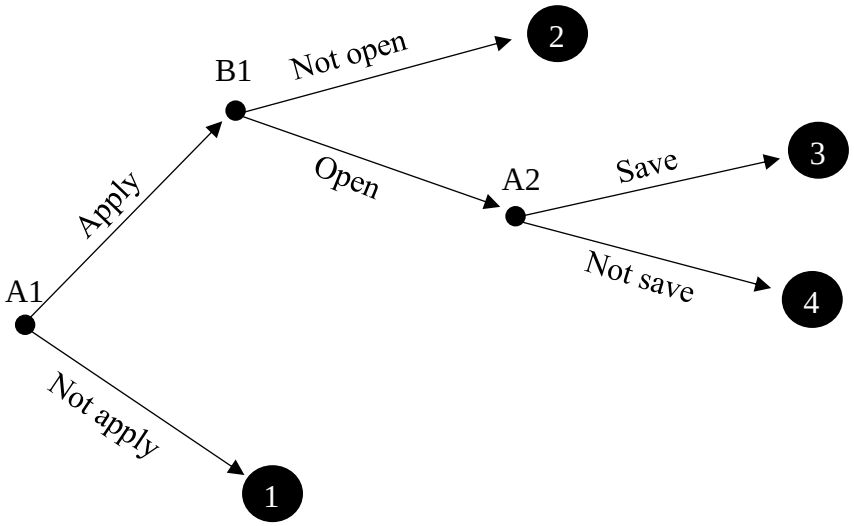
1) Players want to maximise their payoffs (utilities) [24]
2) The game is of common knowledge: each player knows the rules of the game and this fact is known by both players
3) There is perfect information on the previous agent's actions[25]
4) There is perfect recall: each player remembers their previous moves

A starts the game at node A1 by deciding on whether they will open an account (Figure 3.2).[26] If bank accounts are free[27], and the game is of common knowledge, power mechanisms dissipate as there are no economic barrier for the individual to enter the formal financial system (the usage frequency of such service, nonetheless, is beyond this discussion). However, if bank

[23] Also referred to as structure tree or directed graph.
[24] By considering the utility function must be maximised, the numerical payoffs associated with each outcome are referred to as 'utils' (Heap and Varoufakis, 2004, chap. 1).
[25] While each player knows how the other play has acted (as it is a sequential game), there is imperfect information with regards the ability to pay of A, thus also creating an agency problem.
[26] We use "they" as a singular third-person pronoun to prevent gender bias.
[27] It is important to highlight here that free bank accounts are a policy decision, not a characteristic of certain financial institutions. For instance, in Brazil, the Central Bank has imposed a regulation in which all state-owned and private banks must supply individuals with a basic free bank account (Resolução CMN n° 3.919 of 25/11/2010). However, as we will see in Chapter 4, private banks might refuse opening a bank account to certain individuals or tricky them into getting a paid one, as reported by participants.

accounts are not free, the individual must consider if they will earn enough in the future in order to continue paying the incurring monthly costs. In order to decide that, they consider their present and future income. If income is insufficient to afford the service in more than one period, they will not open an account. This decision leads to solution 1, where the game ceases. However, if they consider having enough income, they will apply for opening an account, which takes us to node B1.

Figure 3.2: The deposit-savings game



At node B1, *B* decides on accepting *A*'s application. A decline may be due to several reasons: *B* believes *A* will not have enough income to repay maintenance fees or *A* cannot provide specific documentation, such as a national ID or proof of residence.[28] If *B* does not open the account, we reach solution 2. This solution's outcome is the same as solution 1 but incurs in worse payoffs (as discussed next). Nonetheless, if *B* opens the account, the parts sign a contract in which *A* commits to paying monthly fees, and *B* commits to keeping the money safe and allowing *A* to perform payments and withdrawals.[29] If the account is opened in the first period, *A* acts again at node A2. They decide on building up savings, based on their income and

[28] This documentation issue is common in LMICs (Table 1.1).
[29] While we acknowledge that there could be some amount limitations to withdrawal, for instance, this situation is left out of the analysis for simplicity purposes.

deducting the account fees. If they save, we finish at case 3. If they do not, either by choice or by lack of income, we end at solution 4.

A has two information sets. In their first set, they choose between applying for a bank account (P) or not (P'), as well as saving (S) or not saving (S'), thus generating $2x2$ different combinations. The strategy set for A is:

$$S_A = \{PS, P'S, PS', P'S'\}$$

B has only one information set: open the account (O) or decline the request(O'). The strategy set for B is thus:

$$S_B = \{O, O'\}$$

The best response for A requires enough income to be deposited into a bank account and saving at the end of the period (PS). For B, the best response is to open the account (O), as it receives payment for the account maintenance fee and increases liquidity.

We rank the preferences of each player: A prefers outcomes $\{3, 4, 1, 2\}$ and B also prefers $\{3, 4, 1, 2\}$. As preferences are the same, we know we have one Paretto-efficient Nash equilibrium, namely solution 3. We can also quickly identify the equilibrium using the payoff matrix (Table 3.1). We assign values of utilities that represent the payoff that each agent receives based on each decision and outcome. As we see, the best payoff for A is requesting to open the account and save. Likewise, the best response of B is always to open to the account (and receiving savings from A).

Whereas we find a power mechanism in the first part of the game (node B1), there is no power relation in the second part of the game, i.e., when we reach node A2. The reasoning behind it considers that solution 3 is preferable to both players, but there are no mechanisms through which *B* can enforce *A* to save. Of course, *B* creates incentives for *A*, such as providing interest on savings, but these cannot be regarded as power, as it does not change the Paretto-efficient Nash equilibrium. Therefore, there are expectations from both parts that solution 3 will be reached instead of case 4 but, if A does not have enough income for savings, there are no

penalties for them. Solution 1 yields a payoff of $(0, 0)$, as A does not apply for a bank account, but also does not invest time or effort into it. Likewise, while renouncing possible future profits, B does not invest efforts in reviewing A's application, so its payoff is also 0. In contrast, solution 2 has a $(-1, -1)$ payoff, as both agents put effort into applying/reviewing the application but, with its refusal, both are deprived of possible future gains. The third solution is the best response for both agents as it yields a result of $(2, 2)$. For A, having an account as well as building up savings in the formal financial system provides them with low, but positive, interest rates on deposits. For B, receiving the monthly fees for the account also yields a positive payoff. Furthermore, the low interest rates paid to savers is offset by charging high interest rates to borrowers so that the payoff of solution 3 is B's preferred outcome. Finally, solution 4 $(1, 1)$ is the second-best option. Despite not receiving interest on deposits, A has access to further financial services from B, which yields a positive, but smaller, payoff. To B, it receives account maintenance fees, but liquidity is lower, so the payoff is smaller than in the previous solution. Therefore, as solution 3 is the one with the highest payoffs for both agents, besides being their best responses, it will be our Pareto-efficient Nash equilibrium.

Table 3.1: Payoff matrix of the savings-deposit game[30]

		Financial institution (B)	
		O	O'
Individual (A)	PS	(2,2)	-1, -1
	$P'S$	0,0	0,0
	PS'	1,1	-1, -1
	$P'S'$	0,0	0,0

However, while solution 3 is the best response of A, they may be unable to build up savings due to a lack of income. This outcome is reasonable for individuals in LMICs, where informal workers receive low and irregular income. We argue that, if incapable of building up savings, thus reaching solution 4, A must find an alternative source of funds in the case of an income shock. This assumption is based on the answers given on the Findex questionnaire on funds in

[30] While it seems that the payoff matrix has more solutions than the extensive form, some of the values are the mere repetition of a particular solution. For instance, as there is no solution that represents the possibility Not Apply/No Savings (P'S'), the payoff associated to it is the one from solution 1, i.e., Not Apply (P').

an emergency: if individuals had savings, they would not apply for credit, as it means higher costs than using their own funds.[31] Therefore, if they do not have savings, they must borrow from the same financial institution B, as we see next.

3.3.2 Credit

Unlike the deposit-savings relationship, the social interaction in the credit market is based on non-cooperation, as there is a conflict of interest over how the gains will be divided. Whereas the repayment is beneficial to the lender at a cost to the borrower, default benefits the borrower at a cost to the lender. In this type of relationship, one or more parties seek to advance their interests by the use of threats, promises, conferring rents and repeated interactions (Bowles, 2004, chap. 1).

In this principal-agent problem, contracts between the principal (lender) and agent (borrower) are incomplete, as the borrower's ability to pay is not enforceable for two reasons. First, the borrower may not have enough funds for repayment. This situation can occur as the borrower may use the loan for consumption purposes, yielding no investment returns and increasing the risk of default. Another possibility is the lack of income by the due date because of irregular income streams or unemployment. Second, the type of investment and its associated risks are usually not subject to enforceable contracts (Bowles, 2004, chap. 9). As contracts are incomplete and not enforceable, an asymmetry of information arises, leading to conflict between principal and agent. In an environment with a lack of exogenous enforcement (such as a court), these repayments are facilitated by the exercise of power (Bowles, 2004, chap. 7).

The difference between loans for consumption and investment are significant for our analysis. Existing models on loan repayment focus on individuals or firms who undertake the loan as a business project, which implies that the success or failure of the venture will determine repayments (Bowles and Gintis, 1992; Chao and Zongfang, 2013; Paliński, 2015). In our model, however, the borrower might use the loan for investment or consumption purposes, so repayment is not necessarily associated with the returns on investment.

At the same time, we must make a distinction between different types of consumer loans, in particular the purchase of durable and non-durable goods due to their specific characteristics.

[31] In Chapter 2 (Table 2.1), we saw that more than 30% of individuals prefer to recur to savings, while an average of only 4.5% prefer to borrow from a financial institution. As we are only talking about the relationship between individual and financial institution, we refrain from analysing the possibility of borrowing money from family and friends.

Durable goods, such as vehicles and household appliances, are not necessarily considered essential goods but are often used as a proxy for poverty measurements (Sahn and Stifel, 2000; Booysen et al., 2008; Bérenger et al., 2013; Alkire et al., 2017). Here, the credit relation is similar to household investment (like housing), as the good can be repossessed by the lender in case of debt arrears. In this type of contract, credit is usually provided in the form of low or interest-free instalments, such as store credit, or long-term loan from a financial institution. In this case, credit can indeed smooth consumption, as individuals may lack savings to purchase a durable good in cash.

On the other hand, non-durable goods, such as food and medicine, are necessary essential goods. Their costs are lower and their consumption is more frequent than durable goods. The immediate consumption of non-durable goods prevents them from being seized by the lender, disassociating these consumption loans from investment-type loans. Due to this risk, non-durable goods are usually subject to high-interest loans, such as overdrafts and unpaid credit card statements.[32] Therefore, while allowing for consumption smoothing in the short-term, the recurrent use of high-interest loans for non-durable goods may lead the borrower into a debt trap.

Such high-interest loans bring up the adverse selection issue. High-interest loans are used as screening devices by financial institutions. Here, riskier individuals may accept a higher interest rate as they perceive their probability of repaying to be low (Stiglitz and Weiss, 1981). In this thesis, as base interest rates are inherently higher in LMICs due to the currency premium, besides the interest rate spread, high interest rates may attract riskier borrowers, leading those to possible over-indebtedness.

We now show the borrower-lender interaction through game theory. Following from the previous model, we start from solution 4: the individual opened a bank account but was unable to save. Therefore, they will apply for a loan in order to afford a service or good they need/want. The borrower (A) and the lender (B) engage in a debt contract, where the borrower makes a promise to repay the principal plus interest rates.

Considering the lack of collateral and the possibility of using the loan for non-durable goods, the lender may use its power in order to enforce repayment. A standard enforcement method in LMICs is to create social shame within the individual's community, such as humiliating

[32] In LMICs, it is common to shop in small stores or from self-employed workers and give a promise to pay in the future (Gurgel, 2014; Santanna, 2019). As this is a form of verbal contract, we consider it to be an informal loan.

signs and announcing the owed amount at one's home or workplace.[33] A further power mechanism is to deny further loans to the borrower, which would not be desirable for a credit-constrained individual (Bowles and Gintis, 1992). The latter outcome is prejudicial to borrowers in LMICs, where the poor may need credit for smoothing consumption of durable goods or during emergencies. At the same time, enforcement also incurs costs to the lender, as it must hire agents to go to the borrower's house, for instance, so such situation is less preferred by the lender as well.

We present a dynamic and finite game with the same two players: Individual (A) and Financial Institution (B). The same four assumptions on rationality, common knowledge, perfect information and perfect recall hold for this game. However, we add a further assumption:

5) Players need to maintain their reputation in order to keep playing the game

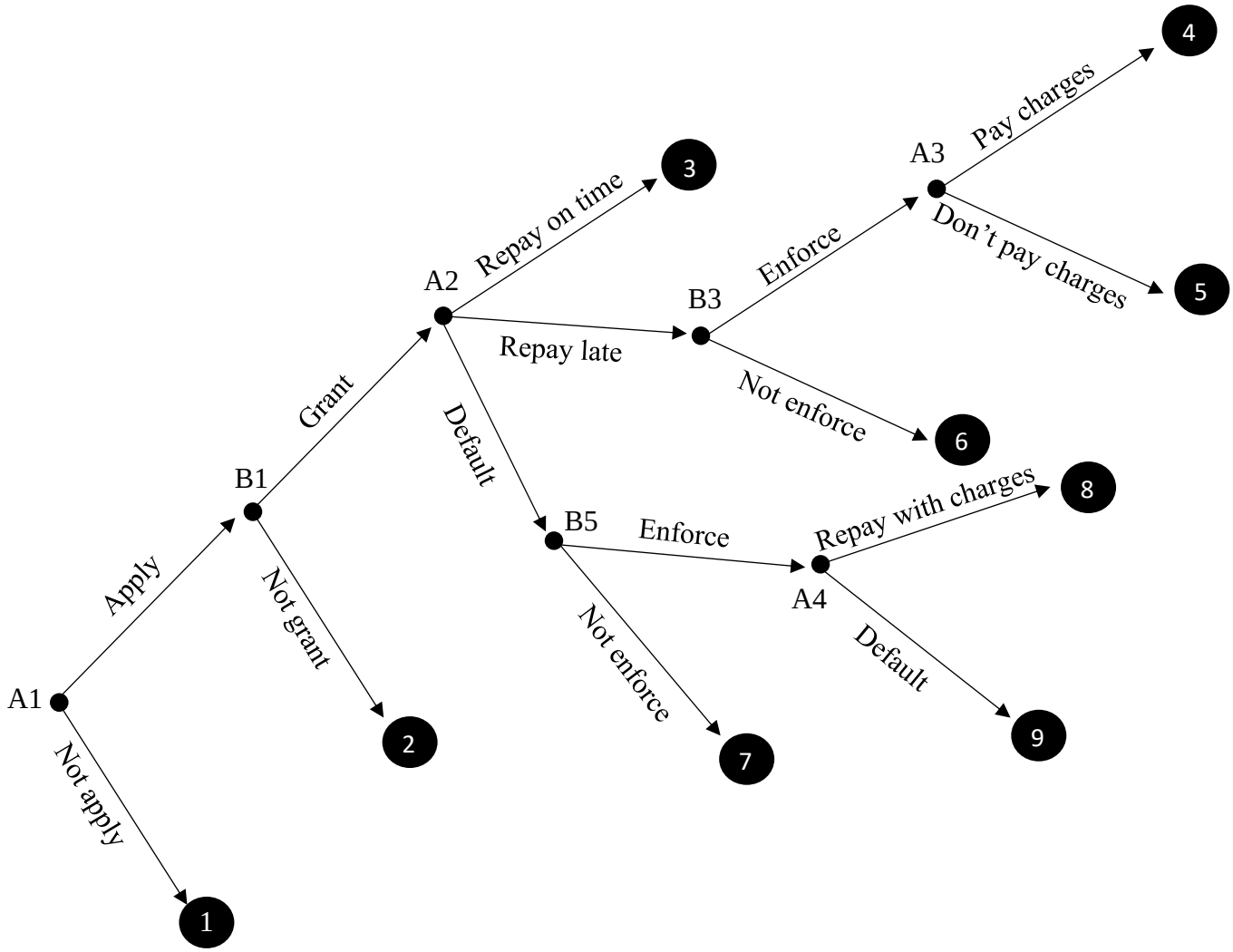
Following Brihaye *et al.* (2018), we develop an extensive form representation for the relationship between A and B in a repeated five-period game (Figure 3.3). Despite being an over-simplification of the borrow-lender relationship, the model allows us to understand the actions of each player.

There are nine possible final solutions. A starts by applying or not for the loan, so A1 is our initial node. If A does not apply, we reach the final node 1. If A applies, B follows at node B1 by granting or not the loan. If B grants it, we go to node A2, where A acts again. If it does not, we reach case 2. A can now act in three different ways: repay the loan on time, repay the loan late or default.

First, if the loan is repaid on time, B does not need to enforce repayment (terminal node 3). Second, if A repays it late, B can act in two ways: it can either enforce or not extra charges for late repayment. If it enforces, we go to decision node A3, where A will move again. If it does not enforce it, we reach outcome 6. If B enforces the contract, A must make a new decision at node A3. Here, A decides to whether to pay the charges (case 4) or not (case 5).

[33] This type of behaviour has been widely documented in the literature (see Solli, 2015).

Figure 3.3: The credit game



The third possibility of A is to default the loan. Again, B can either enforce or not the contract. If it does, we go to decision node A4. If not, we reach case 7. In this fourth period, A has the chance to repay or default the loan at node A4. If A repays with charges, we go to case 8. If they still do not pay, solution 9.

In this credit game, A has three information sets. In the first set, they can choose between applying (P) or not (P') for the loan. In the second set, they choose among repaying the loan on time (R), repay it late (R') or default (D). In the third set, to repay charges (C) or not (C'). Thus, the individual has two alternatives in the first set, three in the second set and two in the last one, i.e. $2x3x2$ different combinations. The strategy set for A is:

$$S_A = \{PRC, P'RC, PRC', P'RC', PR'C, P'R'C, PR'C', P'R'C', PDC, P'DC, PDC', P'DC'\}$$

B, in contrast, only has two information sets. First, it grants (G) or not (G') the loan. Second, it enforces (E) or not (E') repayment. This combination yields a $2x2$ strategy set for B:

$$S_B = \{GE, G'E, GE', G'E'\}$$

As this is a strictly competitive game, whenever the payoff of B increases, the payoff of A will decrease, so there is no room for join game or compromise (Watson, 2013, chap. 12). In our sub-game after A applied for the loan, we can rank the preferences of each player: A prefers the solutions $\{7, 6, 9, 5, 3, 8, 4, 2\}$, while B has the following ranking $\{3, 4, 8, 6, 2, 7, 5, 9\}$.

Let us consider the preference order of B first. B's highest payoff is at case 3, where A repays on time, and there is no cost of enforcement. Next, in solution 4, there is a late repayment and enforcement costs, but A agrees in paying extra charges. Case 8 is B's third option as, despite enforcement costs, A repays the loan in full plus extra charges. Next, solution 6, there is a late repayment cost, but there are no enforcement costs. Sequentially, we find outcome 2, where no loan was granted in the second period. This option is preferable to not receiving the repayment loan, plus incurring charges for enforcement. Case 7 follows as, despite the default, there are no extra enforcement costs. Outcome 5 is less desirable as B bears enforcement costs, and these are not offset by further charges. The last option for B is case 9, where there is an initial default, enforcement costs and no repayment.

Inversely, A prefers not to repay and not to incur in extra charges. At the same time, they also prefer not to be enforced – as there are social costs – and to receive a new loan in the future. These considerations lead us to a game with power mechanisms: while the payoff in case of no-repayment is higher for A, the threat of a decline in new grants, besides the social shame will force A to choose a sub-optimal solution.

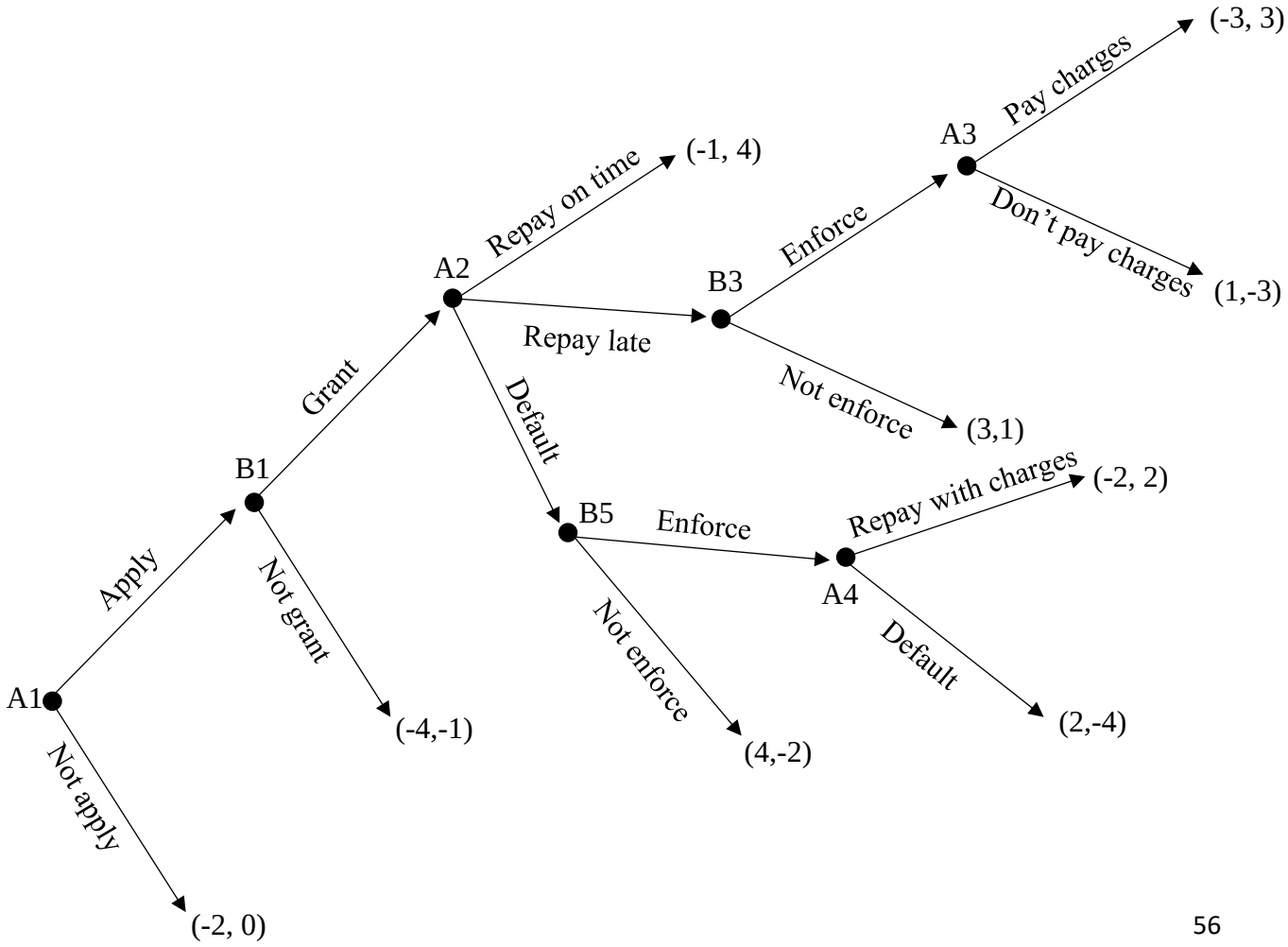
As in the deposit-savings game, we allocate values to each payoff according to the preferences of each player. In Figure 3.4, similarly to the payoff matrix, each solution represents a vector of A and B. For instance, $PGR = (-1, 4)$, as it provides a -1 payoff to A (A suffers no enforcement or extra charges, but has no late repayment/default premium) and 4 to B (it receives the full repayment without enforcing it).

Unlike in the payoff matrix, however, we use a different technique when modelling in sequential games in order to find the Nash equilibrium. Backward induction procedure is a

"process of analysing a game from the end to the beginning" (Watson, 2013, p.186). In representing sequential rationality, we identify the optimal action for each information set by working backwards in the sub-game tree. By starting from the solution nodes, the player selects the best response in order to maximise the payoff. This means that the other actions are dominated by the optimal one (Watson, 2013, chap. 15). However, as B has power over A, A will have its decisions affected, thus selecting a lower payoff.

As we added the fifth assumption that players want to preserve their reputations, social constraint also affects actions. For A, having a good reputation in the credit market is essential. As we have a repeated game, A may need to apply for a further loan in the future, so that this factor shapes their actions. Likewise, they want to maintain their reputation toward the community, so they will avoid being enforced by B. Likewise, B also has a reputation to preserve. It must enforce repayments in order to prevent defaults or delays from other borrowers. Thus, while not imposing the repayment is preferred by B, it still does so in order to maintain its reputation and prevent future bankruptcy.

Figure 3.4: Extensive form representation of the credit game with payoffs



Working backwards, we start by the longest branches: the solutions 4, 5, 8 and 9. For A, the payoffs of not paying changes are higher. Inversely, the payoffs of B are higher when A does pay the charges. Thus, we establish that, once enforcement has taken place, A will select not to pay charges. We say that not paying is a dominated strategy for A. Aware of that, B realises that not enforcing would yield higher payoffs than enforcing but receives no repayment charges. If A knows that B will not enforce, they will decide on defaulting, as no penalties will incur. In this case, our Nash equilibrium is solution 9 $(2, -4)$.

Nonetheless, as stated before, B must preserve its reputation, so it will always enforce repayments – even if it yields lower payoff. Similarly to the chain store paradox (Selten, 1978), the financial institution selects a worst payoff in the short-term in order to prevent the behaviour of other agents in the long-run. Likewise, A is concerned about their reputation within their community and the risk of social shame.[34] Both the potential need for future loans, as well as social implications, will place A under the power of B. The power aspect in this relationship will force A to change their choices to a solution where payoffs are lower. Thus, A will elect to pay on time, with a payoff of -1, in comparison to the payoff of defaulting 4, as they must preserve their reputation and may demand credit in the future.

Because of this power imbalance, B grants the loan as it knows A is likely to repay on time. This is our pure-strategy Nash equilibrium but, as it does not maximise the payoffs of A, it is not Pareto efficient. Thus, bearing in mind our initial assumption that players are rational and want to maximise their payoffs, while also acknowledging the effects of power, both agents will follow the actions that will take them to the payoff $(-1, 4)$.

This model provides us with three critical insights. First, individuals' acts are constrained by the power exerted by financial institutions. Second, both players are willing to select a sub-optimal solution in the short-term to prevent worse adverse outcomes in the future. Third, individuals also choose sub-optimal repayment schedules to avoid social pressures in the present. These aspects of borrowing in LMICs is further discussed in Chapter 4, where participants report power mechanisms.

[34] A complication of the model would be to add other banks that could affect the default decisions of A. We refrain from this possibility in this thesis.

3.3.3 Insurance

Finally, we model the relationship between A and B in the insurance market.[35] Recalling the deposit-savings game, if A's application to open a bank account is accepted by B, A moves further and they either save (solution 3) or not (solution 4). If they did not save, they apply for a loan, initiating the credit game. In turn, to apply for insurance, A must have extra income to afford it, so the insurance departure is from solution 3. While insurance can be useful for income smoothing in case of an emergency, it is not an essential service. In LMICs, where self-employed workers in the informal market have irregular income, purchasing insurance may not be feasible.

Similarly to the lender and borrower relationship, insurance has been modelled through game theory and principal-agent approaches in previous studies (Fields and Tirtiroglu, 1991; Warren et al., 2012; Asimit and Boonen, 2018). While insurance contracts prescribe prudence, they cannot enforce such behaviour (Bowles, 2004), which results in suboptimal outcomes, as in the credit game. Unlike standard insurance games, our model has two particularities. First, the agent is always risk-averse, as living in a LMIC with lack of quality public services[36] and income fluctuations prevents them to undertake risky activities. For simplicity reasons, we also assume that there is no government assistance to prevent income shocks, such as sickness and unemployment benefits, for informal workers. Second, as income is low, the agent needs to consider the possible benefits of allocating part of their constrained budget to insurance policy.

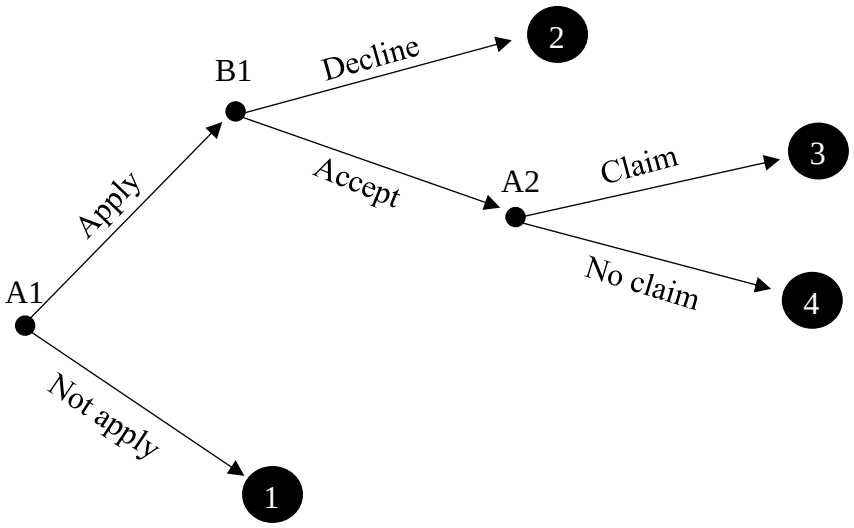
While adverse selection can be found in insurance models, we focus on the moral hazard issue as the principal (B) is not able to force the agent (A) to behave according to its preferences (Dutta, 1999, p.293). Also known as hidden actions, moral hazard implies that the agent will undertake riskier activities once they are insured. For instance, an agent with car insurance against theft may leave the doors unlocked, increasing the robbery risk. In the micro-insurance literature, however, some studies defend that such moral hazard can be beneficial. For example, insuring crops may lead farmers to invest in riskier, but higher-yield crops, which can lift them out of poverty (World Bank, 2012b).

[35] We consider any type of insurance policy, from health care to crop insurance.

[36] While some LMICs, such as Brazil, do offer public service in terms of health care, these services are usually underfunded and precarious.

Following solution 4 of the deposit-savings game, i.e., *A* was able to build up savings, the insurance game starts (Figure 3.5).[37] At node A1, *A* decides whether to apply or not for the insurance policy. *A* must be able to analyse present and future scenarios in order to consider if insurance is beneficial. If benefits do not offset the costs, we reach case 1. If they do apply, *B* reacts to the application. At node B1, the financial institution decides on whether to accept or decline the request of *A*. The potential decline is based on the evaluation that *A* will not behave responsibly or that *A* presents characteristics that may be too risky to *B* (e.g., if *A* lives in a neighbourhood with high levels of crime, *B* may decline insuring *A*'s vehicle). This situation leads us to solution 2. However, if *B* approves *A*'s application, *A* will be able to move again in the third period. At node A2, *A* either submits an insurance claim or not.[38] This circumstance takes us then to two final solutions 3 and 4.

Figure 3.5: The insurance game



Despite the similarities to the deposit-savings game, payoffs in the insurance game are different, as this is not a cooperation game. For *A*, the preference rank is of $\{3, 4, 2, 1\}$. For *B*, $\{4, 3, 1, 2\}$. The change in preferences is due to their associated payoffs, which are a result of gain distribution between *A* and *B*. For *A*, insurance may lead them to peace of mind in case of

[37] The insurance game is a repeated, dynamic and three-period model and follows the same basic assumptions as the deposit-savings game.

[38] For simplicity, we do not consider the possibility of co-payment or excess fees.

financial distress, and they prefer to submit a claim so that the benefit outweighs the costs. To A, a claim means that they chose correctly in applying for the policy, and they will prevent an income shock. Thus, if A knows that B will accept the request, A's best response is first to apply and, if there is no enforcement, to make a claim.

In turn, B prefers that A pays for the insurance policy but does not make a claim, so solution 4 is superior to solution 3. Furthermore, declining the application (end node 2) is less desirable than if A had not applied (case 1) as it incurs screening costs. Again, in order to reflect these preferences, we give *utils* to each solution (Table 3.2).

Again, B has power over A: if A makes a claim, future insurance policies will be more expensive or perhaps declined. Thus, to assure the same price for insurance premium, A will avoid making a claim. Because of that, we have a Nash equilibrium that is not Pareto efficient again, that is, solution 4. Here, A would have higher payoffs if they would have made a claim but, having to move under the power of B, they decide not to make a claim. In this case, like in the credit game, the power of B leads to the solution that yields higher payoffs to B, but not to A.

Table 3.2: Payoff matrix of the insurance game

		Financial institution (B)	
		A	D
Individual (A)	PC	3, -1	-2, -1
	PC'	(1, 3)	-2, -1
	$P'C$	-1,0	-1,0
	$P'C'$	-1,0	-1,0

The insurance game is a short illustration of the relationship of the individual and financial institutions in LMICs. The model shows that, while potentially beneficial to the individual, the power mechanism involved in the relationship reduces their optimal outcome. Therefore, being constrained into making a claim, the individual may be discouraged to apply in the first place. Furthermore, as we address in the following chapter, poor individuals do not prioritise insurance. In turn, if there were disposable income, they would prefer to increase consumption

or save for future emergencies. Therefore, the importance of such aspect of FI is small in comparison to bank account ownership, savings and credit instruments.

3.4 Summary

This chapter starts by presenting three key macroeconomic conditions that shape FI in LMICs: the high levels of labour market informality, their subordinate position in the currency hierarchy, and the oligopoly aspect of the local financial markets. These yield an environment of high service fees and interest rates, which benefits banks but not the poor. Adding these Post-Keynesian hypotheses to the analysis of FI is the first part of our original contribution to the FI literature on the theoretical foundations. To date, mainstream studies focus on mathematical models that have been designed for societies in HICs, which do not grasp the macroeconomic constraints of LMICs. On the other hand, the critical literature focuses on the empirical contradictions of such policy, also not discussing the structural differences between the two regions.

The second part of the chapter acknowledges such structural constraints, but focuses on the micro-level interactions between individual and financial institutions. Such original analysis also brings a new understanding of the relationship between those agents, which had not been developed by the FI literature so far. Moreover, we include the concept of power, which is key to understand the financial markets, particular in LMICs. In this region, the poor and informal workers, which are the subject of FI policies, are more prone to income shocks and have limited options on how to handle such issues (e.g. no social or employment-related benefits, irregular income strems, and high interest rates).

In order to investigate the relationship between for-profit financial institutions and individuals in LMICs, we develop three microeconomic models considering four elements of FI: deposits, savings, credit and insurance. Under the presence of power mechanisms, the outcomes of such games will tend to benefit the financial institution, thus harming the potential benefit of the access and usage of financial instruments to the poor. For the individual, applying for a deposit account is crucial as it allows them to access further financial services, such as savings, credit and insurance. However, they may suffer from an initial income constraint, in which bank account fees become burdensome. The individual will also usually lack disposable income in order to save, thus also preventing them to benefit from the high interest rates. Furthermore, while credit and insurance may be important mechanisms for consumption smoothing, they

lead the individual to sub-optimal solutions as the power of financial institutions change their preferred choices. Therefore, we hypothesise that, under the presence of power, such financial services may, in fact, be detrimental to individuals in LMICs, especially the poor. In the following chapter, we utilise our theoretical contribution to assess the different elements of FI and their effects on the poor's lives, using Brazil as a case study.

Chapter 4
A case study of financial inclusion in Brazil

This chapter presents a mixed-method study of financial inclusion (FI) in Brazil. Despite the success of expanding financial services, few studies have investigated the consequences of these policies in the lives of the poor (Gurgel, 2014; Santanna, 2019). Since the 1990s, the government has fostered FI policies but, from the 2000s, these policies received a boost. Starting in 2003, a consumer and housing credit boom took place, along with new legislation on free basic bank accounts and state-owned banks' correspondent banking[39] (Barone and Sader, 2008; Banco Central do Brasil, 2009; Lavinas, 2015; Santanna, 2019, chap. 4). Thus, this chapter aims at uncovering new aspects of FI from a critical realist approach, and at establishing an association with our theoretical and quantitative research.

According to the critical realism approach, research should be conducted through the mode of reasoning called retroduction. Using retroduction, this chapter is the first step into answering the thesis' second and third research questions:

RQ2. What is the causal relationship between poverty, income inequality and financial inclusion?

RQ3: What are the effects of financial inclusion on poverty and income inequality?

To conduct a study consistent with retroduction, we use between-method triangulation, i.e., quantitative and qualitative methods, as a tool of analysis (Downward and Mearman, 2007). In this way, both approaches are complementary and allow for a more in-depth analysis, including initial assumptions on causality and outcomes.

Following the analysis of Chapter 3, this chapter is divided into four parts. First, it considers the macroeconomic conditions and market structures which shape FI in the country. Second, it presents the qualitative research design of our study. Third, it investigates the perception of

[39] Correspondent banking is the action of using other establishments, such as shops, to provide financial services in the name of banks. In Brazil, a common example is the lottery shops that allow deposits and withdrawals from state-owned banks.

poor individuals in order to verify the theoretical assumptions of the micro-level games and to reveal potential aspects of FI that had not been considered yet. Finally, the qualitative study sheds light on the causality between FI and poverty, which will be further scrutinised in Chapter 6.

4.1 Macroeconomic conditions and market structures in Brazil

This sub-section introduces certain characteristics of the Brazilian labour and financial markets, in order to illustrate the arguments presented in Chapter 3. In line with the previous chapter, we divide this sub-section into three parts: (i) labour market structure, (ii) financial market structure, (iii) further quantitative analysis of the local financial market.

4.1.1 Labour market structure

Previously, we argued that the informality in the labour market reduces demand for financial services, as workers do not have enough income, but also reduces supply as often informal workers do not have collateral or regular income. Income irregularity also implicates that those individuals will be considered high-risk clients, of whom high interest rates will be charged. At the same time, these workers might require expensive emergency loans in order to maintain their consumption during periods of lower or no income.

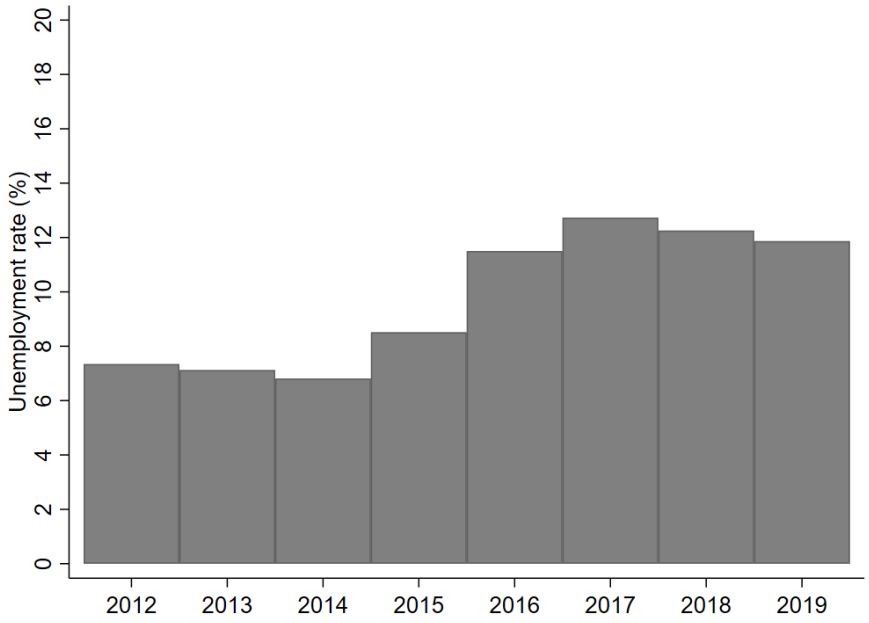
In Brazil, informality and unemployment have risen since late 2015 due to an economic slowdown and government policy shift from a social-democrat to a more liberal policy approach. Figure 4.1 displays the downward unemployment trend until 2014 and its shift from 2015 onwards.

This rise in unemployment has led workers into informality, as they need a new source of income. Whereas the Brazilian government provides low-income individuals with a conditional cash transfer called *Bolsa Família* (BF),[40] such benefit is intended to eradicate extreme poverty (i.e. US$1.90/day), but it is not enough to provide the minimum goods and services to a household, especially in an urban context. In fact, we see in Table 4.1 that those who receive BF or other social benefits, such as the BPC-LOAS (for those with disabilities or

[40] From 2020, the BF is provided to households with per capita monthly income of R$89,00 (GBP12) or between R$89,01 and R$178,00 (GBP24) if there are children in the household. The amount varies depending on the household situation. For instance, if a beneficiary is pregnant, there is an increase of R$41 (GBP 6) per month. More in http://mds.gov.br/assuntos/bolsa-familia/o-que-e/beneficios/beneficios.

elderly without pensions), have a very low income per capita. BF beneficiaries earned an average of R$353 (£50) in 2019, lower than the income in previous years.

Figure 4.1: Unemployment rates in Brazil (2012-2019)



Source: IBGE (2020).

Table 4.1: Average monthly household income per capita (in R$)

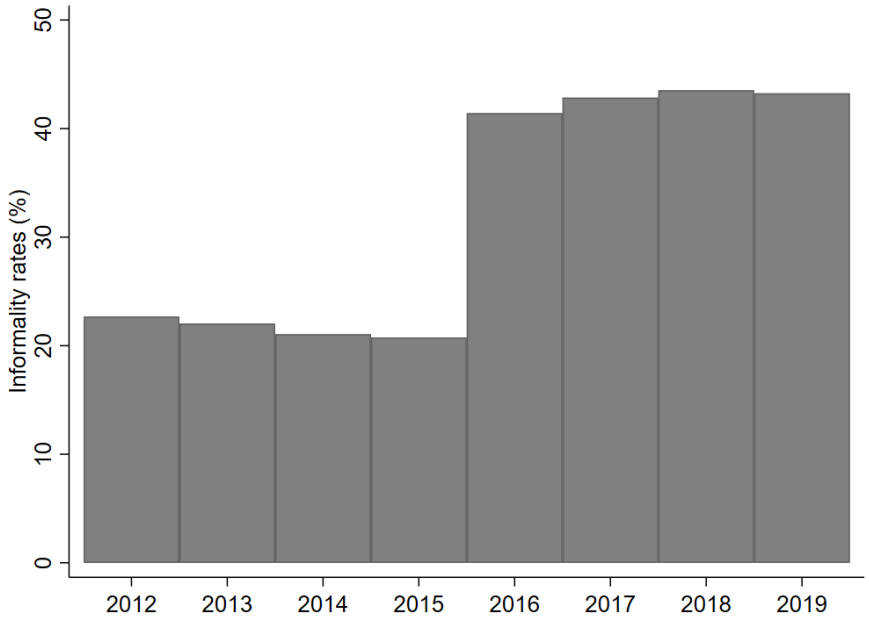
	2012	2013	2014	2015	2016	2017	2018	2019
Bolsa Família	381	403	413	393	369	354	353	352
BPC-LOAS	722	756	776	763	752	751	724	755
No Bolsa Família	1,565	1,602	1,646	1,575	1,570	1,558	1,623	1,641
No BPC-LOAS	1,323	1,359	1,411	1,367	1,357	1,355	1,414	1,433

Source: IBGE (2020)

Therefore, many workers take on other jobs, such as cosmetologists, drivers and petty traders, in order to afford basic necessities, such as food, housing and clothing. In the end, such displacement from formal employment to informality caused an overcrowding the informal sector, which pushes incomes down. In Figure 4.2, we see the upward trend of informality rate in Brazil. Thus, we notice that the country is a significant example of a large informal labour

market and is able to illustrate the barriers faced by informal workers when accessing and using financial services.

Figure 4.2: Informality rates in Brazil (2012-2019)[41]



Source: IBGE (2020).

Note: Before 2016, there is no data for self-employed and employers without taxpayer registry, which partially explains the sharp increase from 2016 and suggests that previous data was an underestimation.

4.1.2 Financial market structure

Besides the labour market, the structure of the financial market can also influence the implementation of FI policies. In order to analyse this issue in Brazil, this sub-section is divided into two: first, we consider the macroeconomic conditions in Brazil that lead to high interest rates and, second, we discuss more in-depth the bank concentration and role of state-owned financial institutions.

As presented before, macroeconomic conditions and market structures also shape the local financial market in LMICs as the international monetary system and bank concentration may explain the high interest rates charged to customers. Brazil, as other LMICs, exhibits a subordinate position in the international currency hierarchy (Kaltenbrunner and Painceira,

[41] Measured as informal worker + self-employed without a taxpayer registry + employer without taxpay registry + contributing family worker.

2015; Trancoso Baltar, 2015; Bortz and Kaltenbrunner, 2018; Kaltenbrunner and Painceira, 2018). The low quality of the Brazilian Real creates low demand for the currency, which is balanced by the monetary authority through increasing base interest rates. From 1996 to 2015, the average real base interest rate in Brazil was of 8.14%, much above HICs and other LMICs under inflation target policy (Balliester Reis, 2018). By adding a premium to the interest rate differential to core currencies, Brazil is able to attract foreign investors. This financial integration policy has been key to the Brazilian government since the 1990s, which includes reductions in capital controls and new policy-friendly rules toward foreign investors (Prates and Cintra, 2007).

Added to the high base interest rates, interest spread in the country is also above other LMICs'. In Brazil, the average spread has increased over time, unlike most LMICs (Table 4.2). Between 2010 and 2017, Brazil had a positive variation in the spread of 7.28 percentage points (p.p.), only behind Argentina whose interest rate level is less than a third of Brazil's.

Table 4.2: Interest rate spread for selected countries

	2010	2017	Variation (p.p)
Argentina	1.39	9.69	8.30
Brazil	31.12	38.40	7.28
China	3.06	2.85	-0.21
Colombia	5.72	7.70	1.98
Indonesia	6.24	4.56	-1.68
Kenya	9.81	5.99	-3.82
Lebanon	1.94	1.18	-0.76
Malaysia	2.50	1.69	-0.81
Mexico	4.07	4.64	0.57
Nigeria	11.06	8.00	-3.07
Pakistan	5.90	3.73	-2.17
Philippines	4.45	3.75	-0.70
Russian Federation	4.20	4.72	0.52
South Africa	3.37	3.13	-0.24
Thailand	3.13	3.13	-0.01
Median	4.20	4.56	-0.24

Source: World Bank (2020)

One explanation for this phenomenon is the high concentration in the credit market. From a Kaleckian perspective, banks can be considered oligopoly industries, where the interest rate spread is the mark-up of the financial institution over the costs (interests paid on deposits and borrowed funds), and it is determined by the degree of concentration. We suggest that fees for other services, such as bank accounts, are also inflated by this lack of competition. In 2017, the five largest banks accounted for 85.9% of loans (Banco Central do Brasil, 2017) and 83.37% of total commercial banking assets, displaying an increase over the years (Table 4.3).

These five largest banks, however, are not of the same nature. Itaú, Bradesco and Santander are private for-profit financial institutions, whereas Banco do Brasil (BB) has a mixed structure and Caixa Econômica Federal (Caixa) is a fully state-owned bank. The BB is a private for-profit bank, in which the government is the largest shareholder. In turn, Caixa is also a for-profit bank, but with the government as the sole owner. While the World Bank (2014, p. 3) advocates that the public policy should only handle market failures and that

> "policies to expand account penetration – such as requiring banks to offer basic or low-fee accounts, […] allowing correspondent banking, and using electronic payments into bank accounts for government payments – are especially effective among those people who are often excluded […]. Other direct government intervention – such as directed credit, debt relief, and lending through state-owned banks – tend to be politicized and less successful",

Whereas Brazil has partially followed the such advices, such as creating correspondent banking systems, providing social benefits through electronic payments and requiring banks for offer basic accounts, the country has also decided to follow a policy in which state-owned banks (SOBs), in particular Caixa and other regional banks, foster the FI of low-income individuals through loans.

As introduced in Chapter 3, whereas SOBs might provide cheaper loans, they are still for-profit financial institutions and, thus, are treated in the same way as private banks in this thesis. In the country, both types of banks must provide basic bank accounts to individuals and both can be used to receive state pensions. However, certain social benefits, such as Bolsa Família, can only be retrieved from a Caixa account. Therefore, it is common that poor individuals will make use of Caixa accounts as their main and/or only account.

Table 4.3: Bank concentration for selected countries (%)

	1996	2001	2006	2011	2012	2013	2014	2015	2016	2017
Argentina	40.31	47.53	46.95	57.76	59.53	61.99	63.36	65.77	65.83	57.92
Brazil	51.10	51.15	49.80	75.95	76.62	77.45	79.50	83.44	84.99	83.37
China	59.68	51.94	49.60	64.68	78.87	77.52	55.38	54.54	52.92	52.48
Colombia	68.66	68.15	76.93	80.40	80.34	80.97	80.38	86.48	89.39	77.03
India	48.17	47.20	46.71	39.89	39.37	39.48	40.17	41.26	44.29	47.03
Indonesia	44.86	48.98	60.27	55.52	54.20	51.23	52.38	52.34	52.39	53.92
Kenya	68.76	66.16	69.64	59.76	54.60	52.80	48.65	55.79	53.53	52.91
Lebanon	48.18	53.86	52.43	58.33	55.86	56.34	57.17	55.95	55.65	55.77
Malaysia	57.71	64.83	61.52	68.48	62.26	62.59	64.66	69.08	69.60	69.94
Mexico	72.51	80.99	80.67	72.03	70.75	72.53	72.88	69.72	68.05	68.96
Nigeria	48.60	48.41	33.42	59.06	55.52	56.47	56.83	57.28	62.73	63.21
Pakistan	89.44	87.32	90.28	100.00	58.92	59.24	58.31	57.52	58.79	59.99
Philippines	89.82	87.23	90.24	56.37	56.48	60.34	62.49	64.28	61.70	65.03
Russian Federation	78.97	77.52	81.60	35.50	38.74	38.06	41.69	55.25	54.80	67.81
South Africa	89.85	87.12	98.22	99.36	99.25	99.12	99.11	99.03	98.84	98.47
Thailand	63.72	65.33	69.96	66.20	67.52	67.43	69.54	66.78	67.73	68.58
Turkey	74.68	65.44	67.89	63.25	61.59	59.70	59.66	60.38	60.04	60.18

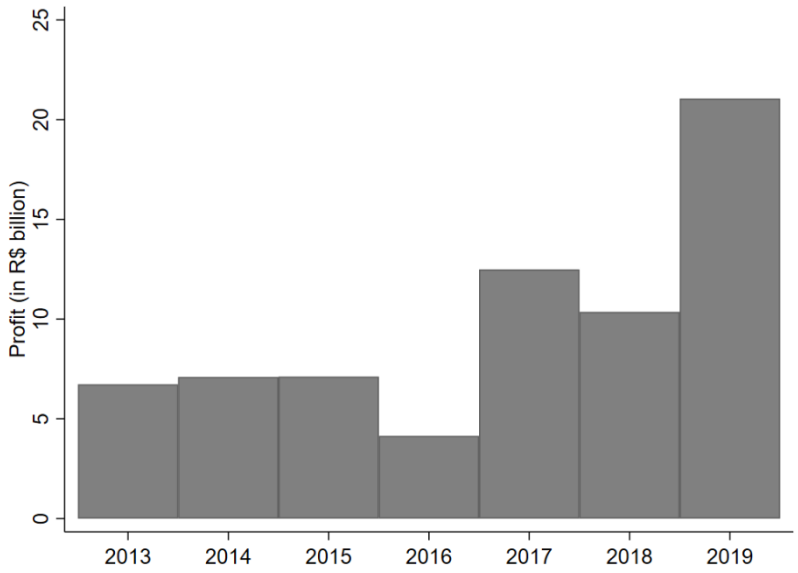
Source: World Bank (2020)

Note: Bank concentration is measured as the share of system assets of five largest banks.

Other regional banks, such as Banco do Nordeste (BNB), also play an important role in promoting FI and microfinance in the country. This regional development bank, known as the "Brazilian Grameen Bank" (Neri and Buchmann, 2008), offers microcredit loans with social collateral, called *CrediAmigo*.[42] However, such policies are still strongly rooted on the microfinance approach.

At the same time, state-owned banks also present a strong profit seeking practice as we will see in our qualitative results. For now, we can investigate the profit goal of the largest state-owned bank in Brazil. In Caixa, recent changes in governance have shifted previous development policies to a more profit-led objective. Like private banks, Caixa has had increasing profits since 2017, reaching R$21.06 billion in 2019 (Figure 4.3).

Figure 4.3: Caixa's net profit (in R$ billion)



Source: Caixa's financial statements 2013-2019.

This high profitability is a result of increasing income from fees, declining funding costs, and a restructuring process aimed at reducing labour costs that started in 2015 (Dieese, 2018). From the revenue side, part of Caixa's profits were from services and fees. Table 4.4 displays this

[42] In comparison to other loans (Table 4.3), *CrediAmigo* seems to offer lower interest rates. A simulation of an investment and consumption loans from BNB is displayed in Appendix C (C.6).

type of income for the top five banks. As we notice, Caixa increased its income by 88% from 2012 to 2018, surpassing other private banks such as Santander and Bradesco.

Table 4.4: Income from services and fees of the top 5 Brazilian banks (in R$ millions)

	2012	2013	2014	2015	2016	2017	2018
Banco do Brasil	21.07	23.30	25.07	22.36	24.00	25.94	27.42
Bradesco	17.07	19.46	21.79	19.30	21.58	24.03	25.22
Caixa	14.28	16.35	18.40	20.72	22.46	25.04	26.85
Itaú	20.31	24.07	27.74	30.82	33.23	35.80	38.40
Santander	9.68	10.67	11.06	11.87	13.72	15.61	17.27

Source: Dieese (2012, 2013, 2014, 2015, 2016, 2017, 2018).

From the cost side, Table 4.5 shows the reversing of the previous upward trend in job creation at Caixa, due to incentives to the voluntary retirement programme, voluntary redundancy programme and the closure of 37 branches in 2017 and 2018 (Dieese, 2015; 2017; 2018). In 2018, Caixa only had more employees than Santander, while from 2013 to 2015, it had surpassed Bradesco and Itaú.

Table 4.5: Number of employees of the top 5 Brazilian banks

	2011	2012	2013	2014	2015	2016	2017	2018
Banco do Brasil	113.81	114.182	112.216	111.628	109.191	100.622	99.161	96.889
Bradesco	104.684	103.385	100.489	95.52	92.861	108.793[43]	98.808	98.605
Caixa	85.633	92.926	98.198	101.484	97.458	94.978	87.654	84.952
Itaú	98.258	90.323	87.589	93.175	83.481	80.871	85.537	86.801
Santander	54.564	53.992	49.621	49.309	50.024	47.254	47.404	48.012

Source: Dieese (2012, 2018)

[43] In 2016, Bradesco hired former HSBC employees which explains the sharp increase.

Therefore, we notice that, whereas there might be some differences between state-owned and private banks in Brazil, these are still for-profit and, charging high fees or interest rates on clients, especially low-income ones, might generate further poverty rather than poverty alleviation. Furthermore, we notice that the direction of SOBs are policy-driven and might fluctuate over time, indicating that such financial institutions might not be so incompatible with the mainstream recommendation on the nature of FI policies.

4.1.3 Further quantitative analysis of the local financial market

The association of high level of labour informality to high interest rates may lead to a negative outcome of FI in LMIC's. In this sub-section, we analyse quantitative information about bank accounts and savings, credit market and insurance in order to pave the way for our in-depth qualitative analysis.

Bank account and savings

Bank accounts are widespread in Brazil and has been boosted by the payment of social benefits through Caixa. According to the Findex dataset, access to bank accounts have increased in the country and the majority of the population (70.1%) had access to this service in 2017 (Table 4.6). Moreover, Caixa is the largest bank in number of clients (103,3 million clients in 2019, although they do not disclose which of those clients are individuals or firms), which shows the importance of this SOB. Finally, we do not have further information on income of clients, nor the type of accounts that are mostly used, but these results suggest that low-income individuals do have widespread access to basic bank accounts in Brazil.

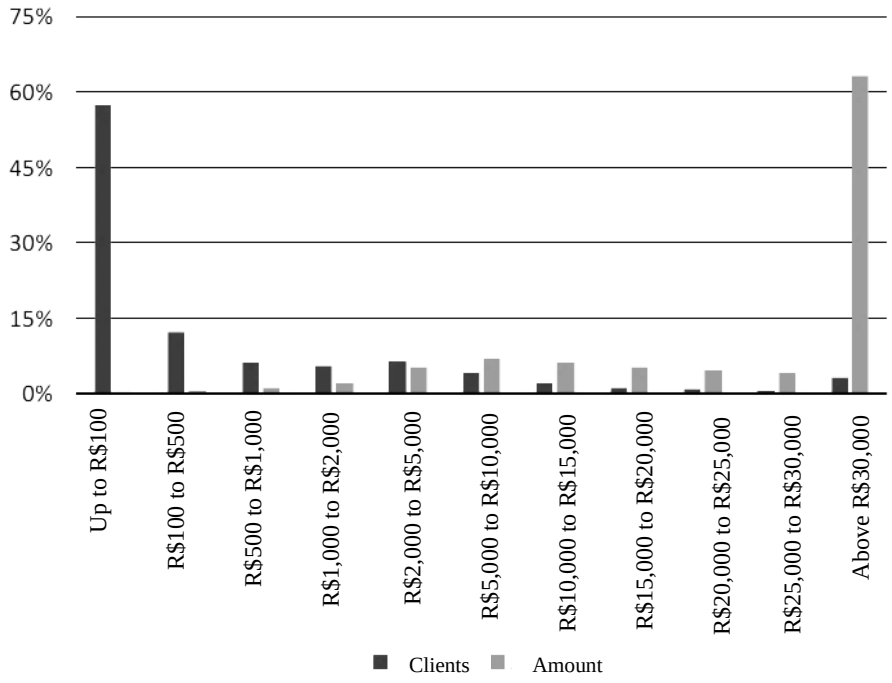
Table 4.6: Has an account at a financial institution? Data for Brazil

Account	2011	2014	2017
No	462	302	292
Yes	575	705	708
Total	1,037	1,007	1,000

Source: Findex 2011, 2014 and 2017

The use frequency of such account, nonetheless, is not well-reported. As already discussed in Chapter 3, low incomes prevent the poor from using further financial services, including savings. In fact, a Central Bank study that shows that about 57% of savers in Brazil held less than R$100, while 3% saved more than R$30,000 in 2017 (Figure 4.4). This concentration of savings also suggests that, in an environment of high interest rates, the savings-rich individuals will benefit more from the financial system. In 2017, the deposit rate was 6.6% a year, and lending rates reached up to 299% (Banco Central do Brasil, 2020). This discrepancy means that the poor will pay a high premium for debts, while the rich will earn high returns on savings. This finding goes in contrast to what is proposed by the mainstream literature, in which financial institutions promote better income distribution by intermediating the income of savers to the expenditures of borrowers. Moreover, beyond being a mere intermediary, for-profit financial institutions appropriate most of this spread in the form of profits, boosting the income of shareholders. Thus, in a situation of low income and irregular income streams, increasing FI of the poor may lead to income inequality.

Figure 4.4: Distribution and participation of clients and amounts by savings deposit bands (2017)



Source: Banco Central do Brasil (2018, fig. 1.13). Translation made by the author.

Credit and interest rates

In the previous chapter, we argued that informal workers and the unemployed are charged a premium on loans due to their repayment riskiness. Expensive loans, in turn, may lead the poor to over-indebtedness especially in an environment of irregular income streams. In the country, commercial bank interest rates clearly reflect the employment situation of borrowers as we can notice in Table 4.7. Breaking interest rates by credit type, we notice that the cheapest credit lines are payday loans[44] to public officers and pensioners (i.e., regular income earners) and vehicle purchase credit (i.e. with collateral). In contrast, non-payday loans, credit card rates and overdrafts display the highest interest rates in the credit market.[45] As long-term loans are inaccessible to self-employed and unemployed workers, they must recur to short-term loans, in particular credit cards and overdrafts, whose interest rates are incompatible to their earnings (Paim, 2015; Costa et al., 2018).[46]

Table 4.7: Average interest rates of selected types of credit (March 2019)[47]

Variable	Annual percentage
Payday loan - public sector workers	21.45
Payday loan - pensioners	24.7
Payday loan - private sector workers	37.65
Non-payday loan	123.71
Vehicle purchase credit	21.38
Other goods purchase credit	75.06
Credit card - instalment by financial institution	178.41
Credit card – "rotativo"[48]	299.45
Overdraft	322.74

Source: Banco Central do Brasil (2020)
Note: This is the average of interest rates supplied to individuals, not firms.

[44] In Brazil, a type of payday loan called 'consigned credit' is designed for public officials and pensioners (either retiree or other type of pension) who may access a cheaper type of credit by deducting the amount from the checking account when the person receives the wage/pension.
[45] Credit card interest rates reached 497.73% in 2017, before the National Monetary Council implemented Resolution 4.549, establishing that unpaid statements could only be charged in "rotativo" up to the following statement (Banco Central do Brasil, 2017; Dieese, 2019).
[46] In Karacimen's (2015) mixed-method study on Turkey, workers under better employment conditions also had access to cheaper loans, while workers in precarious employment situations would often use credit cards as a substitute for wage.
[47] It is important to remind that credit card instalments that are provided by stores are free from interest rates.
[48] *Rotativo* is the loan supplied by a credit card when clients are unable to pay the full statement.

We can also analyse credit access from those households that receive social benefits, i.e., have very low incomes. As we will discuss further in the qualitative analysis, a very important difference emerges from receipients of social benefits in Brazil. Whereas those individuals have a regular income stream, which in turn could allow them to make use of lower interest rates loans, the cash benefits vary a lot depending on the type of programme they are inserted. BF recipients under extreme poverty conditions (i.e., less than R$89 per capita) will earn R$89 plus R$41 per child. In a household with two adults and two children, for example, the household would earn R$171 (£24). This represents only 17% of the minimum wage (R$1,000), which is not a sufficient amount to purchase basic necessities and afford monthly loan repayments. In turn, those who receive the BPC-LOAS, for example, earn the minimum wage, which is considered by banks to be a satisfactory amount of regular income (verified by the lower interest rates charged on payday loans to pensioners as shown in Table 4.7). At the same time, as we notice in Table 4.8, beneficiaries of BF do have credit access, but credit penetration is lower among those than beneficiaries of other social benefits.

Table 4.8: Individuals who are part of social programmes and have credit access (in thousands)[49]

Year	2012	2013	2014	2015	2016	2017
Number of beneficiaries	24,065	30,054	32,925	34,385	34,914	38,620
Non-BF	7,717	10,681	12,538	13,728	14,647	16,160
BF	16,348	19,373	20,386	20,657	20,266	22,460
Number of beneficiaries with active debt	4,561	6,053	6,687	6,840	6,472	6,700
Non-BF	2,014	2,968	3,615	4,110	4,205	4,416
BF	2,547	3,086	3,072	2,729	2,267	2,284
Credit penetration (%)	19.0	20.1	20.3	19.9	18.5	17.3
Non-BF	26.1	27.8	28.8	29.9	28.7	27.3
BF	15.6	15.9	15.1	13.2	11.2	10.2

Source: Central Bank of Brazil (2017, p. 38)

[49] In the survey, only those with a debt larger than R$1,000 (£140) were considered.

Therefore, it is expected that our hypothesis that informal workers and the unemployed will have an increasing demand for emergency loans, but will have to face higher charges due to their riskiness. In the end, we assume that such conditions may lead to further loss of income in the long-run.

Insurance

Unfortunately, not much information is available for insurance markets in Brazil. According to the insurance regulatory agency (SUSEP), which does not include health insurance, there has been a growth of such markets in the country. In 2003, it represented 2.6% of GDP whereas in 2019 it grew to 3.8% (SUSEP, 2020). An interesting fact is the market concentration. While insurances such as car, life or housing insurance are less concentrated and the largest five insurance firms represented only 32% of the market in 2019, private pension schemes markets were highly concentrated. From 2003 to 2019, the market share of the five largest private pension institutions (mostly banks) went from 77% to 92% of the market (*ibid*).

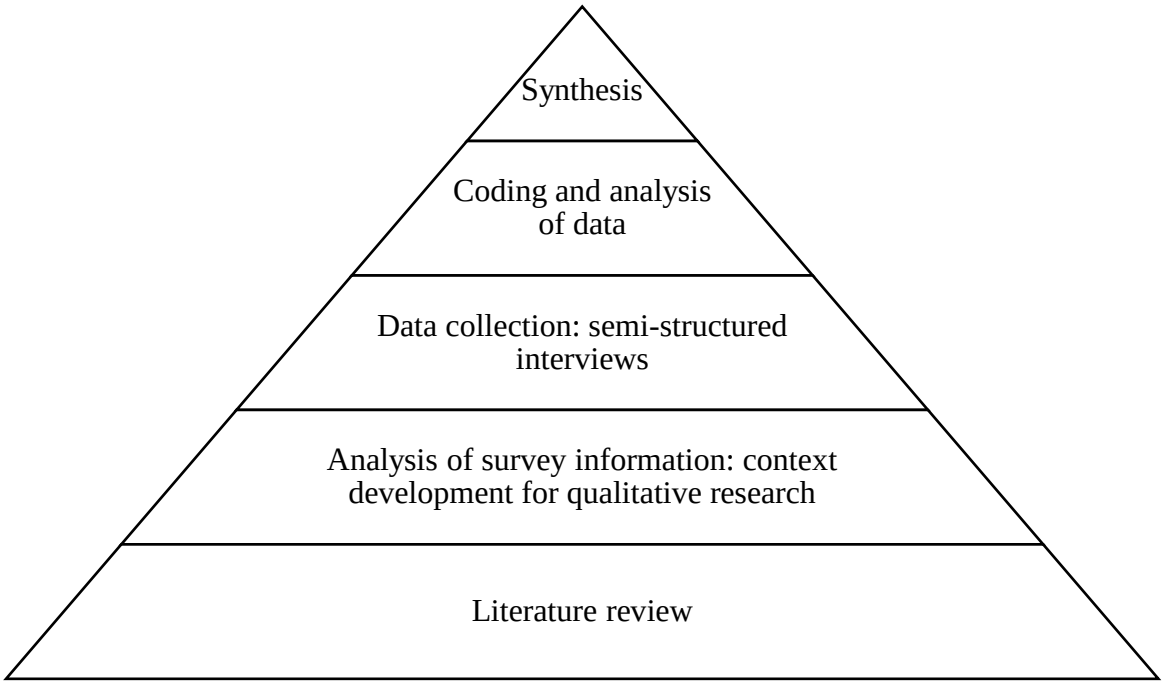
Yet, it is difficult to understand the impact of such changes in the lives of the poorest, as no further data was available. As we will see next, nonetheless, very few participants made use of any type of insurance because of income constraints, as we had hypothesised in our insurance model in the previous chapter.

Thus, after this introduction of the macroeconomic constraints and the local financial market in Brazil, we first present our qualitative research design before analysing the qualitative results.

4.2 Qualitative research design

The research design of this study was done following the guidelines from Bloomberg and Volpe (2012). Figure 4.5 displays the five suggested steps. First, we started by reviewing qualitative and quantitative studies on FI in Brazil. Second, we analysed survey information from publicly available sources, such as the Central Bank of Brazil, in order to grasp the general context of FI. Third, based on existing information, we generated an original questionnaire and conducted the interviews. Fourth, we coded, translated and analysed the qualitative data through a thematic approach. Finally, we conducted the synthesis of findings and compared them to the quantitative data.

Figure 4.5: Flowchart of research design



4.2.1 Data collection method

The data collection was done through semi-structured interviews. Interviews allow for an "in-depth, context-rich personal accounts, perceptions and perspectives" (Bloomberg and Volpe, 2012, p.252), besides the description and explanations of complex interactions and processes. In this way, interviewing individuals gave us a more in-depth understanding of their reasons and motivations to be part of the formal financial system. This tool, however, might have certain limitations, as not all interviewees are equally cooperative and articulate, which might diminish the overall quality of the in-depth research (Bloomberg and Volpe, 2012, chap. 7). In our study, this happened with only two interviews, so its overall quality was not affected.

In particular, semi-structured interviews consist in closed- and open-ended questions, which are able to produce data based on participant's experience, as well as data guided by existing knowledge in the literature (Galletta, 2013, chap. 2). There is also flexibility as it is possible to adapt questions, adjust wording and level of language, change their order and add further questions depending on participants' responses, in order to explore or clarify particular answers (Berg, 2009, chap. 4; Elliot et al., 2016).[50]

[50] Questionnaire can be found in Appendix C (C.1).

There are, nonetheless, further limitations to qualitative research. First, this method cannot guarantee wide *generalisability* (Berg, 2009). However, it still allows for *transferability*, that is, the study makes it possible for other researchers to use similar processes for studying other communities (Bloomberg and Volpe, 2012, chap. 7).

Second, we are unable to provide *validity*. Instead, qualitative research demands *credibility* (Bloomberg and Volpe, 2012, chap. 7). To ensure credibility, we compare participants' answers to those from other studies throughout the chapter (Schicks and Rosenberg, 2011; Gurgel, 2014; Banco Central do Brasil, 2014; Schicks, 2014; Williams et al., 2015; Banco Central do Brasil, 2018; Lindsjö, 2018; Santanna, 2019). Discrepant findings are also reported in order to provide accurate information.

Finally, the method does not provide *reliability*, but *dependability*. To achieve it, we provide an "audit trail" to allow other researchers to replicate the findings (Bloomberg and Volpe, 2012, chap. 7). [51]

4.2.2 Research sample

The research sample consisted of 30 individuals. Participants were selected by purposive sampling, a non-probability sampling strategy to select a specific type of individual displaying a particular attribute (Berg, 2009, chap. 2). According to Guest, Bunce and Johnson (2006), when using purposive sampling, the saturation occurs within the first twelve interviews. Thus, in order to proceed carefully, a total of 15 participants were selected from the rural and 15 participants from the urban area of Minas Gerais, Brazil.[52]

The access to participants was often facilitated by a gatekeeper, i.e., local leaderships who indicated participants based on the socio-economic criteria. The use of a gatekeeper allowed for a more accessible selection of participants, besides ensuring participants about the significance of the research.

First, participants were selected based on their address, as a proxy of income, so that only low-income individuals were interviewed. Second, in order to compare to existing quantitative information, we select only those who earn up to or around one minimum wage (R$1,000

[51] Description of pilot interviews, adjustment of questionnaire and role of gate-keepers can be found in Appendix C (C.2).
[52] Further information, including pictures of locations can be found in Appendix C (C.3).

monthly).[53] Third, further socio-economic criteria were followed so that we could reach a diversity of participants with respect to gender, race, age range, educational status and occupation.[54] Finally, participants were anonymised using numerical identifiers, but their indirect identifiers, such as gender, age, occupation and region, are disclosed so that those socio-economic comparisons can be provided.

4.3 Results

Acknowledging macroeconomic conditions and market structure in LMICs, we illustrate the results of quantitative information through the perception of participants of the qualitative study. We provide such evaluation through thematic analysis, i.e., we identify patterns within the different interviews and provide a conclusion on the particular uncovered themes. We split this section into five sub-sections, following the game models provided in Chapter 3 and adding further insights on power mechanisms and on the causal relationship between poverty and FI. First, we present results on bank accounts and savings, considering the role of state-owned banks and income constraints. Second, we show the findings with respect to credit, highlighting the importance of interest rates and indebtedness. Third, we present results on insurance and discuss the role of income as displayed in the insurance game. Fourth, we discuss the role of power and the enforcement mechanisms used by local banks. Finally, we introduce the discussion on causal relation between FI and poverty through the perception of participants.

4.3.1 Bank accounts and savings

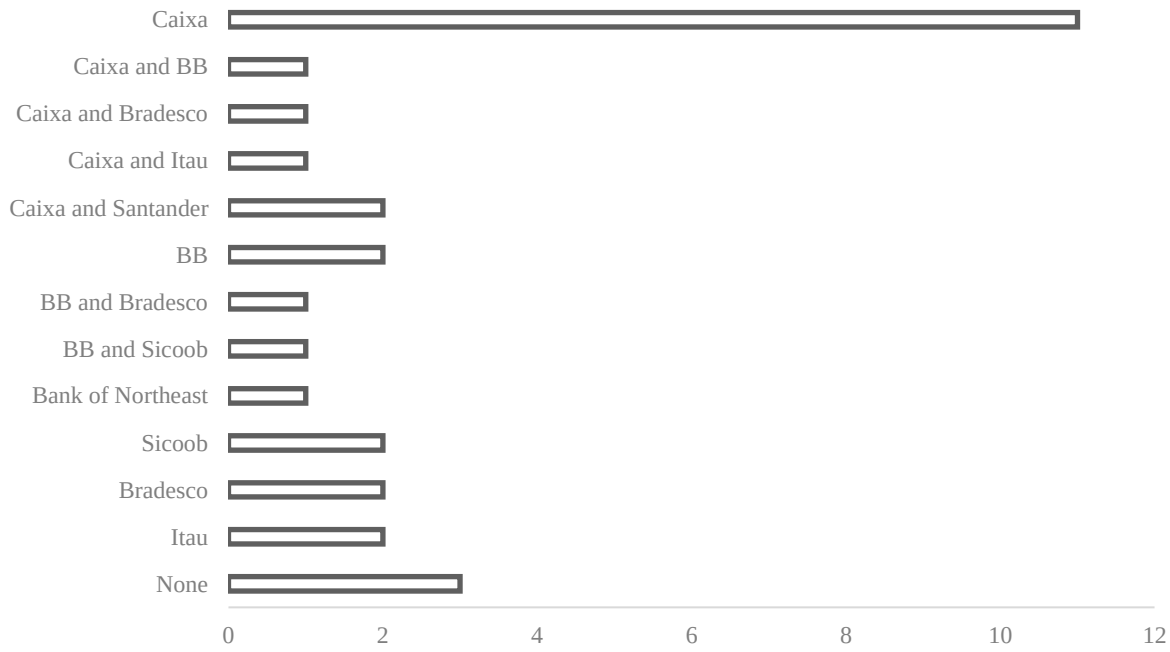
One of the objectives of FI is to ensure bank account ownership to all individuals. This first step allows access to further financial services, such as insurance and savings. However, this approach disregards some key aspects of the labour market informality that influences the access to and usage of formal financial services, as discussed in Chapter 3. First, informal workers may not demand bank accounts, as income is low and irregular, besides performing most transactions in cash. Second, the lack of income does not allow poor informal workers to build up savings, as all income is used for basic consumption needs.

[53] £140 in May 2020.

[54] Full information on participants' socio-economic characteristics can be found in Appendix C (C.4)

In our sample, only three participants did not have a bank account (P9, P12 and P24).[55] The first two declared they were unemployed, thus had no need for a bank account. The latter said she was too indebted and was not allowed to own one anymore. This means that 90% of our sample was included in the formal financial system through bank accounts. As we can see in Figure 4.6, 78% had an account at a SOB (BB, Caixa and/or BNB), while 33% had an account at a private bank (Bradesco, Itaú or Santander) and 11% an account at a cooperative (Sicoob).[56]

Figure 4.6: Account ownership by financial institution



This finding highlights the importance of SOBs, in particular Caixa, to low-income individuals. The bank is considered a more accessible financial institution for low-income individuals and has been referred to as the "bank of poverty" (P2) since it "is more viable for us who don't own much" (P5). For them, "there are banks for posh people and banks for the humbler ones. The bank of the poor and the bank of the rich. Caixa, for me, is more for the ordinary people" (P11). Moreover, "their accounts have a gratifying benefit to the poor. In other banks, we can't do it. Caixa, how do I say it, is the bank of the poor. It is there where you receive unemployment benefits, PIS[57], these things, everything is at Caixa Econômica. Caixa or Banco do Brasil. […]

[55] We use P to characterise participants and keep them anonymous.
[56] Results sum more than 100% as some individuals had more than one account, for instance, one to receive wages and one to receive social benefits.
[57] Programme of Social Integration, a social benefit paid by the employer.

And it is a bank that when you open an account, let's suppose, you want to cancel that account, the fees are not so high. It is not an absurd such as Itaú, Bradesco, Santander" (P12).

Private banks, in contrast, are usually seen as expensive and less accommodating to the needs of the poor. Whereas private banks are also obliged to provide free basic accounts, several participants decided to migrate from private banks to Caixa because of the high costs. At Santander, for instance, the experience "was really bad. They ate up a lot of money because it was a checking account and a salary account. Anyway, I opened it at Caixa, to save a bit of cash on the savings account" (P20).[58] Likewise, at Itaú, "the financial costs were too high, so I couldn't keep the account at Itaú. I had to cancel and keep only Caixa, which is a savings and a salary account" (P4). In turn, at Caixa "if the money would be deposited on one day, you could let it to the next, without any costs. At Santander, no. If you leave it from one day to the other, they already take some of your money" (P20).

Private banks were also reported to take advantage of some participants (P12, P14, P21, P24, P25, P26). The most common practices were pushing checking accounts instead of salary or savings accounts. To P26, a Santander employee "said, 'you must open a checking account', 'am I obliged to?', 'yes', so well, I didn't mind and opened it. But every month I was owing some money. [...] So I said, 'there is something sketchy about it'. [...] Wait a minute, I have a checking account and I am paying almost R$13 to have it?". For participants, the costs of keeping a checking account are too high: "you take R$25 off the minimum wage. If you think about it, R$20 is five packs of rice, of the worst rice" (P17).

The relationship between employment, bank account and savings was also found in our research, which were in line with out theoretical discussion. As we have detailed in sub-section 4.1.1, there has been a shift from formal to informal employement in the past years in Brazil. The worsening labour market conditions were felt by nine participants in our study. P2, for instance, claimed that the end of tourism boom after the World Cup in 2014 caused her to be downgraded from head cleaner to a self-employed cleaner in the hotel she works. Others, such as P14, a former kitchen assistant in the formal labour market was fired and became a self-employed waster picker in a cooperative. Similarly, P12 used to work as a cashier in a supermarket but, due to long-term unemployed, decided to become a self-employed hairdresser.

[58] Standard checking accounts incur fees, while salary and savings accounts are free.

These examples suggest that self-employment is often the last resource of workers. Of the 20 participants in the labour market, 12 were informal workers, especially on low-skill occupations, such as cleaning, hairdresser, sales and construction. This supply shock generates extreme competition in the labour market, which was also noticed. As put by P11, a pensioner who performs sporadic work (*"bicos"*) as a hairdresser, "nowadays there are too many people [working as a hairdresser], so for me it is complicated". This competition put downward pressure on wages and profits, which in turn may increase poverty levels (ILO, 2009; Taylor, 2012; Bateman, 2014). Figure 4.7 shows how self-employed workers in our sample earn in average less than formal workers, as there is no minimum wage floor. While the average of formal workers was R$1,000, informal workers reported average earnings of R$836.

Figure 4.7: Average income by employment status

Note: the numbers on top of each category show the number of participants. While pensioners have the right to a minimum wage, the average is lowered by one of the participants who had issues with proving his disability condition. He was retired for health reasons and had his income reduced to R$35, as he could not afford to go to the largest nearby city to do further exams and take it to the Social Security Office (INSS) to prove his inability to work.

From the demand-side, being in the informal sector reduces the demand for formal financial services, especially bank accounts, "as I am not working [anymore], I can't put money there. So, I don't use it. But I didn't close it" (P15). Unlike formal workers and pensioners, who often receive wages and benefits through a bank account, self-employed and unemployed workers

do not make frequent use of this service. Participants use banks "the less I can. […] as I am self-employed, I already pay [the debts] in cash" (P2). Those who receive benefits, such as the conditional cash transfer *Bolsa Família* (BF), report to use it only once a month: "when it is possible to withdraw everything, I do it, so I can solve things" (P14) and they "prefer to use cash. I don't know if it is true, but they say every time I use my card, they discount R$2. Therefore, I already withdraw everything at once!" (P11). These reports indicate that even those who own a bank account may not make frequent use of it due to earning in cash, the perceived high cost or because the income is spent immediately.[59]

In our deposits/savings game, the second part of the game includes the possibility of saving if the individual has enough income. In our study, we noticed that, indeed, the lack of money constrains savings by the poor. While half of the participants claimed saving some money (Figure 4.8), self-employed workers only manage to save low amounts for everyday needs: "if I have to buy a bit of sand [for constructing a house], I keep some small amount. It is not really saving; it is the necessary. The wage doesn't allow [me] to buy things" (P10). For those "who earn the minimum wage, we end up spending everything. Sometimes, if we do keep [money], it is R$100, it is money that is there for emergencies. For example, if we need something, like gas[60], something fast, you have it there" (P1). However, "there are times by the end of the month that there is not R$1 to spare!" (P10). Therefore, even with access to formal bank accounts, the poor may be unable to save and benefit from the interest-earning of a formal savings account.

[59] Full information on the banking information of participants can be found in Appendix C (C.5).

[60] In Brazil, it is common to buy gas cylinders for household consumption, which costs around £14 and lasts, in average, for up to 3 months. P16, however, said her gas would last one month, so it depends on the household usage.

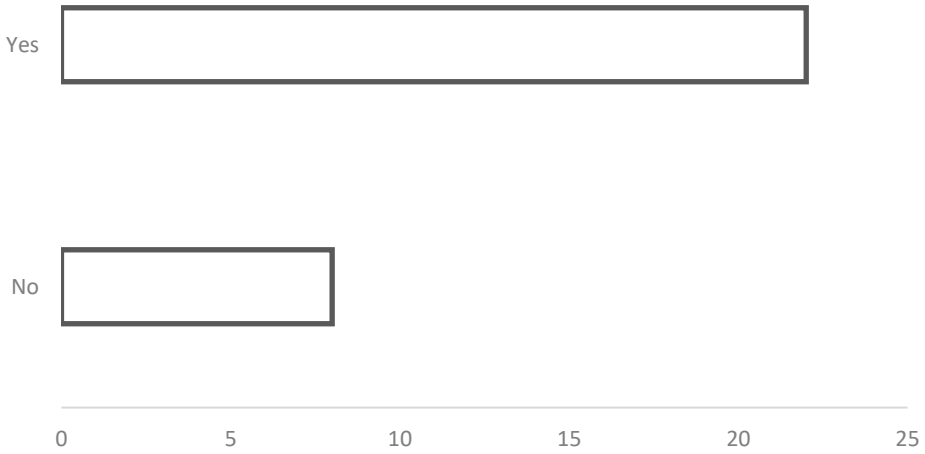
Figure 4.8: Participants' answers on whether they save money

Overall, we notice that formal employment and demand for formal financial services are intrinsically related. Unemployed and self-employed workers often have a reduced need for financial services, either because of low income or for receiving in cash. At the same time, those who receive social benefits have an incentive to open an account, but do not use it frequently, as they prefer to withdraw it at once. Moreover, such low and irregular income constraints them to acquire further financial services, in particular formal savings. Therefore, poor individuals are unable to save high amounts of money and benefit of interest-earning from formal savings accounts.

4.3.2 Credit and indebtedness

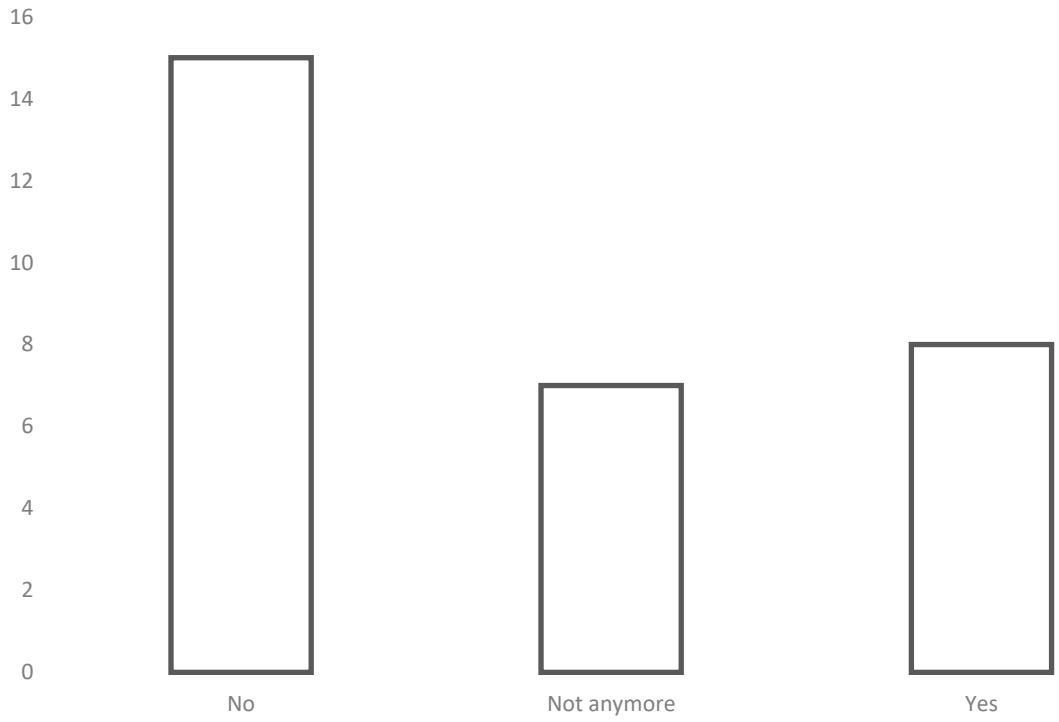
In our sample, the most common formal credit instrument was formal loans, followed by credit cards. Of the 30 participants, 22 claimed having made a formal loan, while eight said they never did it. The majority requested a loan for housing purposes (8), bills (4), repay other loans (2) but also food (2), travel (1), dental care (1) and child birth (1). Only three participants got a loan for business purposes (P22, P24 and P29).

Figure 4.9: Have you ever had a bank loan?



In turn, only nine participants had credit cards: eight declared having them in the past, but not anymore, and 16 of them said they do not have/had one (Figure 4.10). The main reasons for not having a credit card anymore were related to lack of money and over-indebtedness.

Figure 4.10: Credit card ownership



In our study, most participants consider interest rates "high" (P3, P5, P8, P14, P17, P22, P24, P25, P27, P28, P29), "absurd" (P4, P12) and even "abusive" (P2, P16, P19 and P23). Some claim that "in a way, they [banks] take advantage of people's needs, they have abusive interest rates. Then a lot of people in their innocence, in a moment of despair, end up falling for it" (P2). For P29, "the problem of the bank […] is that the interest is very high. So, if you delay one day, it is over. Then you get desperate because they will throw a lot of interest on me". Therefore, they consider banks "sort of thieves. The interest is too high, other things [also] super high. […] They may say they don't steal, but we know they do—super high interests, […] abusive. You take a R$2,000 loan when you realize, in the end, you paid R$5,000. They should offer and supply you with what they propose. Like, it is a R$2,000 loan? Could be, like, R$2,500, to take their share. But to take R$2,000 and pay R$5,000 in interest I think it is unnecessary" (P19).Unlike formal workers, self-employed and unemployed workers do not have access to cheaper lines of credit as we saw in Table 4.7. In turn, social benefit holders, despite having a regular income stream, do not necessarily have access to payday loans either. This group can be divided into two. The first one is constituted of those who receive a minimum wage pension, such as to the elderly or disabled individuals.[61] The second includes those who earn lower benefits, particularly the BF, which in our sample reached an average of around 1/3 of the minimum wage (R$379). The first group has access to similar loan conditions as formal workers, while the second group must recur to expensive loans, such as overdrafts. This constraint is reported by participants like P14, who said she would not even apply for a loan because "I won't get it. If I do get it, how am I going to pay? The money from BF is just for food and gas. There is not even money left to buy clothes for my boys". This finding partially contradicts the hypothesis that government benefits, such as pensions and the BF, are a sort of collateralization in financialised capitalist economies, in order to push FI to poor individuals (Lavinas, 2018). Thus, we suggest that, for a regular income stream to be considered some sort of collateral for loans, it must overcome a certain minimum threshold – which is not the case of BF.

For both formal and informal workers, credit cards play an important role in credit provision. Such credit cards can be provided by banks, insurance firms, retail stores (from supermarkets to department shops), gas station and a range of other institutions. While credit cards are often

[61] For instance, the Benefício de Prestação Continuada (BPC) provides a minimum wage to disabled or above 65-year-old individuals.

used for instalment purchases, participants consider that both credit cards and personal loans[62] have a "snowball effect", as high interest rates and variable income may affect repayment rates and lead to increased indebtedness.

In our sample, only P8 and P15 claimed never making use of instalments, i.e., 93% of participants had already purchased goods in monthly sums. Table 4.9 displays the goods that have been purchased in such manner. We notice that, in fact, individuals pay in instalments to purchase more expensive items, such as mobile and radios (electronics), but also basic necessity such as food, clothing and medicine.

Table 4.9: Purchased goods using instalments

Item	Frequency	Percentage
Electronics	16	53%
Clothes/Shoes	13	43%
Food	9	30%
Furniture	6	20%
School supply	2	7%
Medicine	2	7%

Note: Results add to more than 100% as participants might have made several instalment purchases.

Credit cards also have a wealth effect on participants, since "the card is like this: when you have it, you spend it. Then later is can also become a snowball, a turmoil" (P12) and they "think that we can spend without being able to, so we spend much more than we should" (P19). Therefore, "with a credit card, you take advantage of the opportunities, the sales, and will end up getting indebted" (P2). Such wealth effect does not correspond to their earnings, which may generate over-indebtedness if individuals are unable to repay instalments in time.The problem is aggravated for those who purchase items for relative or friends, but do not receive the payment in time. P5, for instance, purchased a good for her sister-in-law on her credit card, but by the time the statement was due, she did not receive the money: "she was stalling, and when

[62] P23 also considered overdraft to be a snowball but, as she was the only one, we decide to leave out of this analysis.

I was about to pay, the card was becoming a snowball" (P5). Interest rates "were too high and when I decided to pay, I had problems because I had lent the money of the statement and, the person who was supposed to pay me took a long time to do so, and when I went to pay, it became a snowball, and there was no way" (P28). The high costs of delaying a credit card repayment is a problem for low-income individuals and "for me, it is not worth having a credit card, I never liked it. I had to pay for it, and it became a snowball. I managed to pay, but it is not worth it. I had to work a way to pay, because the interests were very high. But I paid it" (P25). Thus, some prefer to use cash instead since they "do the budget with what I have, not what I don't have. Because if I do my budget with what I don't have, after to repay, it becomes a snowball" (P1). In fact, some participants would not have credit cards in order to avoid a potential indebtedness: "I've never used it. I'm scared to death. I have heard a lot of stories of people with credit cards, checks... I have no limits; my eyes are bigger than the stomach. I prefer not to hang myself too much". Her aunt, for instance, "got screwed a lot. She even wanted to commit suicide once. Everything she sees, she wants it. And at the time of paying, only God knows!" (P10). Therefore, we notice that while credit cards could provide consumption smoothing, it could also lead to increasing indebtedness due to their high interest rates, which would go in opposition of the supposed benefits of credit for the poor.

Taking personal loans were also, in general, considered a negative experience (e.g. P4, P6, P10, P16, P19, P24 P28). Participants borrowed "thinking it was one thing, but it was another. So, it became really bad, I delayed bills, everything. It became a snowball in my life" (P4). Moreover, when unable to repay the loan, "the interest rates will only go up, become a snowball, and this snowball will become a dirty name.[63] God forbid me!" (P19). For instance, "last time I got R$1,100. And we keep paying it. This R$1,100 becomes a snowball. And you keep paying it. I will pay in 12 times. I am now on my third instalment" (P16). Moreover, delayed personal loans also create further financial problems and may create a debt trap: "every time I renegotiate, they split [the total] for me in 48 times of R$150. So, I start paying. When it is about 15 instalments, if I delay, they say I need to make a new contract. This new contract starts from scratch: 30 instalments of R$215. And it goes on, it became a snowball" (P24). Therefore, participants believe that banking cannot help people overcome poverty. For P10, the person would not have the skills to manage financial services properly and "would create a

[63] In Portuguese, a "dirty name" or "dirty name in the plaza" means that a person has a bad credit rating.

snowball", as the more opportunities of credit it would appear, the more they would get indebted.[64]

Four participants who borrowed higher amounts for housing purposes were also displeased. P28 said she "bitterly regretted" taking a R$4,000 loan, as it took her six years to repay the debt (a total of R$13,392) and, in the end, "it was a lot of spending and it didn't work out. And I think the interest rates were really high". Likewise, P29 also "regretted, regretted, regretted, because they charged R$4,900 in interest from me! I got R$5,000, I was building a little house up there, to add to this house, but later I said, 'dear god, how can human beings have such a weak mind?', because when I realized, I took R$5,000 and paid R$9,800. I paid it for 5 years. Never again". In another case, P1 "heard that I could open [an account] and ask for a loan", so she "went to Caixa and talked to the manager". She received R$5,000 but "ended up paying R$10,000 because interest rates are very expensive". However, she does not regret it because she "had no place to go, where to run, another alternative." Finally, P11, who lives in Izidora occupation,[65] borrowed R$7,000 "as I arrived at a tent, there was nothing. So always there was a loan to be able to buy something to build the masonry". In the end, she "was paying more than R$14,000!". As a pensioner, she also was able to get a payday loan from BMG[66], "so I could either withdraw R$1,500 or buy [with it]. So, I went and withdrew the R$1,500 as I bought the materials for my house. But later I could no longer repay it".

The concept of over-indebtedness has been the subject of much debate in the literature, in part because it has been measured in different ways. We follow the definition that over-indebtedness occurs when individuals must make sacrifices in order to comply with repayments, such as cutting on food, as well as becoming impoverish through debt (Schicks and Rosenberg, 2011; Guérin et al., 2013; Schicks, 2014; Afonso et al., 2017; Guérin et al., 2018). Within this framework, more than a third of participants could be considered currently or previously over-indebted as they claimed working more hours (P8, P26, P29), cutting on food (P1, P2, P10, P12, P18, P19), reducing/not paying utilities (P4, P18) and selling assets to repay the loan (P24, P25). This evidence indicates that over-indebtedness within low-income

[64] More on the relationship between poverty and FI in sub-section 4.3.5.
[65] The region is a squatting movement of working-class people who built their houses in abandoned areas part of the *Brigadas Populares* social movement. More on the occupation can be found in Isaias (2017) and Galera (2019).
[66] BMG is one of the largest non-bank financial institutions (*financeira*) in Brazil. For payday loans, they have a programme called "Extra Cash" (*Dinheiro extra*), in which pensioners with bad credit can borrow. More on https://www.bancobmg.com.br/site/.

individuals may be more recurrent than what is acknowledged by the mainstream literature on FI.

Besides the high interest rates, an important driver of over-indebtedness is an income shock, such as unemployment or unexpected sickness.[67] Some participants, for instance, stopped paying credit cards statements because "the firm sent me away, so I had to sell some goods I had in order to repay [the debt]" (P25), but "it was not because I acted in bad faith, it was because there was no time. I got unemployed. So, I did a plan, and everything went wrong" (P4). To further illustrate this issue, we use the example of P14. She purchased a sound system through instalments while formally employed but, after made redundant, she was unable to keep repayments. According to her, the store called to negotiate the debt, but she "didn't have the money to pay. I was sad because I didn't have the money to be able to pay. When I asked how much I owed, they said I was owing R$5,000, but I bought it for R$1,000 when I was working. I told them that I could go back to the store when I was working again. But I haven't got a job until today. I am unemployed. It is hard to find a job. I have already signed up, handed out CVs, but no one calls me back". These examples show that, while a steady income stream may facilitate loans, as it acts as a collateral to banks, it may lead to a debt-led consumption, as has been reported in the microfinance literature (Schicks, 2014; dos Santos and Harvold Kvangraven, 2017; Guérin et al., 2018).

In our study, two extreme over-indebtedness cases were reported. First, P11, a widow and mother of two, suffered an accident that has incapacitated her to work. She reported having outstanding loans "with Caixa, […] with this BMG, then, with another financial institution that I went, they said it was called Olé,[68] but I never even heard of this bank". All of these loans were on a payday basis, as she receives a pension due to the early death of her husband. Most of her loans were for building a house, as her family was previously living under a plastic tent. Of her R$1,000 monthly benefit, R$400 is withheld by Caixa, which leaves her with little money to provide for her family. She said it was "her dream" to pay these debts in full, "but for me there was no way […]. It was either paying […] or leaving my children hungry". Such

[67] Formal workers may apply for unemployment benefits up to 5 months and sickness benefits during the illness period. This benefit is, however, not available to informal workers.

[68] Specialized on payday loans for pensioners and public officers, Olé is part of Santander bank. In their website, they state "you and your needs are our focus. Therefore, we do not consult SPC/Serasa" – credit ratings agencies. They also state that interest rates are of a maximum 5.5% a month, i.e., 66% a year. While it may not seem so high in comparison to credit card or overdraft rates, these are still above the average showed on Table 4.4, of 24.7% for pensioners and 21.45% for public sector officers.

example illustrates our argument that SOBs do not necessarily provide financial services to improve the well-being of low-income individuals.

Second, a craftswoman from the rural area, P24, claims she has paid over R$40,000 in interest rates to Itaú over 20 years. In 1996, she took a R$700 loan from BEMGE[69] to purchase supplies for her business. She had paid half of the loan when she "suffered a disease I was not expecting at the time, so the raw material wasn't even used. I didn't even work with what I had invested; therefore I couldn't [repay], and delayed the instalments. […] At the time, I was very sick, in a wheelchair, […] and I had no other help. So, I had to deal with it myself, sold what I had, sold my house, sold my goods to treat the disease, to pay for the delayed bills and trying to pay the loan. But it didn't work out". When she tried to negotiate "this amount of R$700, it was R$29,000! And it was interest on interest, and I couldn't solve it. I would go there, negotiate again, started paying […] but if I delayed, they would tell me I had to make a new contract". Therefore, she has "decided that I will no longer pay for this. I am being a slave to this bank, I feel like a slave of this bank".

These experiences are similar to those reported in a qualitative study using focus groups to investigate over-indebtedness in Brazil (Banco Central do Brasil, 2014). Its preliminary results showed that unexpected situations (such as unemployment, medical issues, pregnancy or divorce), lack of financial planning (including impulse shopping and too many instalments) and borrowing on behalf of someone else were the leading reported causes of over-indebtedness. Based on our sample, we confirm that the first factor, in particular health issues and unemployment, were key drivers of over-indebtedness. Therefore, promoting FI in an environment of little to no social protection mechanisms as it is common in many LMICs may also drive the poor into over-indebtedness in the case of an income shock.

4.3.3 Insurance

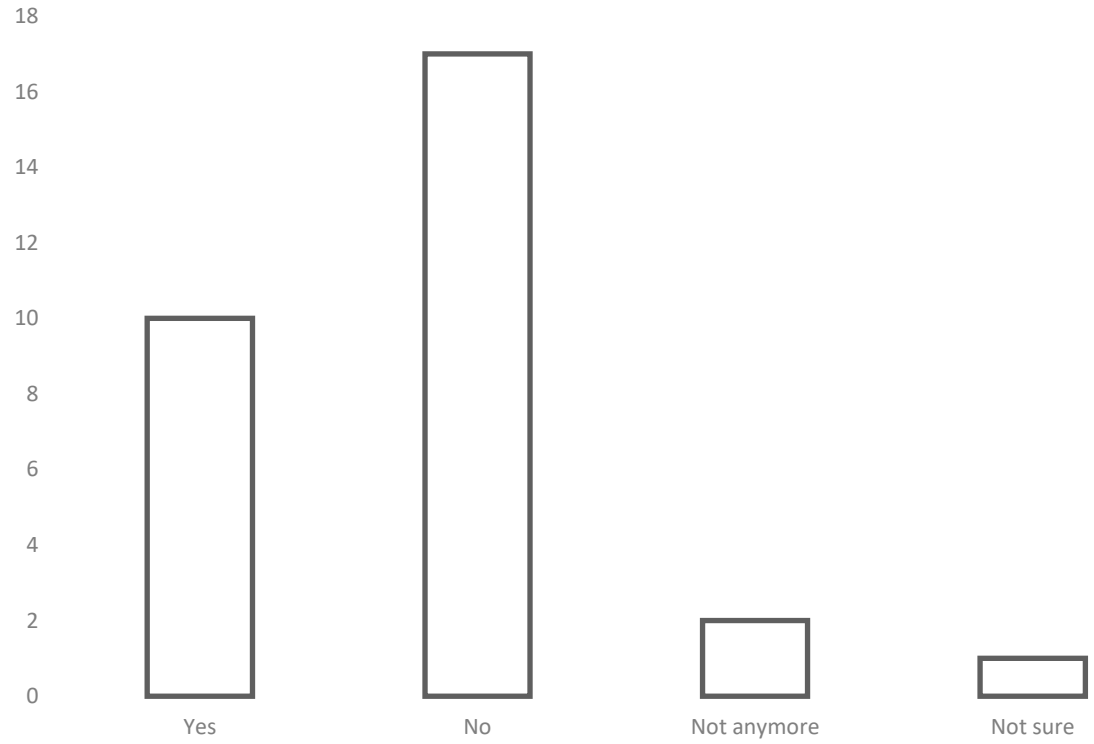
The third relevant instrument in our analysis is insurance. According to the mainstream literature, insurance for the poor can smooth consumption during income shocks, which is necessary for workers that have irregular earnings. However, as discussed in Chapters 2 and 3, low-income individuals often do not have enough income to afford financial instruments such

[69] In 1998, the public bank BEMGE (State Bank of Minas Gerais) was bought by Itaú. More on https://www1.folha.uol.com.br/fsp/brasil/fc15099802.htm

as insurance and would prefer to consume the basics now instead of preventing income shocks in the future.

In Brazil, a common type of insurance is for health care. Whereas the country counts with a public, free and universal health care system, the Sistema Único de Saúde (Unified Health System), those can be quite precarious and require long waiting for non-urgent procedures. Thus, individuals with higher income levels often have a private health insurance. However, among our low-income participants, only a third claimed having health insurance (Figure 4.11). Of those, all were beneficiaries of another relative who had access to it often through their workplace health insurance (P5, P6, P8, P10, P15, P17, P18, P22, P27 and P29).

Figure 4.11: Do you have health insurance?

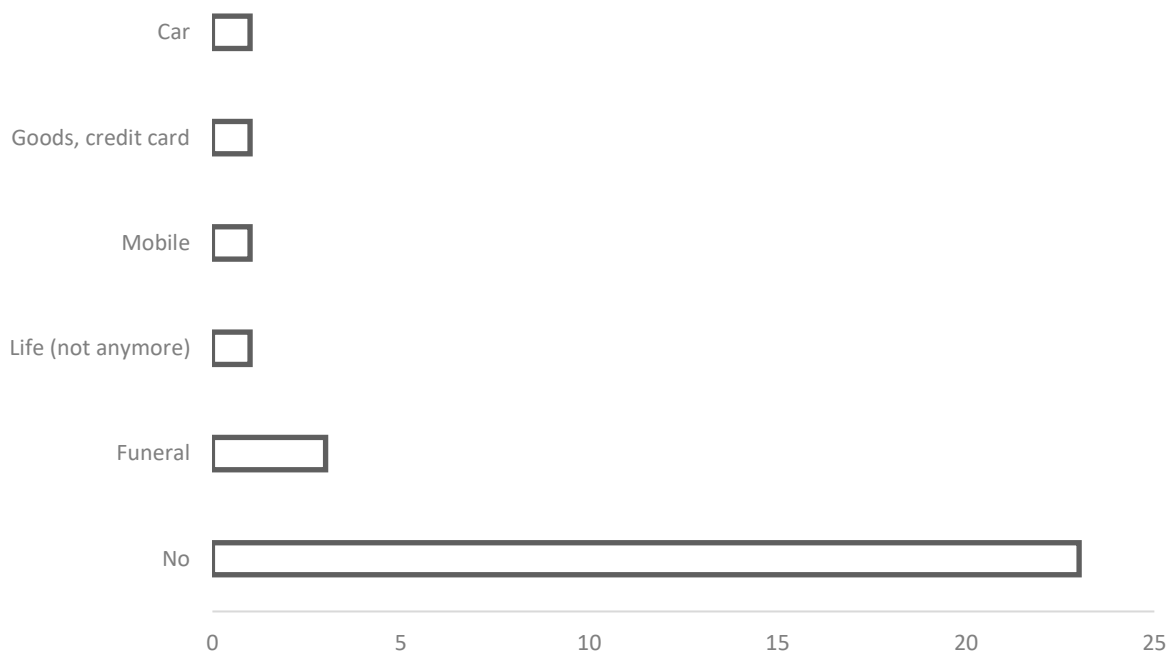


Despite acknowledging the importance of health insurance, they "haven't done yet, precisely because of the income, which is low. There are times that it sells well; there are times that doesn't. We are scared of doing a commitment like this, and I can't do it right now" (P22). Thus, "usually those who have health insurance are the ones with a signed [formal] contract. The company has an agreement with someone else, INSS… [but I don't] because I am not

working formally. And to pay health insurance without working and without being sick [it is not worth it]" (P30).

Besides the low income, irregular income streams create uncertainty, which discourages individuals from acquiring further financial services, in particular insurance. While pensioners and formal workers "think like this 'well, I can do this commitment. If I can't pay, I will have to take from the money that I earn'. Even if he gets tight, eat less rice, less beans, no rice, no beans" (P26), informal workers need to be careful as "today you are working, tomorrow you don't know. So today you earn a salary, tomorrow you don't know" (P2). In fact, only six participants had another type of insurance (Figure 4.12). Those who had more expensive goods, such as car and mobile, would sometimes get coverage for potential theft, but the most common one was for funeral costs, as individuals were afraid of being buried as indigents in case the family would not be able to afford a proper funeral.

Figure 4.12: Do you have another type of insurance?



Such stories support our hypothesis presented in sub-section 3.3.3 in which low-income individuals may not have spare income to afford financial services such as insurance policies. At the same time, we realise that certain types of insurance, such as for health care, has a strong

link to formal employment again, which reinforces the importance of labour market policies for promoting FI in LMICs.

4.3.4 Power relations and enforcement mechanisms

Besides the macroeconomic conditions under which LMICs are inserted, we also discussed the micro-level aspect of FI in Chapter 3. In our three models of deposits and savings, credit and insurance, we concluded that the asymmetric relationship between individuals and financial institutions lead to a position of power of the latter. In our interviews, we wanted to assess this hypothesis. While most participants did not feel that banks have direct power over them, power relations were reported through three enforcement mechanisms: exclusion of credit market, social shame and daily pressure to repay.[70]

To start, some participants denied feeling that the financial institutions have any direct power over them. For them, if they disagree with a policy or fee, they would go to the bank to solve the issue. We noticed that, despite having low levels of formal education, participants had proper financial literacy levels and were aware of their costumer's rights. This finding goes in a different direction of mainstream studies that show that low-income individuals present a general lack of financial education, thus reducing the demand for financial services and causing over-indebtedness (World Bank, 2014; Lusardi and Tufano, 2015; French and McKillop, 2016). In fact, some participants "already had to negotiate. I negotiated a debt that was delayed, I was about two months without paying, so I had to negotiate. But it was chilled. I had no problem" (P1). Usually, the bank would call to offer negotiation and "I conversed; I told my opinion. I do have the means of conversing, talking, questioning. And it worked out. They reduced it [the debt]" (P5). If they had financial means to repay a debt earlier, for instance, they would claim a reduction in interest rates. P2, for example, "financed [her house] with a longer deadline, [but] I had the means to reduce it, so there was a negotiation, and the interest rates went down". Furthermore, if there were unexplained charges, they would "question what is being charged, like 'it was not like that before, why is it like this now?'. If I feel I am being harmed, I can also cancel the account and open at another bank" (P3). For the banks, it is better to negotiate outstanding debt as, according to the Brazilian costumer's protection law, after five years, customers have their bad credit records removed from credit rating database (but

[70] We focus on the credit game model, as there was not enough use of insurance by participants to illustrate this model.

there is no debt cancellation).[71] Aware of such law, P25, despite his negotiation skills, said he would prefer to wait five years to have his name "cleaned" again than repaying the debt. Therefore, we notice that this type of consumer's rights could be a mechanism to reduce the asymmetric relationship between lenders and borrowers in other LMICs, as it seems that awareness of their rights empowers the poor to negotiate with financial institutions.

However, not all participants felt they had the capabilityto negotiate with financial institutions. Some confirmed feeling vulnerable when dealing with banks, as "when you go pay [the loan], not always is what you had agreed on, [they] always create an excuse, and you end up losing" (P21). The argument is that "the bank takes advantage of the opportunity. They go and try to stick more things on the person. And if the person is not careful, if it is not a person who pays attention to things, she will end up taking more things that she wanted" (P5). This issue may be due to the legal wording used in contracts. As many participants have low educational levels, they may feel intimidated by the bank's staff and agree with the contracts without analysing them carefully. Therefore, in order to avoid being deceived, sometimes they "would call someone to help me, even because it is a lot of bureaucracy, many words that sometimes they say and we don't understand, not in our language. We, the poor, arrive and swear a lot![72] Not them, some words that you don't get, words that, for you to get, you need to be with a person who understands it. So, yes, I would call [someone], not by fear, but for not understanding what they are saying and end up creating a riot. Instead of solving it, end up disturbing [the situation]" (P12). In fact, we could also consider the legal language of contracts a further aspect of power from financial institutions. Thus, a potential mechanism to reduce such imbalance could be to enforce financial institutions to provide contracts in simplified language.

Participants' experiences show that, while direct power may be subtle, it is still present through enforcement. We address three recurrent reported mechanisms: the exclusion of credit market, social shame and daily pressures in case of outstanding debts.

First, a bad credit rating prevents participants from taking further credit when in need, which is considered a severe constraint to the poor as it is a pre-requisite for accessing other services, such as utilities. Therefore if "a poor person doesn't have a clean name, at least, to buy things in instalments, things will get complicated" (P23) and "you won't get anything today with a dirty name. Nothing! Not even if you want internet at your house, if you have a dirty name,

[71] Law N° 8.078 of 11 September 1990 from the consumer legislation.
[72] In Portuguese, "let the verb go".

you can't do it. It is very embarrassing" (P18). Moreover, a bad credit rating can restrict further income as "there are many [work] places that don't accept you with a 'dirty name'. If you have a 'dirty name', you won't get a job. You might have an [educational] course, may have it all, but you can't get [the job]" (P23). P24, likewise, says she can't work as a craftswoman with bad credit as "today I am earning little because I don't have the means to invest for me to earn more, because of the lack of name".

Second, outstanding debts also lead to social shame. Some consider "lack of character to owe and not pay" (P9) and that "people will look at you differently, a swindler" (P7). Those who have been through this situation said that "it was embarrassing" (P4) and that "there is nothing more embarrassing than owing and not being able to pay. […] I arrived at the bank, and they talk to us as if we had committed a crime" (P24). Because of that, they "felt shame. It generates a shame in the family", which made her "nervous, sad. I lost sleep, lost appetite" (P10). For them, the name is everything they have got (P1, P7, P13, P18, P23, P24, P29).

Third, participants reported that banks contact them several times a day and are not flexible with the repayment dates and values, which generates stress and increasing wiliness to repay. According to them, banks "call, call and call. But what happens? We are getting a call like 'you have debt; can I schedule a repayment?'. I say 'no, because I don't have [money]'" (P1). They "call in the morning. At lunchtime, they call again, and in the afternoon, they call once more. So, it disturbs people's daily lives" (P3). In the end, "it is so many calls to us that we lose patience! They put psychological pressure on us. When we owe, they call so much and say the same thing, 'will you pay? Which day?'. They want you to schedule a date, so there is pressure" (P5). Because of the "non-stop" calls, some turn off the phone or "would ask my boy to pick up and say there was no one there with that name! Seriously" (P11).

This pressure causes a negative psychological effect on participants. They would feel "insecure. I was worried all the time; if I would be able to pay; if everything would work out fine. It didn't affect my daily life, but when I got home, laid down to rest, these thoughts would come" (P20). Other reported that "just from knowing my name was dirty, I was terrified! [I was] eager to clean it, [as it] made me anxious" (P5). Some even "had to go to a psychologist. I was very stressed, you know? Around this time of *CrediAmigo,* the bank would call, we called each other, cursed, we were tight on the money" (P24).

These three enforcement mechanisms are in line to our theoretical model of credit, in which individuals select a sub-optimal solution due to power imbalances. Because of the stress and

anxiety, most participants would prefer not to owe and pay on time, including “stop buying things for the household in order to repay the store. Sometimes, I had no money left because I had to repay them” (P1). Others would “be in favour of not eating in order to pay the [credit] card or the debt” (P2). Thus, we can affirm that power relations between financial institutions and poor individuals are, in fact, present and may have negative effects on borrowers.

4.3.5 Causal relationship between poverty and financial inclusion

By acknowledging the imposed macroeconomic constraints on FI in LMICs, as well as the power relations between individuals and financial institutions, we gave the first step into investigating the hypothesis that the policy reduces poverty and income inequality in Chapter 3. In turn, in our qualitative research, we tried to understand the underlying mechanisms on the relationship between FI, poverty and income inequality based on the opinions of participants, following the critical realist approach.

In our case study, poverty was not considered a result of lack of financial access. In fact, many participants considered that banking could increase poverty. For them, the roots of poverty were mainly three: income inequality, bad institutions and individual responsibility.

First, one-third of the participants considered that income inequality was the leading cause of poverty. While a person “who is born in a golden crib is not to blame for poverty” (P2), “if the big ones had more love in their hearts, the little ones would not suffer so much” (P9). P3 illustrates this inequality through his work experience. As a glassmaker, he visits different types of houses and “you go through certain places that are very poor, but if you go to a gated community, with houses that for you to go around the house, you get lost”.

Inequality is, however, considered a tradition in the country, and participants felt that there was no solution for it. For them, “the money is poorly divided. And this is not from now, it is since they discovered Brazil” (P30). Inequality is a “chronic problem, [which could be solved by] dividing income. If the income in the country was divided with more humanity, some wouldn’t earn as much as they do, and others wouldn’t earn almost anything. This is the problem of Brazil, and everyone knows it. Everyone who reads knows that the problem in Brazil is income distribution” (P26). Thus, “this is the reality of our life. This goes from generation to generation; this is the reality. That’s poverty, and you can’t outrun poverty. The day you do, it

is only the day you die. Then you outran it. But, yet, you will create problems for who is left, because they have to bury you. This is the reality; there is no way of overcoming it" (P17).

While high income inequality has been a long-term feature of Brazilian society (Fishlow, 1972), programmes to tackle income inequality were introduced in the past two decades. These, however, may display a "distributional ratchet" effect, that is, improvement tends to be temporary, but deterioration tends to be more permanent (Palma, 2011; Palma and Stiglitz, 2016). Indeed, a study using tax information found that, in Brazil, income concentration in the top remained stable from 2006 to 2012, despite the reduction in income inequality in the bottom and middle of the income distribution (Medeiros et al., 2015).

The second group (eight participants) perceived the causes of poverty to be bad institutions, including government corruption. As politicians "govern for themselves, not for the people" (P7), besides "stealing millions" (P30), funds for poverty reduction are scarce. Nonetheless, if "the rulers would think more on the middle class and the poor, peripherical, class" (P12) or "if the government wouldn't steal so much" (P13), they believe poverty could be overcome. Therefore, "from everything the steal, if they would take some to solve a bit of poverty, it would be very nice" (P11), as "depending on the president that is there, if it is a good president, if he knows how to work properly, [poverty] would get better" (P29).

Finally, four participants thought that individual responsibility, due to a lack of education or goals, would be the cause for their impoverished situation. "If the person has some character and has the will to work, he can overcome [poverty]" (P17) and "if the person chases a better life, she could do it" (P25), even if "you can eat today, but not tomorrow, but you get by" (P17). While the government may be seen as a support, it is "also us. […] For example, today I am currently poor. I am not poor; I am just currently poor. Tomorrow, I can have a better situation if I fight for it. We don't have to die in poverty because we were born in poverty. We must have faith in God, work, fight and I am sure it will be solved" (P24).

Bearing in mind these perceived poverty roots, banking was not considered a key solution to fight poverty. In fact, participants often highlighted the limitations of access to finance in reducing poverty. For them, the policy success would depend on individuals' income, financial skills and loan purpose. Otherwise, FI would lead individuals into deeper poverty conditions due to over-indebtedness.

On the one hand, some considered that having access to banking could improve people's income, as long as they had enough money and/or wage as "it is no use to have access to banking, but not having money, a high wage; it depends a lot on the wage. Because they look and if you earn R$1,000, how can you do a R$500 instalment? How will you eat, take medicine, if you need to pay water, energy? There is no way, you can't" (P1). Therefore, just having a bank account would not solve poverty, as "the person would have to have a job, a better dignity, in order to have some money" (P5), especially if there is no particular purpose for it: "how will he have a bank card? What for? To keep it the drawer? If he has no means to use it…" (P27). Thus, if "there is no salary, [the poor] will end up indebted" (P8). This situation can then lead to a bigger problem as "if it is to make debts, they will just be going in a hole. Like an armadillo! Just going in a hole and there is no way out" (P13). Such finding also confirms the importance of formal employment into fostering FI policies in LMICs.

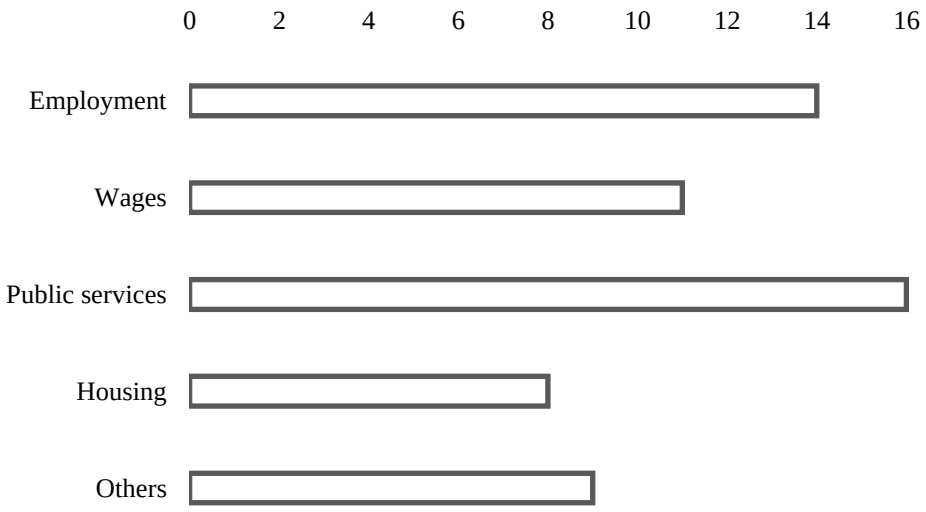
On the other hand, 17 participants thought that access to banking would lead to an increase in poverty, in particular, due to a lack of income and high interest rates. They believe that "the poor without banking is better off" (P19) as they "already don't have anything. If we start with banking, [the situation] will get worse!" (P9).The lack of income and the possibility of losing wealth over time is the first reason participants believe the poor would get poorer by using financial services. P21 thinks a person "would get more [poor] because she will ask for a loan and won't be able to repay". If the poor "doesn't have employment, doesn't have work, how will she pay?". For them, "the economy of Brazil must get better because it is useless for the bank to provide a loan, that he [the poor] won't be able to repay" (P26). Thus, repayment problems may lead to wealth destitution as "dealing with banks being poor is bad. If I get some money to build a house and don't pay it, I will lose the house" (P20).

The second reason, high interest rates, are also seen as impoverishing, as "the bank […] takes you out of suffocation and puts you into an even bigger one, because of the interests, the payment designs. Let's suppose: today you didn't manage to repay your statement. When next month starts, when you go to pay it, you will have to pay twice, and one of the statements will be almost double than it was before, because of interests. [...] So, if me, poor, didn't pay one, when it is the following month, you won't pay the next. […] It will become a snowball and that's it. You won't pay anything anymore, your name is dirty, you can't do anything anymore" (P16). Furthermore, "the banks steal so much, the person would deepen into bills, loans, cards…It would come to a point in which he would be suffocated and would not be able to

afford it" (P18). In conclusion, "the bank will not come and say, 'take this money for you to overcome poverty', they won't do that. They could even bog you down deeper. Like, 'do a loan here, we will help you out. Do a R$200 loan'. In the end, it ends up being R$300, so it is not worth it" (P19). Those perceptions also contribute to our hypothesis that FI might increase poverty, in contrast to what it claimed by the mainstream literature.

Because of these potential drawbacks of FI, participants considered that a better solution for poverty reduction would be through improved employment conditions and public services (Figure 4.14). For participants, in order to help the poor, the government should fund better health care and education, which could reduce these costs to the poor and improve their chances in the labour market, besides creating jobs and establishing higher wages. In sum, "just give a job to a person, and she can handle on her own. For sure, the solution would be to create jobs, educational centres, something like that, to recover those people who believe they are no one in this world. Employment, the basics: health care, education. The least they deserve" (P7).

Figure 4.13: Poverty solution (participants' answers)



Note: Some participants provided more than one possible solution.

Participants' perception that FI is unlikely to reduce poverty and that policies, such as those related to employment and wage, is in accordance with our hypothesis that high informality levels in the labour markets of LMICs are a key determinant of the demand for financial

services. Furthermore, the high interest rates driven by macroeconomic conditions, but also employment status, may contribute to over-indebtedness and impoverishment.

In conclusion, on one side, where the poorest receive less than the minimum wage but pay interest rates around 300% on credit card debts and overdrafts, it is reasonable to suggest that market-led FI may lead to indebted individuals' dispossession. On the other side, financial expropriation allows banks to boost profitability and growth, expanding their oligopoly power and furthering poverty and income inequality in the country. In this context, FI policies are designed to fail the poor.

4.4 Summary

This chapter presented a case study of FI in Brazil, thus contributing with an empirical research to the critical literature on FI. The analysis builds on the previous chapters and analyses the experiences and perception of 30 low-income Brazilians regarding FI, poverty and income inequality. The chapter combined quantitative and qualitative research in order to uncover aspects of the relationship between FI, poverty and income inequality in a LMIC.

The quantitative part describes the structural and macroeconomic constraints of Brazil as discussed in Chapter 3. This thesis suggests that low demand for LMICs' currencies influence interest rates. Furthermore, the high bank concentration in the country also pushes interest spread up. Thus, as in our hypothesis, LMICs are, indeed, constrained by the structure of their financial system. Moreover, we noticed that formal employment is an important factor to establish the demand for financial services, as well as a determinant of loans' interest rates, as we had also stated in our theoretical analysis.

Mirroring the game models developed in Chapter 3, the current chapter gathered evidence of the micro-level relationship between individuals and for-profit banks. First, we noticed that low-income individuals have a preference for free basic bank accounts, as they have little disposable income to afford fee-based current accounts. However, we heard reports that some participants had been tricked in the past by private banks in order to create more expensive accounts, which reinforces our hypothesis of the presence of power relations between individuals and financial institutions. Moreover, the lack of income was also stated to be the main reason for low or no savings, which has also been discussed previously. Whereas we believe that savings might have a positive effect on smoothing income and prevent the

individual from falling into poverty, we noticed that it is unlikely that those who earn around the minimum wage in Brazil will have enough income to save such a significant amount over time.

Second, as already discussed in the microcredit literature, most loans and credit card purchases by individuals are used for consumption. As discussed in section 3.3.2, these types of credit do smooth consumption but do not present return as investment loans. Thus, a failure to repay by the due date often result in over-indebtedness in such an environment of high interest rates. Extreme cases were also reported in the chapter, which shows that such ocurrances are not so rare. The role of power in this credit relation is also very clear, as we notice that participants are afraid of failing payments and producing a "snowball", i.e. a situation that they will never solve. Thus, the poor might prefer not to eat or pay utility bills in order to repay formal loans or credit card balances, as the consequences of not complying with the rules of the financial institutions is perceived as too costly financially, socially and psychologically.

Third, we discussed the access and usage of insurance policies by low-income individuals. Most claimed having a health insurance related to a family member who was formally employed. Such finding reinforces our hypothesis that formal employment is a key determinant of FI. Furthermore, as in the case of savings, most participants stated they did not have enough nor regular income to afford insurance premiums, suggesting once more that the causality might run from poverty to FI.

At last, our interviews also provided evidence on the potential positive effect of FI on poverty as participants report that using financial services might increase poverty due to the high interest rates and the unstable and largely informal labour market.

Moreover, we confirm that income shocks under an environment of a lack of social protection and high interest rates may lead to over-indebtedness of the poorest, which also undermines the potential of FI to reduce poverty. To our knowledge, such bottom-up research strategy to grasp the relationship between poverty, income inequality and FI has never been conducted and, therefore, provides an unique view on such causal relations. In Chapter 6, we utilise such reports, along with our theoretical framework, as the foundation of our statistical analysis.

Chapter 5
Measuring financial inclusion

Chapters 2 and 3 have summarised academic studies arguing that financial inclusion (FI) reduces poverty and income inequality. The empirical literature has often conducted cross-country comparisons to assess the effectiveness of the policy. However, most studies use aggregate data to construct multi-dimensional indexes of FI, which may not fully reflect individuals' access to and usage of the financial system. In order to provide an accurate measurement of FI to assess its effects on poverty and income distribution,this chapter constructs a microdata index using 446,776 observations from the World Bank's Findex dataset. This novel index is employed to econometrically test the effects of FI on poverty and income inequality in the following chapter.

We divide the chapter into six sub-sections: first, we review existing measurements of FI; second, we display the differences between micro- and macro-data analyses of FI; third, we present the dataset; fourth, we discuss the method (multiple correspondence analysis) along with the construction of the micro-level index; fifth, we present the country-level index and compare our results to the existing literature; finally, we summarise our findings.

5.1 Existing measurements of financial inclusion

In Chapters 2 and 3, we presented the theoretical basis of mainstream definitions of FI, which is grounded on the financial development (FD) literature. While FI and FD are primarily linked through their theoretical frameworks, their measurements also often overlap.

FD studies select aggregate variables to capture the depth of financial systems, such as the number of ATMs per 1000km^2 and credit to GDP ratio (Honohan, 2004; Beck et al., 2004; Rewilak, 2017). Cross-country empirical studies on FI use similar macroeconomic variables (Honohan, 2008; Piñeyro, 2013; Chakravarty and Pal, 2013; Amidžić et al., 2014; Sarma, 2016). Nonetheless, as FI targets financial services at the individual level, aggregate data may distort the actual level of FI of a country's population. For instance, private credit to GDP ratios (e.g. as used in Sarma 2016) may be driven by a small number of highly-indebted units and thus imperfectly reflect how many individuals have access to bank accounts or credit

instruments. Table 5.1 displays eight existing studies that have constructed FI multi-dimensional indexes both using aggregate and micro-level data.

The limitations of aggregate indexes are considered by another stream of the FI literature, who uses microdata to evaluate FI. Nevertheless, some of these studies do not provide multi-dimensional indexes. They assess the determinants of FI by performing maximum likelihood estimations with univariate indicators at multiple points in time, such as account ownership, savings or formal credit (Fungáčová and Weill, 2015; Zins and Weill, 2016; Allen et al., 2016; Wang and Guan, 2017). While their findings, e.g. that the poor, self-employed and women have a lower likelihood of having a bank account, are a first step toward understanding certain aspects of FI, analysing single FI indicators in isolation creates difficulties in concluding on the general implications of a multi-dimensional policy.

To address these issues, three studies use a multi-dimensional approach based on micro-economic indicators. Camara & Tuesta (2014) apply principal correspondence analysis (PCA) for analysing the 2011 Findex database, but combine the microdata results to aggregate variables, yielding scores very similar to standard macroeconomic indexes. Aslan, Deléchat, Newiak, & Yang (2017), on the other hand, conduct joint correspondence analysis of the same dataset for 2011 and 2014, but as different variables are selected for each year, the results lack over time comparability. Finally, Koomson et al. (2020) employ the Ghana Living Standards Survey to generate an index using multiple correspondence analysis (MCA). However, as it analyses only one country, it cannot be used for a cross-country analysis.

This thesis aims to overcome two shortcomings of existing micro-data studies of FI: their limitation to make comparisons over time and their use of single indicator analyses. We create a multi-dimensional index of FI employing multiple correspondence analysis (MCA) to reduce the dimensions of 11 categorical variables drawn from the Global Findex database for the years 2011, 2014 and 2017.[73] Using available data for the access to and use of deposits, payments, creditand savings by individuals provided by financial institutions, we hold that FI must encompass all of these aspects, as each of them plays a distinct role in including individuals in the formal financial system.

[73] More on the motivation and particular characteristics of the Findex database can be found in Demirgüç-Kunt and Klapper (2012b).

Table 5.1: Summary of approaches to existing indexes of financial inclusion[74]

	Study	Method	Countries	Variables
1	Amidžić, Massara and Mialou (2014)	Factor analysis; weighted geometric mean	23 to 31	Macrodata (e.g. number of ATMs per 1,000 km^2, number of branches of other depository corporations)
2	Aslan *et al.*, (2017)	Joint correspondence analysis	129	Microdata (e.g. account, debit card, credit card ownership)
3	Camara and Tuesta (2014)	Two-stage principal component analysis	82	Macrodata (e.g. number of ATMs per 1,000 sq. km, commercial bank branches per 100,000 adults) and Microdata (e.g. account ownership, barriers)
4	Chakravarty and Pal (2013)	Axiomatic distance-based approach	India	Macrodata (e.g. number of ATMs per 1,000 km2, credit-GDP ratio)
5	Honohan (2008)	Fitted values (OLS)	162	Macrodata (e.g. number of bank accounts per 100 adults, number of accounts at microfinance institutions per 100 adults)
6	Koomson et al. (2020)	Multiple correspondence analysis	Ghana	Microdata (e.g. ownership of savings account, transactions using ATM)
7	Sarma (2016)	Axiomatic distance-based approach	57 to 128	Macrodata (e.g. number of registered mobile money service providers agents, Total volume of mobile money transactions as % of GDP)
8	Piñeyro (2013)	Principal component analysis	Mexico	Macrodata (e.g. number of branches and banking agents, percentage of illiterate adults, number of technical and legal advice and disputes)

[74] Full details on selected variables and methods of multi-dimensional indexes of FI in Appendix D (Table D.1).

5.2 Measuring FI with macro- vs microdata

First, while aggregated information can be useful for a cross-country and over-time comparison, it can also give an incomplete picture of FI.[75] The use of the number of ATMs and bank branches per 100,000 adults (or per 1,000 km^2) is one example. As many countries have digitalized in recent years, there has been a reduction of this type of physical presence, even in countries with high levels of FI (Sarma, 2016). According to Demirguc-Kunt et al. (2018), 29% of adults used the internet to pay bills or purchase goods online worldwide in 2017 – ranging from 68% in HICs to 11% in LMICs, excluding China. The need for bank branches or ATMs seems to have diminished, so that using it as a measure for individuals' FI could be misleading, especially in HICs.

Second, aggregate variables may not correspond to the actual access and use of the financial system by individuals. For instance, the volume of credit as a share of GDP and other national-level financial development measurements can also be deceptive as credit can be concentrated in large firms, rather than in loans for individuals. Demirgüç-Kunt and Klapper (2013, p.290) compare Vietnam and the Czech Republic as examples. In Vietnam, the amount of domestic credit given to the private sector corresponds to 112% of GDP, while only 21% of individuals have a formal bank account. In contrast, Czech domestic credit to the private sector is 55% of GDP, although 81% of adults have a bank account.

In order to further illustrate these differences, Table 5.2 compares two countries with high level of FI when using microdata (Finland and Sweden) and two countries with high levels of FI in indexes that use aggregate variables (Portugal and Spain) for 2011 and 2014.

As we notice, Portugal displays a higher credit to GDP ratio than Sweden and Finland, even though its population has less access to credit cards and loans from financial institutions. This outcome can reflect that either credit has been mostly designated to firms, or that a few individuals hold large amounts of credit. Similarly, Spain surpassed Sweden in credit card ownership and Finland in formal loans in 2014, but the country lags behind Finland in credit card ownership and Sweden in formal loans, in addition to being slightly behind both countries when it comes to account ownership.

[75] A more detailed discussion about the difference between micro (demand) and macro (supply-side) data of FI can be found in Klapper & Singer (2017).

Table 5.2. Country comparison of selected variables (2011 and 2014)

		Finland		Sweden		Portugal		Spain	
		2011	2014	2011	2014	2011	2014	2011	2014
Macro	Domestic credit provided by financial sector (% of GDP)	189.43	164.41	152.47	156.68	204.79	173.73	248.93	211.25
	Commercial bank branches (per 100,000 adults)	15.09	12.06	21.70	21.10	63.94	53.39	88.22	69.68
	Depositors with commercial banks (per 1,000 adults)	2294.86	2222.02	3856.01	4242.81	2538.17	2358.41	2176.60	1987.04
Micro	Account at a financial institution	98.60	100.00	98.50	99.70	85.31	91.61	92.61	98.30
	Credit card ownership (%)	72.49	68.64	57.04	51.47	39.53	36.07	48.14	63.40
	Loan from a financial institution (%)	22.97	18.40	24.47	28.71	7.95	10.99	11.14	19.88

Portugal and Spain also have at least double the number of bank branches than Sweden and Finland. Such indicator, however, may not necessarily denote a higher level of FI as the latter two countries may have highly automatized systems in which individuals can use bank cards to pay in stores or online, thus not needing the physical presence of banks.

In sum, these examples illustrate how aggregated data may provide an inaccurate view of FI, both in HICs and LMICs. Thus, we consider that the use of micro-level data is more reliable for creating an index that genuinely reflects the level of FI of individuals in any given country.

5.3 Data

The World Bank, with financial support from the Bill and Melinda Gates Foundation, first published the Global Findex database in 2011. Further survey rounds were conducted in 2014 and 2017, yielding a pooled cross-sectional database (Demirgüç-Kunt et al., 2018). Using nationally representative data[76] for 149,761, 146,688 and 154,923 individuals across the three years respectively, the surveys are constituted mostly of categorical variables (yes or no) that included questions on account and credit card ownership, formal savings and credit, as well as different purposes of credit usage. The dataset also provides information on individuals' characteristics, including gender, age, income quintile and educational level.

While some countries have been dropped or added in each survey round, all surveys include HICs and LMICs. Most countries have a sample of around 1,000 individuals per year, but larger countries such as China have a sample size of around 4,000 individuals. In turn, smaller countries, such as Haiti, have a sample size of around 500 individuals.[77]

Among the 18, 44 and 48 questions used in 2011, 2014 and 2017, respectively, we select the 11 main indicators that correspond to the access, credit and savings dimensions, in line with the theoretical hypotheses previously presented in this thesis.[78] This selection allows us not only to assess the access to certain financial services, such as an account or card ownerships but also to consider the usage of such services through loans and savings. Unfortunately, as insurance was only surveyed in 2011, we decided to leave this dimension out of the index as there is no comparative data in subsequent years. Table 5.3 presents the selected variables for

[76] Weights are based on household size, sex, age, education and socioeconomic status and are provided by the Findex dataset (Demirgüç-Kunt and Klapper, 2013).
[77] Further information on data collection can be found at www.worldbank.org/globalfindex.
[78] Description of indicators can be found in Appendix D.1 (Table D.2).

index construction and their respective dimensions. These indicators are binary variables that take the value of 1 if the survey respondent answered yes to this question and 0 if they answered no.

Table 5.3. Selected variables for the financial inclusion index

Dimension	Variable
Access	Account at a financial institution[79]
	Debit card ownership
	Credit card ownership
	Mobile money account[80]
Credit	Loan from a financial institution in the past 12 months
	Loan from a store (store credit) in the past 12 months[81]
	Loan to start, operate or expand a farm or business in the past 12 months[82]
	Loan for school fees[83]
	Loan for health purposes
	Loan for housing purposes
Savings	Savings at a financial institution in the past 12 months

5.4 Method

5.4.1 Multiple correspondence analysis

As in Akotey & Adjasi (2016), Booysen, van der Berg, Burger, Maltitz, & Rand (2008) and Pasha (2017), we employ MCA to construct an index using categorical variables. By imposing

[79] For 2011, there are three variables for account ownership: q1a, q1b and q1, where the latter is a composite indicator. This indicator, however, suffers of several drawbacks, which are explained in Appendix D.2.
[80] For 2011, a new variable was created in order to be comparable to the ones of 2014 and 2017. Further information in Appendix D.2.
[81] Not available for 2017.
[82] Not available for 2011.
[83] Not available for 2017.

fewer constraints on data, MCA is more suitable for the analysis of discrete and categorical variables than PCA, the more common technique for constructing indexes.

Data-driven weights can be particularly advantageous in comparison to other techniques, such as the counting approach, in which normative weights are assigned (Pasha, 2017). In the case of equal weights, this particular technique suffers from "perfect substitutability", which means that an increase/decrease in one variable can be equally offset by a decrease/increase in another one, as they will have equivalent values (Sarma, 2016). Likewise, arbitrary weights hold a judgment value that may not be considered reasonable (Decancq and Lugo, 2013). Thus, after testing such method, we decide on selecting the data-driven weights of MCA.[84]

The first step in MCA is to recode the data using an indicator matrix of dummy variables (Husson and Josse, 2014). An indicator matrix is a table that links individuals and categories. Its elements will be 1 where the category was chosen and 0 otherwise (Greenacre and Blasius, 2006). Unlike PCA, which uses an orthogonalization technique, MCA assigns scale values to each of the categories of a variable and maximizes the variance of those scores, transforming the association between categories and displaying them in a multidimensional space (Dungey et al., 2018). The assigned weights and coordinates in the plots will then be used to generate the scores for each individual.[85]

5.4.2 Data visualisation

We can visualise the relationship between categories and variables using the Findex dataset. Figure 5.1 displays the relationship between the 11 selected indicators for the years 2011, 2014 and 2017.[86] Using the Euclidean space, MCA allows us to project the answers of 446,776 individuals for each category of the indicators. Such cloud of individuals is not visualised directly, as it is found in a high-dimensional space (Husson and Josse, 2014). Instead, we use

[84] Using equal weights for dimensions boosts the real value of credit, as there are several indicators for credit, but not as many for savings, for example. To illustrate the issues of such method, Haiti had better levels of FI than Chile (12.89 to 12.77), which is unexpected due to the development of the financial system in Chile and the higher levels of income. The issue stems from the fact that Haiti has high level of indebtedness (for example, the country has mean of 29.33% for school credit) but low levels of access to bank accounts, debit and credit cards (mean 23.94%, 6.9% and 4.54%). In turn, Chile had higher levels of account ownership, debit and credit cards (56.21%, 44.46% and 27.64%) but low levels of indebtedness (4.69% of indebted for school purposes). Thus, selecting equal weights produced unsatisfactory results.

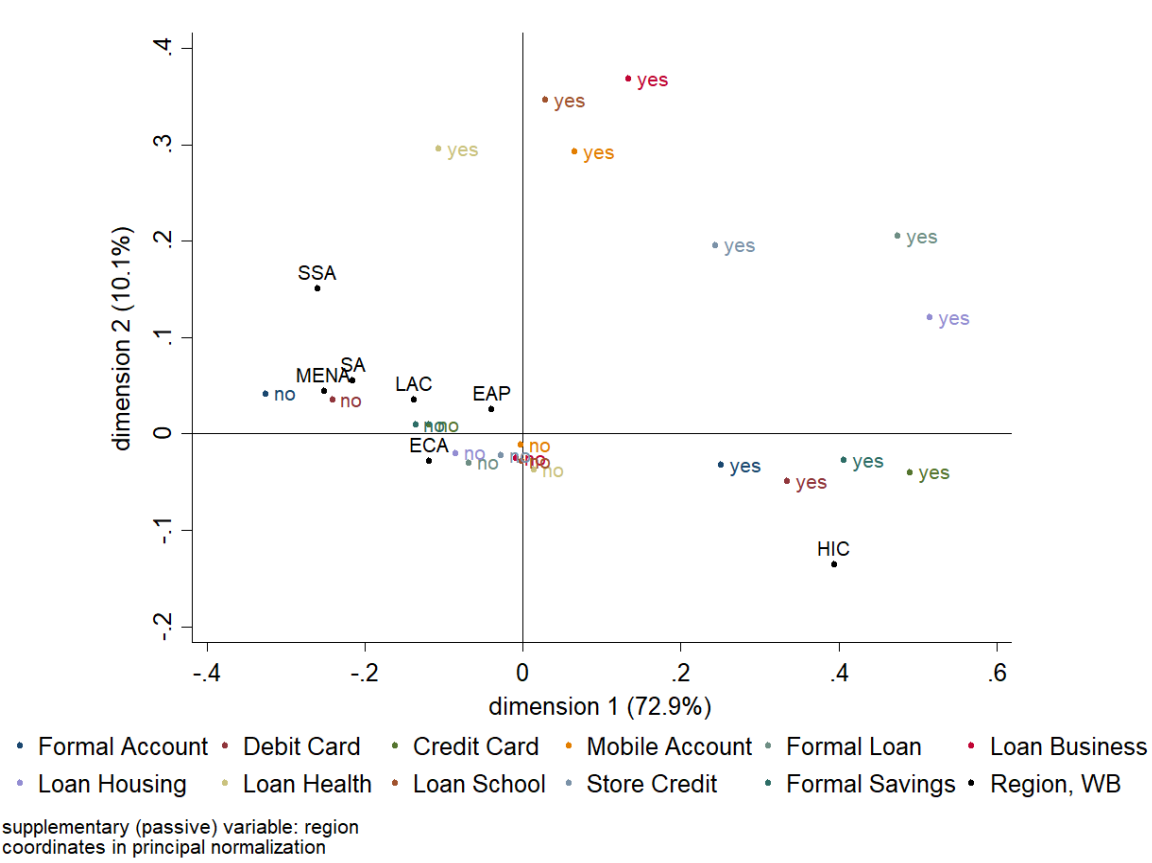
[85] A small-sample illustration of the MCA process using the Findex dataset can be found in Appendix D.3.

[86] In order to establish a comparison to the index values, the x-axis of this plot was negated, which means this is a mirror version of the automatically generated plot.

the categories (yes/no) to understand their relationship. Each category is positioned at the barycentre (average) of individuals' answers. The coordinates themselves do not have an useful interpretation as they are not the response profile of each individual, but the average of the 446,776 participants. Rather, we are interested in the distance between the answers in order to aggregate them into groups.

The horizontal axis (dimension 1) is related to access and savings variables. The more we move to the right, the more an individual has access to basic financial services. The vertical axis (dimension 2) displays credit relationships, where those in the upper quadrants are more indebted.

Figure 5.1: Financial inclusion by region (pooled version)[87]



[87] The abbreviations correspond to World Banks' regions: High Income Countries (HIC), East Asia and Pacific (EAP), Europe and Central Asia (ECA), Latin America and Caribbean (LAC), South Asia (SA), Middle East and North Africa (MENA), and Sub-Saharan Africa (SSA).

The interpretation of the active variables[88] in the plot is straightforward: answers are clustered together if individuals answered yes/no to the same questions. Moreover, frequent answers are placed close to the origin (mean) and rare answers far from it.

Our results show that basic financial services (formal account, debit card, credit card and formal savings) are clustered together in the bottom-right quadrant. This means that individuals tend to use these services jointly. More advanced services, such as store credit, formal loan and loan for housing are rare and are displayed farther from the origin. Likewise, mobile money account and loan for business, health care and school fees are less prevalent and appear at the top of the plot. The plot illustrates that, while certain individuals have access to basic financial services, the majority still have low access and usage of financial services, as those who have answered "no" to several questions are closer to the origin.

By adding world regions as supplementary variables[89], we are also able to see the geographic distribution. Individuals in high-income countries (HIC) have access to more basic services and are less indebted. On the other hand, individuals from sub-Saharan African (SSA) countries have lower access to and use of basic financial services and are more indebted. We suggest that this could be related to the fact that the African continent exhibits very low levels of social protection and health care, as these benefits are mostly confined to formal workers and a high proportion of the workforce are employed in the informal sector (ILO, 2017). Those outside the formal sector may need to make use of other forms of financing medical emergencies, maternity leave or retirement. Likewise, although certain countries, such as Tanzania and Rwanda, have abolished school fees, there are still hidden costs to education, such as uniforms, school supplies and examination fees (Williams et al., 2015; Lindsjö, 2018). Thus, it is plausible that individuals in SSA are more indebted than those in other regions. In contrast, the Middle East and North Africa (MENA) region exhibit lower levels of indebtedness, but individuals still show low levels in the access dimension. This could be partially explained by religious reasons. The region has a considerable Muslim population and within Islam certain financial practices, in particular interest rates, are prohibited if they do not comply with Sharia law (Pearce, 2011; Demirgüç-Kunt et al., 2014; Zulkhibri, 2016).

[88] Active variables are those used to construct the axis and the index, i.e., the 11 financial inclusion indicators.
[89] Also known as "passive" variables, supplementary variables yield additional points to the row or column profiles that have zero mass, so not influencing the result of the active ones (Greenacre & Blasius, 2006).

In summary, this visual representation shows us that, as previously hypothesised, LMICs and HICs are quite different when investigating the access to and usage of financial services. Thus, using theoretical frameworks that are based on a HIC environment should be unable to provide us with an accurate guide to the relationship between individuals and financial institutions, as well as to the effects of the use of financial services on poverty and income inequality reduction. Moreover, our analysis shows that individuals in LMICs are more likely to be indebted to essential social services, in particular health care, which should also be considered when promoting further FI policies in LMICs.

5.4.3 Index construction

MCA is useful not only for the geometric representation it yields but also for its ability to generate scores based on standardization to either rows or columns coordinates (Blasius and Greenacre, 2014). Standard row scores are computed as the row coordinate R for the tth dimension for the ith observation with indicator matrix elements Z_{ih}:

$$R_{it} = \sum_{h=1}^{J} \frac{Z_{ih} X_{ht}}{a\sqrt{\phi_t}} \tag{5.1}$$

where X is the matrix of standard coordinates, a is the number of active variables, and ϕ_t is the eigenvalue of the correspondence analysis on the Burt matrix. However, as we are using principal normalization, we multiply the row score by the square root of the corresponding principal inertia (eigenvalue), so that

$$R_{it} = \sum_{h=1}^{J} \left(\frac{Z_{ih} X_{ht}}{a\sqrt{\phi_t}} \right) \sqrt{\phi_t} \tag{5.2}$$

For the individuals' scores, after generating the row profiles, we pre-multiply by the category-weights of this first axis. Next, we weight the results according to the individual's national representation so that we can reach a single value for each individual in the sample, for each of the three available years. The results are then normalized with values between 0 and 1 and multiplied by 100 to facilitate interpretation.

In order to illustrate the index construction, we show the values of selected individuals in the dataset. Table 5.4 illustrates the key values of our index by presenting the answers of six individuals, their respective weights and the index values before normalization. For instance, our lowest score is from a 28-year-old Japanese woman belonging to the poorest 20% of the income distribution. While several indicators are missing, her negative responses to two of the questions, besides the high nationally representative weight cause her index value to be the lowest in our sample. In contrast, our highest index value is from a 29-year-old Austrian man who is part of the middle 20% of the income distribution with a secondary educational level. Again, while some answers are missing, the positive response to most of the questions, in addition to the high allocated weight, transforms his index value into the highest in our sample.

Table 5.4. Composition of particular values of the financial inclusion index

Closest to	Index value	Negated MCA score	Weight[90]	Year	Country	Indicator										
						Formal account	Debit Card	Credit Card	Mobile money	Formal loan	Store credit	Loan business	Loan school	Loan health	Loan housing	Formal savings
Lowest value	-1.136	- 0.325	3.502	2014	Japan	No	.	.	No	.	.	.	.	.	.	.
25%	-0.123	- 0.125	0.988	2011	Guinea	No	No	No	No	No	No	.	No	No	No	No
Median	-0.000	-0.000	1.133	2011	Russia	No	Yes	No	No	No	No	.	No	No	No	No
Mean	0.018	0.060	0.299	2017	Philippines	Yes	No	No	No	Yes	.	Yes	.	No	No	No
75%	0.116	0.270	0.429	2017	Panama	Yes	Yes	No	No	Yes	.	No	.	No	Yes	No
Highest value	4.039	0.847	4.763	2011	Austria	Yes	Yes	Yes	.	.	Yes	.	.	.	Yes	Yes

Note: Some of the variables are missing due to lack of information, while others are missing because individuals did not answer the question.

[90] Nationally representative weight provided by the World Bank's Findex dataset.

5.5 Country-Level Financial Inclusion

Finally, in order to use our index in a cross-country comparison in the following chapter, we transform the individual-score to an aggregate-level measurement.. In order to construct the country-values, we use the previously generated micro-level index of FI and calculate the simple average over all the individuals of the respective country. Finally, we use the index to construct a cross-country ranking in order to be able to compare our results to the existing literature (Table 5.5).[91] As we can notice, in average, HICs have higher levels of FI than LMICs, however, this does not indicate any causality between income levels and the level of FI. Such analysis will be further developed in the following chapter.

This ranking provides a unique perspective on FI. As argued above, if the purpose of FI is to include individuals, macroeconomic variables that have been used to construct previous indexes may not be suitable. Comparing our results to Sarma's (2016), which is the most complete ranking using only aggregate variables, and Camara & Tuesta's (2014), who mix macro and micro-level data, key differences can be found.[92,93] Table 5.6 presents the comparison among the top 10 countries in both indexes.

[91] It is important to notice, nonetheless, that the scores for HICs are somewhat overestimated for 2011, as debt and mobile phone usage variables were not part of the survey for this group.

[92] Sarma (2016) has data for 2004-2014 and Camara & Tuesta (2014) only for 2011. Variables used in the indexes of such studies can be found in Table D.1 of Appendix D.

[93] A comparison to Aslan et al. (2017) would be more desirable, as they only use the Findex dataset. However, the paper does not provide enough information on the scores for FI, nor does it rank countries.

Table 5.5. The Global Ranking of Financial Inclusion (GRFI)[94]

Rank	GRFI 2011	Score	GRFI 2014	Score	GRFI 2017	Score
1	Sweden	1.000	Norway	1.000	Norway	1.000
2	New Zealand	0.961	New Zealand	0.948	Canada	0.939
3	Finland	0.943	Canada	0.933	New Zealand	0.881
4	Australia	0.935	Sweden	0.920	Sweden	0.881
5	Canada	0.920	Finland	0.890	Luxembourg	0.865
…						
50	China	0.381	Macedonia	0.442	Chile	0.449
51	Brazil	0.361	Saudi Arabia	0.441	Bulgaria	0.438
52	Saudi Arabia	0.360	Greece	0.441	Hungary	0.436
53	Serbia	0.357	Jamaica	0.432	Venezuela, RB	0.425
54	South Africa	0.351	Serbia	0.430	Uruguay	0.423
…						
140	Madagascar	0.013	Burundi	0.022	Afghanistan	0.021
141	Burundi	0.011	Madagascar	0.019	South Sudan	0.011
142	Guinea	0.010	Niger	0.000	Chad	0.008
143	Congo, Dem. Rep.	0.006			Madagascar	0.006
144	Niger	0.000			Niger	0.000

[94] Full ranking in Appendix D.4 (Table D.6).

Table 5.6. Ranking comparison

Year	2011			2014	
Rank	GRFI	Sarma	Camara & Tuesta	GRFI	Sarma
1	Sweden	Switzerland	Korea	Norway	Switzerland
2	New Zealand	Portugal	Spain	New Zealand	San Marino
3	Finland	Spain	Portugal	Canada	Japan
4	Australia	Japan	Belgium	Sweden	Portugal
5	Canada	United Kingdom	Japan	Finland	Malta
6	Denmark	Malta	Canada	Australia	Spain
7	Netherlands	Korea	France	United Kingdom	France
8	Luxembourg	France	United States	Luxembourg	Belgium
9	United States	Greece	Australia	Denmark	Greece
10	Belgium	Belgium	New Zealand	Israel	Russia

A critical issue to note when drawing this comparison is that highest-ranked countries in our GRFI, including Sweden and New Zealand, are not part of Sarma (2016). Countries with leading financial centres, such as the United States, Luxemburg or Singapore, are also not present in the study.[95] Second, by selecting aggregate variables to analyse individuals' FI, results are inflated for several countries, in particular Portugal and Spain. One reason for this inflation is that the shrinking of GDP in these countries during the economic crisis positively affected their credit to GDP ratios, and, in turn, boosted their index values. Another one, as discussed above, is the high number of bank branches in these two countries.

When comparing the GRFI to Camara & Tuesta's (2014) ranking, we find that their usage dimension is quite similar to that used to come to our results, as they also select 2011 Findex information to construct the first part of the index (top countries are New Zealand, Sweden and Finland). However, the final ranking includes macroeconomic variables, which results in a similar

[95] According to the Global Financial Centres Index, the world's top financial hubs were London, New York, Hong Kong and Singapore in 2011 and 2014.

ranking as Sarma's (2016). The highest-ranked countries in their study are Korea, Spain and Portugal. Sweden and Finland, on the other hand, are found down at the 16th and 19th positions.

A more precise comparison can be conducted through the Spearman's rank correlation (*rho*) and Kendall's rank correlation (*tau*). Using these correlations, Sarma's index and the one provided in this article had 101 countries in common for their 2011 rankings. The rankings displayed a Spearman's rho of 0.84 and Kendall's tau of 0.64, both significant at the 1% level. For 2014, the indexes had 86 countries in common, with a rho of 0.74 and tau of 0.54, both also significant at the 1% level.

These results suggest that, while there is a positive and sometimes strong correlation between the two indexes, there are still significant differences between them. That is, in both indexes, HICs are ranked higher than LMICs. However, the ranking of these sub-groups is ordered differently because of variable selection. Thus, this comparison indicates that, while indicative of the level of financial development of a country, macroeconomic variables do not give the same results as when one uses financial inclusion microdata. Thus, in order to assess an accurate relationship between FI, poverty and income inequality, it is necessary to use this microdata index.

5.6 Summary

This chapter has developed a novel index of financial inclusion using micro-level information. Employing multiple correspondence analysis, we generated index scores for 446,776 individuals in about 150 countries for the years 2011, 2014 and 2017 using the World Bank's Findex dataset. Furthermore, the index was transformed into a country-level score to be used to construct a Global Ranking of Financial Inclusion (GRFI), allowing for an over-time and a cross-country comparison.

The chapter has two important insights. First, it confirms the proximity of mainstream financial inclusion to the financial development literature. Not only are those extremely connected through their theoretical foundations, we showed that they are also measured using very similar (sometime the same) aggregate variables. Therefore, if FI is a novel policy that is able to reduce poverty and income inequality, but it is theorised and measured as FD, there seems to be a lack of novelty in such policy. Such finding confirms the need for a new theory of FI and a new measurement, which has been provided in Chapters 3 and 5.

Second, the multiple correspondence analysis both visually and through the generation of country-level measurements, has unveiled the strong differences between LMICs and HICs. In Chapter 3, we hypothesised that such differences could be due to three main factors: the currency hierarchy, the oligopolistic nature of the financial system in LMICs and the large informal labour market in LMICs in comparison to HICs. Whereas, so far, we were unable to confirm if such hypotheses determine FI in those regions, we have showed that, in average, individuals from LMICs have less access to basic financial services but are, at the same time, more indebted.

Overall, our analysis has demonstrated the advantages of micro-level data to measure FI. Our new microdata-based country-level measure of FI constitutes the first step towards a dynamic comparison of FI across countries and their relation to poverty and income inequality, which is provided in the following chapter.

Chapter 6
An econometric analysis of the effects of financial inclusion on poverty and income inequality

In previous chapters, we noticed the importance of macro-economic conditions and market structure variables for financial inclusion (FI). In Chapter 3, we discussed three key macro-economic and structural differences between HICs and LMICs. First, LMICs are characterised by a high rate of labour market informality, which reaches over 90% of total employment in some countries in Sub-Saharan Africa and Southeast Asia. Second, oligopolies formed by for-profit banks in the financial industry are an important feature in LMICs, more so than in HICs. Countries such as Turkmenistan, Sierra Leone and Iran display a bank concentration of 95% or higher. This factor may lead to higher lending rates and expensive financial services. Finally, according to the currency hierarchy hypothesis, LMICs' currencies display lower quality than core currencies, such as the US dollar and the Euro. This subordinated position pushes central banks to increase nominal base interest rates in order to keep demand for the local currency. Such policy increases banks' lending rates, thus inflating the costs of FI in LMICs.

The findings in Chapter 4 complemented our theoretical discussion, as participants reported that employment status and high interest rates were significant determinants of demand for financial services. First, we noticed that unemployed and informal workers report a lack of need and use of financial services, either due to lack of income or the high prices of financial services. This find is also similar to the one presented in the Findex dataset. In 2017, 64.63% and 29.99% of participants reported not having a bank account due to lack of money or its high prices, respectively (Table 1.1). Second, many participants claimed loan interest rates were "abusive" and could generate a "snowball" effect, thus leading to over-indebtedness and wealth destitution. When asked on whether they considered if access to banking could lead to poverty reduction, most of them gave a negative answer or claimed it could only be possible under stringent conditions, such as a having formal employment or receiving high wages.

The theoretical and qualitative study directed us to answer our last two research questions:

RQ2: What is the causal relationship between poverty, income inequality and financial inclusion?

RQ3: What are the effects of financial inclusion on poverty and income inequality?

Based on the previous exercises, we develop an econometric model that focuses on the particularities of LMICs. The estimation of the model is expected to test two hypotheses. First, unlike the mainstream argument that FI reduces poverty and income inequality, we suggest that the reverse mechanism is more relevant, that is, poverty and income inequality have a more substantial impact on FI. In this case, a reduction of poverty and income inequality may boost FI. Second, we expect FI to have a positive or statistical insignificant effect on poverty and income inequality in LMICs. This outcome would be explained by the inherently high interest rates, the bank concentration and the shift of wealth from the poor to the rich.

This chapter aims to contribute to the existing literature in two ways: first, by employing a microdata-based index of FI to assess its causal relationship to poverty and income inequality; second, by selecting variables stemmed from the Post-Keynesian theory and the case study results in order to evaluate the effects of FI on poverty and income inequality, as well as the effects of other policies on these development goals.

6.1 Existing research

While FI has been promoted as a development tool to reduce poverty and income inequality, few cross-country empirical studies have been conducted in order to provide evidence for such a claim. In the mainstream literature, three key issues undermine the effectiveness of the results: (i) the theory-based selected variables, (ii) the measurement of FI, and (iii) the omission of the potential simultaneity bias.

First, existing studies are grounded in mainstream theories, in particular the financial development (FD) literature, as presented in Chapters 2 and 3. This connection is also evident regarding variable selection as presentend in Chapter 5. Selected control variables are frequently related to country-level measures of human capital (such as literacy levels), trade openness, rule-of-law, inflation and infrastructure. Kim (2016) is an exception, as the study includes variables that could determine the level of income inequality, such as taxation and social expenditure. In this thesis, we partially follow Kim (2016), but we add further control variables in line with the Post-Keynesian (PK) literature on the macroeconomic market structure.

Second, five out of seven studies that analyse the relationship between FI, poverty and income inequality use Sarma's (2008) index of FI (Kim, 2016; Park and Mercado, 2018; Turegano and Garcia-Herrero, 2018; Sethi and Acharya, 2018; Dahir, 2019).[96] As discussed in Chapter 5, macro-level variables such as ATM per 1,000 individuals and credit to GDP ratio, might be good proxies for FD measurement, but not for FI. A more accurate measure of FI must utilise individual-level information in order to assess its effects on the reduction of poverty and income inequality.

Two studies employ microdata indexes to assess the effects of FI on poverty and income inequality. Aslan, Deléchat, Newiak, & Yang (2017) present a partial solution to this issue by generating an index of FI inequality for 2011 using the Findex dataset. They estimate the effects of FI inequality on income inequality, measured by the Gini coefficient. However, the study does not assess the effects of FI itself, but rather inequality in access to and usage of FI. Moreover, the study only uses data for 2011, overlooking the information from 2014 and 2017. Koomson et al. (2020) follow their work and generate a microdata index for FI in Ghana using multiple correspondence analysis (MCA). Results show that, in the country, FI reduces poverty. Nevertheless, the authors' do not negate the axis as it was done in this thesis, which means that positive answers are considered negative values.[97] This issue suggests that the results may be the opposite, i.e., that FI increases poverty in Ghana.

[96] Full details of cross-country studies on the relationship between FI, poverty and income inequality can be found in Appendix E.1.

[97] In the article's Appendix 1, we notice that the individuals who answered "yes" to FI variables, such as bank account ownership, are given a negative value. This generates opposite results when estimating the effects of such index on poverty, as an increase in the FI index would represent a smaller level of FI.

Third, the simultaneity issue is not addressed in any cross-country study to date.[98] While it may be the case that FI reduces poverty and income inequality, it is also possible that a reduction in poverty and income inequality levels would also enhance the level of FI, as individuals would have more disposable income to use financial services. Thus, current results may be biased.

In sum, existing results conclude that FI reduces income inequality[99] and poverty. This is expected from studies that employ aggregate measurement of FI, as the FD literature has already established that aggregate finance reduces income inequality and poverty, besides boosting economic growth (King and Levine, 1993; Levine et al., 2000; Honohan, 2004; Beck et al., 2004).[100] However, studies that employ microdata indexes also reach similar conclusions, but these suffer from a lack of robustness due to the selection of only a single year, as well as measurement issues. This chapter aims to overcome these issues by estimating the relationship between FI, income inequality and poverty using a microdata-based measurement. Moreover, by using instrumental variables (IV) to correct for the simultaneity bias, we address the shortcomings of previous studies.

6.2 The simultaneous equations model

To address these critical shortcoming in existing studies that estimate the effects of FI on poverty and income inequality, we implement three modifications in the prevailing empirical models. First, instead of following the FD literature, we base our control variables selection in the PK theory and the findings from our case study. Second, we employ the Global Ranking of Financial Inclusion (GRFI), which is based on individual-level data, as a proxy on the country-level of FI in order to estimate its effects on poverty and income inequality. Finally, we correct for simultaneity bias in our model using instrumental variables.

[98] Simultaneity bias is further discussed in section 6.3.

[99] With exception of the full model (Model 6) in Dahir (2019), which shows an increase in income inequality. The author, however, reports only the results of Model 1, where FI decreases income inequality but results are not statistically significant.

[100] It is important to highlight that such studies focus on the role of finance to firms, not households.

6.2.1 The three equations

In order to answer RQ2 and RQ3, we consider three equations. In Equation 6.1, FI is determined by poverty (pov) and income inequality ($ineq$), besides control variables (a) grounded in the PK theory and findings of our case study.[101] We include four control variables. First, the central bank interest rate ($cbint$) acts as a proxy for currency hierarchy. According to this hypothesis, LMICs must set higher $cbint$ in order to attract capital, as the high volatility and low quality of currencies reduce the demand for national currency (Herr, 2008; Carneiro and Rossi, 2013; Conti et al., 2014; Bortz and Kaltenbrunner, 2018). As the $cbint$ serves as a base rate for commercial banks loans to household and firms, we expect $cbint$ to reduce FI. Second, bank concentration ($bcon$) is used to assess if our hypothesis that oligopoly in the financial market increases the costs of financial services, thus reducing FI.[102] Third, self-employment to total employment ratio ($self$) serves as a measurement of whether self-employed workers have less access to financial services, as reported by our participants in our case study. We expect that an increase in self-employment will reduce the level of FI. Fourth, we add a variable to account for the employment rate ($work$), as workers may display a higher demand for financial services. Finally, we add dummy variables for years to control for time-specific effects.

$$FI_{it} = \beta_0 + \beta_1 pov_{it} + \beta_2 ineq_{it} + \beta_k a_{itk} + u_{it} \tag{6.1}$$

Acknowledging the possibility that FI might impact poverty and income inequality, as per the mainstream literature, we face a simultaneity issue. As we might have simultaneity in the relationship between FI, poverty and income inequality, we must consider two further equations:

$$pov_{it} = \beta_0 + \beta_1 FI_{it} + \beta_k b_{itk} + u_{it} \tag{6.2}$$

[101] A detailed outlook of the dataset is presented in the following sub-section.

[102] The bank concentration measurement displays a drawback, as there is no distinction between state-owned and private banks. This point will be further discussed in the results section (6.4).

Based on the existing literature, poverty is determined by FI, the self-employment ratio, GDP growth, literacy rate, public social protection expenditure and urban population ratio. We expect that self-employment and poverty will have a positive relationship, as self-employed workers have reduced income and no formal employment benefits (Chen et al., 2006; Tassot et al., 2019). In turn, GDP growth, should have a negative effect on poverty, as it is expected increase the income of the poorest according to empirical research (Ravallion, 1995; Ghura et al., 2002; Dollar and Kraay, 2004). Education should also display a negative effect on poverty (Mukherjee and Benson, 2003; European Commission, 2010; Rahman, 2013). Thus, we add literacy rates as a proxy for the level of education in a country. Social protection and poverty are expected to have a negative relationship, as basic income and other social benefits may reduce poverty levels (Jefferson and Kim, 2012). The variable urb accounts for the differences between urban and rural population, as research shows that rural areas are, in average, poorer than urban regions (Mukherjee and Benson, 2003; Rahman, 2013; UNCTAD, 2015; Lekobane and Seleka, 2017; Tassot et al., 2019). Finally, we add time variables to this equation as well.

Lastly, we provide an equation for income inequality (Eq. 6.3). Here, income inequality is determined by FI, GDP per capita, social expenditure, self-employment, gross capital formation as percentage of GDP and the tax revenue as percentage of GDP of each country. First, we use GDP per capita and its squared value as the literature shows a inverted-U relationship between income level and income inequality (Kuznets, 1955; Deyshappriya, 2017). Social expenditure is expected to act a redistributive policy, thus reducing income inequality (Odedokun and Round, 2001; Tridico, 2018). Self-employment, in turn, would increase income inequality as workers would earn less and would not have the possibility of organising to increase their income share, such as through trade unions (Tridico, 2018). Gross capital formation has also shown a negative effect on income inequality (Sarel, 1997; Maldonado, 2017; Bucevska, 2019). Finally, we use the tax revenue as a proxy for redistributive policies and expect them to have a negative effect on income inequality (Roine et al., 2009; Martorano, 2018)

.

$$ineq_{it} = FI_{it} + \beta_{\mathrm{k}} c_{itk} + u_{it} \tag{6.3}$$

As we assume a potential simultaneous relationship between FI, poverty and income inequality, ordinary least squares (OLS) is biased and inconsistent. Thus, we solve this issue by implementing panel-data instrumental variables.[103]

6.2.2 Addressing simultaneity and causality

Simultaneity is a form of endogeneity of the explanatory variables, which arises when one or more of the explanatory variables is jointly determined with the dependent variable. The nature of a structural equation in a system of simultaneous equations, also known as simultaneous equations models (SEMs), indicates a correlation of the explanatory variable with the error term. Thus, applying OLS to solve SEMs leads to bias and inconsistent results (Wooldridge, 2012, chap. 16).

Within the empirical literature on the effects of FI on poverty and income inequality, no study explicitly acknowledges the potential simultaneity bias. Nevertheless, four studies mention possible endogeneity problems, without discussing them in depth (Kim, 2016; Park and Mercado, 2018; Le et al., 2019; Koomson et al., 2020). Kim (2016) addresses the endogeneity of income inequality by generalised method of moments (GMM) but does not consider the endogenous characteristic of FI. It also does not justify the nature of the endogeneity, so we are unable to compare such study to ours. Next, both Park and Mercado (2018) and Le et al. (2019) recognise the potential endogeneity of FI in their models, but only the latter addresses the issue by utilising two-stage least squares (2SLS) method. Results show a substantial and statistically significant negative effect of FI on income inequality. However, FI is measured by aggregate variables (using principal component analysis and Sarma's (2016) distance-based approach). Therefore, we consider that FI in this study is based on FD variables and does not correspond to individual-level FI. The study also does not consider the reverse causality, i.e., that income inequality may affect FI. Finally, Koomson et al. (2020) consider the endogeneity of FI and use three-stage feasible generalised least squares (3SFGLS) to address the endogeneity bias. However, the nature of endogeneity is also not discussed. Table 6.1 resumes these four studies, their selected methods and instruments.

[103] To be further discussed in sub-section 6.3.

Table 6.1 Endogeneity issue

Study	Endogeneity acknowledged	Tests	Method	Instruments	Endogenous variables
Le et al. (2019)	Yes	Sargan; Cragg-Donald Wald F	2SLS	Lagged FI and lagged GDPPC	FI and GDPPC
Kim (2016)	No	N/A	GMM	Social transfer to GDP ratio	Gini coefficient
Koomson et al. (2020)	Yes	Wald	3SFGLS	Distance to the nearest bank	FI
Park and Mercado (2018)	Yes	N/A	N/A	N/A	FI

As in Le et al. (2019), we select the 2SLS method.[104] The method consists of selecting an exogenous variable, i.e., an instrumental variable, that is correlated to the endogenous explanatory variable, but it is not correlated with the error term. In other words, the instrument must be relevant and exogenous (Greene, 2012, chap. 8). We also use GMM as a robustness test. While GMM is necessary with dynamic unobserved effects panel data models, GMM improvements are small in comparison to 2SLS that corrects for heteroscedasticity or serial correlation. In fact, in cross-section regressions, point estimates and statistical significance between 2SLS and GMM are very similar, even under heteroscedasticity (Wooldridge, 2001). As we will show next, due to the short period in our dataset (2011, 2014, 2017) and the low variance over time, results using between-effect are more appropriate. Thus, applying 2SLS instead of GMM should display alike results.

Besides overcoming bias and inconsistency, we aim to find causal relationships between FI and poverty and income inequality. When applying OLS, we refer to conditional expectations, not causal inference:

> "Put differently, when we interpret the model as a conditional expectation, the *ceteris paribus* condition only refers to the included variables, while for a causal interpretation it

[104] More precisely, we use the Generalised 2SLS (G2SLS) from Balestra and Krishnakumar (1987), where the exogenous variables are used after being transformed through feasible GLS. The method is more appropriate for random-effects model.

also includes the unobservables (omitted variables) in the error term" (Verbeek, 2008, chap. 5).

This means that, in order to answer our RQ2 on causality, we must investigate the error term and address its correlation to the endogenous variables. In this case, structural equation models characterised by simultaneity are an adequate choice as "each equation represents a causal link, rather than a mere empirical association" (Goldberger, 1972, p.979).

In our SEM, equations 6.1, 6.2 and 6.3 are autonomous, i.e., each has an economic meaning in isolation from the other equations in the system. Moreover, each SEM equation represents a causal relationship as the change in an explanatory variable (including endogenous ones) has a direct interpretation when holding other variables fixed (Wooldridge, 2002, chap. 9). Thus, by applying 2SLS, we can consider a causal effect of FI on poverty and income inequality, as well as income inequality and poverty on FI.

6.3 Data

6.3.1 The dataset

To start, we present an outlook of the ten selected variables that are used to estimate our three models (Table 6.2). Whereas the FI variable has been generated in the previous chapter utilising the Findex dataset, other variables have been retrieved from international institutions' database, such as the World Bank and the ILO.

We notice that six variables display a drop in the number of observations when aligned to our FI variable: Gini, central bank interest rate, literacy, social expenditure and taxation. Therefore, in order to enlarge the sample size of our estimations, we utilise different approaches to missing data. We discuss how we handled missing values for each of the variables separately.

Table 6.2: Summary of selected variables

Name	Variable	Measurement	Total observations	Observations (FI≠0)	Source
FI	Financial inclusion	Normalised index of FI	427	427	Chapter 5
pov	Poverty	Poverty headcount ratio at $1.90 a day, 2011 PPP (% of population)	1,099	167	World Bank
$ineq$	Income inequality	Gini coefficient	1,489	233	UNU-Wider
$cbint$	Central bank interest rate	Central bank interest rate (%)	1,486	193	IMF
$bcon$	Bank concentration	Assets of largest three banks to total banks ratio	2,529	405	World Bank
$self$	Self-employment ratio	Self-employed, total (% of total employment)	3,140	424	World Bank
urb	Urban population	Urban to total population	2,983	424	World Bank
lit	Literacy	Literacy rate, adult total (% of people ages 15 and above)	654	119	World Bank
$growth$	GDP growth	GDP growth (annual %)	3,089	422	World Bank
$gdppc$	GDP per capita	GDP per capita, PPP (constant 2011 international $)	3,044	418	World Bank
gkf	Gross capital formation	Gross capital formation (% of GDP)	2,848	414	World Bank
soc	Social expenditure	Public social protection expenditure (% of GDP)	886	117	ILO/OECD
tax	Taxation	Tax to GDP ratio excluding social contributions (%)	1,941	279	UNU-Wider

Note: All variables measured from 0 to 100, with exception of $cbint$ (-0.75 to 105.83), $gdppc$ (630 to 115,415) and gkf (-3.74368 to 85.1013).

6.3.2 Handling missing values

Gini coefficient, poverty ratio, literacy and social expenditure

After an extensive selection of information from the UNU-Wider dataset,[105] the first step was to add further information from the World Bank dataset, which results in only seven additional observations. Assuming that income inequality changes slowly over time, we decide to first add missing information by cubic interpolation. If the value of 2011, 2014 or 2017 is missing, a smooth measurement is added based on two previous and following observations. Such procedure yielded only further 24 observations. The small addition is due to the fact that, through cubic interpolation, there must be two values before and after the missing value, so that missing variables for 2017 are often not addressed. Because of that, we also handle missing values through nearest neighbour interpolation. Using this method, we added another 153 observations. Finally, countries without information of Gini coefficient were excluded from the analysis. This was the case of Belize, Kuwait, Oman, Turkmenistan, and Trinidad and Tobago. To illustrate the full procedure, Table 6.3 presents cubic and nearest neighbour interpolations for Chile and Cameroon.

The same method is used for the poverty ratio and literacy. Data were retrieved from the World Bank datasets but was incomplete. As before, we use cubic interpolation to handle missing values, which only added 16 and 37 observations, respectively. Thus, we utilise the nearest neighbour interpolation, which added another 191 and 234 values each.

Finally, we address the missing values of social expenditure. After adding the information from the ILO database, we merged it to the OECD dataset, which provided another 38 observations. Cubic interpolation included 36 observations to the years 2011, 2014 and 2017, and was helpful to provide more specific values when using the nearest neighbour interpolation. The latter added further 208 observations.

[105] The details on the selection of Gini coefficients for each country and year are displayed in Appendix E.2.

Table 6.3: Interpolation of Gini coefficient for Chile and Cameroon

	Chile			Cameroon		
	Merged	Cubic interpolated	Nearest neighbour	Merged	Cubic interpolated	Nearest neighbour
2000	54.6	54.599998	54.599998	.	.	42.139999
2001	.	.	54.599998	42.14	42.139999	42.139999
2002	.	.	52.799999	.	.	42.139999
2003	52.8	52.799999	52.799999	.	.	42.139999
2004	.	51.735802	51.735802	.	.	42.48
2005	.	50.686419	50.686419	.	.	42.82
2006	49.8	49.799999	49.799999	.	.	42.82
2007	.	49.654443	49.654443	42.82	42.82	42.82
2008	.	49.645832	49.645832	.	.	42.82
2009	49.6	49.599998	49.599998	.	.	42.82
2010	.	49.147143	49.147143	.	.	42.82
2011	48.7	48.700001	48.700001	.	.	46.639999
2012	.	48.43125	48.43125	.	.	46.639999
2013	48.3	48.299999	48.299999	.	.	46.639999
2014	.	48.568749	48.568749	46.64	46.639999	46.639999
2015	48.5	48.5	48.5	.	.	46.639999
2016	.	.	46.950001	.	.	46.639999
2017	45.4	45.400002	45.400002	.	.	46.639999
2018	.	.	45.400002	.	.	46.639999
2019	.	.	45.400002	.	.	46.639999

Central bank interest rate

Policy rate had 234 missing observations. To handle this issue, we took three steps. First, we add the policy rate of the European Central Bank, which was absent from the dataset. This increased observations from 193 to 247. Second, we substituted the interest rates of four dollarized countries in 2011, 2014 and 2017, namely El Salvador, Puerto Rico, Ecuador and Zimbabwe, adding another 12 observations. Third, we added information of remaining missing values by checking the official central bank source and, when this step was not possible, data was added through information from secondary sources.[106] In the end, we reached 415 observations.[107]

6.4 Model selection

In this sub-section, we start by displaying the correlations between FI, poverty and income inequality and the above-mentioned control variables. Next, we show the tests we have conducted in order to select the best model for our estimations. We proceed to discuss the necessary instruments to provide unbiased estimations and causal effects.

6.4.1 Correlations

We start by presenting a Pearson correlation of all variables (Table 6.4). First, we notice that FI has a negative correlation both with respect to poverty and income inequality. Yet, causal effects cannot be concluded from it. Central bank interest rates and self-employment are also negatively correlated to FI, which is expected from our theory discussion. In turn, bank concentration and work (i.e., employment) have unexpected signs. It is also interesting to notice that FI also has strong correlations with GDP per capita, literacy, social protection, urbanisation and taxation.

[106] Full details are displayed in Appendix E.3.

[107] Data was unavailable for Somalia and Turkmenistan.

Table 6.4 Pearson correlations

	FI	pov	$gini$	$cbint$	$bcon$	$self$	$work$	$growth$	lit	soc	urb	$gdppc$	gkf	tax
FI	1													
pov	-0.4741	1												
$gini$	-0.3088	0.282	1											
$cbint$	-0.3473	0.3046	-0.0219	1										
$bcon$	0.0632	0.0635	-0.0231	-0.2055	1									
$self$	-0.6662	0.6531	0.2696	0.2958	-0.0054	1								
$work$	-0.2114	0.3728	0.203	0.1112	0.019	0.4813	1							
$growth$	-0.2847	0.2621	0.1526	0.1426	-0.014	0.3752	0.3401	1						
lit	0.5395	-0.6331	-0.2119	-0.157	-0.1537	-0.7118	-0.2571	-0.2635	1					
soc	0.6109	-0.4302	-0.37	-0.2205	0.0921	-0.6813	-0.5099	-0.4314	0.5727	1				
urb	0.5084	-0.5981	0.0115	-0.2776	0.0349	-0.6529	-0.3192	-0.2736	0.6136	0.5008	1			
$gdppc$	0.8132	-0.5465	-0.3372	-0.4374	0.0624	-0.7485	-0.2094	-0.2888	0.5603	0.6141	0.6296	1		
gkf	-0.1554	0.0866	0.0143	0.1028	0.0362	0.2813	0.3178	0.4704	-0.0822	-0.2869	-0.196	-0.1801	1	
tax	0.4455	-0.3294	-0.1934	-0.2137	0.119	-0.5106	-0.3	-0.2941	0.4173	0.6246	0.3321	0.3765	-0.1401	1

However, it is possible that these correlations are linked through poverty and income inequality. For instance, if literacy reduces poverty and poverty reduces FI, we would expect that the correlation between literacy and FI is positive and strong. We will address such issues further in section 6.4.4.

Second, we see a positive correlation between poverty and self-employment, and a negative correlation between poverty and social expenditure. Such relationships are expected as informality may reduce income and social expenditure reduce households spending in basic services, thus increasing disposable income. Finally, GDP growth and literacy display a negative correlation with poverty, which is also unexpected.

Lastly, the Gini coefficient and self-employment have a positive correlation, while social expenditure and taxation have negative ones. Such results are expected as they address distribution policies. Yet, our preliminary results suggest that certain variables, such as bank concentration and gross capital formation (the proxy for investment), may have low explanatory power when conducting more advanced analyses.

6.4.2 Differences between LMICs and HICs

The first step into selecting a model is to establish if LMICs and HICs will follow different regression functions when analysing the effects of FI on poverty and income inequality. In order to test such hypothesis, we performed a Chow test. The test shows whether independent variables have different impacts on each sub-group of a sample. The null hypothesis is that there are no differences between groups (Chow, 1960).

Using a model with between and within-effects, we estimate Eq. 6.1 with both groups. We use robust standard errors as the F-statistics are only valid under homoskedasticity. This equation includes 12 parameters (demeaned and mean values of each of the six explanatory variables) and 371 observations. The result for our Chow test was 28.63, which is statistically significant at the 1% level. This suggests that there are differences between these two regions. Thus, to account for potential heterogeneity in slope coefficients, we estimate FI for HICs and LMICs separately.

6.4.3 Within- or between-effects model

Before estimating Equation 6.1, we also conduct a Hausman test to evaluate whether the coefficients of the within-effect or between-effect model are equal.[108] Our null hypothesis (H0) is that the difference in coefficients is not systematic. The p-value of each equation is displayed in Table 6.5, where b is consistent under the H0 and HA and B is inconsistent under HA and efficient under H0.

Table 6.5: P-value results of Hausman test

Equation	Total sample	LMICs	HICs
Eq. 6.1	0.0015	0.1054	0.1309
Eq. 6.2	0.0472	0.0827	0.6391
Eq. 6.3	0.0551	0.3969	0.0879

We notice that half of the results indicate a rejection of the H0 (i.e., a p-value smaller than 0.1), which means that the within- and between-effects models are not the same. The rejection would direct us to select the within-estimator. However, selecting a fixed-effect model for low time-variant variables generates poor results. At the same time, we notice that, for the other half of results, we fail to reject the H0. Such result means that estimates using between- or within-estimators are equal.

In our evaluation, we want to address two distinct effects. First, we want to estimate how much FI affects poverty and income inequality between countries, that is, if the effects are similar across countries. Second, we want to estimate the within-country effect, i.e. if a change in FI within a country will affect poverty and income inequality. A between-effects model is best identified using low-frequency data (Calderon et al., 2002), which is the case of our dataset. In turn, within-effects are unable to account for time-invariant variables, which may generate issues in our estimations.

In our study, several variables change little over time, which generates issues for selecting the within estimator (Bell and Jones, 2015). In fact, Bell, Fairbrother, & Jones (2019) conclude

[108] Also sometimes referred as fixed- and random-effects, respectively. We prefer the terms within- and between-effects, in turn, as random-effects represent a weighted average of the within- and between-effects, which leads to confusing interpretation of coefficients (Bell et al., 2019).

that within-effects should only be selected in three particular cases: (i) if groups are of no interest; (ii) where slopes are not different across groups; and (iii) there are few level-2 entities (country, in our research) such that random slopes cannot be estimated.

As (i) we are interested in addressing difference across countries, (ii) we have a hypothesis that slopes are different between HICs and LMICs, and (iii) we have about 150 level-2 entities, we conclude that the sole selection of within-estimator, as suggested by the Hausman test is inappropriate.[109] Thus, we select the between-effects estimator for our analysis.

6.4.4 The instruments

To identify the three equations, each must have at least one exogenous variable with a non-zero coefficient that is excluded from previous equations (Wooldridge, 2012, chap. 16). In Eq. 6.1, social expenditure, urbanisation, literacy and GDP growth are related to poverty, but not directly to FI. Moreover, GDP per capita, gross capital formation, taxation and social expenditure are associated with income inequality but not directly to FI. Thus, we say that these variables are exogenous in Eq. 6.1. Likewise, in Eq. 6.2 and Eq. 6.3, central bank interest rates, bank concentration and employment level are related to FI, but directly not to poverty and income inequality. Therefore, those are the potential instruments for our estimations. Finally, it is possible to add lagged values of the instrumented variables as instruments, but this procedure generates limitations due to the short time span of our dataset.

Instrument selection was straightforward for Eq. 6.2 and Eq. 6.3, but not for Eq. 6.1. As we perform estimations for a full sample (FS), LMICs and HICs, the first obstacle we encountered was to select valid instruments for each of the specifications. To confirm the validity, i.e., exogeneity of instruments, we conducted an overidentifying restriction test. The Sargan test's null hypothesis holds the joint validity of selected instruments (Sargan, 1958; Verbeek, 2008, chap. 5). Thus, a rejection of the null hypothesis requires experimentation on the selection of valid instruments.

Besides valid, instruments should also be relevant. If instruments are only marginally relevant, they are considered "weak" instruments, which causes biased results (Stock and Yogo, 2005). For 2SLS in which there is a single endogenous variable, instrument weakness can be tested if the first-stage F-statistics is less than 10 (Staiger and Stock, 1997; Sanderson and Windmeijer, 2016). Eq. 6.2 and 6.3 are such cases, in which FI the single endogenous regressor. However,

[109] Further results on between and within-effects models using GLS can be found in Appendix E.4.

such F-statistics threshold of 10 is a rule of thumb, not a necessary condition for instrument selection (Stock and Yogo, 2005). In cases with more than one endogenous regressors, such as in Eq. 6.1, this rule of thumb no longer holds. In turn, we use the Cragg-Donald Wald (CDW) F-statistics and compare to Stock & Yogo's (2005) weak identification critical values, where the null hypothesis is that instruments are weak.

It is also important to highlight that increasing the number of instruments may reduce the accuracy of estimates (Sargan, 1958). This happens as instruments can overfit endogenous variables, failing to remove their endogenous components. For instance, if the numbers of instruments are equal to the number of observations, the first-stage estimation will display a R^2 of 1, thus producing results akin to an OLS regression (Roodman, 2009). In fact, "if the first few instrumental variables are well chosen, there is usually no improvement, and even a deterioration, in the confidence regions as the number of instrumental variables is increased beyond three or four" (Sargan, 1958, p.414). Thus, in this thesis, we select one instrument above the instrumented variable. In practice, this means that Eq. 1, which has two endogenous variables, has three instruments. Meanwhile, Eq. 2 and Eq. 3, which have one endogenous variable, have only two instruments.

Another aspect is the choice between internal and external instruments. Internal instruments, i.e., lagged values of endogenous variables, suffer from limitations, as "there is a trade-off between the lag distance used to generate internal instruments and the depth of the sample for estimation" (Roodman, 2009, p.137). If there are missing values from previous observations, we must drop all observations for the period, resulting in a reduced sample. As we have a short period in our analysis, we prefer selecting external instruments when possible.

In Eq. 6.1, we start with the maximum number of instruments for all the three specifications (FS, LMICs and HICs). If the Sargan test was rejected (that is, the instruments are not valid), we eliminate each instrument until the joint validity is achieved.[110] As we want only three instruments in each estimation, we proceed into deleting instruments until we reach three jointly valid instruments. Next, we compare the F-statistics in order to select the most reliable instruments.

For the FS, we select $lit, pov_{t-1}\ and\ gini_{t-1}$. These instruments fail to reject the null hypothesis with a p-value of 0.3089 which confirms the validity of our instruments. Moreover, the results display the F-statistics of the first-stage regression for poverty and income inequality

[110] Full process in Appendix E.5.

above the threshold of 10 (8214.49 and 826.10). The CDW test of 2588.058 rejects the null hypothesis, which indicates theinstruments are not weak, i.e., they are relevant. For LMICs, we select $urb, pov_{t-1}, gini_{t-1}$. These are also jointly valid (p-value 0.9237) and relevant instruments (F-statistics of 6067.82 and 634.78, respectively). Moreover, the CDW F-statistic of 1922.822 is above the 13.43 critical value in the 10% level, confirming not weak instruments. Finally, for HICs, $lit, pov_{t-1}, gini_{t-1}$ were also selected.[111] These instruments are also jointly valid (p-value 0.4758). The first-stage F-statistics for the effects of explanatory variables and instruments on poverty is 238.04. The F-statistics for the income inequality regression is 262.80, indicating that instruments are relevant. The CDW F-statistics of 128.958 confirms such result.

Besides the tests that confirm validity and relevance, such instruments are also intuitively sound. First, we expect lagged valued of the endogenous variables (poverty and income inequality) to be uncorrelated to the contemporary dependent variable (FI). Also known as predeterminant variables, the error term in time t is uncorrelated with current exogenous and all past endogenous and exogenous variables, allowing us to address endogeneity (Wooldridge, 2012). Second, urbanisation is highly negatively correlated to poverty as we expect those who live in urban areas to display higher levels of income. Yet, urbanisation per se does not imply a higher level of FI, but works through other variables, such as poverty. Third, like urbanisation, literacy itself is not expected to affect FI, but to act through its effects on poverty reduction. Therefore, the choice for internal and external instruments are coherent with tests and current literature.

In Eq. 6.2 and Eq. 6.3, instruments selection is more straightforward as there is only one endogenous variable, FI. Here, we have three potential instruments, $cbint, bcon\ and\ work$, besides the lagged value of FI. However, as FI is measured every three years, the lagged value must be FI_{t-3}. As this gap between lagged and contemporaneous variables is significant, we decide to avoid the use of this variable as an instrument. We start with the only internal and the three external instruments and aim to reduce it to two jointly valid and not weak instruments.

In Eq. 6.2, we select $bcon\ and\ work$ (FS) and $cbint\ and\ work$ (LMICs and HICs). In the FS model, instruments are jointly valid (p-value 0.5643) and relevant (F-statistics 18.18 in first-

[111] According to the joint validity and weak instruments tests, we should have selected $soc, tax\ and\ pov_{t-1}$. However, by choosing these instruments, we have highly biased coefficients and large standard errors. For example, the constant is 2216.218 with standard errors of 26439.55. Similarly, poverty displayed a coefficient of 703.5695 and standard error of 8836.93. Thus, we select our second-best option, which yields more accurate results.

stage). In the LMICs model, instruments are also jointly valid (p-value 0.3774) but are marginally weak according to Stock and Yogo's rule of thumb (F-statistics 9.24). Finally, in the HICs sample, the Sargan test is not rejected (p-value 0.7620) which indicated that instruments are indeed valid. However, the instruments seem to be very weak (F-stat 1.70).

In Eq. 6.3, instruments are $bcon\ and\ work$ (FS), $cbint\ and\ work$ (LMICs) and $cbint\ and\ bcon$ (HICs). In the full sample, the p-value is 0.9492 and F-statistics of 83.56, indicating valid and relevant instruments. For the LMICs, Sargan test was not rejected (p-value 0.22) and the weak instrument rule of thumb fell a bit short (9.07). Finally, for HICs, instruments are valid (p-value 0.9573) and are not weak (10.87).

Using $cbint, bcon\ and\ work$ as external instruments are also intuitively sounds. We expect that a change in central bank interest rate, bank concentration and employment levels will not directly influence poverty or income inequality but could indirectly affect them through FI.

Finally, to confirm if our potential endogenous variables are in fact endogenous, we conduct a Durbin-Wu-Hausman test. The test compares 2SLS to OLS in order to state if instrument variables are necessary or if OLS would yield similar results. The null hypothesis is that regressors are exogenous. In our tests, we find that poverty and income inequality are not jointly endogenous in Eq. 6.1 (p-value = 0.12) nor is FI in Eq. 6.3 (p-value = 0.63). In turn, FI is in fact endogenous in Eq. 6.2 (p-value = 0.00). Such results suggest that FI may not be simultaneously related to income inequality as we had expected and might not yield results different from OLS regression.

Thus, we consider our results to be unbiased for all our three LMICs specifications, but not for the HICs in Eq. 6.2. However, as we are mostly interested in addressing FI in LMICs, such drawback does not invalidate our findings.

6.5 Results

Finally, we estimate Eq. 6.1, Eq. 6.2 and Eq. 6.3 using a generalised two-stage least squares (G2SLS) in order to address endogeneity deriving from simultaneity. As presented in section 6.3, the simultaneity problem causes coefficients to be biased. In fact, results in the existing literature that do not address endogeneity can only be regarded as correlations, but do not offer causal relations. We address this bias through IV in order to evaluate the causal effects between FI, poverty and income inequality.

However, before showing the results, we highlight that, as we have normalised the FI index, it displays low variation, as we see in Table 6.6. Thus, small changes in explanatory variables may affect FI substantially. In LMICs, where the maximum FI score ranges from 15.18 to 57.59, a 1-percentage point fluctuation can be economically meaningful.

Table 6.6: Summary statistics of FI for LMICs and HICs

	LMICs	HICs
1%	0	14.57
50%	15.18	67.99
99%	54.17	100
Smallest	0	14.44
Largest	57.59	100
Mean	18.57	64.78
Std. deviation	13.26	19.96
Variance	175.83	398.51
Observations	289	138

We have previously stated that within-effects do not contribute much to our analysis, as our variables change slowly over time. Thus, we conduct a 2SLS using GLS estimators of the between-effects model. Here, we use the exogenous variables after transforming them through the feasible GLS (Balestra and Krishnakumar, 1987). We address heteroskedasticity and serial correlation by using clustered standard errors. Finally, we also add a GMM estimation for a robustness check.

6.5.1 The effects of poverty and income inequality on financial inclusion

To start, we analyse the first causal relationship that runs from poverty and income inequality to FI. Such results is our main contribution to the simultaneous relationship analysis among those variables, as the mainstream literature focuses on the reverse causality, i.e., the effect of FI on poverty and income inequality. In turn, we argue that poverty and income inequality are the main determinants of FI, and that FI can actually have a detrimental effect on poverty and income inequality due to indebtedness, high fees and an income transfer from the poor to the wealthy. Table 6.7 shows the results of Eq. 6.1, where, pov and $gini$ were instrumented using

the following variables: $lit, pov_{t-1}, gini_{t-1}$ (1.1); $urb, pov_{t-1}, gini_{t-1}$ (1.2); and $lit, pov_{t-1}, gini_{t-1}$ (1.3).

Table 6.7: The effects of poverty and income inequality on FI (G2SLS and GMM)

Variables	(1.1) FS	GMM	(1.2) LMICs	GMM	(1.3) HICs	GMM
pov	-0.04	-0.03	-0.15**	-0.16***	-4.17***	-4.02***
	(0.07)	(0.04)	(0.06)	(0.04)	(1.46)	(1.05)
ineq	-0.19	-0.18**	0.23**	0.22***	-0.86	-0.92***
	(0.14)	(0.08)	(0.11)	(0.07)	(0.68)	(0.25)
cbint	-0.37*	-0.33***	0.20	0.19**	-1.74	-1.18*
	(0.22)	(0.12)	(0.16)	(0.09)	(1.25)	(0.61)
bcon	-0.02	-0.01	-0.12**	-0.10***	0.06	0.10
	(0.07)	(0.04)	(0.06)	(0.04)	(0.18)	(0.08)
self	-0.52***	-0.54***	-0.25***	-0.25***	-0.20	-0.16
	(0.06)	(0.04)	(0.04)	(0.03)	(0.71)	(0.27)
work	0.40***	0.38***	0.22**	0.21***	-0.09	-0.03
	(0.10)	(0.06)	(0.09)	(0.05)	(0.51)	(0.20)
y14	1.57	7.43***	6.19	8.50***	omitted	9.06***
	(5.34)	(1.74)	(5.07)	(1.33)	N/A	(3.37)
y17	-7.45	6.04***	-4.54	6.58***	omitted	4.02
	(9.23)	(1.79)	(5.26)	(1.35)	N/A	(3.37)
Constant	40.19***	34.00***	18.42**	13.32***	93.62***	83.37***
	(10.44)	(5.77)	(7.31)	(4.21)	(29.13)	(13.57)
Observations	315	315	253	253	63	63
Countries	115	N/A	95	N/A	21	N/A

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

We notice that results are very robust as coefficients remain very similar using both 2SLS and GMM estimators. The first significant result is that poverty reduction has different effects on FI in HICs and LMICs. While in the former an increase in poverty strongly reduces FI (-4.02), the latter displays a much smaller effect (-0.16), where both results are statistically significant at the 1% level. This means that a percentage point (p.p.) increase in the poverty ratio will decrease FI by -0.16 p.p. in LMICs. However, these results confirm our hypothesis that reducing poverty could boost the level of FI.

Second, both in the full sample (FS) and in HICs, income inequality reduces FI. These results contribute to our hypothesis that causality runs from income to FI. Nevertheless, a puzzling

result emerges in the LMICs specification, where income inequality increases FI. Such result can be analysed through the finding that there is not a Kuznets' "inverted-U" curve with respect to income inequality in LMICs. In countries in Latin America and Southern Africa, for example, high inequality is a historical process which can be hardly overcome by merely economic aspects. In turn, the power of the elites should also be considered in order to address income inequality in these regions (Palma and Stiglitz, 2016). Thus, the non-monotonic relationship between FI and income inequality in LMICs is not grasped by our estimations, yielding such puzzling findings.[112]

Other results are interesting to our analysis, as they partially confirm our hypothesis on the role of interest rates and employment status. Central bank interest rate, for instance, has a negative effect in FI of -0.33 p.p. in the FS, which means that, in average, higher interest rates are negatively related to FI. However, in LMICs, an increase in $cbint$ pushes FI up, which is not consistent with our hypothesis that currency hierarchy can lead to lower levels of FI. At the same time, bank concentration in LMICs does have a negative effect on FI. This result could be related to the fact that oligopoly financial institutions may charge higher prices for loans and services to clients, thus reducing the level of FI, despite the high base interest rate.

Self-employment also reduces FI both in the FS (-0.52 p.p.) and in LMICs (-0.25 p.p.). These results confirm the statements of participants in the Brazilian case study that the lack of formal employment reduces the demand for formal financial services, besides being a barrier to formal loans. Finally, the employment ratio of a country has a positive effect on FI in LMICs, also contributing to our hypothesis of the importance of work, and in particular formal employment, to the access and use of formal financial services.

6.5.2 The effects of financial inclusion on poverty

We turn now our attention to the first reverse causality mechanism, i.e., if FI influences aggregate poverty. Theoretical and empirical evidence in the mainstream literature argue that FI is able to reduce poverty (or at least prevent it) through three mechanisms: first, individuals will be able to borrow in order to invest in human capital or small businesses; second, it will allow them to save in order to have a cushion for times of financial distress; third, they will be

[112] A microdata analysis in South Africa, for instance, discovered that FI has a negative relationship with income inequality. However, FI also reduces the wealth of the poor, while increasing the wealth of middle-classes (von Fintel and Orthofer, 2020). Thus, there might be more elements of distribution that have not been analysed through our macroeconomic analysis using the Gini coefficient.

able to purchase insurance policies, which will also prevent them into falling into poverty in the case of unemployment, crop loss or medical emergency.

However, as we have introduced through our game-theory model in Chapter 3 and our qualitative analysis in Chapter 4, most low-income individuals do not have collateral nor formal jobs in order to borrow at fair rates, besides not having disposable income for savings nor insurance. Thus, making use of such financial instruments may lead to over-indebtedness and wealth destitution, as it was the case of some participants in our qualitative study.

By estimating Eq. 6.2 (Table 6.8), in which instruments were $bcon\ and\ work$ (2.1), $cbint\ and\ work$ (2.2) and (2.3), we do not find very robust results for most of our coefficients.

Table 6.8: The effects of FI on poverty (G2SLS and GMM)

Variables	(2.1) FS	GMM	(2.2) LMICs	GMM	(2.3) HICs	GMM
FI	1.41*	-0.06	3.34	-0.18*	0.06	-0.02***
	(0.86)	(0.06)	(2.89)	(0.10)	(0.07)	(0.01)
self	0.81***	0.35***	1.04*	0.47***	0.14	0.06***
	(0.29)	(0.07)	(0.58)	(0.09)	(0.10)	(0.02)
growth	-1.39	0.13	-3.56	-0.26	0.29	0.04
	(1.55)	(0.27)	(2.80)	(0.32)	(0.20)	(0.03)
lit	-0.30	-0.28***	-0.75	-0.18**	0.08	0.08*
	(0.20)	(0.07)	(0.57)	(0.08)	(0.20)	(0.04)
soc	-0.91	0.38***	-0.02	0.58***	-0.02	-0.02
	(0.91)	(0.14)	(1.06)	(0.20)	(0.14)	(0.02)
urb	-0.36*	-0.15***	-0.63	-0.13*	-0.03	-0.02*
	(0.19)	(0.06)	(0.39)	(0.07)	(0.03)	(0.01)
y14	-21.26	-0.65	-49.19	0.00	omitted	0.34
	(18.72)	(2.19)	(31.70)	(2.78)	N/A	(0.31)
y17	3.68	0.02	-32.19	0.06	omitted	-0.02
	(19.15)	(2.11)	(34.84)	(2.67)	N/A	(0.24)
Constant	5.68	27.52***	32.96	13.82	-11.26	-4.95
	(27.47)	(9.70)	(34.84)	(11.39)	(21.48)	(3.96)
Observations	293	293	240	240	63	63
Countries	107	N/A	89	N/A	21	N/A

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

With respect to the relationship between poverty and FI, in our full sample using 2SLS, FI increases poverty by 1.41 p.p. While this result may not be dramatic for countries with high

levels of poverty ratio, this is particularly dangerous to those with very low levels of individuals receiving less than US$1.90 a day. As we see in Table 6.9, while dispersion is larger in LMICs, both groups could face a relatively significant increase in poverty. China, who displayed a poverty ratio of 0.5% in 2017, would see poverty more than double with a 1.41 p.p. increase in FI. For HICs, likewise, this would be an economically significant increase, bearing in mind the group mean of 0.67% of poverty incidence. The result that FI increases poverty also confirms the perception of most participants of the case study. For them, the poor are unable to overcome poverty through banking, and are likely to become poorer due to the high interest rates and inflexible payment schedules. At the same time, our GMM estimations display a different picture: FI could, indeed, slightly reduce poverty in both LMICs and HICs. This result would confirm the mainstream theories, but the lack of robustness shows that the effects of FI on poverty are not very clear.

Table 6.9: Summary statistics of poverty for LMICs and HICs

	LMICs	HICs
1%	0	0
50%	11.4	0.3
99%	77.87	9.9
Smallest	0	0
Largest	94.1	15.5
Mean	21.68	0.67
Std. deviation	23.42	1.45
Variance	548.59	2.11
Observations	2,073	780

More robust results arise from the effects of self-employment and urbanisation on poverty. In all our specifications, self-employment increases poverty and most results are statistically significant at the 1% level. This reiterates our qualitative findings in which self-employed workers were earning, in average, less than those who are formally employed due to a lack of minimum wage floor for the former. Thus, for those countries with high levels of self-employment, it is understandable that many individuals will earn less than U$1.90 a day.

Finally, urbanisation also has a negative effect on poverty. In our FS (2SLS), for instance, an increase in the urban population by 1 p.p. leads to a reduction of 0.36 p.p. in the poverty ratio.

Such result is statistically significant at the 5% level. This finding also contributes to the existing literature on poverty that states that urbanisation is able to reduce absolute poverty.

6.5.3 The effects of financial inclusion on income inequality

Lastly, we estimate the causal effects of FI on income inequality (Table 6.10). Our hypothesis is that FI could lead to an increase of income inequality as the income stream of rentists is the interest rates paid by workers. Thus, an increase in borrowing from poor individuals would also increase the income of rentiers and reduce the income of workers due to the high interest rates in LMICs. In turn, mainstream theories argue that the financial system could reduce such inequalities as the income of rentiers (savers) would be allocated to borrowers that could invest in human capital and business, therefore increasing their income.

Table 6.10: The effects of FI on income inequality (G2SLS)

Variables	(3.1) FS	GMM	(3.2) LMICs	GMM	(3.3) HICs	GMM
FI	-0.07	-0.04	-0.55	0.13*	0.51	-0.08**
	(0.54)	(0.04)	(0.55)	(0.08)	(1.26)	(0.03)
GDPpc	-0.00	-0.00	0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$GDPpc^2$	0.00	0.00	-0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
soc	-0.50***	-0.50***	-0.52	-0.54***	-0.46	-0.42***
	(0.17)	(0.09)	(0.41)	(0.16)	(0.35)	(0.08)
self	-0.03	-0.04	0.02	-0.00	0.58	0.22***
	(0.08)	(0.04)	(0.13)	(0.05)	(0.85)	(0.07)
gkf	-0.10	-0.11	-0.11	-0.20**	-0.10	-0.01
	(0.14)	(0.08)	(0.24)	(0.09)	(0.57)	(0.10)
tax	0.12	0.12	0.42	0.26**	-0.61	-0.03
	(0.40)	(0.09)	(0.35)	(0.13)	(1.24)	(0.08)
y14	-9.02	-0.59	-4.33	-2.85*	-29.18	0.66
	(8.99)	(1.03)	(9.54)	(1.67)	(32.84)	(0.95)
y17	0.34	-1.23	-3.81	-1.92	omitted	-1.17
	(9.80)	(1.01)	(13.01)	(1.63)	N/A	(0.92)
Constant	50.91***	49.16***	41.60***	43.93***	49.78**	40.76***
	(8.82)	(3.13)	(13.51)	(5.06)	(17.35)	(3.54)
Observations	297	297	171	171	127	127
Countries	105	N/A	62	N/A	43	N/A

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As in Eq. 6.2, the effect of FI is not robust in our estimations, which suggests an irrelevant influence of the policy on better distributional outcomes. In the GMM specifications, FI increases income inequality in LMICs, whereas it reduces in HICs. While such result would be in line with our theoretical framework for LMICs, the results are not consistent enough to allow us to make strong affirmations.

Likewise, other variables such as GDP per capita, self-employment and gross capital formation do not seem to play an important role in determining income inequality neither in LMICs nor HICs.

However, we do find a robust negative effect of public social expenditure and income inequality. In LMICs, increasing the spending on social goods and services, such as education and health care, by 1 p.p. of GDP reduces income inequality by 0.55 p.p. Whereas such effect does not seem large, it is important to notice that the Gini coefficient has low variation across countries as we can see in Table 6.11. For instance, in 2017, Slovakia had the smallest Gini coefficient (23.2), while South Africa had the highest value (65.5). Therefore, we notice that values are quite concentrated, which means that a 0.55 p.p. change can be quite significant.

Table 6.11: Key number for the Gini index, 2017

	Gini index
Smallest value	23.2
Median	36.39
Mean	38.07
Largest value	65.5
Standard deviation	8.78
Variance	77.16

Therefore, whereas it seems FI increases income inequality in LMICs, we are unable to draw strong conclusions from our results as those were not robust. In turn, we conclude that the effect of FI on income inequality is potentially null or very small. However, social expenditure does reduce income inequality is both HICs and LMICs, which indicates that such policy could yield better results in reducing income inequality than fostering the access to and usage of financial services.

6.6 Summary

This last empirical chapter aimed at answering the final two research questions regarding causality and effects of FI on poverty and income inequality. We contributed to the literature by addressing the potential simultaneous relationship among these variables, estimating these effects through a multi-dimensional microdata-based index, and including Post-Keynesian hypotheses and our qualitative research as a basis to control for further determinants of these three key variables.

We first analysed the effect of poverty and income inequality on the levels of FI. Such estimation brings an unique perspective on the determinants of FI which, to date, have only been discussed through an individual-level characteristics. In turn, while we acknowledge that gender, race and education might be important determinants of the individual's access to and usage of financial services, we add that structural conditions must also be accounted for.

In Chapter 3, we start by theorising that interest rates and the labour market structure are essential to understand FI and how it relates to poverty and income inequality. Through our qualitative research in Chapter 4, we confirmed that such factors are key in determining the demand of financial services by the poor. Moreover, high interest rates and informal labour might have negative effects on how FI is instrumentalised to reduce poverty and income inequality.

In fact, we find that an increase in poverty reduces FI, which has not been addressed in the literature so far. Therefore, if FI is to be promoted, a key policy would be to reduce poverty levels in the first place. Moreover, we find partial confirmation of our hypothesis based on the PK literature. Whereas the effects of central bank interest rates (a proxy for the currency hierarchy) are not robust, we find that an increase in bank concentration reduce the levels of FI in LMICs. Our suggestion is that this occurs *through* the oligopoly power of financial institutions that allow them to set high fees and interest rates on individuals. Finally, we find that self-employment is, in fact, a significant determinant of FI. In our estimations, an increase of the self-employment ratio reduces FI, confirming our theoretical and qualitative results. As self-employed workers usually earn in cash and have irregular income streams, they are less likely to use the formal financial system. Furthermore, we notice that those in the labour force (*work*) also present higher levels of FI – confirming the report of unemployed workers in our interviews that they had no demand for banking when out of work. Thus, besides addressing poverty rates, a boost in formal employment could improve the levels of FI in LMICs.

The results on the effect of income inequality on FI are, however, inconclusive. In LMICs, an increase in the Gini coefficient increases the level of FI. A possible explanation for such puzzling result is that our estimations do not grasp the potential non-linear relationship and particularities of LMICs such as those in Latin America. At the same time, an increase in income inequality seem to reduce FI in our full sample and in HICs. However, our results are also not robust as our 2SLS estimates are not statistically significant. Thus, we conclude that the effect of income inequality on FI might be insignificant or zero.

Our results also challenge existing claims that FI reduces poverty and income inequality in LMICs. In estimating Eq. 6.2, FI increases poverty in our full sample estimation using 2SLS, but slightly reduces in LMICs and HICs when using GMM estimators. However, as results are not robust, we cannot confirm a clear effect that FI has over poverty. We do, nonetheless, find that self-employment displays a strong and robust effect on poverty reduction in LMICs. As the literature on labour markets show, and our qualitative results confirm, self-employed workers usually earn less (sometimes below the minimum wage) and have more precarious socio-economic situations. Thus, in order to address poverty in LMICs, a solution that is more likely to be effective than fostering FI would be to address the large informality of the labour market. This would allow workers to earn higher wages, in average, besides being able to benefit from work-related conditions such as unemployment benefits, health insurance and pensions.

In estimating the effect of FI on income inequality (Eq. 6.3), we also do not find robust results. In fact, using the GMM estimator, FI seems to increase income inequality in LMICs, while it reduces in HICs. Thus, we are unable to provide a confident conclusion of such effects. As in the previous estimation, however, another variable does display a statistically significant reduction on income inequality in LMICs: social expenditure. In fact, an increase in social expenditure reduces income inequality by about 0.50 in all our full sample, LMICs and HICs. Therefore, we conclude that a social policies that do display a robust negative effect on income inequality should be fostered instead of FI, as the latter does not have a consistent nor robust effect on distributional outcomes.

Finally, we confirm that there is a simultaneous relationship between poverty and FI, but were unable to provide the same conclusion for the relationship between FI and income inequality. Our results also suggest that labour and social policies are more effective in reducing poverty than FI but that, by addressing poverty, FI levels can be boosted. Thus, instead of the existing

mainstream literature conclusion that FI can be a direct factor that reduces poverty, we confirm the reverse causality.

Chapter 7
Conclusion

7.1 Summary and key findings

This thesis has presented a critical appraisal of financial inclusion (FI). As a complex policy, FI had to be assessed from different approaches and perspectives in order to fully grasp its relationship with poverty and income inequality. We provided a critical conceptual evaluation of FI, developed a model that connected the different instruments of FI and considered the role of intra-country power in such dynamic, discussed the macroeconomic factors that shape micro-level policies, investigated how individuals relate to financial services, offered a new measurement of FI and, finally, estimated the simultaneous effects between FI, poverty and income inequality. We conclude that FI is unable to reduce poverty in a market-based programme and may be detrimental to poor individuals if structural and labour market conditions lead them to over-indebtedness.

We started by offering theoretical and empirical evidence exposing some shortcomings in the claim made in the mainstream literature that FI reduces poverty and income inequality in low- and middle-income countries (LMICs). Theoretically, the literature is based on the human capital and life-cycle hypothesis, in which individuals can overcome poverty by investing in themselves and making use of financial instruments during income shocks. Empirically, the lack of proper measurement of FI, as well as the lack of acknowledgement of the simultaneous relationship between FI, poverty and income inequality, has led to inappropriate conclusions on the effects of FI on development goals.

To address these issues, we have answered three research questions grounded in Post-Keynesian hypotheses and in the critical realist methodology. These questions led us to our conceptual, theoretical and empirical contributions to the literature.

RQ1: How do intra-country power relations affect financial inclusion in low and middle-income countries?

RQ2: What is the causal relationship between poverty, income inequality and financial inclusion?

RQ3: What are the effects of financial inclusion on poverty and income inequality?

In Chapter 2, we investigate the conceptual foundations of FI. We evaluated 67 studies through systematic analysis to reach common grounds in the mainstream literature with respect to (i) the subject; (ii) the intermediaries; and (iii) the elements of FI. First, we discussed the subject of FI, i.e. who is supposed to be included in the formal financial system. We distinguished firms from households due to their creditworthiness and loan purposes. We also distinguish households from individuals, as individuals within a household may still be excluded from the formal financial system. Thus, we concluded that, currently, FI focuses on the *individual*.

Second, we highlighted the often-implicit consideration that for-profit financial institutions should conduct FI. In the mainstream literature, FI should be a market-led policy, as government interventions through subsidies and state-owned banks lead to unsuccessful and politicised outcomes. However, the profit maximisation objective in such FI is incompatible with development goals due to the high costs of financial services and inflexible payment schedules.

Third, we discussed the key elements of FI. This step is essential to understand all instruments that should be tackled by FI in order to avoid different interpretations and policy design. We concluded that, in the existing literature, banking, credit, insurance and savings are the most relevant instruments. Based on such analysis, we provided a summary of the concept of FI in the mainstream literature: "*the access and usage of credit, deposits, savings, payments and insurance by individuals provided through for-profit financial institutions".*

Whereas such definition clarifies the concept of FI, two issues arise from it. First, it does not consider the the macroeconomic constraints of LMICs, nor it addresses the power imbalance present in the relationship between individuals and financial institutions. This lack of analysis leads to a misunderstanding of the effects that FI can have on poverty and income inequality in this region, which is addressed in further chapters.

In Chapter 3, we developed our theoretical contribution. Based on Post-Keynesian hypotheses, we discussed the importance of macroeconomic conditions and market structures that distinguish LMICs from high-income countries (HICs). We put forth three key aspects: (i) the subordinated position of LMICs' currencies in the international monetary and financial system; (ii) the oligopoly characteristic of local financial markets in LMICs; and (iii) the high incidence of self-employed workers in the labour market in LMICs. The first two features were expected to positively influence the rate of interest and service costs. Yet, high levels of self-employment

were anticipated to exhibit a negative effect on the demand for FI. Moreover, based on World Bank data, we argue that income is the main constraint to access to and usage of financial services, which points to a potential simultaneous relationship between poverty and FI. Finally, we proposed that self-employment conditions would raise the likelihood of over-indebtedness in the face of workers' irregular and low income.

Considering these macroeconomic constraints, Chapter 3 also presented our micro-level model of FI. We developed a deposit-savings, credit and insurance game model with two agents: the poor individual and a for-profit financial institution in a LMIC. The first model was a cooperative game in which, if the individual had enough income, they applied to open a bank account. If the bank account is free, there are no power relations that can prevent the individual to access this financial services. However, if there is a fee to it, the first power imbalance emerges as financial institutions can decline to offer them a bank account. In this case, the individual only applies to a bank account if they have disposable income to afford this service. If the individual is able to open the account, they might be able to save if they have sufficient income. However, savings may not always be built if individuals are income constrained. Such hypotheses will be tested in the following chapter.

Unlike the deposit-savings model, the credit and insurance models were non-cooperative games. There, we also added the concept of power to address the asymmetric relationship between the two agents. In our credit model, individuals demand loans when they do not have savings but the financial institution may decline to offer the loan if it believes the individual will be unable to repay it. Our insurance model adapted this conceptual approach to explore behaviour in the insurance market. However, such relationship is expected to be less present in the lives of poor individuals in LMICs, as it also requires disposable and regular income to afford the insurance premiums. In both models, the individual selected a sub-optimal solution to avoid enforcement from the financial institution. Such pressure can be social or a threat of exclusion from the formal financial system. Therefore, from a theoretical analysis, we hypothesised that FI in LMICs might be detrimental to the poor in an environment of high interest rates and low and irregular income, besides the asymmetric relationship between financial institutions and individuals that pushes the latter to act in a unfavourable manner.

Subsequently, in Chapter 4, we verified our theoretical assumptions on the relationship between financial institutions and individuals with respect to deposit, savings, credit and insurance. Moreover, we uncovered mechanisms on the causal relationship between FI, poverty and income inequality (RQ2) and the perceived effects of FI on poverty (RQ3). We interviewed

30 low-income individuals in the region of Minas Gerais, Brazil, using a semi-structured questionnaire. Using a thematic analysis, we examined five topics: (i) bank accounts and savings; (ii) credit and indebtedness; (iii) insurance; (iv) power relations and enforcement mechanisms; and (v) causal relationship between poverty and financial inclusion.

We reached five crucial conclusions. First, income and employment status are essential determinants of FI. This is an important contribution as such factors have not been addressed by the mainstream literature. In it, it is clear that the poor have low access to financial services, but this is related to supply constraints, such as a lack of bank branches or lack of documentation. However, we find that unemployed and self-employed participants claimed not needing nor frequently using formal financial services due to a lack of money or for earning in cash. This finding also contributes to our hypothesis that there might be a simultaneous relationship between FI and poverty.

Second, high interest rates and the uncertainties in the labour market contributed to over-indebtedness and influenced the aversion toward financial institutions. Such finding also supports our hypothesis that macroeconomic constraints must be taken into account when designing FI policies. Moreover, these foundational issues in LMICs and their effects on the relationship between FI and poverty have not been addressed in the FI literature. Despite the empirical evidence of such issues in the microfinance literature, this factor is often disregarded by mainstream studies on FI. Therefore, highlighting the potential of over-indebtedness of FI should be done and carefully addressed when proposing new FI initiatives.

Third, we also found that power mechanisms are extremely present on the relationship between low-income individuals and banks (even state-owned ones). Participants reported different enforcement mechanisms from financial institutions, such as recurrent calls and exclusion from the credit market, which are considered very detrimental to income-constrained individuals. Thus, some interviewees said they would prefer to not eat to owe the bank as such debt might become a “snowball”, i.e., they would prefer a sub-optimal solution as in our credit game. This is a key issue that is not properly addressed in the mainstream literature either, despite confirming the potential negative effects of credit to the poor in LMICs.

Fourth, participants considered that employment and wages, not FI, were key factors to address poverty. Such a bottom-up research is an unique approach to establishing the perceived effects of FI on poverty reduction. Moreover, our finding contributes to the hypothesis that FI might

have little to no effect on poverty reduction, but that employment related variables might be more relevant in addressing development goals.

Finally, we noticed the importance of state-owned banks (SOBs) in promoting FI in the country, mainly through Caixa and Banco do Nordeste. This result is also at odds with the recommendations of the World Bank, for instance, in which SOBs are considered an improper intermediary of FI as it can lead to market distortions and tends to be a less successful initiative.

Using the theoretical framework and the qualitative research as benchmarks for our final empirical analysis, we started by developing a new measurement of FI that is more in line with this specific policy. In Chapter 5, we measured FI using microdata from the World Bank Findex dataset, which provided us with the tools to perform the econometric analysis in the following chapter. Through multiple correspondence analysis, we created an index that reduced the dimensionalities of 11 FI variables for 446,776 observations in 2011, 2014 and 2017.

To allow a cross-country comparison of FI, we aggregated our microdata index and produced the Global Ranking of Financial Inclusion. As in previous rankings (e.g. Camara and Tuesta, 2014; Sarma, 2016; Aslan et al., 2017), HICs are on the top of the ranking, whereas LMICs are found in middle and bottom positions. Nevertheless, our ranking overcame certain shortcomings of previous aggregate indexes, such as the low scores of highly automatised national financial systems, and contributed to the literature by providing the first cross-country microdata-based ranking of FI. By transforming the index into a country-level score, we were able to employ it on further quantitative analyses.

In Chapter 6, we provided our final empirical contribution and resumed answering RQ2 and RQ3. Acknowledging the potential simultaneous relationship between FI, poverty and income inequality, we suggested that both causal directions should be investigated. Because of such endogeneity bias, we used an instrumental variable approach through two-stage least squares estimations and a generalised method of moments as a robustness check. We presented three equations, in which control variables stemmed from Post-Keynesian hypotheses and our previous results from the case study.

In Eq. 6.1, we estimated the effects of poverty and income inequality on FI, considering central bank interest rates, bank concentration, self-employment and employment ratios. Our results validated our previous hypothesis that poverty and income inequality were important determinants of FI. The effect of poverty on FI levels were negative, which means that an increase in poverty rates decreases the access to and usage of financial services. This result was

not only in line with our qualitative study, but also led to the confirmation of the causal relation running from poverty to FI. In turn, the effects of income inequality on FI were puzzling, as our estimations show that an increase in the former leads to an increase in FI as well. Besides these two key findings, our results also confirm our theoretical approaches in which bank concentration and self-employment reduce the level of FI in LMICs. Yet, we were unable to confirm the currency hierarchy hypothesis as central bank interest rate, as a proxy for such subordination, did not provide robust results for LMICs.

In Eq. 6.2, we analysed the reverse causality and estimated the effects of FI on poverty, taking into account self-employment, social expenditure, urbanisation and gross capital formation. This relationship stems from the mainstream literature which suggests that FI is able to reduce poverty. However, our alternative suggestion was that FI could worsen poverty due to potential over-indebtedness and the high costs of financial services in LMICs. However, our results did not indicate a relevant effect of FI on poverty, which suggests that such policy might not have much influence in either HICs or LMICs. In turn, we found that self-employment contributes to poverty, which was confirms the findings in our qualitative result where informal workers earn, in average, less than formal ones. Thus, such results suggest that a more effective poverty reduction policy would be to promote formal employment, not FI policies.

Lastly, in Eq. 6.3, we estimated the effects of FI on income inequality. Nonetheless, results displayed mixed evidence and were not robust. In our GMM estimations, FI slightly increases income inequality in LMICs but reduces in HICs. However, as results are not robust, we are unable to provide a clear conclusion on the effects of FI and income inequality. At the same time, we also find that another variable has a stronger potential to address this development goal. An increase in social expenditures, either in LMICs or HICs, reduce income inequality by around 0.50 percentage points. Therefore, such policy could also be prioritised instead of FI.

In sum, the thesis addressed three research questions and concluded the following. First, there are power imbalances between poor individuals and for-profit financial institutions in LMICs. This generates a situation in which individuals will select sub-optimal solutions, for instance, prefer not to eat in order to pay a loan, in order to prevent being excluded from the credit market or suffering social shame. Second, we addressed the simultaneous relationship between FI, poverty and income inequality, but conclude that there is little evidence to support that FI is able to reduce poverty and income inequality by itself. In turn, FI could be a consequence of other development policies, such as formal employment generation that creates a demand for

financial services or social expenditures, in which poor individuals must withdraw their social benefits through a bank account. On the other hand, we established that poverty is a key determinant of FI as individuals with little to no income do not demand formal financial services. Therefore, if FI is to be promoted, the first step would be to solve the demand constraint, i.e., the lack of income. Third, whereas we did not find a robust result on the effects of FI on poverty and income inequality in our econometrics estimation, our qualitative investigation showed that individuals might fall further into poverty when making use of formal financial services in mainly two ways: first, by having an income shock that prevents them from repaying their debts in time and, second, by being unable to afford the very high interest rates that are charged by for-profit financial institutions. Thus, if the supply side of FI is to be addressed by governments or financial institutions, interest rates and a social safety net could enable the poor to use financial services in a safer and more sustainable manner.

7.2 Policy recommendations

Bearing in mind our findings and our key conclusions, we provide five policy recommendations. We present five channels to reduce poverty and income inequality and, finally, suggest how FI policies could be redesigned in LMICs.

First, to reduce poverty, we endorse the opinion of our participants that there should be a focus on employment creation and wage policies. Formal employment leads to better wages and working conditions, allowing individuals to overcome poverty on their own terms and preventing shocks that an irregular income stream may generate.

In order to create such formal employment opportunities with higher wages, our second suggestion is that governments should promote long-term investment projects. Large-scale projects, instead of microfinance to "entrepreneurs", are more likely to generate formal jobs. Such projects could be financed through state-owned financial institutions (either commercial or development banks) that would provide long-term credit with low interest rates and, possibly, subsidised rates.

In third place, governments should promote public services, such as education and health care, in order to reduce the income allocation of the poor towards these essential services. Furthermore, this public investment would suppress income shocks generated by medical emergencies, thus preventing individuals from falling into over-indebtedness and poverty.

In the same note, our fourth policy recommendation is that governments and international organisations should foster social safety nets in LMICs. Policies like unemployment benefits and sickness allowance could both reduce poverty and prevent over-indebtedness of the poorest. Alternatives to informal workers should also be considered, such as cash transfer programmes that could provide steady income during prolonged periods.

Finally, if FI policies are still to be promoted, such strategies should be led by state-owned financial institutions. To include the poor into the formal financial system, these banks should provide free basic accounts and other low-cost financial services, including lower interest rates. In turn, market-driven FI should be focused on higher-income individuals who are able to afford such costs. At the same time, we do not believe that FI are able to reduce poverty and income inequality by itself, so it should not be the main focus on international organisations nor governments.

7.3 Limitations and future research

The thesis aimed to answer questions on power relations, causality and effects of FI on poverty and income inequality using mixed methods. Whereas we were successful in addressing some of its aspects, some results were unable to confirm our hypotheses.

First, whereas we hypothesise about intra-country power relationships between financial institutions and inviduals in LMICs, our empirical evidence of such phenomena has fallen short. In our interviews, we noticed that individuals did not perceived a direct power relationship, but did report on mechanisms that would lead them to take unfavourable actions (such as reducing food consumption) in order to afford loans, for instance. Yet, the small sample of our qualitative interview and the lack of a further analysis from a financial institution perspective do not provide robust evidence of such power imbalances when examining FI in LMICs.

The simultaneous causal relationship between poverty and FI was evident in our analysis. Reduction of poverty is able to increase the demand for FI, but an increase in FI by itself cannot lead to mass exit from poverty and might be detrimental in some cases. Such issue stemmed from the inherently high interest rates and the high levels of self-employment in LMICs. However, we were unable to conclude the relationship between FI and income inequality. First, from our qualitative research, such connections could not be established. Second, in our econometric estimations, we did not find evidence for endogeneity on the effects of FI on

income inequality. Third, our estimations provided mixed evidence on such effects, and the results were not robust. Therefore, further research should be conducted in order to investigate the shortcomings of these results.

Finally, data constraints were also found in our research, in particular with regards to the binary nature of the Findex dataset and missing data in other control variables, such as the Gini coefficient, poverty rate and social expenditure. Whereas we tried to address such limitations by selecting more appropriate methods of analysing the relationship between FI, poverty and income inequality, it is clear that some of the econometric results must be taken with a grain of salt as the data is not as accurate as one would have expected.

At the same time, other topics for future work have derived from this thesis. We highlight three potential themes. First, making use of the transferability aspect of our qualitative study, a proposal would be to adapt the questionnaire to another country. A second round of interviews in a different context could provide further insights on similarities among the access to and usage of formal financial services by the poor in LMICs.

Second, an interesting study would be to provide a more detailed and systematic comparison of FI levels among urban and rural workers. While we interviewed individuals from both regions in Brazil, such analysis was out of the scope of this thesis. However, as we noticed in our econometric estimations, urbanisation also tends to reduce poverty. Thus, addressing potential disparities could enhance the design of policies to fight poverty and potentially promote FI.

Finally, based on the visual results of the multiple correspondence analysis, a more in-depth investigation of the geographical distribution of FI could be provided. For instance, the low indebtedness and access in Middle Eastern and North African countries could be addressed by considering religious reasons. In turn, the higher levels of debt in Sub-Saharan countries could be related to the lack of formal employment and social safety nets.

To conclude, the thesis has contributed conceptually, theoretically and empirically to the literature of FI. In so doing, it has generated new evidence and created innovative instruments that can be used in future studies of this topic, stimulating further debate within the field of economic development studies.

References

Abdi, H. and Valentin, D. 2007. Multiple Correspondence Analysis *In*: *Encyclopedia of Measurement and Statistics*., pp.648–651.

Aduda, J. and Kalunda, E. 2012. Financial Inclusion and Financial Sector Stability With Reference To Kenya: A Review of Literature. *Journal of Applied Finance & Banking*. **2**(6), pp.1–8.

Afonso, J.S., Morvant-Roux, S., Guérin, I. and Forcella, D. 2017. Doing Good by Doing Well? Microfinance, Self-Regulation and Borrowers' Over-indebtedness in the Dominican Republic. *Journal of International Development*. **29**(7), pp.919–935.

Aghion, P. and Bolton, P. 1997. A Theory of Trickle-Down Growth and Development. *Review of Economic Studies*. **64**(2), pp.151–172.

Agier, I. and Szafarz, A. 2013. Microfinance and Gender: Is There a Glass Ceiling on Loan Size? *World Development*. **42**, pp.165–181.

Aitken, R. 2013. The Financialization of Micro-Credit. *Development and Change*. **44**(3), pp.473–499.

Akileng, G., Lawino, G.M. and Nzibonera, E. 2018. Evaluation of determinants of financial inclusion in Uganda. *Journal of Applied Finance & Banking*. **8**(4), pp.1–4.

Akotey, J.O. and Adjasi, C.K.D. 2016. Does Microcredit Increase Household Welfare in the Absence of Microinsurance? *World Development*. **77**, pp.380–394.

Alkire, S., Roche, J.M. and Vaz, A. 2017. Changes Over Time in Multidimensional Poverty: Methodology and Results for 34 Countries. *World Development*. **94**, pp.232–249.

Allen, F., Carletti, E., Cull, R., Qian, J.Q., Senbet, L. and Valenzuela, P. 2014. The African Financial Development and Financial Inclusion Gaps. *Journal of African Economies*. **23**(5), pp.614–642.

Allen, F., Demirgüç-Kunt, A., Klapper, L. and Martinez Peria, M.S. 2016. The foundations of financial inclusion: Understanding ownership and use of formal accounts. *Journal of Financial Intermediation*. **27**, pp.1–30.

Alonso, J., Lis, S.F. de, Hoyo, C., Lopez-Moctezuma, C. and Tuesta, D. 2013. La banca movil en Mexico como mecanismo de inclusion financiera. Desarrollos recientes y aproximacion al mercado potencial. *Working Papers*.

Alves Diniz, A.M. and Batella, W.B. 2005. O Estado de Minas Gerais e suas regiões: um resgate histórico das principais propostas oficiais de regionalização. *Sociedade e Natureza*. **17**(33), pp.59–77.

Ambarkhane, D., Shekhar Singh, A. and Venkataramani, B. 2016. Developing a Comprehensive Financial Inclusion Index. *Management and Labour Studies*. **41**(3), pp.216–235.

Amidžić, G., Massara, A. and Mialou, A. 2014. *Assessing Countries' Financial Inclusion Standing - A New Composite Index*. Washington D.C.: International Monetary Fund.

Anzoategui, D., Demirgüç-Kunt, A. and Martínez Pería, M.S. 2014. Remittances and Financial Inclusion: Evidence from El Salvador. *World Development*. **54**, pp.338–349.

Armendariz de Aghion, B. and Morduch, J. 2000. Microfinance Beyond Group Lending. *The Economics of Transition*. **8**(2), pp.401–420.

Arun, T. and Kamath, R. 2015. Financial inclusion: Policies and practices. *IIMB Management Review*. **27**(4), pp.267–287.

Asian Development Bank, J., Gunatilake, H., Niimi, Y., Khan, M.E., Jiang, Y., Hasan, R., Khor, N., Lagman-Martin, A.S., Bracey, P. and Huang, B. 2008. *ADB economics working paper series.* [Online]. Asian Development Bank. [Accessed 17 March 2018]. Available from: https://think-asia.org/handle/11540/1829.

Asimit, V. and Boonen, T.J. 2018. Insurance with multiple insurers: A game-theoretic approach. *European Journal of Operational Research*. **267**(2), pp.778–790.

Aslan, G., Deléchat, C., Newiak, M. and Yang, F. 2017. *Inequality in Financial Inclusion and Income Inequality* [Online]. Washington D.C.: International Monetary Fund. [Accessed 27 June 2018]. Available from: https://ideas.repec.org/p/imf/imfwpa/17-236.html.

Aterido, R., Beck, T. and Iacovone, L. 2013. Access to Finance in Sub-Saharan Africa: Is There a Gender Gap? *World Development*. **47**, pp.102–120.

Atkinson, A. and Messy, F.-A. 2013. *Promoting Financial Inclusion through Financial Education*. Paris.

Bader, M. and Savoia, J.R.F. 2013. Logística da distribuição bancária: tendências, oportunidades e fatores para inclusão financeira. *Revista de Administração de Empresas*.

53(2), pp.208–215.

Balestra, P. and Krishnakumar, J. 1987. Full Information Estimations of a System of Simultaneous Equations with Error Component Structure. *Econometric Theory*. **3**(2), pp.223–246.

Balliester Reis, T. 2018. Why Are Policy Real Interest Rates So High in Brazil? An Analysis of the Determinants of the Central Bank of Brazil's Real Interest Rate. *International Journal of Political Economy*. **47**(2).

Banco Central do Brasil 2009. *Perspectivas e desafios para inclusão financeira no Brasil: visão de diferentes atores*. Brasília.

Banco Central do Brasil 2014. *Pesquisa qualitativa sobre o processo de endividamento - Resultados preliminares*.

Banco Central do Brasil 2018. *Relatório de Cidadania Financeira*. Brasília.

Banco Central do Brasil 2017. *Relatório de Economia Bancária*. Brasília.

Banco Central do Brasil 2020. Time Series Management Database.

Banerjee, A., Duflo, E., Glennerster, R. and Kinnan, C. 2015. The Miracle of Microfinance? Evidence from a Randomized Evaluation. *American Economic Journal: Applied Economics*. **7**(1), pp.22–53.

Banerjee, A., Karlan, D. and Zinman, J. 2015. Six Randomized Evaluations of Microcredit: Introduction and Further Steps. *American Economic Journal: Applied Economics*. **7**(1), pp.1–21.

Banerjee, A. V. and Newman, A.F. 1993. Occupational Choice and the Process of Development. *Journal of Political Economy*. **101**(2), pp.274–298.

Bara, A. 2013. Mobile Money for Financial Inclusion: Policy and Regulatory Perspective in Zimbabwe. *African Journal of Science, Technology, Innovation and Development*. **5**(5), pp.345–354.

Barone, F.M. and Sader, E. 2008. Acesso ao crédito no Brasil: evolução e perspectivas. *Revista de Administração Pública*. **42**(6), pp.1249–1267.

Bateman, M. 2012. How Lending to the Poor Began, Grew, and Almost Destroyed a Generation in India. *Development and Change*. **43**(6), pp.1385–1402.

Bateman, M. 2014. *The Rise and Fall of Muhammad Yunus and the Microcredit Model*. Halifax.

Bateman, M. and Chang, H.-J. 2012. Microfinance and the Illusion of Development: From Hubris To Nemesis in Thirty Years. *World Economic Review*. **1**, pp.13–36.

Baum, C.F., Schaffer, M.E. and Stillman, S. 2007. Enhanced routines for instrumental variables/generalized method of moments estimation and testing. *Stata Journal*. **7**(4), pp.465–506.

Beck, T., Demirgüç-Kunt, A., Laeven, L. and Levine, R. 2004. *Finance, Firm Size, and Growth*. Cambridge, MA: National Bureau of Economic Research, Inc.

Beck, T., Demirgüç-Kunt, A. and Levine, R. 2007. Finance, inequality and the poor. *Journal of Economic Growth*. **12**(1), pp.27–49.

Becker, G.S. 1962. Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy*. **70**(5), pp.9–49.

Becker, J., Jäger, J., Leubolt, B. and Weissenbacher, R. 2010. Peripheral Financialization and Vulnerability to Crisis: A Regulationist Perspective. *Competition & Change*. **14**(3–4), pp.225–247.

Bell, A., Fairbrother, M. and Jones, K. 2019. Fixed and random effects models: making an informed choice. *Quality and Quantity*. **53**(2), pp.1051–1074.

Bell, A. and Jones, K. 2015. Explaining Fixed Effects: Random Effects Modeling of Time-Series Cross-Sectional and Panel Data. *Political Science Research and Methods*. **3**(1), pp.133–153.

Bérenger, V., Deutsch, J. and Silber, J. 2013. Durable goods, access to services and the derivation of an asset index: Comparing two methodologies and three countries. *Economic Modelling*. **35**, pp.881–891.

Berg, B.L. 2009. *Qualitative research methods for the social sciences* [Online] 7th ed. Pearson. [Accessed 24 October 2018]. Available from: http://www.worldcat.org/title/qualitative-research-methods-for-the-social-sciences/oclc/963932886.

Besley, T. and Coate, S. 1995. Group lending, repayment incentives and social collateral. *Journal of Development Economics*. **46**(1), pp.1–18.

Bhaduri, A. 1977. On the formation of usurious interest rates in backward agriculture. *Cambridge Journal of Economics*. **1**(4), pp.341–352.

Blasius, J. and Greenacre, M.J. 2014. *Visualization and verbalization of data* 1st ed. Abingdon: Chapman & Hall/CRC.

Bloomberg, L. and Volpe, M. 2012. *Completing Your Qualitative Dissertation: A Roadmap from Beginning to End* [Online] 2nd ed. 2455 Teller Road, Thousand Oaks California 91320 United States: SAGE Publications, Inc. [Accessed 24 October 2018]. Available from: http://methods.sagepub.com/book/completing-your-qualitative-dissertation.

Boot, A.W.A. and Thakor, A. V. 1994. Moral Hazard and Secured Lending in an Infinitely Repeated Credit Market Game. *International Economic Review*. **35**(4), p.899.

Booysen, F., van der Berg, S., Burger, R., Maltitz, M. von and Rand, G. du 2008. Using an Asset Index to Assess Trends in Poverty in Seven Sub-Saharan African Countries. *World Development*. **36**(6), pp.1113–1130.

Bortz, P.G. and Kaltenbrunner, A. 2018. The International Dimension of Financialization in Developing and Emerging Economies. *Development and Change*. **49**(2), pp.375–393.

Bowles, S. 2004. *Microeconomics : behavior, institutions, and evolution* [Online]. Russell Sage. [Accessed 22 January 2019]. Available from: https://press.princeton.edu/titles/7610.html.

Bowles, S. and Gintis, H. 2007. *Power*. Amherst.

Bowles, S. and Gintis, H. 1992. Power and Wealth in a Competitive Capitalist Economy. *Philosophy and Public Affairs*. **21**(4), pp.324–353.

Bowles, S. and Gintis, H. 1975. The Problem with Human Capital Theory-A Marxian Critique. *American Economic Review*. **65**(2), pp.74–82.

Brau, J.C., Merrill, C. and Staking, K.B. 2011. Insurance theory and challenges facin the development of microinsurance markets. *Journal of Developmental Entrepreneurship*. **16**(04), pp.411–440.

Brihaye, T., Pril, J. De, Labie, M. and Périlleux, A. 2018. Positive versus negative incentives for loan repayment in microfinance: A game theory approach. *Review of Development Economics*.

Bucevska, V. 2019. Determinants of income inequality in EU candidate countries: a panel analysis. *Economic Themes*. **57**(4), pp.397–413.

Calderon, C.A., Chong, A. and Loayza, N. V. 2002. Determinants of Current Account Deficits in Developing Countries. *The B.E. Journal of Macroeconomics*. **2**(1), pp.1–33.

Camara, N. and Tuesta, D. 2014. *Measuring Financial Inclusion: A Multidimensional Index*. Madrid: BBVA Bank, Economic Research Department.

Cao, H. and Zhang, S. 2010. Analysis of the main interests of agricultural insurance main body based on the perspective of evolutionary game. *Agriculture and Agricultural Science Procedia*. **1**, pp.354–363.

Carneiro, R. and Rossi, P. 2013. *The Brazilian experience in managing interest-exchange rate nexus*. Berlin.

Chakravarty, S.R. and Pal, R. 2013. Financial inclusion in India: An axiomatic approach. *Journal of Policy Modeling*. **35**(5), pp.813–837.

Chao, X. and Zongfang, Z. 2013. The Evolutionary Game Analysis of Credit Behavior of SME in Guaranteed Loans Organization. *Procedia Computer Science*. **17**, pp.930–938.

Chauvet, L. and Jacolin, L. 2017. Financial Inclusion, Bank Concentration, and Firm Performance. *World Development*. **97**, pp.1–13.

Chen, M., Vanek, J. and Heintz, J. 2006. Informality, Gender and Poverty: A Global Picture. *Economic and Political Weekly* . **41**(121).

Chick, V. and Dow, S. 2005. The meaning of open systems. *Journal of Economic Methodology*. **12**(3), pp.363–381.

Chow, G.C. 1960. *Tests of Equality Between Sets of Coefficients in Two Linear Regressions*.

Churchill, C. and Matul, M. 2012. *Protecting the poor: A microinsurance compendium, Volume II*. Geneva.

Cnaan, R.A., Moodithaya, M.S. and Handy, F. 2012. Financial Inclusion: Lessons from Rural South India. *Journal of Social Policy*. **41**(01), pp.183–205.

Conti, B.M. De, Prates, D.M. and Plihon, D. 2014. A hierarquia monetária e suas implicações para as taxas de câmbio e de juros e a política econômica dos países periféricos. *Economia e Sociedade*. **23**(2), pp.341–372.

Correa, E. and Girón, A. 2019. Financial Inclusion and Financialization: Latin American Main Trends after the Great Crisis. *Journal of Economic Issues*. **53**(2), pp.496–501.

Costa, T.B.G., Vieira, A.S. and Neto, J.A. de S. 2018. Análise do Endividamento Financeiro: Um Estudo de Caso entre Instituições Pública e Privada na Cidade de Cajazeiras – PB. *Revista de Finanças e Contabilidade da UNIMEP*. **5**(1), pp.58–76.

Cynamon, B.Z. and Fazzari, S.M. 2008. Household Debt in the Consumer Age: Source of Growth--Risk of Collapse. *Capitalism and Society*. **3**(2), pp.1–32.

Dabla-Norris, E., Ji, Y., Townsend, R.M. and Filiz Unsal, D. 2020. Distinguishing constraints on financial inclusion and their impact on GDP, TFP, and the distribution of income. *Journal of Monetary Economics*.

Dahir, A.M. 2019. *Novel Ways To Reduce Income Inequality: Financial And Digital Inclusion*. University of Texas at Dallas.

Dattasharma, A., Kamath, R. and Ramanathan, S. 2016. The Burden of Microfinance Debt: Lessons from the Ramanagaram Financial Diaries. *Development and Change*. **47**(1), pp.130–156.

Davis, J.B. 2010. *Individuals and Identity in Economics* [Online]. Cambridge: Cambridge University Press. [Accessed 28 February 2019]. Available from: http://ebooks.cambridge.org/ref/id/CBO9780511782237.

Davis, J.B. 2003. *The theory of the individual in economics : identity and value*. Routledge.

Decancq, K. and Lugo, M.A. 2013. Weights in Multidimensional Indices of Wellbeing: An Overview. *Econometric Reviews*. **32**(1), pp.7–34.

Demirgüç-Kunt, A., Beck, T.H.L. and Honohan, P. 2008. *Finance for all? : Policies and pitfalls in expanding access*. Washington D.C.: The World Bank.

Demirgüç-Kunt, A. and Klapper, L. 2012a. *Financial Inclusion in Africa: an overview*. Washington D.C.

Demirgüç-Kunt, A. and Klapper, L. 2013. Measuring Financial Inclusion: Explaining Variation in Use of Financial Services across and within Countries. *Brookings Papers on Economic Activity*. **2013**(1), pp.279–340.

Demirgüç-Kunt, A. and Klapper, L. 2012b. *Measuring Financial Inclusion: The Global Findex Database*. Washington D.C.

Demirgüç-Kunt, A., Klapper, L. and Randall, D. 2014. Islamic Finance and Financial Inclusion: Measuring Use of and Demand for Formal Financial Services among Muslim Adults. *Review of Middle East Economics and Finance*. **10**(2), pp.1–42.

Demirgüç-Kunt, A., Klapper, L. and Singer, D. 2017. *Financial inclusion and inclusive growth : a review of recent empirical evidence*. Washington D.C.

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S. and Hess, J. 2018. *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution* [Online]. Washington D.C.: The World Bank. [Accessed 29 September 2018]. Available from: http://elibrary.worldbank.org/doi/book/10.1596/978-1-4648-1259-0.

Demirgüç-Kunt, A., Klapper, L., Singer, D. and Van Oudheusden, P. 2015. *The Global Findex Database 2014: Measuring Financial Inclusion around the World*. Washington D.C.

Demirgüç-Kunt, A., Klapper, L.F. and Singer, D. 2013. *Financial Inclusion and Legal Discrimination Against Women: Evidence from Developing Countries*. Washington D.C.

Dev, M. 2006. Financial inclusion: Issues and Challenges. *Economic and Political Weekly*. **41**(41), pp.4310–4313.

Deyshappriya, R. 2017. *Impact of macroeconomic factors on income inequality and income distribution in Asian countries*. Tokyo.

Dieese 2012. *Desempenho dos Bancos 2012*. Sao Paulo.

Dieese 2013. *Desempenho dos Bancos 2013*. Sao Paulo.

Dieese 2014. *Desempenho dos Bancos 2014*. Sao Paulo.

Dieese 2015. *Desempenho dos Bancos 2015*. Sao Paulo.

Dieese 2016. *Desempenho dos Bancos 2016*. Sao Paulo.

Dieese 2017. *Desempenho dos Bancos 2017*. Sao Paulo.

Dieese 2018. *Desempenho dos Bancos 2018*. Sao Paulo.

Dieese 2019. *Juros e spread bancários no Brasil: Razões estruturais para os patamares elevados*. Sao Paulo.

Dollar, D. and Kraay, A. 2004. Trade, Growth, and Poverty. *Economic Journal*. **114**(493), pp.F22–F49.

Downward, P. and Mearman, A. 2007. Retroduction as mixed-methods triangulation in economic research: reorienting economics into social science. *Cambridge Journal of Economics*. **31**(1), pp.77–99.

Dungey, M., Doko Tchatoka, F. and Yanotti, M.B. 2018. Using multiple correspondence analysis for finance: A tool for assessing financial inclusion. *International Review of Financial Analysis*. **59**, pp.212–222.

Dutta, P.K. 1999. *Strategies and games : theory and practice*. MIT Press.

Duvendack, M. and Mader, P. 2019. *Impact of financial inclusion in low- and middle-income countries: a systematic review of reviews*. Oslo.

Duvendack, M., Palmer-Jones, R., Copestake, J.G., Hooper, L., Loke, Y. and Rao, N. 2011. *What is the evidence of the impact of microfinance on the well-being of poor people?* London.

Dymski, G.A. 2005. Financial globalization, social exclusion and financial crisis. *International Review of Applied Economics*. **19**(4), pp.439–457.

Dymski, G.A. 1995. The Theory of Bank Redlining and Discrimination: An Exploration. *The Review of Black Political Economy*. **23**(3), pp.37–74.

Dymski, G.A. 2010. Why the subprime crisis is different: a Minskyian approach. *Cambridge Journal of Economics*. **34**(2), pp.239–255.

Dymski, G.A., Hernandez, J. and Mohanty, L. 2013. Race, Gender, Power, and the US Subprime Mortgage and Foreclosure Crisis: A Meso Analysis. *Feminist Economics*. **19**(3), pp.124–151.

Dymski, G.A. and Veitch, J. 1996. Financial Transformation and the Metropolis: Booms, Busts, and Banking in Los Angeles. *Environment and Planning A*. **28**(7), pp.1233–1260.

Ehrmann, M. and Ampudia, M. 2017. Financial inclusion: what's it worth? *Working Paper Series*.

Elliot, M., Fairweather, I., Olsen, W.K. and Pampaka, M. 2016. *A dictionary of social research methods* [Online]. Oxford University Press. [Accessed 31 October 2018]. Available from: http://www.oxfordreference.com/view/10.1093/acref/9780191816826.001.0001/acref-9780191816826.

Encyclopaedia Britannica 2012. Minas Gerais. *Encyclopædia Britannica, inc.* [Online]. [Accessed 20 May 2020]. Available from: https://www.britannica.com/place/Minas-Gerais.

European Commission 2010. *Macro determinants of individual income poverty in 93 regions of Europe*. Luxemburg.

Fan, Z. and Zhang, R. 2017. Financial Inclusion, Entry Barriers, and Entrepreneurship: Evidence from China. *Sustainability*. **9**(2), p.203.

Fields, J.A. and Tirtiroglu, D. 1991. Agency-Theory Implications for the Insurance Industry: A Review of the Theoretical and Empirical Research. *Quarterly Journal of Business and Economics*. **30**, pp.40–61.

von Fintel, D. and Orthofer, A. 2020. Wealth inequality and financial inclusion: Evidence from South African tax and survey records. *Economic Modelling*.

Fishlow, A. 1972. Brazilian Size Distribution of Income. *American Economic Review*. **62**(2), pp.391–402.

Fleetwood, S. 2001. Causal Laws, Functional Relations and Tendencies. *Review of Political Economy*. **13**(2), pp.201–220.

Fleetwood, S. 1999. Situating critical realism in economics *In*: S. Fleetwood, ed. *Critical realism in economics: development and debate*. Routledge, pp.127–136.

Fleming, P. 2017. The Human Capital Hoax: Work, Debt and Insecurity in the Era of Uberization. *Organization Studies*. **38**(5), pp.691–709.

French, D. and McKillop, D. 2016. Financial literacy and over-indebtedness in low-income households. *International Review of Financial Analysis*. **48**, pp.1–11.

Fundação João Pinheiro 2018. *Produto Interno Bruto de Minas Gerais 2016*. Belo Horizonte.

Fungáčová, Z. and Weill, L. 2015. Understanding financial inclusion in China. *China Economic Review*. **34**, pp.196–206.

Gabor, D. and Brooks, S. 2017. The digital revolution in financial inclusion: international development in the fintech era. *New Political Economy*. **22**(4), pp.423–436.

Galletta, A. 2013. *Mastering the semi-structured interview and beyond : from research design to analysis and publication* [Online]. [Accessed 31 October 2018]. Available from: https://nyupress.org/books/9780814732946/.

Galor, O. and Zeira, J. 1993. Income Distribution and Macroeconomics. *The Review of Economic Studies*. **60**(1), p.35.

Garg, S. and Agarwal, P. 2014. Financial Inclusion in India – a Review of Initiatives and Achievements. *IOSR Journal of Business and Management*. **16**(6), pp.52–61.

Ghosh, J. 2013. Microfinance and the challenge of financial inclusion for development. *Cambridge Journal of Economics*. **37**(6), pp.1203–1219.

Ghosh, S. and Vinod, D. 2017. What Constrains Financial Inclusion for Women? Evidence from Indian Micro data. *World Development*. **92**, pp.60–81.

Ghura, D., Leite, C.A. and Tsangarides, C.G. 2002. Is Growth Enough? Macroeconomic Policy and Poverty Reduction.

Girón, A. 2015. Women and Financialization: Microcredit, Institutional Investors, and MFIs. *Journal of Economic Issues*. **49**(2), pp.373–396.

Godechot, O. 2020. Financialization and the Increase in Inequality *In*: *The Routledge International Handbook of Financialization*. Routledge, pp.413–424.

Goldberger, A.S. 1972. Structural Equation Methods in the Social Sciences. *Econometrica*. **40**(6), pp.979–1001.

González, F. 2020. Micro-credit and the Financialization of Low-income Households *In*: *The Routledge International Handbook of Financialization*. Routledge, pp.301–311.

Gopalan, S. and Rajan, R.S. 2018. Foreign Banks and Financial Inclusion in Emerging and Developing Economies: An Empirical Investigation. *Journal of International Development*. **30**(4), pp.559–583.

Greenacre, M. and Blasius, J. 2006. *Multiple Correspondence Analysis and Related Methods* [Online] 1st ed. (M. Greenacre & J√∂rg Blasius, eds.). Boca Raton: Chapman and Hall/CRC. [Accessed 2 March 2018]. Available from: https://www.taylorfrancis.com/books/9781420011319.

Greene, W.H. 2012. *Econometric Analysis* 7th ed. Pearson.

Guérin, I. 2014. Juggling with Debt, Social Ties, and Values. *Current Anthropology*. **55**(S9), pp.S40–S50.

Guérin, I., D'Espallier, B. and Venkatasubramanian, G. 2013. Debt in Rural South India: Fragmentation, Social Regulation and Discrimination. *Journal of Development Studies*.

49(9), pp.1155–1171.

Guérin, I., D'Espallier, B. and Venkatasubramanian, G. 2015. The Social Regulation of Markets: Why Microcredit Fails to Promote Jobs in Rural South India. *Development and Change*. **46**(6), pp.1277–1301.

Guérin, I. and Kumar, S. 2017. Market, Freedom and the Illusions of Microcredit. Patronage, Caste, Class and Patriarchy in Rural South India. *The Journal of Development Studies*. **53**(5), pp.741–754.

Guérin, I., Labie, M. and Morvant-Roux, S. 2018. Inadequate growth, over-indebtedness, and crises in microcredit: What have we learned? *Enterprise Development and Microfinance*. **29**(2), pp.118–132.

Guérin, I., Morvant-Roux, S. and Villarreal, M. 2013. *Microfinance, debt and over-indebtedness : juggling with money* [Online] 1st ed. (I. Guérin, S. Morvant-Roux, & M. Villarreal, eds.). Routledge. [Accessed 26 February 2019]. Available from: https://www.routledge.com/Microfinance-Debt-and-Over-Indebtedness-Juggling-with-Money-1st-Edition/Guerin-Morvant-Roux-Villarreal/p/book/9780415835251.

Guerineau, S. and Jacolin, L. 2013. L'inclusion financière en Afrique sub-saharienne : faits stylisés et déterminants. *Revue d'économie financière*. **116**(4), pp.57–80.

Guest, G., Bunce, A. and Johnson, L. 2006. How Many Interviews Are Enough? *Field Methods*. **18**(1), pp.59–82.

Güngen, A.R. 2018. Financial Inclusion and Policy-Making: Strategy, Campaigns and Microcredit *a la Turca*. *New Political Economy*. **23**(3), pp.331–347.

Gupte, R., Venkataramani, B. and Gupta, D. 2012. Computation of Financial Inclusion Index for India. *Procedia - Social and Behavioral Sciences*. **37**, pp.133–149.

Gurgel, C.M.C. de A. 2014. *A Desigualdade Financeira Induzida: Discussão sobre as Dimensões da Exclusão Financeira e seus Efeitos sobre os Indivíduos em Condições de Desvantagem Social e Econômica, Influenciados pelos Aspectos Espaciais – Casos Brasileiros e Americano*. Universidade Federal de Minas Gerais.

Hair, J.F.J., Black, W.C., Babin, B.J. and Anderson, R.E. 2014. *Multivariate data analysis* [Online]. [Accessed 19 February 2018]. Available from: http://www.worldcat.org/title/multivariate-data-analysis/oclc/900353065.

Han, R. and Melecky, M. 2013. Financial inclusion for financial stability : access to bank deposits and the growth of deposits in the Global Financial Crisis. *Policy Research Working Paper Series*.

Harris, M. and Raviv, A. 1978. Some results on incentive contracts with applications to education and employment, health insurance, and law enforcement. *The American Economic Review*. **68**(1), pp.20–30.

Heap, S.H. and Varoufakis, Y. 2004. *Game theory : a critical text*. Routledge.

Hein, E. 2015. Finance-dominated capitalism and re-distribution of income: a Kaleckian perspective. *Cambridge Journal of Economics*. **39**(3), pp.907–934.

Herr, H. 2008. Financial Systems in Developing Countries and Economics Development *In*: E. Hein, T. Niechoj, P. Spahn and A. Truger, eds. *Finance-led Capitalism? Macroeconomic Effects of Changes in the Financial Sector*. Marburg: Metropolis, pp.123–150.

Hillig, A. 2019. Everyday financialization: The case of UK households. *Environment and Planning A*. **51**(7), pp.1460–1478.

Honohan, P. 2008. Cross-country variation in household access to financial services. *Journal of Banking & Finance*. **32**(11), pp.2493–2500.

Honohan, P. 2004. *Financial Development, Growth and Poverty: How Close are the Links?* [Online]. Washington D.C.: Palgrave Macmillan UK. [Accessed 26 February 2019]. Available from: http://link.springer.com/10.1057/9780230374270_1.

Hoyo, C., Pena, X. and Tuesta, D. 2013. Factores de demanda que influyen en la Inclusion Financiera en Mexico. Analisis de las barreras a partir de la ENIF. *Working Papers*.

Husson, F. and Josse, J. 2014. Multiple Correspondence Analysis *In*: J. Blasius and M. J. Greenacre, eds. *Visualization and verbalization of data*. Boca Raton: CRC Press, pp.165–182.

IBGE 2010. Census 2010.

IBGE 2020. Pesquisa Nacional por Amostra de Domicílios Contínua.

ILO 2009. *The financial and economic crisis: A decent work response*. Geneva.

ILO 2018a. *Women and men in the informal economy: a statistical picture* 3rd ed. Geneva: ILO.

ILO 2018b. *World Employment and Social Outlook – Trends 2018*. Geneva.

ILO 2017. *World Social Protection Report 2017-19: Universal social protection to achieve the Sustainable Development Goals*. Geneva.

Janda, K. 2006. Lender and Borrower as Principal and Agent. *Working Papers IES*.

Jefferson, P.N. and Kim, K. 2012. Determinants of Household Welfare and Poverty in Botswana *In*: *The Oxford Handbook of the Economics of Poverty*. Oxford University Press, pp.319–350.

Johnson, S. 2016a. *A promisse fulfilled? Financial market development in Kenya 2011-2015*. Nairobi.

Johnson, S. 2016b. Competing visions of financial inclusion in Kenya: the rift revealed by mobile money transfer. *Canadian Journal of Development Studies / Revue canadienne d'études du développement*. **37**(1), pp.83–100.

Kaffenberger, M. and Totolo, E. 2018. *A Digital Credit Revolution - Insights from Borrowers in Kenya and Tanzania*. Nairobi.

Kalpana, K. 2005. Shifting Trajectories in Microfinance Discourse. *Economic and Political Weekly*. **40**(51), pp.5400-5401+.

Kaltenbrunner, A. 2018. Financialised internationalisation and structural hierarchies: a mixed-method study of exchange rate determination in emerging economies. *Cambridge Journal of Economics*. **42**(5), pp.1315–1341.

Kaltenbrunner, A. and Painceira, J.P. 2015. Developing countries' changing nature of financial integration and new forms of external vulnerability: the Brazilian experience. *Cambridge Journal of Economics*. **39**(5), pp.1281–1306.

Kaltenbrunner, A. and Painceira, J.P. 2018. Subordinated Financial Integration and Financialisation in Emerging Capitalist Economies: The Brazilian Experience. *New Political Economy*. **23**(3), pp.290–313.

Karacimen, E. 2015. Interlinkages between credit, debt and the labour market: evidence from Turkey. *Cambridge Journal of Economics*. **39**(3), pp.751–767.

Karpowicz, I. 2016. Financial Inclusion, Growth and Inequality: A Model Application to Colombia. *Journal of Banking and Financial Economics*. **2016**(2), pp.68–89.

Keynes, J.M. 1997. *The general theory of employment, interest, and money* [Online].

Prometheus Books. [Accessed 4 March 2019]. Available from: https://www.penguinrandomhouse.com/books/229543/the-general-theory-of-employment-interest-and-money-by-john-maynard-keynes/9781573921398/.

Khan, M.S. and Senhadji, A. 2000. *Financial Development and Economic Growth: An Overview*. Washington, DC: IMF.

Khandker, S.R. 1998. *Fighting poverty with microcredit : experience in Bangladesh* [Online]. Oxford University Press. [Accessed 15 February 2018]. Available from: http://documents.worldbank.org/curated/en/549951468768619206/Fighting-poverty-with-microcredit-experience-in-Bangladesh.

Khemraj, T. 2010. *The simple analytics of oligopoly banking in developing economies* [Online]. University Library of Munich, Germany. [Accessed 26 July 2018]. Available from: https://ideas.repec.org/p/pra/mprapa/22266.html.

Kim, D.-W., Yu, J.-S. and Hassan, M.K. 2018. Financial inclusion and economic growth in OIC countries. *Research in International Business and Finance*. **43**, pp.1–14.

Kim, J.-H. 2016. A Study on the Effect of Financial Inclusion on the Relationship Between Income Inequality and Economic Growth. *Emerging Markets Finance and Trade*. **52**(2), pp.498–512.

King, R. and Levine, R. 1993. Finance, entrepreneurship and growth. *Journal of Monetary Economics*. **32**(3), pp.513–542.

Klapper, L. and Singer, D. 2017. The role of demand-side data – measuring financial inclusion from the perspective of users of financial services *In*: Marrekech: Bank for International Settlements, pp.1–15.

Kohler, K., Guschanski, A. and Stockhammer, E. 2019. The impact of financialisation on the wage share: a theoretical clarification and empirical test. *Cambridge Journal of Economics*. **43**(4), pp.937–974.

de Koker, L. and Jentzsch, N. 2013. Financial Inclusion and Financial Integrity: Aligned Incentives? *World Development*. **44**, pp.267–280.

Koomson, I., Villano, R.A. and Hadley, D. 2020. Effect of Financial Inclusion on Poverty and Vulnerability to Poverty: Evidence Using a Multidimensional Measure of Financial Inclusion. *Social Indicators Research*., pp.1–27.

Krnic Martinic, M., Pieper, D., Glatt, A. and Puljak, L. 2019. Definition of a systematic review used in overviews of systematic reviews, meta-epidemiological studies and textbooks. *BMC Medical Research Methodology*. **19**(1), p.203.

Kumar, N. 2013. Financial inclusion and its determinants: evidence from India. *Journal of Financial Economic Policy*. **5**(1), pp.4–19.

Kuznets, S. 1955. Economic Growth and Income Inequality. *The American Economic Review*. **45**(1), pp.1–28.

Lai, K. 2018. Financialization of Everyday Life *In*: *The New Oxford Handbook of Economic Geography*.

Langley, P. 2020. The Financialization of Life *In*: *The Routledge International Handbook of Financialization*. Routledge, pp.68–78.

Lapavitsas, C. 2009. Financialised Capitalism: Crisis and Financial Expropriation. *Historical Materialism*. **17**(2), pp.114–148.

Lapavitsas, C. 2013. The financialization of capitalism: 'Profiting without producing'. *City*. **17**(6), pp.792–805.

Lavinas, L. 2015. A financeirização da política social: o caso brasileiro. *Politika*. **2**, pp.35–51.

Lavinas, L. 2020. The Collateralization of Social Policy by Financial Markets in the Global South *In*: *The Routledge International Handbook of Financialization*. Routledge, pp.312–323.

Lavinas, L. 2018. The Collateralization of Social Policy under Financialized Capitalism. *Development and Change*. **49**(2), pp.502–517.

Lawson, T. 1999. Development in economics as realist social theory *In*: S. Fleetwood, ed. *Critical realism in economics: development and debate*. Routledge, pp.3–20.

Lawson, T. 2003. *Reorienting economics*. Routledge.

Le, Q.H., Ho, H.L. and Mai, N.C. 2019. The impact of financial inclusion on income inequality in transition economies. *Management Science Letters*. **9**(5), pp.661–672.

Lee, F.S. 2002. Theory creation and the methodological foundation of Post Keynesian economics. *Cambridge Journal of Economics*. **26**(6), pp.789–804.

Lekobane, K.R. and Seleka, T.B. 2017. Determinants of Household Welfare and Poverty in Botswana, 2002/2003 and 2009/2010. *Journal of Poverty*. **21**(1), pp.42–60.

Levine, R. 1997. Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature*. **35**(2), pp.688–726.

Levine, R., Loayza, N. and Beck, T. 2000. Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*. **46**(1), pp.31–77.

Leyshon, A. and Thrift, N. 1995. Geographies of Financial Exclusion: Financial Abandonment in Britain and the United States. *Transactions of the Institute of British Geographers*. **20**(3), p.312.

Leyshon, A. and Thrift, N. 2007. The Capitalization of Almost Everything. *Theory, Culture & Society*. **24**(7–8), pp.97–115.

Li, L. 2018. Financial inclusion and poverty: The role of relative income. *China Economic Review*. **52**, pp.165–191.

Lin, K.H. and Tomaskovic-Devey, D. 2013. Financialization and U.S. income inequality. *American Journal of Sociology*. **118**(5), pp.1284–1329.

Lindsjö, K. 2018. The financial burden of a fee free primary education on rural livelihoods–a case study from rural Iringa Region, Tanzania. *Development Studies Research*. **5**(1), pp.26–36.

Lopez, T. and Winkler, A. 2018. The challenge of rural financial inclusion – evidence from microfinance. *Applied Economics*. **50**(14), pp.1555–1577.

Lusardi, A. and Tufano, P. 2015. Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics and Finance*. **14**(4), pp.332–368.

Mader, P. 2018. Contesting Financial Inclusion. *Development and Change*. **49**(2), pp.461–483.

Maldonado, J.E. 2017. *Financial Systems and Income Inequality. Bruges European Economic Research Papers 36/2017* [Online]. Bruges. [Accessed 9 January 2021]. Available from: https://www.coleurope.eu/website/study/european-economic-studies/research-activities/bruges-european-economic-research-papers.

Martorano, B. 2018. Taxation and Inequality in Developing Countries: Lessons from the Recent Experience of Latin America. *Journal of International Development*. **30**(2),

pp.256–273.

McKinnon, R.I. 1973. *Money and capital in economic development*, [Online]. Brookings Institution. [Accessed 22 March 2018]. Available from: https://play.google.com/store/books/details?id=erOVlDIY1jEC.

Medeiros, M., de Souza, P.H.G.F. and de Castro, F.A. 2015. O Topo da distribuição de renda no Brasil: Primeiras estimativas com dados tributários e comparação com pesquisas domiciliares (2006-2012). *Dados*. **58**(1), pp.7–36.

Mehrotra, A. and Yetman, J. 2015. Financial inclusion - issues for central banks. *BIS Quarterly Review*.

Mensah, S. and Abor, J. 2012. *Agency Conflict and Bank Interest Spreads in Ghana*. London.

Modigliani, F. 1966. The Life Cycle Hypothesis Of Saving, The Demand For Wealth And The Supply Of Capital. *Social Research*. **33**(2), pp.160–217.

Mohieldin, M., Rostom, A., Fu, X. and Iqbal, Z. 2012. The Role of Islamic Finance in Enhancing Financial Inclusion in Organization of Islamic Cooperation (OIC) Countries. *Islamic Economic Studies*. **20**–**2**, pp.55–120.

Moncayo, J. and Reis, M. 2016. *Un análisis inicial del dinero electrónico en Ecuador y su impacto en la inclusión financiera*.

Montgomerie, J. 2020. Indebtedness and Financialization in Everyday Life *In*: *The Routledge International Handbook of Financialization*. Routledge, pp.380–389.

Mookherjee, D. and Png, I. 1989. Optimal Auditing, Insurance, and Redistribution. *The Quarterly Journal of Economics*. **104**(2), p.399.

Moore, W. and Craigwell, R. 2002. Market power and interest rate spreads in the Caribbean. *International Review of Applied Economics*. **16**(4), pp.391–405.

Morgan, P.J. and Pontines, V. 2018. Financial Stability And Financial Inclusion: The Case Of SME Lending. *The Singapore Economic Review*. **63**(01), pp.111–124.

Morvant-Roux, S., Guérin, I., Roesch, M. and Servet, J.-M. 2010. Politiques d'inclusion financière, microfinance et financement de l'agriculture. *Mondes en développement*. **151**(3), pp.9–24.

Moura, R. 2016. Consigned Credit: the face of financial expropriation on the course of the counter-reformation of social security. *SER Social*. **18**(39), pp.374–390.

Mukherjee, S. and Benson, T. 2003. The Determinants of Poverty in Malawi, 1998. *World Development*. **31**(2), pp.339–358.

Mundlak, Y. 1978. On the Pooling of Time Series and Cross Section Data. *Econometrica*. **46**(1), p.69.

Mutsonziwa, K. and Fanta, A. 2019. Over-indebtedness and its welfare effect on households. *African Journal of Economic and Management Studies*. **10**(2), pp.185–197.

Naceur, S. Ben, Barajas, A. and Massara, A. 2015. *Can Islamic Banking Increase Financial Inclusion?* [Online]. International Monetary Fund. [Accessed 29 September 2018]. Available from: https://ideas.repec.org/p/imf/imfwpa/15-31.html.

Nawaz, T. 2018. Lifting the Lid on Financial Inclusion: Evidence from Emerging Economies. *International Journal of Financial Studies*. **6**(2), p.59.

Neri, M. 2014. Programa Bolsa Família e a inclusão financeira *In*: T. Campello, T. Falcão and P. Vieira da Costa, eds. *O Brasil sem miséria*. Brasília, pp.727–744.

Neri, M. and Buchmann, G. 2008. CrediAmigo: o Grameen tupiniquim *In*: M. Neri, ed. *Microcrédito - O mistério nordestino e o Grameen brasileiro*. Rio de Janeiro: FGV, pp.191–229.

Odedokun, M. and Round, J.I. 2001. *Determinants of Income Inequality and its Effects on Economic Growth* [Online]. Helsinki. [Accessed 9 January 2021]. Available from: https://www.wider.unu.edu/publication/determinants-income-inequality-and-its-effects-economic-growth.

Okello Candiya Bongomin, G., Munene, J.C., Mpeera Ntayi, J. and Akol Malinga, C. 2018. Financial intermediation and financial inclusion of the poor. *International Journal of Ethics and Systems*. **34**(2), pp.146–165.

Okello Candiya Bongomin, G., Munene, J.C., Ntayi, J.M. and Malinga, C.A. 2018. Exploring the mediating role of social capital in the relationship between financial intermediation and financial inclusion in rural Uganda. *International Journal of Social Economics*. **45**(5), pp.829–847.

Okello Candiya Bongomin, G., Ntayi, J.M., Munene, J.C. and Malinga, C.A. 2018. Institutions and Financial Inclusion in Rural Uganda: the Mediating Role of Social Capital. *Journal of African Business*. **19**(2), pp.244–261.

Olsen, W. 2007. Critical Realist Explorations in Methodology. *Methodological Innovation Online*. **2**(2), pp.1–5.

Ouma, S.A., Odongo, T.M. and Were, M. 2017. Mobile financial services and financial inclusion: Is it a boon for savings mobilization? *Review of Development Finance*. **7**(1), pp.29–35.

Paim, B. 2015. Perfil da dívida das famílias e o Sistema Financeiro Nacional. *Indicadores Econômicos FEE*. **42**(4), pp.9–24.

Paliński, A. 2015. Game-Theoretic Approach to Bank Loan Repayment. *Decision Making in Manufacturing and Services*. **9**(1), p.79.

Palma, J.G. 2011. Homogeneous Middles vs. Heterogeneous Tails, and the End of the 'Inverted-U': It's All About the Share of the Rich. *Development and Change*. **42**(1), pp.87–153.

Palma, J.G. and Stiglitz, J.E. 2016. Do Nations Just Get the Inequality They Deserve? The "Palma Ratio" Re-examined *In*: *Inequality and Growth: Patterns and Policy*. Palgrave Macmillan UK, pp.35–97.

Park, C.-Y. and Mercado, R. 2018. Financial inclusion, poverty, and income inequality. *The Singapore Economic Review*. **63**(01), pp.185–206.

Pasha, A. 2017. Regional Perspectives on the Multidimensional Poverty Index. *World Development*. **94**, pp.268–285.

de Paula, L.F., Fritz, B. and Prates, D.M. 2017. Keynes at the periphery: Currency hierarchy and challenges for economic policy in emerging economies. *Journal of Post Keynesian Economics*. **40**(2), pp.183–202.

Pearce, D. 2011. *Financial inclusion in the Middle East and North Africa : analysis and roadmap recommendations*. Washington D.C.

Peña, X., Hoyo, C. and Tuesta, D. 2014. *Determinantes de la inclusión financiera en México a partir de la ENIF 2012*. Madrid.

Piñeyro, C.M.Z. 2013. Financial Inclusion Index: Proposal Of A Multidimensional Measure For Mexico. *Mexican Journal of Economics and Finance*. **8**(2), pp.157–180.

Polillo, S. 2020. Solving the paradox of mass investment: expertise, financial inclusion and inequality in the politics of credit. *Review of Social Economy*.

Pollard, J.S. 1996. Banking at the Margins: A Geography of Financial Exclusion in Los Angeles. *Environment and Planning A*. **28**(7), pp.1209–1232.

Postelnicu, L., Hermes, N. and Szafarz, A. 2014. Defining Social Collateral in Microfinance Group Lending *In*: *Microfinance Institutions* [Online]. London: Palgrave Macmillan UK, pp.187–207. [Accessed 12 February 2019]. Available from: http://link.springer.com/10.1057/9781137399663_10.

Prates, D.M. and Cintra, M.A.M. 2007. *Keynes e a hierarquia de moedas: possíveis lições para o Brasil*. Campinas.

Prefeitura de Belo Horizonte 2017. BH em Pauta: Grupos geram trabalho e renda na capital. [Accessed 20 May 2020]. Available from: https://prefeitura.pbh.gov.br/noticias/bh-em-pauta-grupos-geram-trabalho-e-renda-na-capital.

Prefeitura de Belo Horizonte 2020. Mapas IVJ-BH. [Accessed 20 May 2020]. Available from: https://public.tableau.com/views/TGC/IVJ?:embed=y&:showVizHome=no&:host_url=https%3A%2F%2Fpublic.tableau.com%2F&:embed_code_version=3&:tabs=no&:toolbar=yes&:animate_transition=yes&:display_static_image=no&:display_spinner=no&:display_overlay=yes&:display_.

Rahman, M.A. 2013. Household Characteristics And Poverty: A Logistic Regression Analysis. *The Journal of Developing Areas*. **47**(1), pp.303–317.

Ramji, M. 2009. *Financial Inclusion in Gulbarga: Finding Usage in Access*. New Delhi.

Rastogi, S. and E., R. 2018. Financial inclusion and socioeconomic development: gaps and solution. *International Journal of Social Economics*. **45**(7), pp.1122–1140.

Ravallion, M. 1995. Growth and poverty: Evidence for developing countries in the 1980s. *Economics Letters*. **48**(3–4), pp.411–417.

Rewilak, J. 2017. The role of financial development in poverty reduction. *Review of Development Finance*. **7**(2), pp.169–176.

Roa, M.J. 2013. *Inclusión financiera en América Latina y el Caribe: acceso, uso y calidad* [Online]. Centro de Estudios Monetarios Latinoamericanos. [Accessed 30 September 2018]. Available from: https://ideas.repec.org/a/cml/boletn/vlixy2013i3p121-148.html.

Roine, J., Vlachos, J. and Waldenström, D. 2009. The long-run determinants of inequality:

What can we learn from top income data? *Journal of Public Economics*. **93**(7–8), pp.974–988.

Rojas-Suarez, L. 2016. Financial Inclusion in Latin America: Facts and Obstacles - Working Paper 439. *Working Papers*.

Roodman, D. 2009. A Note on the Theme of Too Many Instruments. *Oxford Bulletin of Economics and Statistics*. **71**(1), pp.135–158.

Roodman, D. and Morduch, J. 2014. The Impact of Microcredit on the Poor in Bangladesh: Revisiting the Evidence. *The Journal of Development Studies*. **50**(4), pp.583–604.

van Rooyen, C., Stewart, R. and de Wet, T. 2012. The Impact of Microfinance in Sub-Saharan Africa: A Systematic Review of the Evidence. *World Development*. **40**(11), pp.2249–2262.

Rousseas, S. 1985. A Markup Theory of Bank Loan Rates. *Journal of Post Keynesian Economics*. **8**(1), pp.135–144.

Safavian, M. and Haq, A. 2013. *Are Pakistan's Women Entrepreneurs Being Served by the Microfinance Sector?* [Online]. [Accessed 17 October 2018]. Available from: http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-9833-3.

Sahn, D.E. and Stifel, D.C. 2000. Poverty Comparisons Over Time and Across Countries in Africa. *World Development*. **28**(12), pp.2123–2155.

Sanderson, E. and Windmeijer, F. 2016. A weak instrument F-test in linear IV models with multiple endogenous variables. *Journal of Econometrics*. **190**(2), pp.212–221.

Santanna, D. 2019. *A critical study of financial inclusion policies in Brazil*.[Online] University of Leeds. [Accessed 8 May 2019]. Available from: http://etheses.whiterose.ac.uk/23504/.

dos Santos, P.L. and Harvold Kvangraven, I. 2017. Better than Cash, but Beware the Costs: Electronic Payments Systems and Financial Inclusion in Developing Economies. *Development and Change*. **48**(2), pp.205–227.

Sarel, M. 1997. *How Macroeconomic Factors Affect Income Distribution: The Cross-Country Evidence by Michael Sarel :: SSRN* [Online]. Washington DC. [Accessed 9 January 2021]. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=882728.

Sargan, J.D. 1958. The Estimation of Economic Relationships using Instrumental Variables. *Econometrica*. **26**(3), p.393.

Sarma, M. 2008. *Index of Financial Inclusion*. New Delhi.

Sarma, M. 2012. *Index of Financial Inclusion – A measure of financial sector inclusiveness*. Berlin.

Sarma, M. 2016. Measuring Financial Inclusion using Multidimensional Data. *World Economics*. **17**(1), pp.15–40.

Sarma, M. and Pais, J. 2011. Financial Inclusion and Development. *Journal of International Development*. **23**(5), pp.613–628.

Schicks, J. 2014. Over-Indebtedness in Microfinance – An Empirical Analysis of Related Factors on the Borrower Level. *World Development*. **54**, pp.301–324.

Schicks, J. and Rosenberg, R. 2011. *Too Much Microcredit? A Survey of the Evidence on Over-Indebtedness* [Online]. Washington, D.C. [Accessed 26 July 2018]. Available from: http://www.cgap.org/publications/too-much-microcredit-survey-evidence-over-indebtedness.

Schumpeter, J.A. 1934. *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle* 13th ed. Harvard University Press.

Schunck, R. 2013. Within and between estimates in random-effects models: Advantages and drawbacks of correlated random effects and hybrid models. *Stata Journal*. **13**(1), pp.65–76.

Schwittay, A.F. 2011. The financial inclusion assemblage: Subjects, technics, rationalities. *Critique of Anthropology*. **31**(4), pp.381–401.

Selten, R. 1978. The chain store paradox. *Theory and Decision*. **9**(2), pp.127–159.

Servet, J.-M. 2009. Responsabilité Sociale Versus Performances Sociales En Microfinance. *Revue Tiers Monde*. **197**(1), p.55.

Sethi, D. and Acharya, D. 2018. Financial inclusion and economic growth linkage: some cross country evidence. *Journal of Financial Economic Policy*. **10**(3), pp.369–385.

Sethy, S.K. and Goyari, P. 2018. Measuring Financial Inclusion of Indian States: An Empirical Study. *Indian Journal of Economics and Development*. **14**(1), p.111.

Snilstveit, B., Eyers, J., Bhavsar, A., Gallagher, E. and Stevenson, J. 2014. *3ie database of systematic reviews in international development: search strategy and procedures document*. London.

Soederberg, S. 2013. Universalising Financial Inclusion and the Securitisation of Development. *Third World Quarterly*. **34**(4), pp.593–612.

Solli, J. 2015. *What Happens to Microfinance Clients who Default? An Exploratory Study of Microfinance Practices*.

Sotiropoulos, D.P. and Hillig, A. 2020. Financialization in Heterodox Economics *In*: *The Routledge International Handbook of Financialization*. Routledge, pp.125–135.

Staiger, D. and Stock, J.H. 1997. Instrumental Variables Regression with Weak Instruments. *Econometrica*. **65**(3), pp.557–586.

Stata 2019. Longitudinal-data/Panel-data reference manual - release 16.

Stata 2013. Multiple and joint correspondence analysis.

Stiglitz, J.E. 1990. Peer Monitoring and Credit Markets. *The World Bank Economic Review*. **4**(3), pp.351–366.

Stiglitz, J.E. 1989. Principal and Agent *In*: *Allocation, Information and Markets* [Online]. London: Palgrave Macmillan UK, pp.241–253. [Accessed 13 March 2019]. Available from: http://link.springer.com/10.1007/978-1-349-20215-7_25.

Stiglitz, J.E. and Weiss, A. 1981. Credit Rationing in Markets with Imperfect Information. *American Economic Review*. **71**(3), pp.393–410.

Stock, J.H. and Yogo, M. 2005. Testing for weak instruments in Linear IV regression *In*: *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg*. Cambridge University Press, pp.80–108.

Stockhammer, E. 2015. Rising inequality as a cause of the present crisis. *Cambridge Journal of Economics*. **39**(3), pp.935–958.

Suijs, J., De Waegenaere, A. and Borm, P. 1998. Stochastic cooperative games in insurance. *Insurance: Mathematics and Economics*. **22**(3), pp.209–228.

Suri, T. and Jack, W. 2016. The long-run poverty and gender impacts of mobile money. *Science (New York, N.Y.)*. **354**(6317), pp.1288–1292.

SUSEP 2020. *8o Relatório de Análise e Acompanhamento dos Mercados Supervisionados*. Rio de Janeiro.

Tambunlertchai, K. 2018. Determinants and barriers to financial inclusion in Myanmar: what determines access to financial services and what hinders it? *The Singapore Economic Review*. **63**(01), pp.9–26.

Van Tassel, E. 2004. Household bargaining and microfinance. *Journal of Development Economics*. **74**(2), pp.449–468.

Tassot, C., Pellerano, L. and La, J. 2019. *Informality and Poverty in Zambia*. Geneva: OECD and ILO.

Taylor, M. 2012. The Antinomies of 'Financial Inclusion': Debt, Distress and the Workings of Indian Microfinance. *Journal of Agrarian Change*. **12**(4), pp.601–610.

Tedeschi, G.A. 2006. Here today, gone tomorrow: Can dynamic incentives make microfinance more flexible? *Journal of Development Economics*. **80**(1), pp.84–105.

Tissot, B. and Gadanecz, B. 2016. *Measures of financial inclusion - a central bank perspective*. Basel.

Trancoso Baltar, C. 2015. Inflation and economic growth in an open developing country: the case of Brazil. *Cambridge Journal of Economics*. **39**(5), pp.1263–1280.

Tridico, P. 2018. The determinants of income inequality in OECD countries. *Cambridge Journal of Economics*. **42**, pp.1009–1042.

Turegano, D.M. and Garcia-Herrero, A. 2018. Financial inclusion, rather than size, is the key to tackling income inequality. *The Singapore Economic Review*. **63**(01), pp.167–184.

Ulwodi, D.W. and Muriu, P.W. 2017. Barriers of Financial Inclusion in Sub-Saharan Africa. *Journal of Economics and Sustainable Development*. **8**(14), pp.66–81.

UNCTAD 2015. *The Least Developed Countries Report 2015 - Transforming Rural Economies*. Geneva.

Vera-Hernandez, M. 2003. Structural Estimation of a Principal-Agent Model: Moral Hazard in Medical Insurance. *The RAND Journal of Economics*. **34**(4), p.670.

Verbeek, M. 2008. *A guide to modern econometrics*. John Wiley & Sons.

Vogelgesang, U. 2003. Microfinance in times of crisis: The effects of competition, rising

indebtedness, and economic crisis on repayment behavior. *World Development*. **31**(12), pp.2085–2114.

Waddington, H., White, H., Snilstveit, B., Hombrados, J.G., Vojtkova, M., Davies, P., Bhavsar, A., Eyers, J., Koehlmoos, T.P., Petticrew, M., Valentine, J.C. and Tugwell, P. 2012. How to do a good systematic review of effects in international development: a tool kit. *Journal of Development Effectiveness*. **4**(3), pp.359–387.

Wang, X. and Guan, J. 2017. Financial inclusion: measurement, spatial effects and influencing factors. *Applied Economics*. **49**(18), pp.1751–1762.

Warren, R., Yao, J., Rourke, T. and Iwanik, J. 2012. *Game Theory in General Insurance - How to outdo your adversaries while they are trying to outdo you*. London.

Watson, J. 2013. *Strategy : an introduction to game theory* [Online] Third. London: W. W. Norton & Company Ltd. [Accessed 28 January 2019]. Available from: https://books.wwnorton.com/books/webad.aspx?id=4294969499.

Williams, T.P., Abbott, P. and Mupenzi, A. 2015. 'Education at our school is not free': the hidden costs of fee-free schooling in Rwanda. *Compare*. **45**(6), pp.931–952.

Wooldridge, J.M. 2001. Applications of generalized method of moments estimation. *Journal of Economic Perspectives*. **15**(4), pp.87–100.

Wooldridge, J.M. 2002. *Econometric analysis of cross section and panel data* [Online]. MIT Press. [Accessed 14 January 2019]. Available from: https://mitpress.mit.edu/books/econometric-analysis-cross-section-and-panel-data-second-edition.

Wooldridge, J.M. 2012. *Introduction of econometric: a modern approach* 5th ed. South-Western College Pub.

World Bank 2020. Global Financial Development Database (GFDD).

World Bank 2014. *Global Financial Development Report 2014: Financial Inclusion* [Online]. Washington D.C.: The World Bank. [Accessed 8 February 2018]. Available from: http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-9985-9.

World Bank 2012a. *Information and Communications for Development 2012* [Online]. Washington D.C.: The World Bank. [Accessed 29 September 2018]. Available from: http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-8991-1.

World Bank 2012b. Insurance for the poor. *Africa Social Protection Policy Briefs*.

Wray, R. 2008. *Financial markets meltdown - what can we learn from Minsky?*

Zachariadis, M., Scott, S. and Barrett, M. 2013. Methodological Implications of Critical Realism for Mixed-Methods Research. *MIS Quarterly*. **37**(3), pp.855–879.

Zins, A. and Weill, L. 2016. The determinants of financial inclusion in Africa. *Review of Development Finance*. **6**(1), pp.46–57.

Zulkhibri, M. 2016. Financial inclusion, financial inclusion policy and Islamic finance. *Macroeconomics and Finance in Emerging Market Economies*. **9**(3), pp.303–320.

van der Zwan, N. 2014. Making sense of financialization. *Socio-Economic Review*. **12**(1), pp.99–129.

Appendixes

Appendix A

Table A..1: Systematic review of definition of financial inclusion

No.	Main paper	Source	Type of study	Definition quote
1	Aduda and Kalunda (2012)	Google Scholar	Journal article	"Financial inclusion or banking sector outreach can be defined broadly as the process of availing an array of required financial services, at a fair price, at the right place, form and time and without any form of discrimination to all members of the society"
2	Akileng, Lawino and Nzibonera (2018)	EconLit	Journal article	"Earlier the definition of financial inclusion considered only banking products and services. But now, this definition has been expanded to consider other financial services (insurance, pension and remittances) and institutions (NBFCs)"
3	Allen *et al.* (2016)	Google Scholar	Journal article	"use of formal accounts"
4	Alonso *et al.* (2013)	Google Scholar	Institutional working paper	"De acuerdo al Centro para la Inclusión Financiera (Center for Financial Inclusion, CFI), la inclusión financiera es “un estado en el que las personas que puedan utilizar servicios financieros de calidad, tengan acceso a ellos, a precios asequibles, proveídos de manera conveniente y con dignidad para los clientes”. Por otra parte, Morales y Yánez (2006) definen a la bancarización como el establecimiento de relaciones estables y amplias ente los bancos y sus usuarios respecto de un conjunto de servicios financieros disponibles. La medición de la bancarización no es única y debe considerarse desde diferentes puntos de vista al ser un fenómeno multidimensional. Las dimensiones utilizadas con mayor frecuencia para su medición son: i) profundidad, como proporción que guarda el crédito al PIB (penetración del crédito en la economía de un país) o bien depósitos en relación al PIB; ii) inclusión, que puede registrarse en términos de segmentos de la población que son atendidos por la banca y por su alcance geográfico, que también puede ser interpretado como cobertura de servicios y, iii) intensidad de uso de los diferentes instrumentos o productos bancarios."

5	Ambarkhane, Shekhar Singh and Venkataramani (2016)	Cross-reference	Journal article	Earlier the definition of financial inclusion considered only banking products and services. But now, this definition has been expanded to consider other financial services (insurance, pension and remittances) and institutions (NBFCs) (Planning commission, Govt. of India, 2009).
6	Amidžić, Massara and Mialou (2014)	Google Scholar	Institutional working paper	"Financial inclusion can be broadly defined as an economic state where individuals and firms are not denied access to basic financial services based on motivations other than efficiency criteria"
7	Anzoategui, Demirgüç-Kunt and Martínez Pería (2014)	Google Scholar	Journal article	"households' access to and use of financial services"
8	Arun and Kamath (2015)	Web of Science	Journal article	"state in which everyone who can use them has access to a full suite of quality financial services, provided at affordable prices, in a convenient manner, with respect and dignity"
9	Atkinson and Messy (2013)	Google Scholar	Institutional working paper	"Financial inclusion refers to the process of promoting affordable, timely and adequate access to a wide range of regulated financial products and services and broadening their use by all segments of society through the implementation of tailored existing and innovative approaches including financial awareness and education with a view to promote financial well-being as well as economic and social inclusion"
10	Bader and Savoia (2013)	Google Scholar	Journal article	"possibilidade de levar serviços financeiros a pessoas até então excluídas do sistema bancário"
11	Bara (2013)	Google Scholar	Journal article	"Financial inclusion means that the majority of the population has broad access to a portfolio of quality financial products and services"
12	Chakravarty and Pal (2013)	Google Scholar	Journal article	"Financial inclusion can be defined as a process that serves to remove the barriers and overcome the inabilities of some societal groups and individuals, including the poor and disadvantaged, to access and use low-cost, fair and safe formal financial services, such as credit, deposits, insurance and payments, whenever needed"

13	Chauvet and Jacolin (2017)	Cross-reference	Journal article	"financial inclusion, i.e., the distribution of financial services across firms"
14	Cnaan, Moodithaya and Handy (2012)	Web of Science	Journal article	"Broadly speaking, financial inclusion means access to finance and financial services for all in a fair, transparent and equitable manner at an affordable cost (Sarma, 2008; Solo, 2008). Fuller and Mellor (2008) noted that financial inclusion is the desire to develop 'alternative', welfare-oriented (rather than profit-driven), reliable, affordable and accessible financial services for all sections of the population. Others, however, view inclusion as a market-driven solution for poverty alleviation (Alpana, 2007)."
15	de Koker and Jentzsch (2013)	Google Scholar	Journal article	"'Financial inclusion" can be defined in general as ensuring access to formal financial services at an affordable cost in a fair and transparent manner (FATF, 2011a, p. 12)"
16	Demirgüç-Kunt and Klapper (2012a)	Google Scholar	Institutional working paper	"Inclusive financial systems—allowing broad access to financial services, without price or nonprice barriers to their use"
17	Demirgüç-Kunt and Klapper (2012b)	Cross-reference	Institutional working paper	"Inclusive financial systems—allowing broad access to financial services, without price or nonprice barriers to their use"
18	Demirgüç-Kunt and Klapper (2013)	Google Scholar	Journal article	"More-inclusive financial systems—those that allow broad access to appropriate financial services"
19	Demirgüç-Kunt, Beck and Honohan (2008)	Cross-reference	Institutional working paper	"Financial inclusion, or broad access to financial services, implies an absence of price and nonprice barriers in the use of financial services; it is difficult to define and measure because access has many dimensions"
20	Demirguc-Kunt, Klapper and Singer (2017)	Cross-reference	Institutional working paper	"Financial inclusion means that adults have access to and can effectively use a range of appropriate financial services. Such services must be provided responsibly and safely to the consumer and sustainably to the provider in a well regulated environment."
21	(Dev, 2006)	Google Scholar	Journal article	"Financial inclusion can be defined as delivery of banking services at an affordable cost to the vast sections of disadvantaged and low-income groups. In the case of credit, the proper definition of the financially excluded would include households who are denied credit in spite of their demand"

22	dos Santos and Harvold Kvangraven (2017)	Cross-reference	Journal article	"'financial inclusion', that is, to extend the reach of credit, savings and insurance services to those households, communities and regions"
23	Fan and Zhang (2017)	Web of Science	Journal article	"financial inclusiveness, which is typically defined as the extent to which individuals can directly access formal financial systems"
24	Fungáčová and Weill (2015)	Google Scholar	Journal article	"Financial inclusion, defined as the use of formal financial services"
25	Garg and Agarwal (2014)	Google Scholar	Journal article	"Financial exclusion describes as a situation in which people do not have access to mainstream financial product and services such as banks accounts, credit cards and insurance policies, particularly home insurance, education loan."
26	Gopalan and Rajan (2018)	EconLit	Journal article	"Financial inclusion can be said to encompass the process of broadening the accessibility of financial services for households and firms. In other words, it relates to the issue of providing and enabling the firms and households in an economy with access to the formal credit market."
27	Guerineau and Jacolin (2013)	Google Scholar	Journal article	"l'inclusion financière, c'està-dire un meilleur accès et une utilisation plus intensive des services financiers"
28	Güngen (2018)	EconLit	Journal article	"Financial inclusion assumes that removing barriers to accessing formal finance benefits the poor and triggers their entrepreneurial spirit, thereby contributing to development by enabling households and small- and medium-sized enterprises (SMEs) to access the financial system. Under its most basic definition, financial inclusion simply means having a bank account. To achieve the developmental objectives associated with financial inclusion, however, entails converting people into financial consumers or investors, which means they should use their accounts actively to benefit from financial campaigns and services. The promotion of financial savings and investment, and the provision of financial education and digitised payments can all be considered as aspects of financial inclusion."
29	Gupte, Venkataramani and Gupta (2012)	Google Scholar	Journal article	"Financial inclusion initiatives highlight the concerted efforts undertaken by the financial system or any constituent thereof to bring into its fold sections of the economy that have been excluded from access to affordable credit and other financial services."

30	Han and Melecky (2013)	Google Scholar	Institutional working paper	"Greater diversification of deposits could be achieved by enabling a broader access to and use of bank deposits, i.e. involving a greater share of adult population in the use of bank deposits (financial inclusion)."
31	Hoyo, Pena and Tuesta (2013)	Google Scholar	Institutional working paper	"para el presente estudio se adopta la definición de la Comisión Nacional Bancaria y de Valores (CNBV), según la cual la inclusión financiera "…comprende el acceso y uso de servicios financieros bajo una regulación apropiada que garantice esquemas de protección al consumidor y promueva la educación financiera para mejorar las capacidades financieras de todos los segmentos de la población". Bajo este concepto, la inclusión financiera tiene cuatro componentes: 1) acceso, 2) uso, 3) protección al consumidor y 4) educación financiera."
32	Kim (2016)	Cross-reference	Journal article	"Financial inclusion has many different definitions. However, according to the previous studies and theories, financial inclusion generally refers to a state in which all working-age adults have effective access to credit, savings, payments, and insurance from formal service providers. Effective access involves convenient and responsible service delivery, at a cost affordable to the customer and sustainable for the provider, with the result that financially excluded customers—such as those low-income groups and others who are financially disadvantaged—use formal financial services rather than existing informal options."
33	Kim, Yu and Hassan (2018)	EconLit	Journal article	"Financial inclusion, as dealt with in this study, means the ease of accessibility and availability of the formal financial services, such as bank deposit, credits, insurance, etc., for all participants in an economy."
34	Kumar (2013)	Google Scholar	Journal article	"Broadly speaking, Financial Inclusion is delivery of banking services at affordable cost to vast sections of disadvantaged and low-income groups"
35	Li (2018)	Cross-reference	Journal article	"Defined as access to formal financial services (Demirgüç-Kunt and Klapper, 2013)."
36	Lopez and Winkler (2018)	EconLit	Journal article	"Financial inclusion, i.e. access to and use of formal financial sector services"
37	Mehrotra and Yetman (2015)	Google Scholar	Institutional working paper	"Financial inclusion – access to financial services"

38	Mohieldin *et al.* (2012)	Google Scholar	Journal article	"The concept initially referred to the delivery of financial services to low-income segments of society at affordable cost. During the past decade, the concept of financial inclusion has evolved into four dimensions: easy access to finance for all households and enterprises, sound institutions guided by prudential regulation and supervision, financial and institutional sustainability of financial institutions, and competition between service providers to bring alternatives to customers."
39	Morgan and Pontines (2018)	EconLit	Journal article	"financial inclusion, i.e., greater access to financial services for low-income households and firms."
40	Morvant-Roux *et al.* (2010)	Google Scholar	Journal article	"l'inclusion financière des populations, c'est-à-dire l'accès et l'usage par ces populations exclues de services financiers fournis par des intermédiaires financiers formels : banques, coopératives financières, institutions de microfinance, etc."
41	Naceur, Barajas and Massara (2015)	Google Scholar	Institutional working paper	"Defined as the share of the population who use financial services"
42	Nawaz (2018)	Web of Science	Journal article	"Following Sarma (2012, p. 3) financial inclusion in this paper refers to "a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy""
43	Neri (2014)	Google Scholar	Institutional report	"O Relatório de Inclusão Financeira do Banco Central do Brasil, define inclusão financeira como "o processo de efetivo acesso e uso pela população de serviços financeiros adequados às suas necessidades, contribuindo para sua qualidade de vida""
44	Okello Candiya Bongomin, Munene, Mpeera Ntayi, *et al.* (2018)	EconLit	Journal article	"While IMF (2008) defined financial inclusion as "access to formal financial services including savings, credit, insurance and payments through a formal financial intermediary at an affordable cost"."
45	Okello Candiya Bongomin, Munene, Ntayi, *et al.* (2018)	EconLit	Journal article	"The World Bank (2013) refers to financial inclusion as the universal access to a wide range of financial services by individuals and SMEs at a reasonable cost provided by responsible and sustainable financial institutions. Similarly, ACCION (2011) defines it as a state in which all people who can use financial services, including the poor, have access to a full suite of quality financial services, provided at affordable prices, in a convenient manner, and with dignity for the clients. Besides, Chakrabarty (2011) describes it as "the process of ensuring access to appropriate financial

				products and services needed by all sections of the society in general and vulnerable groups such as weaker sections and low income groups in particular at an affordable cost in a fair and transparent manner by mainstream institutional players.”
46	Okello Candiya Bongomin, Ntayi, *et al.* (2018)	EconLit	Journal article	While ACCION (2011) defines financial inclusion as “a state in which all people who can use them have access to a full suite of quality financial services provided at affordable prices, in a convenient manner, and with dignity for the clients”. The Ministry of Finance, Planning & Economic Development in Uganda (2002–2009) refers to a poor person as “an individual who faces the situation of poor health, low level of income and consumption, unemployment, illiteracy, low level of production, physical insecurity, disempowerment, and isolation socially and geographically.” Coleman (1988) defined social capital as “a variety of different entities (which) all consist of some aspect of social structure, which facilitate certain actions of actors whether personal or corporate actors within the structure.”
47	Park and Mercado (2018)	EconLit	Journal article	"Financial inclusion is a broad concept. As defined by Sarma (2008), financial inclusion is the process that ensures the ease of access, availability, and usage of formal financial system for all members of an economy."
48	Peña, Hoyo, & Tuesta (2014)	Google Scholar	Institutional working paper	"La Comisión Nacional Bancaria y de Valores (CNBV) define a la Inclusión Financiera como “… el acceso y uso de servicios financieros bajo una regulación apropiada que garantice esquemas de protección al consumidor y promueva la educación financiera para mejorar las capacidades financieras de todos los segmentos de la población”"
49	Piñeyro (2013)	Cross-reference	Journal article	"Financial inclusion is defined as the access and usage of financial services under appropriate regulations to ensure consumer protection schemes and promote financial education such that it improves the financial capabilities of all segments of the population." (Secretaria de Hacienda)
50	(Ramji, 2009)	Google Scholar	Institutional working paper	"Financial inclusion herein refers to the timely delivery of financial services to disadvantaged sections of society."
51	Rastogi and E. (2018)	EconLit	Journal article	"In generalized manner, FI can be explained as the access and availability of the formal financial system to all the sections of the society. This definition includes people of lower income groups and less privileged sections of the society (Haldar et al, 2016). Financial inclusion has been divided into two parts. The first part is for individuals and the second is for firms. Using this twin-pronged concept, FI has also been defined as proportions of the individuals and firms who are banked (or unbanked for financial exclusion measurement)."

52	(Roa, 2013)	Google Scholar	Institutional working paper	"Aunque al principio no existía consenso general sobre la definición de inclusión financiera, hoy en día algunos de los organismos internacionales involucrados en el tema han dado definiciones e indicadores mundialmente aceptados. Por ejemplo, la Asociación Global para la Inclusión Financiera (gpfi, por sus siglas en inglés) y el Grupo Consultivo de Ayuda a los Pobres (cgap, por sus siglas en inglés) consideran la siguiente definición de inclusión financiera (cgap, 2011): "se refiere a una situación en la que todos los adultos en edad de trabajar, incluidos aquellos actualmente excluidos del sistema financiero, tienen acceso efectivo a los siguientes servicios financieros provistos por las instituciones formales: crédito, ahorro (incluyendo cuentas corrientes), pagos y seguros". Y se puntualiza, el acceso efectivo: "implica prestación del servicio conveniente y responsable, a un costo que el cliente puede asumir y sostenible para el que lo provee, que tenga como resultado que los clientes excluidos utilicen los servicios financieros formales en lugar de las opciones informales existentes". Por excluidos del sector financiero: "se refiere a aquellos que no tienen acceso o no están lo suficientemente cubiertos por los servicios financieros formales". Por servicio responsable: "implica tanto conducta de mercado responsable por parte de los proveedores y protección efectiva al consumidor financiero", y finalmente por instituciones formales: "se refieren a proveedores de servicios financieros que tiene un estatus legal reconocido e incluye entidades (en algunos casos incluso personas) con amplios y variados atributos regulatorios, sujetos a diferentes tipos y niveles de supervisión externa".
53	(Rojas-Suarez, 2016)	Cross-reference	Institutional working paper	"Based on the concept of usage of financial services to define financial inclusion"
54	Sarma and Pais (2011)	Google Scholar	Journal article	"Financial inclusion refers to a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy"
55	(Sarma, 2016)	Cross-reference	Journal article	"we define financial inclusion as a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy."
56	(Schwittay, 2011)	Google Scholar	Journal article	"financial inclusion as a global assemblage that constitutes materially poor people as fiscal subjects, financial consumers, and monetary innovators."
57	(Servet, 2009)	Google Scholar	Journal article	"Celle-ci doit être entendue comme offre de services financiers répondant effectivement et efficacement aux besoins des différentes catégories de la population, à un coût devant rester compatible avec leurs capacités de le couvrir."
58	(Sethi and Acharya, 2018)	Web of Science	Journal article	"In a broader sense, financial inclusion is defined as a process which brings different sections of people under a single roof of financial system, especially people in very low-income brackets, the poor and the

				marginalized sections including migrants and makes them access the basic financial services. These services include not only banking products but also other products such as insurance, pension and remittances at an affordable cost."
59	(Sethy and Goyari, 2018)	EconLit	Journal article	"Financial inclusion is defined as the process of ensuring access of financial services timely and adequately, and credits where needed by vulnerable groups such as weaker section and low-income groups at an affordable cost (Rangarajan Committee, 2008)."
60	(Soederberg, 2013)	Cross-reference	Journal article	"It refers to increasing broad-based access for some 2.7 billion poor adults to formal or semi-formal financial services ranging from banking to micro-credit to housing loans"
61	(Tissot and Gadanecz, 2016)	Cross-reference	Institutional working paper	"Financial inclusion, broadly defined as access to financial services"
62	Turegano and Garcia-Herrero (2018)	EconLit	Journal article	"Regarding the second concept of interest for this paper, financial inclusion, it is relatively recent and thus quite difficult to define, let alone to measure. Sarma (2008) defines financial inclusion as “a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy”. In the same vein, Cámara and Tuesta (2014) define an inclusive financial system as “one that maximizes usage and access, while minimizing involuntary financial exclusion”."
63	(Ulwodi and Muriu, 2017)	Cross-reference	Journal article	"This paper adopts access and usage as the working definition for financial inclusion."
64	(Wang and Guan, 2017)	Web of Science	Journal article	"Financial inclusion means that everyone not only has access to financial services but also can enjoy various types of financial services, such as payment, deposits, credit etc."
65	(World Bank, 2014)	Cross-reference	Institutional report	"Financial inclusion—typically defined as the proportion of individuals and firms that use financial services—"
66	(Zins and Weill, 2016)	Cross-reference	Journal article	"In its most basic definition, financial inclusion refers to the fact that a person owns an account at a formal financial institution."
67	(Zulkhibri, 2016)	Cross-reference	Journal article	"Financial inclusion is defined as a process that ‘ensures the ease of access, availability and usage of formal financial services’ (Sarma and Pais 2008). It describes the state in which all members of society have access to a full set of financial services at affordable prices and in a convenient manner."

Table A.2: Frequency of word usage in the definition of 67 studies on financial inclusion

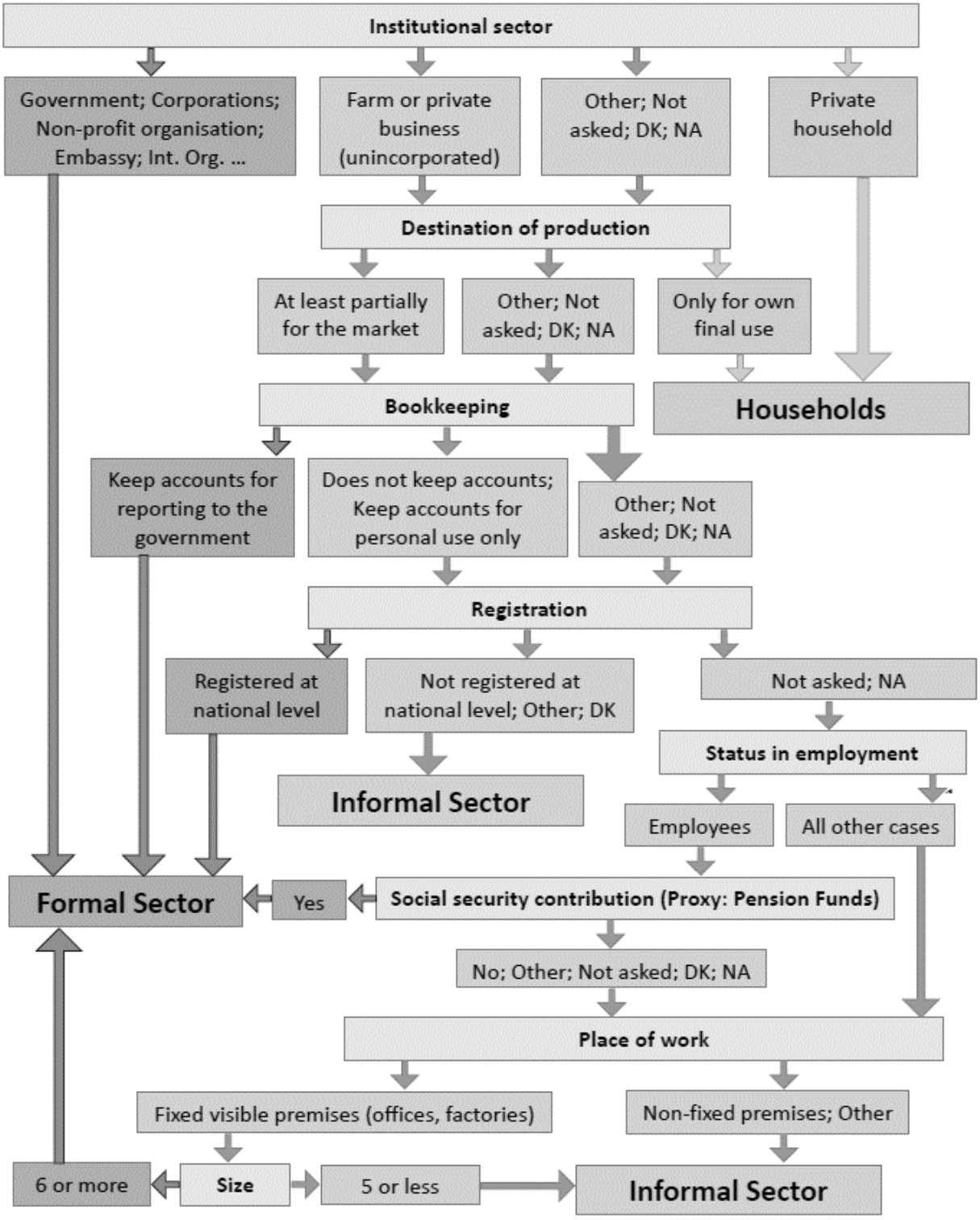
Rank	Word	Count	%	Similar Words
1	services	76	6.30	service, services, services'
2	access	63	5.22	access, accessibility, accessible, accessing
3	formal	29	2.40	formal
4	banking	21	1.74	bank, banked, banking, banks
5	affordable	17	1.41	affordable
6	usage	17	1.41	usage
7	credit	16	1.33	credit, credits
8	system	16	1.33	system, systems
9	broadly	14	1.16	broad, broadly
10	cost	14	1.16	cost
11	process	14	1.16	process
12	people	12	0.99	people
13	sections	12	0.99	section, sections
14	groups	11	0.91	group, groups
15	insurance	11	0.91	insurance
16	availability	10	0.83	availability, available, availing
17	institutions	10	0.83	institutional, institutions
18	products	10	0.83	product, production, products
19	income	10	0.83	income
20	population	10	0.83	population
21	economy	9	0.75	economy
22	individuals	9	0.75	individual, individuals
23	poor	9	0.75	poor
24	prices	9	0.75	price, prices
25	consumer	8	0.66	consumer, consumers
26	effective	8	0.66	effective, effectively
27	firms	8	0.66	firms
28	households	8	0.66	households, households'
29	society	8	0.66	society
30	convenient	7	0.58	convenient
31	different	7	0.58	different
32	ease	7	0.58	ease
33	education	7	0.58	education
34	members	7	0.58	members
35	state	7	0.58	state
36	deposits	7	0.58	deposit, deposits

37	accounts	6	0.50	account, accounts
38	appropriate	6	0.50	appropriate
39	payments	6	0.50	payment, payments
40	regulation	6	0.50	regulated, regulation, regulations
41	segments	6	0.50	segments
42	responsible	6	0.50	responsible, responsibly
43	adults	5	0.41	adult, adults
44	clients	5	0.41	client, clients
45	general	5	0.41	general, generalized, generally
46	measurement	5	0.41	measure, measurement
47	needed	5	0.41	needed, needs
48	protection	5	0.41	protection, protections
49	sustainable	5	0.41	sustainability, sustainable, sustainably
50	barriers	5	0.41	barriers
51	delivery	5	0.41	delivery
52	disadvantaged	5	0.41	disadvantaged
53	fair	5	0.41	fair
54	quality	5	0.41	quality
55	sarma	5	0.41	sarma
56	savings	5	0.41	savings
57	basic	4	0.33	basic
58	dignity	4	0.33	dignity
59	finance	4	0.33	finance
60	full	4	0.33	full
61	range	4	0.33	range, ranging
62	social	4	0.33	social, socially
63	timely	4	0.33	time, timely
64	adequate	3	0.25	adequate, adequately
65	allowing	3	0.25	allow, allowing
66	based	3	0.25	based
67	capabilities	3	0.25	capabilities
68	customers	3	0.25	customer, customers
69	development	3	0.25	develop, development
70	dimensions	3	0.25	dimensions
71	economic	3	0.25	economic
72	enabling	3	0.25	enabling
73	exclusion	3	0.25	exclusion
74	existing	3	0.25	existing
75	following	3	0.25	following

76	greater	3	0.25	greater
77	improve	3	0.25	improve, improves
78	involved	3	0.25	involved, involves, involving
79	level	3	0.25	level, levels
80	nonprice	3	0.25	nonprice
81	paper	3	0.25	paper
82	pension	3	0.25	pension
83	person	3	0.25	person, personal
84	proportion	3	0.25	proportion, proportions
85	remittances	3	0.25	remittances
86	sector	3	0.25	sector
87	situation	3	0.25	situation
88	study	3	0.25	studies, study
89	suite	3	0.25	suite
90	transparent	3	0.25	transparent
91	view	3	0.25	view
92	well	3	0.25	well
93	without	3	0.25	without
94	working	3	0.25	working
95	accion	2	0.17	accion
96	achieve	2	0.17	achieve, achieved
97	actors	2	0.17	actors
98	alternatives	2	0.17	alternative’, alternatives
99	aspect	2	0.17	aspect, aspects
100	bancarisation	2	0.17	bancarisation

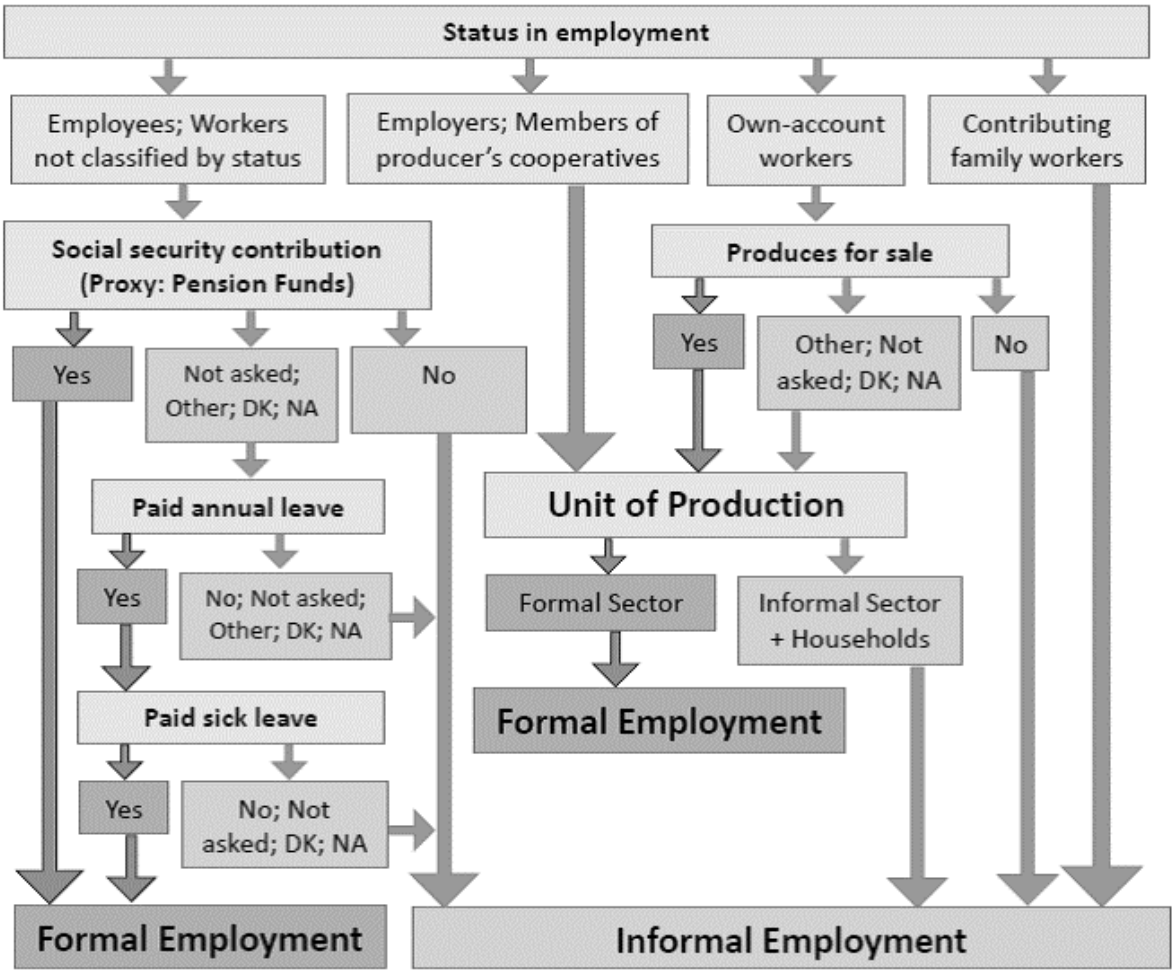
Appendix B

Table B.1. Informal sector measurement



Source: https://ilostat.ilo.org/resources/methods/description-informality/

Table B.2. Informal employment measurement



Source: https://ilostat.ilo.org/resources/methods/description-informality/

Appendix C

C.1 Questionnaire

Part I: Demographic questions

1. How old are you?
2. What is your gender/sex?
3. Are you married?
4. Do you have children?
5. How many people live in your house? Are there other families (households) living with you?
6. What is your religion?
7. How do you define your race? White, black, mixed, yellow or indigenous?
8. What is your educational level? Primary, secondary or tertiary and more (complete/incomplete)?
9. What is your profession?
10. What is your occupation? Unemployed, self-employed, formal or employer? Has this always been your occupation?
11. Are you the household chief, i.e., are responsible for the majority of the expenditures in the household? If not, who is?
12. Do other people in the household contribute to the total household income?
13. Who takes the decisions about household expenditures, for example, how will pay for each bill?
14. Most of your income comes from work? Do you have any pension, social benefits or allowance?
15. What is your monthly income? And of all people in the household?
16. How many bedrooms does your house has? And bathrooms? How many rooms in total?
17. Are you from here? If not, when did you move and why?

Part II: Data on financial access and usage

BASIC ACCESS

1. Is there any bank around your house? How long does it take for you to get there?
2. What about your workplace? How long does it take for you to get there?
3. Have you used it already? If yes, is this the bank you use the most or is there another one you use more?
4. Do you have a bank account? Do you have it for a long time? Do you know what type of bank account you have (current account, salary, savings)? Why did you open this account? If not, why not? If not anymore, why? (If no account, skip to question 7)
5. If you do not have, do you receive payment in cash?
6. If you do not have it, do you think it makes your life difficult in any aspect?
7. Do you pay to have this account? How much? If not, why not?

8. Who told you about this account? What did they tell you that convinced you to open it?
9. Would you recommend a friend or family member to open a bank account either on this or another bank? Why? Would you recommend any specific bank? If yes, why? If not, why not?
10. Do you have a debit card? In which situations do you use your card? How many times more or less (day or week)? Do you use it more often than cash?
11. What are the benefits of the debit card in your opinion? And disadvantages?
12. When you receive money to this account, do you withdraw it fully or partially, or leave it in the account? If you withdraw, what do you use the money for?
13. Have you ever used someone else's account or borrowed yours, like a friend or family member? For instance, if you/they needed to receive a transfer.
14. Do you pay or have paid bills (*boleto*)? Do you use a bank account to pay it? Or do you prefer other ways of paying, such as a lottery shop?

SAVINGS, INSURANCE AND EMERGENCIES

15. Do you use to save money? Where/how (home, bank…)
16. If you save, why or what for are you saving? Any specific motive or event?
17. If you have saved money, would you use it in a case of emergency (accident or disease in the family, etc.) or would you act differently? If you do not have savings, how would you deal with this unexpected event?
18. Do you have a health insurance? Why/why not?
19. Do you know any other types of insurance? Have you ever hired any? Why/why not?
20. Do you think that a person goes more to the doctor if he/she had a health insurance? Why/why not? Or if he/she had a car insurance, would it care less about accidents or being more relaxed? Why/ why not?

CREDIT

21. Have you ever borrowed money from a friend or family member?
22. And from a bank or another credit institution?
23. For what for did you use this money? (Distinguish among investment, human capital and consumption)
24. Did you manage to repay this loan? How long did it take until you paid it fully?
25. Did your daily live or plans changed after you asked for money (ex. Did your relationship with the lender changed/ did you stop paying something else to repay it)
26. Do you have any debts today? With whom?
27. And have you ever lent money? To whom? Could you tell a bit more about it?
28. Do you think it makes a difference borrowing from friends and family, banks or other ways? Why?
29. Do you have a credit card? In which occasions to you use it? If not, why not?

30. If you do not have a credit card, have you used a friend's or family member's card? If you have, have you ever lent it?
31. Have you been unable to repay the credit card fully or partially ("*rotativo*")? Why?
32. Do you know if you had to pay more because of it?
33. Have you ever paid anything in instalments, either with your own card or someone else's? To buy what?
34. If you did, in how many instalments and how much did you pay per month? Do you think this value is low, reasonable or high?
35. Do you know what an overdraft is? Have you ever used it? To pay something specific?
36. Do you remember how much you paid to use it? Do you think it is better or worse than other types of loan? Do you think it is more expensive, cheaper or same prices as other loans?
37. Have you ever heard of or used payday loans ("*consignado*")? If yes, could you tell a bit about this experience?
38. And formal store credit? Could you tell us about it?
39. And have you had a store credit card (C&A, Casas Bahia, Renner, supermarket)? If yes, what are the advantages and disadvantages in your opinion?
40. Have you ever used informal credit ("*fiado*") ? Where and why?
41. Have you ever heard of Crediamigo of the Banco do Nordeste? If yes, do you or someone you know have used this service? With which purpose? If not, why?

PERCEPTIONS

42. Have you ever had any problems with you bank or cards?
43. Have you ever felt anxious or angry in any point when using these services?
44. Have you ever been pushed to pay or hire a service beyond the one you wanted? For instance, an insurance when you applied for a store card.
45. Do you think it is a problem to have a bad credit score ("dirty name")? Have you ever been in this situation? How was it?
46. Have you ever felt you were treated differently in a bank or when applying for a card by any reason? Which?

Part III: Theoretical approach

POWER RELATIONS

47. What is your opinion about banks in general? Do you think that if you ask them for money, will they have any type of power over you? What do you mean?
48. If ever borrowed, did you have to offer any type of guarantee?
49. Do you feel that you are able to negotiate with a bank, if you need to, for instance if you need to renegotiate a debt or if you believe they charged you more than they should? Why?

50. Have you ever suffered any type of threat or pressure to repay a debt? Could you tell a bit more?

RATIONALITY AND EXPECTATIONS

51. Do you think that in the future you will have more, less or the same income as today? Why is that?
52. Does this influence how much or to whom you would borrow?
53. And if you should pay in instalments?
54. And on whether to buy expensive things?
55. Are you planning any important event over the next years, like a wedding, having children, a trip, buying a car or a house? Are you saving money, or do you plan to borrow/pay in instalments for it?

IMPORTANCE OF FINANCIAL INCLUSION TO POVERTY

56. Do you think poverty is a problem? Do you think it could have a solution?
57. Do you think the government could help anyhow? If you were the president, what would you do?
58. Do you think that a person who earns more money, spends more as well? And do you think he/she use more cards, make more loans?
59. Do you think that if a poor person would have access to a bank, he/she could get out of poverty?
60. If you would earn 3 times more, what would you do with that money? And would you use more bank services, like savings, investment, more limit on credit cards, loans?

OTHERS

61. What do you plan to do with the money of this interview?
62. Would you like to say something else?

C.2 Interview process

Pilot interviews took place between 02/06/2019 and 11/06/2019 and interviews used for this study took place between June and July 2019 in the region of Minas Gerais, Brazil. These were conducted in Portuguese and were documented using a voice recorder. From August to October 2019, interviews were transcribed both by the researcher and a research assistant, Ms Laís Landes, and translated into English by the researcher. Participants were also remunerated for their time, in the value of R$50.

Pilot interviews

The first step was to carry a pilot study, in which two participants answered the first draft of the semi-structured questionnaire in order to account for potential pitfalls in the elaboration of the questions. The test of questionnaire started with two pilot interviews in the urban area: a self-employed female who was temporarily unemployed and a wage-earner male who worked as a cleaner. The former, interviewed on the 2nd of June 2019, was unable to understand certain questions, as they seemed to have been unclearly formulated, in particular the ones about power and the relationship between income and spending. Moreover, while she was not aware of the specific name of some services, she knew what they meant, so a decision has been made in first asking if the person knows the service and if she says no, to explain what it is. The original question about poverty solution made the interviewee uncomfortable, as she felt she did not have the necessary knowledge to answer the question. Thus, this part was reformulated to introduce the topic by asking if the participant thinks poverty is a problem and if the government could help. At last, as a suggestion from Pilot 1, further questions were introduced, such as who take the financial decisions in the household and on whether the person has come from a different location. These could show some gender issues, as well as migration movements.

After reformulating the questionnaire in order to make it clearer and more straightforward, the second pilot interview was conducted on the 11th of June 2019. The interviewee, a 19-year-old male, was a wage earner and worked as a cleaner. We noticed that questions using the terminology “is this your main/secondary income?” was a bit confusing, reason why we changed to “is most of your earnings from work” if the person answered they worked, and directly asked if they receive any other income by asking “do you receive benefits, pension or allowance?”, which then gave us more direct answers as well. The question about poverty still

made the interviewee a bit uncomfortable, but it worked better than in Pilot 1. An implemented change was to directly ask “if you were president, what would you do to solve poverty?” and if the person looked overwhelmed, I would suggest “just one important measure in your opinion”. A last necessary addition to the questionnaire was to ask further questions when the person did not own a bank account, such as “do you think this makes your life harder?”, so we could understand better the possible constraints of an unbanked person.

Process of contacting participants

The first round of interviews happened as Pilot 2 told Participant 2 he had joined this study. She then acted as a gate-keeper and made the contact with the following participants: 1, 3, 4, 5, and 6. P1 then contacted P9. These were residents of the Pampulha and North regions. P13 was not directly contacted by P2, but her husband was, who then indicated his wife to participate, as his income was above the sample selection. They live in the West region of Belo Horizonte (Oeste). The second round of interviews took place at Jatobá, where Neli, the coordinator of the institution, introduced me to P4 and P5. The last round in Izidora was facilitated by P13, the local leader of Helena Greco area put me in touch with P10, P11, P12 and P14. P15 was interviewed at the Rosa Leão area, introduced by the other local leader, Charlene.

In the rural area, the process was different. Interviews were done in fewer days and counted with the support of a research assistant, Ms Landes, who helped conducting some of the interviews. The first round happened in a district area of Nova Esperança. There, we first contacted P16, who then put us in touch with participants 17, 18, 19 and 20. The second round was in Glaucilândia. There, we started with a door-to-door search of participants and managed to conduct separate interviews of participant 26 and 21. Later, participant 21 introduced us to P22. After seen us conducting the interview, interviewees 23, 24, 25, 26 and 27 asked if they could also participate. We associate this interest with the fact that we were paying R$50 for each participant, which was considered a large amount in that community. The third round, in Extração, we did a door-to-door research and interviewed P29 at his residence, whereas P30 was interviewed at his workplace.

C.3 Information on interview locations

Interviews were conducted in Minas Gerais, a federal state with the second largest population (around 10% of total)[113] and third largest GDP with a participation of 8.7% (Fundação João Pinheiro, 2018). Figure C.1 shows its location.

Figure C.1: Location of Minas Gerais

Source: Encyclopaedia Britannica (2012), colour changed by the researcher.

Two primary regions were selected to conduct the interviews: Norte de Minas (North) and Jequitinhonha, representing the rural areas, and Belo Horizonte, representing the urban region. Choosing these two contrasting regions was preferred as the access and usage of financial services are different depending on location. Figure C.2 displays these regions' location.

[113] Estimated population of 21.168.791 (IBGE).

Figure C.2: Interview locations

Source: Alves Diniz and Batella (2005, fig. 5), region names added by the author.

Urban area interviews

The urban area interviews were organised as follows: the first two rounds took place in the Pampulha neighbourhood. The second round took place at Barreiro, in the southwest area. The last round was conducted in the North (Norte). Figure C.3 displays the city divisions based on neighbourhoods, as well as the income level of the area. Lighter areas are those with lower income.

Figure C.3: Belo Horizonte by income (R$ 2010)

Source: Prefeitura de Belo Horizonte (2020), colour changed by the researcher.

The first round of interviews was in the Pampulha and North regions, working class/low middle-class neighbourhoods, mostly constituted of individuals who work on services at lower Pampulha or Centre (upper-middle class/rich neighbourhoods). The second round of interviews took place at Jatobá (Barreiro region), on a waste picker cooperative (Figure C.4).

The third round of interviews happened in the North region of Zilah Sposito, particularly in the occupation Izidora. This is a very precarious neighbourhood, where there is not pavement and much of the infrastructure was built by the residents (Figure C.5).

Figure C.4: Women working at Coopersoli, Jatobá

Source: Prefeitura de Belo Horizonte (2017)

Figure C.5: Izidora occupation, Zilah Sposito

Source: picture taken by the researcher.

Rural area interviews

The rural area interviews were conducted in three different locations. The first round happened in a district area of Montes Claros (400,000 habitants), called Nova Esperança (Figure C.6). The district had 1,676 habitants in 2010 and has no banks or lottery houses, as well as no public transport to the Montes Claros, which is at a 23km distance.

Figure C.6: Nova Esperança, Montes Claros

Source: Google maps.

The second round of interviews took place at Glaucilândia (Figure C.7), a town 34km away from Montes Claros. Despite being an independent town, the location had only 548 habitants and has no with public connections to Montes Claros.

Figure C.7: Glaucilândia

Source: Google maps.

Finally, two further interviews were conducted in Extração, also known as Curralinho (Figure C.8). The district has 628 dwellers and belong to Diamantina (a town with 44,746 habitants). However, these are not connected by public transport (IBGE, 2010).

Figure C.8: Village centre of Extração (Curralinho), Diamantina

Source: photo by the researcher.

C.4 Socio-economic information of participants

Table C.1: Socio-economic information of participants

Participant	Location	Region	Age	Gender	Married status	Children	Household size	Religion	Race	Education	Profession	Occupation	Previous occupation
Pilot 1	Brasilia	Urban	31	Female	Single, Co-living	0	2	Catholic (non-practicing)	White	Complete tertiary	International relations	Self-employed	NA
Pilot 2	Belo Horizonte	Urban	19	Male	Single	0	3	No	Mixed	Complete secondary	Cleaner	Employed	NA
1	Belo Horizonte	Urban	54	Female	Divorced	3	3	Evangelic	Mixed	Complete primary	Cleaner	Employed	Chief cleaner
2	Belo Horizonte	Urban	42	Female	Single	1	3	Evangelic	Mixed	Complete secondary	Chief cleaner	Self-employed, informal	Chief cleaner, but employed
3	Belo Horizonte	Urban	18	Male	Single	0	4	Evangelic	White	Complete secondary	Glassmaker assistant	Employed	Kitchen assistant, informal
4	Belo Horizonte	Urban	51	Female	Single, Co-living	3	5	Catholic (non-practicing)	Mixed	Complete secondary	Waste selector and cook	Self-employed	Kitchen assistant, employed
5	Belo Horizonte	Urban	43	Female	Single	2	4	Evangelic	Mixed	Complete secondary	Administrator	Self-employed	School assistant, employed
6	Belo Horizonte	Urban	26	Male	Married	1	1	Evangelic	Mixed	Incomplete primary	Glassmaker assistant	Employed	Employed
7	Belo Horizonte	Urban	24	Male	Single	0	4	No	Mixed	Incomplete secondary	Waiter	Self-employed	NA
8	Belo Horizonte	Urban	58	Male	Married	2	4	Catholic	White	Complete secondary	General services	Employed	Self-employed
9	Belo Horizonte	Urban	57	Female	Married	2	4	Evangelic	Black	Incomplete secondary	Cleaner	Unemployed	NA
10	Belo Horizonte	Urban	36	Female	Single	4	3	Umbanda	Mixed	Incomplete primary	Baker	Employed	Self-employed
11	Belo Horizonte	Urban	34	Female	Widow	2	3	Umbanda	Mixed	Incomplete primary	Hairdresser	Unemployed	Self-employed

Participant	Location	Region	Age	Gender	Married status	Children	Household size	Religion	Race	Education	Profession	Occupation	Previous occupation
12	Belo Horizonte	Urban	40	Female	Single	5	6	Evangelic	Black	Complete secondary	Hairdresser	Self-employed	Employed
13	Belo Horizonte	Urban	54	Female	Married	2	2	Catholic	Mixed	Incomplete secondary	Cleaner	Employed	Employed
14	Belo Horizonte	Urban	47	Female	Single	9	3	Catholic	Mixed	Incomplete primary	Cleaner	Unemployed	Employed
15	Belo Horizonte	Urban	36	Female	Single, Co-living	2	4	Catholic	Mixed	Incomplete primary	Cleaner	Unemployed	Employed
16	Nova Esperança	Rural	26	Female	Single	4	6	Evangelic	Mixed	Incomplete secondary	Housewife	Unemployed	Housewife
17	Nova Esperança	Rural	54	Male	Divorced	7	6	Evangelic	White	None	Cleaner	Employed	Farmer, mining, self-employed
18	Nova Esperança	Rural	24	Female	Married	3	4	Catholic	Mixed	Incomplete secondary	Housewife	Unemployed	Sales, informal
19	Nova Esperança	Rural	21	Female	Single	1	5	Catholic	Black	Complete secondary	Sales	Self-employed	Nanny, cleaner, self-employed
20	Nova Esperança	Rural	22	Male	Single	2	7	Catholic	Black	Incomplete secondary	Construction worker	Self-employed	Same
21	Glaucilândia	Rural	25	Female	Single	0	3	Evangelic	Mixed	Incomplete tertiary	Sales	Self-employed	Same
22	Glaucilândia	Rural	49	Female	Single	1	4	Catholic	Mixed	Incomplete primary	Cleaner and sales	Self-employed	Same
23	Glaucilândia	Rural	32	Female	Married	3	4	Evangelic	White	Complete secondary	Hairdresser	Unemployed	Self-employed (hairdresser); employed (sales)
24	Glaucilândia	Rural	47	Female	Divorced	2	3	Evangelic	Black	Complete primary	Craftswoman	Self-employed	Same

Participant	Location	Region	Age	Gender	Married status	Children	Household size	Religion	Race	Education	Profession	Occupation	Previous occupation
25	Glaucilândia	Rural	44	Male	Married	2	4	No	Mixed	Incomplete primary	Butcher	Employed	Doorman (employed)
26	Glaucilândia	Rural	54	Male	Divorced	6	1	No	Black	Complete primary	Construction worker	Retired	Construction (employed)
27	Glaucilândia	Rural	65	Female	Married	5	5	Catholic	White	Incomplete primary	Agriculture worker, craftswoman	Retired	Self-employed
28	Glaucilândia	Rural	56	Female	Divorced	4	4	Evangelic	White	Incomplete secondary	Sales	Self-employed	Same
29	Curralinho	Rural	47	Male	Married	1	3	Catholic	Black	Incomplete primary	Agriculture worker, construction worker	Employed	Same
30	Curralinho	Rural	34	Male	Single	2	4	Evangelic	Black	Incomplete primary	Cameraman, photographer, editor, musician and craftsman	Self-employed	Employed, educator

Participant	Head of household	Other household income	Household financial decisions	Main income	Secondary income	Income	Household income (including participant)	Rooms in the house	Origin	Time of moving	Reason for moving
Pilot 1	No	Yes, partner	x	Work	No	No fixed income	Don't know	4	NA	NA	NA
Pilot 2	No	Yes, mom	Mom and him	Work	No	No fixed income	R$5,000	6	North Minas (Itaobim)	As child	Better city
1	Yes	Yes, son	Her	Work	No	Minimum wage	R$2,000	6	East Minas (Rio Casca)	As child	Mother was sick; better health care
2	No	Yes, partner	Her and partner	Work	No	No fixed income	R$3,000	6	North Minas (Itaobim)	20 years-old	To work/study
3	No	Parents	Everyone	Work	No	R$950 net	Don't know	7	Belo Horizonte	NA	NA
4	No, shared	Husband and children	Shared	Work	No	1 MW	R$5,000	9	South Minas (Lamim)	16 years-old	Health care
5	Yes	Yes, children	Her	Work	No	Around MW	Not sure about son, daughter is on unemployment benefit of 1 MW	5	Belo Horizonte	NA	NA
6	Yes	No	Him	Work	No	Around MW	R$1,100	3	Belo Horizonte	NA	NA
7	No	Yes, mom and stepfather	Mom	Work	No	R$800	R$4,000	8	Belo Horizonte	NA	NA
8	Yes	Wife	Wife	Work	No	R$900; but some extra sometimes	R$2,000	6	Vale do Jequitinhonha	As child	Work
9	No	Husband	Husband	None	No	0	R$3,000	5	Rio Casco	As child	Mom was sick

Participant	Head of household	Other household income	Household financial decisions	Main income	Secondary income	Income	Household income (including participant)	Rooms in the house	Origin	Time of moving	Reason for moving
10	Yes	No	Her	Work	No	R$1,100	R$1,100	5	Belo Horizonte		
11	Yes	No	Her	Pension		R$1,000	R$1,000	5	Belo Horizonte		
12	Yes	Yes, the father of oldest daughter	Her	Work	R$300 (pension); Bolsa Familia is currently blocked because children skip school	R$800	R$1,100	3	Yes, but parents from Ponte Nova (West)		
13	No, shared with husband	Yes, husband	Husband	Work	No	R$1,100	Doesn't know	7	Alfredo Vasconcelos	1990 (25yo)	Work
14	Yes	Yes, son	Her	Pension	No	R$480	Doesn't know	3	Belo Horizonte		
15	Husband	No	Her and husband	Pension	Bolsa Familia	R$296	R$1,300	1	Belo Horizonte		
16	No, shared with father	Father	Her and father	Pension		R$250	R$250	5	Nova Esperança		
17	Yes, shared with daughter	Daughter	Him and daughter	Work	No	MW	No	5	Nova Esperança		
18	No	Husband	Her and husband	No		0	R$1200	4	Nova Esperança		
19	Yes	No	Her	Work	No	R$1,100	R$1,100	5	Belo Horizonte		
20	Yes	No	Her	Pension		R$1,000	R$1,000	5	Belo Horizonte		

Participant	Head of household	Other household income	Household financial decisions	Main income	Secondary income	Income	Household income (including participant)	Rooms in the house	Origin	Time of moving	Reason for moving
21	No, mother	Mother and father	Mother	Work	Allowance	Around R$1000	Not sure	5	Montes Claros	9 years-old	Mother's divorce
22	No, brother	No	Brother	Work	Bolsa Familia	Around R$1000	No	5	Glaucilândia		
23	No, husband	Husband	Her and husband	Pension		R$250	1 MW	5	Montes Claros	1 year-old	
24	Yes	No	Her	Work	Bolsa Familia	R$500	R$500	4	Montes Claros	14 years ago	Cheaper
25	Yes	No	Him	Work		R$946	R$946	4	Glaucilândia		
26	Yes	No	Him	Pension		R$35	R$35	7	Montezuma	11 years ago	Cheaper
27	Yes, shared with husband	Husband	Her and husband	Pension		1 MW	2 MW	9	Glaucilândia		
28	Yes	No	Her	Pension	Work	1 MW	1 MW	5	Glaucilândia		
29	Yes	No	Him	Work	No	1 MW	1 MW	6	Serro	10 years-old	Father's work
30	No, father	Him, sister	Mother	Work	Allowance	R$800	maybe 3 MW	7	Diamantina	30 years-old	Entrepreneurship

C.5 Banking information of participants

Table C.2: Banking information of participants

Participant	Bank distance (in min)	Account	Bank status	Type	Reason	Debit card	Credit card	Lent card	Payment of bills
1	15	Caixa	Public	Salary	Loan	Yes	Yes	Yes	Lottery
2	10	Caixa	Public	Savings	Work	Yes	Not anymore	Yes	Lottery
3	5	Itau	Private	Savings	NA	Yes	No	No	Online
4	3	Caixa	Public	Salary/Savings	BF	Yes	Not anymore	Yes	Lottery and shop
5	3	Caixa and BB	Public	Savings/Salary/Checking Account	Work	Yes	Yes	Yes	Lottery and credit card
6	30	Caixa	Public	Savings	Savings	Yes	No	No	Lottery and direct debit
7	30	Caixa	Public	Savings	Savings	Yes	No	Yes	Lottery
8	10	Caixa and Itau	Public and private	Savings/Salary	NA	Yes	Yes	Yes	Lottery
9	30	No	NA	NA	Unemployment	No	No	No	No
10	3	Bradesco	Private	Salary	Work	Yes	No	No	Lottery
11	50	Caixa	Public	Savings	Pension	Yes	Yes	No	NA
12	90	No	NA	NA	Unemployment	Not anymore	No	No	Shop
13	15	Caixa and Santander	Public and private	Savings/Salary	Work	Yes	Yes	Yes	No
14	60	Caixa	Public	Savings	BF	Yes	Yes	Yes	Lottery and shop
15	60	Caixa	Public	Savings	Savings	Yes	No	No	No
16	100	BB	Public	Savings	Loan	Yes	No	No	Lottery or bank
17	100	Itau	Private	Salary	Work	Yes	No	No	Lottery
18	60	Bank of Northeast	Public	Crediamigo	Loan	Yes	No	No	Lottery
19	60	Bradesco	Private	Savings	Benefit	Yes	No	Yes	Lottery

Participant	Bank distance (in min)	Account	Bank status	Type	Reason	Debit card	Credit card	Lent card	Payment of bills
20	20	Caixa	Public	Savings	Work	Yes	No	No	Lottery
21	15	BB and Bradesco	Public	Checking account/savings	Savings/Payment/Pension	Yes	Not anymore	No	Lottery
22	10	Sicoob	Private	Savings	Savings	Yes	No	Yes	Lottery or bank
23	3	Caixa	Public	Savings	Benefit	Yes	Not anymore	Yes	Lottery
24	15	No	NA	NA	Debt	No	Not anymore	Yes	Lottery or bank
25	3	Santander/Caixa	Private and public	Salary/Savings	Work	Yes	Not anymore	Yes	Lottery
26	5	Sicoob/BB	Private and public	Savings	Savings/Benefit	Yes	No	No	Lottery or bank
27	10	Sicoob	Private	Savings	Savings	No	Yes	Yes	Lottery or bank
28	2	BB	Public	Checking account	Pension	Yes	Not anymore	No	Lottery
29	80	Bradesco and Caixa	Public and private	Salary/Savings	Work	Yes	Yes	Yes	Lottery
30	NA	Caixa	Public	Savings	Business	Yes	No	Yes	Bank

Participant	Savings	Money for emergency	Health insurance	Reason	Other insurance	Store credit	Instalments
1	No	Family	No	Expensive	No	Shoes	TV
2	Yes	Family	No	No money	No	Department	Food, clothes, TV
3	Yes	Savings/Extra work	No	Expensive	No	No	Mobile
4	Yes	Savings/Family	No	NA	No	Car, Department, Shoes	Food, mobile, fridge
5	Yes	Savings/Family	Yes	Husband's work	No	Shoes, Department	Mobile, laptop, TV
6	Yes	Savings	Yes	Grandma pays	No	Not anymore	DVD and radio
7	Yes	Savings	No	Not interested	Mobile	Shoes, Clothes	Mobile
8	Yes	Savings/bank loan	Yes	NA	Car	Department	No
9	No	God	No	No money	Funeral	No	Furniture
10	No	Savings/bank loan	Yes	Work	No	Sister's name	TV, furniture, school supply, shoes
11	No	Friends	No	No money	No	Department, clothes	Food, clothes
12	No	Neighbours	Not anymore	Unemployment	No	Mobile	Mobile
13	Yes	None	Not anymore	Expensive	No	Shoes	Shoes
14	No	None	No	No money	No	Shoes, radio	Radio, medicine
15	Yes	Savings/Family	Yes	Mom pays	Funeral	No	No
16	No	Family	No	NA	Funeral	No	School supply, shoes, clothes, furniture
17	No	Family	Yes	Brother pays	No	No	Mobile
18	Yes	Savings/Family/Bank	Yes	Husband's work	No	Supermarket, drugstore	Furniture, fridge
19	Yes	Savings	No	Expensive	No	Department	Laptop
20	Yes	Family/workplace	Not sure	NA	No	Clothes, furniture	Clothes, furniture
21	No	Bank loan	No	No interest	No	Department store	Food, clothes, shoes, TV, cable
22	Yes	Family/Friends/Bank	Yes	Sister's insurance	No	Clothes	Clothes to sell
23	Yes	Friends/Family	No	No money	No	Department, school	School supply, shoes, clothes, food, education
24	No	NA	No	No advantage	No	NA	Food
25	No	Family	No	Free health care	Life (not anymore)	Department	TV, food
26	No	Family/Bank	No	No money	No	NA	Mobile

Participant	Savings	Money for emergency	Health insurance	Reason	Other insurance	Store credit	Instalments
27	Yes	Savings/Friends	Yes	Son pays	No	Supermarket, department	Clothes, mobile, food
28	No	Bank loan	No	NA	No	Drugstore	Medicine, food
29	No	NA	Yes	Wife bought	Goods, credit card	Yes	Furniture
30	No	Family	No	No work	No	Drugstore, clothes	Guitar, clothes, shoes

Participant	Formal loan	Amount	Years to repay	Final amount	Interest rate/year	Total interest	Interest share	Bad credit	Reason
1	Housing	R$ 5,000	3	R$ 10,000	52.40%	R$ 5,000	50%	Yes	Credit card
2	Housing	NA	10	NA	NA	NA	NA	No	NA
3	No	NA	NA	NA	NA	NA	NA	No	NA
4	Traveling	R$ 1,000	2	R$ 5,000	248.04%	R$ 4,016	80.10%	Yes	NA
5	Credit card repay	NA	1	NA	NA	NA	NA	Yes	Credit card
6	Child birth (layette, furniture), delay car payment	R$ 2,000	3	R$ 4,000	52.23%	R$ 1,996	49.90%	Yes	Bank loan
7	No	NA	NA	NA	NA	NA	NA	Yes	Store credit
8	Household	R$ 3,200	2	R$ 6,720	84.49%	R$ 3,532	52.50%	No	NA
9	No	NA	NA	NA	NA	NA	NA	No	NA
10	No	NA	NA	NA	NA	NA	NA	Yes	Store credit
11	Housing, food	R$ 9,100	NA	14000+	NA	NA	NA	Yes	Bank loan
12	No	NA	NA	NA	NA	NA	NA	Yes	TV cable unpaid
13	Housing	NA	8	NA	NA	NA	NA	No	NA
14	Goods	R$ 1,000	Unpaid	R$ 5,000	NA	NA	NA	Yes	Credit card
15	No	NA	NA	NA	NA	NA	NA	Yes	NA
16	Bills	R$ 1,100	1	R$ 1,416	49.40%	R$ 316	22.30%	Yes	Store credit
17	Food	NA	NA	NA	NA	NA	NA	Yes	Store credit
18	Housing and health care	R$ 1,500	0.5	NA	NA	NA	NA	Yes	Store credit
19	No	NA	NA	NA	NA	NA	NA	No	NA
20	Household, bills	R$ 1,000	0.66	NA	NA	NA	NA	No	NA
21	School and bills	NA	10	NA	NA	NA	NA	Yes	Bank loan
22	Investment for sister's business	NA	NA	NA	NA	NA	NA	No	NA
23	No	NA	NA	NA	NA	NA	NA	Yes	Credit card
24	Raw material	R$ 700	10+	R$ 40,000	590%	R$ 39,300	98.30%	Yes	Loan

Participant	Formal loan	Amount	Years to repay	Final amount	Interest rate/year	Total interest	Interest share	Bad credit	Reason
25	Dental care	R$ 2,000	3	R$ 3,000	28.25%	R$ 1,000	33.10%	Yes	Loan
26	Yes	NA	NA	NA	80%	NA	NA	Yes	Loan
27	Housing	R$ 5,000	5	R$ 9,800	30.70%	R$ 4,800	49.20%	No	NA
28	Housing	R$ 4,000	6	R$ 13,392	53.37%	R$ 9,392	70.10%	Yes	Credit card
29	Business	R$ 5,000	NA	R$ 4,400	NA	NA	NA	No	NA
30	Housing	R$ 600	NA	R$ 1,200	NA	NA	NA	Yes	Loan

Participant	Overdraft	Payday loan	Bank/card problem	Poverty cause	Poverty solution	Banking reduces poverty	Interview money
1	No	No	Cancelled card	Inequality	Housing, health care	Depends on the wage	Bill
2	No	No	No	Inequality	Employment, higher wages, reduce wage inequality	No	Childcare
3	No	No	Withdraw problem	Inequality	Education	Depends on the purpose of the loan	Transport
4	No	No	Delayed release of card after payment	NA	Employment, education, higher wages	Depends on the person's administration skills	Savings
5	No	No	Lottery only accepted R$1000, interest rates on the rest	NA	Housing	Depends on the wage	Savings
6	Yes	No	Broken card	NA	NA	Depends on the purpose of the loan	NA
7	No	No	Bill didn't arrive and he got a bad credit rating	Bad politicians	Health care, education, employment	No	Savings
8	No	No	No	Unemployment	Employment, higher wages	Depends on the wage	Food
9	No	No	No	Inequality	Health care	No	Food
10	No	No	No	Inequality	Housing, education	No	Informal loan repayment
11	No	Yes	Everything	Inequality, corruption	Social assistance	No	Food
12	No	No	Bank didn't close account/Racism	Bad politicians	Employment and higher wages	Depends on the type of bank	Food, toilet paper
13	No	No	No	Bad politicians	Wage reduction, health care, clothing, food	Depends on wage	Beauty care
14	No	No	Tricked to open current account	NA	Employment, school, health care	Depends on the wage	Food
15	No	No	No	NA	Employment, higher wages, education	NA	Food
16	No	No	No	Lack of information	Employment, education, transport	No	Food

Participant	Overdraft	Payday loan	Bank/card problem	Poverty cause	Poverty solution	Banking reduces poverty	Interview money
17	No	No	No	History, inequality	Reduce wage inequality, education, water supply	No	Food
18	No	No	No	Corruption	Housing, education, health care, child care	No	Construction supply
19	No	No	No	Inequality	Employment, reduce wage inequality, education	No	Medicine
20	NA	No	High fees	NA	Employment	No	Not sure
21	Not sure	No	Added insurance without requesting	NA	Lower taxes, employment	No	Transport
22	No	No	No	Bad politicians	Higher benefits, higher wages, easy retirement, housing	No	Debt and fabric for craft
23	No	No	No	NA	Employment, higher wages, health care, housing	No	Delayed energy bills
24	Yes	No	High interest rates	NA	Lower interest rates, investment	Depend on the person's administrative skills	Household need
25	Yes	Yes	High interest rates; lack of negotiation	Lack of education; goals	Housing, employment, education, kindergarden, health care	No	Food
26	NA	Yes	Debt sold to another bank	Inequality	Income distribution, lack of opportunity	No	Food
27	No	Yes	No	NA	Housing, food, easier retirement, employment	Depends on if the person has income	Shoes
28	Yes	No	Blocked card	NA	Allowing easier retirement pensions	No	Transport
29	No	No	No	Bad politicians	Reduce wage inequality	No	Bill
30	No	Yes	Bank charged payday loan but he was unemployed	Lack of personal planning; corruption	NA	Depends on the person's administration skills	Food

C.6 Simulations of loans from BNB

Figure C.9 Personal loan of R$1,000 at BNB (28/10/2019)

Banco do Nordeste

Simulador de Financiamento

Data da Simulação: 28/10/2019

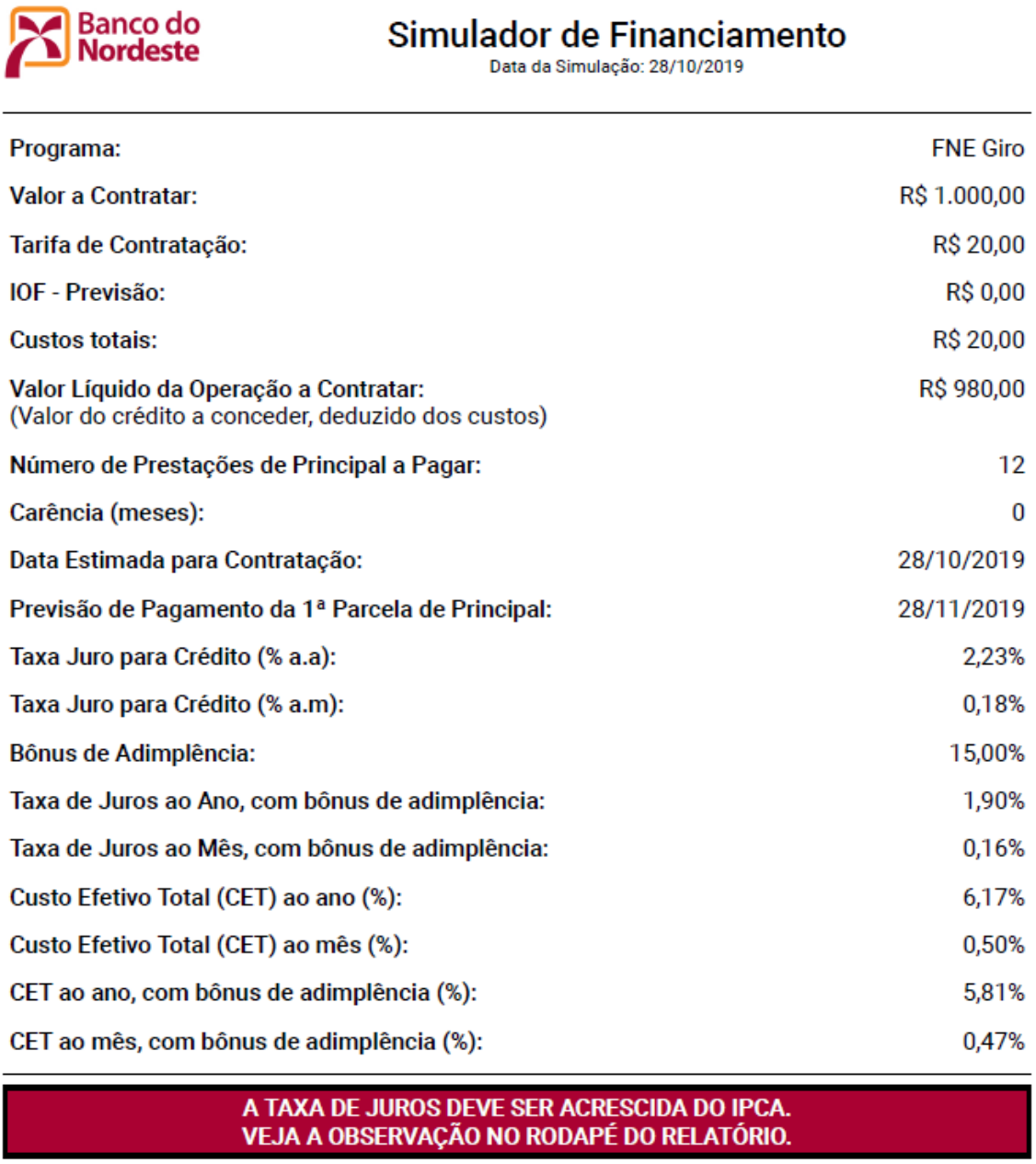
Programa:	Crédito Pessoal
Valor a Contratar:	R$ 1.000,00
IOF:	R$ 27,64
Valor Líquido da Operação a Contratar: (Valor do crédito a conceder, deduzido dos custos)	R$ 972,36
Número de Prestações a Pagar:	12
Data Estimada para Contratação:	28/10/2019
Data de Previsão de Pagamento da 1ª Parcela:	28/01/2020
Valor da Prestação com Juros:	R$ 135,01
Taxa de Juros ao ano (%):	103,51%
Taxa de Juros Equivalente ao Mês (%):	6,10%
Custo Efetivo Total (CET) ao ano (%):	112,00%
Custo Efetivo Total (CET) ao mês (%):	6,46%

Detalhamento da Simulação

SEQ PGT PREST	DATA	JUROS A PAGAR	PRINCIPAL	% PRINCIPAL / TOTAL A PAGAR	TOTAL A PAGAR
1	28/01/2020	R$ 135,01	R$ 0,00	0,0000%	R$ 135,01
2	28/02/2020	R$ 124,00	R$ 11,01	0,6680%	R$ 135,01
3	28/03/2020	R$ 60,33	R$ 74,68	4,5323%	R$ 135,01
4	28/04/2020	R$ 55,77	R$ 79,24	4,8088%	R$ 135,01
5	28/05/2020	R$ 50,94	R$ 84,07	5,1021%	R$ 135,01
6	28/06/2020	R$ 45,81	R$ 89,20	5,4133%	R$ 135,01
7	28/07/2020	R$ 40,37	R$ 94,64	5,7435%	R$ 135,01
8	28/08/2020	R$ 34,60	R$ 100,41	6,0939%	R$ 135,01
9	28/09/2020	R$ 28,47	R$ 106,54	6,4656%	R$ 135,01
10	28/10/2020	R$ 21,97	R$ 113,04	6,8600%	R$ 135,01
11	28/11/2020	R$ 15,08	R$ 119,93	7,2785%	R$ 135,01
12	28/12/2020	R$ 7,76	R$ 127,25	7,7225%	R$ 135,01

1. As informações geradas são fruto de simulação. Os valores poderão sofrer alterações, em função de eventuais mudanças das taxas e outras condições.
2. Cálculo referente aos encargos que incidem diretamente sobre a operação. Não foi incluída tarifa de cadastro, eventualmente cobrada ao cliente.
3. Impostos sobre Operações Financeiras (IOF) incidem sobre parcela de recursos internos do Banco.
4. Para mais informações, entre em contato por meio de nossos canais de atendimento.
5. A garantia deste tipo de operação é a fiança, que poderá ser dispensada quando o cliente optar por contratar um seguro prestamista com vigência durante o prazo da operação.

Figure C.10 Investment loan of R$1,000 at BNB (28/10/2019)



Banco do Nordeste

Simulador de Financiamento

Data da Simulação: 28/10/2019

Programa:	FNE Giro
Valor a Contratar:	R$ 1.000,00
Tarifa de Contratação:	R$ 20,00
IOF - Previsão:	R$ 0,00
Custos totais:	R$ 20,00
Valor Líquido da Operação a Contratar: (Valor do crédito a conceder, deduzido dos custos)	R$ 980,00
Número de Prestações de Principal a Pagar:	12
Carência (meses):	0
Data Estimada para Contratação:	28/10/2019
Previsão de Pagamento da 1ª Parcela de Principal:	28/11/2019
Taxa Juro para Crédito (% a.a):	2,23%
Taxa Juro para Crédito (% a.m):	0,18%
Bônus de Adimplência:	15,00%
Taxa de Juros ao Ano, com bônus de adimplência:	1,90%
Taxa de Juros ao Mês, com bônus de adimplência:	0,16%
Custo Efetivo Total (CET) ao ano (%):	6,17%
Custo Efetivo Total (CET) ao mês (%):	0,50%
CET ao ano, com bônus de adimplência (%):	5,81%
CET ao mês, com bônus de adimplência (%):	0,47%

A TAXA DE JUROS DEVE SER ACRESCIDA DO IPCA.
VEJA A OBSERVAÇÃO NO RODAPÉ DO RELATÓRIO.

Appendix D

D.1 Variables description

Table D.1: Full description of selected variables and methods of multi-dimensional indexes of FI

	Study	Method	Sample	Dimensions	Variables
1	Amidžić, Massara and Mialou (2014)	Factor analysis and weighted geometric mean	23 to 31 countries (depends on the year)	Access (weight 0.52 for 2009 and 0.51 remainder)	Number of ATMs per 1,000 sq. km; Number of branches of other depository corporations (ODCs)
				Usage (0.48 for 2009 and 0.49 remainder)	Number of resident households' depositors with ODCs per 1,000 adults; Number of resident households borrowers with ODCs per 1,000 adults
2	Aslan *et al.*, (2017)[114]	Joint correspondence analysis (JCA)	129 countries	Access	Individual has an account (composite indicator)/ debit card/ credit card Moreover, for 2014: if has a debit card, card in own name
				Usage	Individual has saved/borrowed from a financial institution in the past 12 months; uses electronic payments; has used mobile phone to pay bills/ send/ receive money; has a loan from financial institution for home/land purchase or construction Moreover, for 2014: used debit card/credit card in the past 12 months; made deposit/withdrawal in past 12 months; made transaction with mobile phone; made internet payments
				Other	Possibility of coming up with emergency funds

[114] The study does not define the dimensions, so I allocate them on my own discretion to make it comparable across studies.

3	Camara and Tuesta (2014)	Two-stage principal component analysis (PCA)	82 countries	Access	ATM per 100,000 adults; commercial bank branches per 100,000 adults; ATMs per 1,000 km^2; commercial bank branches per 1,000km^2
				Usage	Individual has a bank account/ mobile service/ debit card/ credit card/ savings/ loans; someone else in household has an account
				Barrier	Distance; affordability; documentation; trust
4	Chakravarty and Pal (2013)	Axiomatic distance-based approach	India	Access	Bank branches per 1,000km^2; Bank branches per lakh[115] adults; deposit account per 1,000 adults; Number of loans per 1,000 adults; deposit-income ratio; credit-income ratio
5	Honohan (2008)	Fitted values (OLS)	162 countries	Access	Number of bank accounts per 100 adults, percentage of access (household survey); Number of accounts at microfinance institutions per 100 adults
6	Koomson et al. (2020)	Multiple correspondence analysis (MCA)	Ghana	Access	Ownership of mobile money, current or cheques, investment, savings, susu, fixed deposit, E-zwich accounts; insurance policy; access to credit
				Usage	Cheque book, ATM, E-zwich card, E-banking transactions; remittance receipt
7	Sarma (2016)	Axiomatic distance-based approach	57 to 128 (depends on the year)	Access	Number of deposit bank account per 1,000 adults
				Availability	Number of bank branches + Number of registered mobile money service providers agents (2/3 weight); Number of ATMs (1/3 weight)

[115] Lakh is a unit in the Indian numbering system equal to one hundred thousand

				Usage	Total volume of credit/ deposit/ mobile money transactions as % of GDP
8	Piñeyro (2013)	PCA	Mexico	Access	Number of branches and banking agents; bank, co-op and microfinance, banking agents' presence; Number of ATMs; Number of point of services
				Usage	Number of deposits, loans and credit accounts; proportion of bank, co-op and microfinance deposit and credit accounts
				Financial Education	Average adult education in years; percentage of population with lack of education; percentage of illiterate adults; adults with incomplete elementary school
				Consumer protection	Number of technical and legal advices and disputes
				Social development	Average income per municipality; percentage of non-poor and non-vulnerable population; incidence of poverty

Table D.2 Description of variables of Findex 2011, 2014 and 2017

Variable	2011	2014	2017
Account at a financial institution	Denotes the percentage of respondents with an account (self or together with someone else) at a bank, credit union, another financial institution (e.g., cooperative, microfinance institution), or the post office (if applicable) including respondents who reported having a debit card.	Respondents who report having an account (by themselves or together with someone else) at a bank or another type of financial institution	Refers to respondents who reported having an account (by themselves or together with someone else) at a bank or another type of financial institution
Debit card ownership	Denotes the percentage of respondents with a debit card.	Respondents who report having a debit card.	Refers to respondents who reported having a debit card
Credit card ownership	Denotes the percentage of respondents with a credit card.	Respondents who report having a credit card.	Refers to respondents who reported having a credit card
Mobile money account [Composite variable created by author]	1. Mobile phone used to pay bills: denotes the percentage of respondents who report using a mobile phone to pay bills in the past 12 months (q15a1a) 2. Mobile phone used to send money: denotes the percentage of respondents who report using a mobile phone to send money in the past 12 months (q15a1b) 3. Mobile phone used to receive money: denotes the percentage of respondents who report using a mobile phone to receive money in the past 12 months (q15a1c)	Respondents who report personally using a mobile money service in the past 12 months	Refers to respondents who reported personally using a mobile money service in the past 12 months.

Loan from financial institution in past 12 months	Denotes the percentage of respondents who report borrowing any money from a bank, credit union, microfinance institution, or another financial institution such as a cooperative in the past 12 months.	Respondents who report borrowing any money from a bank or another type of financial institution in the past 12 months.	Refers to respondents who reported borrowing any money from a bank or another type of financial institution, or using a credit card, in the past 12 months
Loan from a store (store credit) in past 12 months	Denotes the percentage of respondents who borrowed any money in the past 12 months from a store by using installment credit or buying on credit.	Respondents who report borrowing any money from a store by using installment credit or buying on credit in the past 12 months.	Denotes respondents who report borrowing any money from a store by using installment credit or buying on credit in the past 12 months
Loan to start, operate, or expand a farm or business in past 12 months	N/A	Respondents who report borrowing any money to start, operate, or expand a farm or business in the past 12 months.	N/A
Loan for school fees	Denotes the percentage of respondents who report having an outstanding loan to pay for school fees.	Respondents who report borrowing any money for education or school fees in the past 12 months.	Denotes respondents who report borrowing any money for education or school fees in the past 12 months
Loan for medical purposes	Denotes the percentage of respondents who report having an outstanding loan for emergency or health purposes.	Respondents who report borrowing any money for health or medical purposes in the past 12 months.	Denotes respondents who report borrowing any money for health or medical purposes in the past 12 months.
Loan for home purchase	Denotes the percentage of respondents who report having an outstanding loan to purchase their home or apartment.	Respondents who report having an outstanding loan from a bank or another type of financial institution to purchase a home, an apartment, or land.	Refers to respondents who reported having an outstanding loan (by themselves or together with someone else) from a bank or another type of financial institution to purchase a home, an apartment, or land.

Savings at a financial institution in the past 12 months	Denotes the percentage of respondents who report saving or setting aside any money by using an account at a formal financial institution such as a bank, credit union, microfinance institution, or cooperative in the past 12 months.	Respondents who report saving or setting aside any money by using an account at a bank or another type of financial institution in the past 12 months.	Refers to respondents who reported saving or setting aside any money at a bank or another type of financial institution in the past 12 months.

D.2 Data selection and transformation

In the Findex 2011 dataset, q1 or "account" is defined as a composite indicator based on the values of q1a ("has an account at a financial institution") and q1b ("has an account at the post office"). However, it is not clear how this composite indicator q1 has been built. When analyzing the variable in detail, it is possible to see that it overestimates account ownership of several individuals. Table D.2 provides a sample of where q1 has been designated a positive value, although q1a and q1b were either missing or negative.

Table D.2. Sample of account ownership measurements from the Findex 2011 database

ID	Economy	Account at financial institution	Account at the post office	Account (composite indicator)
82522	LUX	no	no	yes
82523	LUX	refused	refused	yes
82524	LUX	refused	refused	yes

Due to this measurement failure, we decide to use only "Account at financial institution" instead of the provided composite indicator q1 in the analysis.

Another issue that has risen while analysing the data is that very few countries use mobile phones for financial purposes. These, however, have a higher usage of this device. When using three different variables to assess similar activities, countries such as Kenya, where 71% of the population have used a mobile to receive money, was overestimated with respect to financial inclusion. We decide to create a new variable "Mobile Account" (q15a1d), in which if any of the three variables were positive, the new variable would also be positive (Table D.3). This is also an important way of comparing the results of the Findex 2011 with its latest versions.

Table D.3. Summary statistics for mobile usage variables from the Findex 2011 database

Variable	Observation	Mean	Standard deviation
Mobile phone to pay bills	148,328	0.021	0.145
Mobile phone to send money	148,261	0.036	0.187
Mobile phone to receive money	148,268	0.049	0.217

D.3 Index generation with multiple correspondence analysis

Multiple correspondence analysis (MCA) is part of the methodology known as multivariate analysis, a statistical technique that is used to analyse more than two variables simultaneously. Multivariate statistical techniques can be classified into either dependent or independent. In a dependence technique, one or more variables are identified as the dependent variable as to be predict or estimate by other explanatory variables. This means that there is a causal relation among them. This would be the case of multiple regressions or structural equation modelling. In contrast, an interdependence technique has no defined dependent variable. Its purpose is to analyse the relation among all the variables in order to find their underlying structure. Therefore, in interdependence techniques, there is no causality (Hair et al., 2014).

Within the interdependence technique, there are five main types of approaches: factor analysis, confirmatory factor analysis, cluster analysis, perceptual mapping[116] and correspondence analysis. In factor analysis, which includes principal component analysis, we analyse a large number of variables and explain them by their underlying dimensions (factors). We reduce these variables into factors with the aim of creating a composite measure. Confirmatory factor analysis, however, is used to identify the contribution and quality of a particular scale. Cluster analysis differs from these previous analyses as it creates subgroups of individuals or objects. This allow us to identify particular groups as we do not predefine them. Another technique, the multidimensional scaling, focus on graphical representation, in which the similarity of continuous data is transformed into distances in a multidimensional space. Finally, correspondence analysis (CA) also displays observations in a multidimensional space but employing categorical data. It then transforms these observations into a metric level and creates both a dimensional reduction and perceptual mapping (Hair et al., 2014).

MCA is inserted within the broader CA framework. Nonetheless, unlike CA, which is based on a cross-tabulation of two categorical variables, MCA is able to compute several variables simultaneously by using an indicator or Burt matrix. MCA is considered to be an extension of the simple correspondence analysis for when using more than two variables. It can also be seen as an equivalent of PCA, but for categorical variables (Abdi and Valentin, 2007; Husson and Josse, 2014).

When using MCA as an extension of CA, the method is to apply the observations into an indicator matrix (Z). An indicator matrix is a table that links individuals and categories. Its

[116] Sometimes known as multidimensional scaling.

elements will be 1 where the category was chosen and 0 otherwise. It is also described as a matrix of dummy variables (Greenacre and Blasius, 2006). The dataset is composed of N individuals defined by Q categorical variables. Each Q has J options of answer (Husson and Josse, 2014). In our example, as the choice of answers is only "yes" or "no", $J = 2$. However, in one of the supplementary variables that are part of the Findex, there are different possibilities of answering. For instance, when asked about their level of education, individuals can answer "primary or less", "secondary" or "tertiary or more". In this case, $J = 3$. Mathematically,

$$J = \sum_{q=1}^{Q} J_q \tag{D.1}$$

In trying to demonstrate how the MCA works, I chose a create a small sample of 7 individuals and present a stepwise example (Table D.4). Using the Findex data, the indicator matrix will look like this:

Table D.4: Supposed sample of Findex dataset

ID	Bank account	Credit card
1	Yes	Yes
2	No	Yes
3	Yes	No
4	No	No
5	Yes	Yes
6	Yes	No
7	Yes	No

This will be transformed into the Z matrix of size $7x4$ (Figure D.1):

Figure D.1: Indicator matrix of Findex dataset sample

	Bank account		Credit card		
ID	Yes	No	Yes	No	
1	1	0	1	0	$Q = 2$
2	0	1	1	0	$Q = 2$
3	1	0	0	1	$Q = 2$
4	0	1	0	1	$Q = 2$
5	1	0	1	0	$Q = 2$
6	1	0	0	1	$Q = 2$
7	1	0	0	1	$Q = 2$
	$N_1 = 5$	$N_2 = 2$	$N_3 = 3$	$N_4 = 4$	

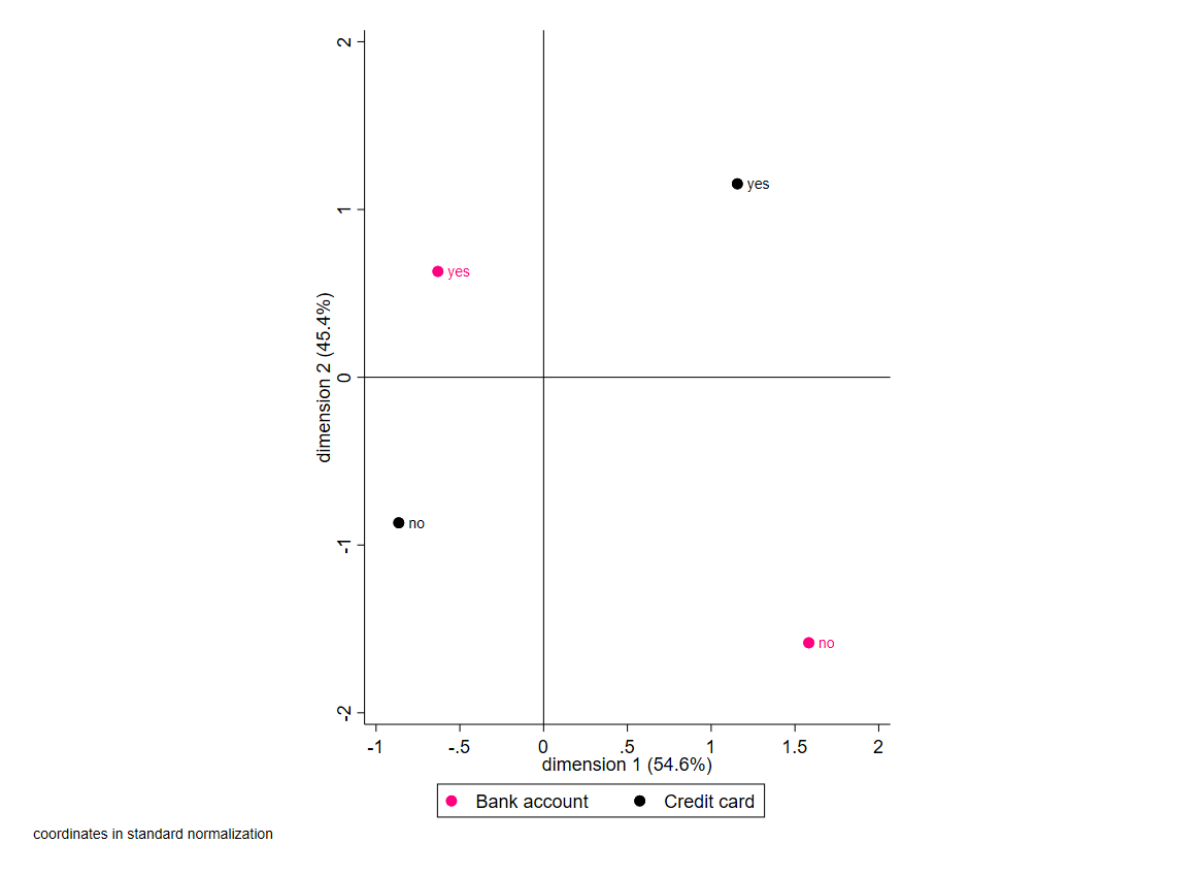
This indicator table will then be used to project the answers in a two-dimensional plan, according to their frequencies and masses[117]. As we can see, the "no" category displays a positive coordinate, reason for which I decide to invert the coordinates of the y axis (Table D.5). This will allow for a more straightforward analysis of Figure D.2.

Table D.5: Coordinates for Findex sample using MCA

Categories		dim1	dim2
Bank account	No	1.581	1.581
	Yes	-.632	- .632
Credit card	No	-.866	.866
	Yes	1.155	-1.155

[117] Mass in the correspondence analysis literature is the row and column relative totals. Those are used as weights to give more or less importance to the profiles (Greenacre and Blasius, 2006; Husson and Josse, 2014).

Figure D.2: MCA plot for Findex sample



As we notice in Figure D.2, positive answers to account and credit card ownerships are on the upper side of the graph, while negative ones are on its bottom side. At the same time, we see that, as the majority of individuals has a bank account, these answers are displayed close to the origin, while those that have answered they do not own one are placed far from it, as it is a rare response. Moreover, as 3 out of 7 individuals have bank accounts but do not have credit cards, their answers are slightly closer together than those who also have a bank account but own a credit card (2 out of 7).

This sample analysis was done using the indicator matrix (Z), due to limited observations. However, Z is burdensome and can exceed memory limitations for large samples (Stata, 2013). Moreover, there is a considerable underestimation of the measure of fit with respect to explained inertias[118] when using the indicator matrix (Greenacre and Blasius, 2006). Therefore, for large datasets, as it is the case of the Findex, it is preferable to use the Burt matrix method. The Burt table is defined as the product of the indicator matrix and its transpose.

[118] Inertia is the variation in MCA.

$$B = Z^T Z \tag{D.2}$$

In the Findex data example, a Burt table is represented in Figure D.3:

Figure D.3: Burt table of Findex dataset sample

		Bank account		Credit card	
	ID	Yes	No	Yes	No
	1	1	0	1	0
	2	0	1	1	0
	3	1	0	0	1
	4	0	1	0	1
	5	1	0	1	0
	6	1	0	0	1
	7	1	0	0	1
Bank account	Yes	5	0	2	3
	No	0	2	1	1
Credit card	Yes	2	1	3	0
	No	3	1	0	4

In our full sample, $N = 446{,}776$ and $Q = 11$. As all the answers are binary, $J = 2$ for each Q. The Z matrix is thus of size $446{,}776\ x\ 22$ and the B matrix of size $22\ x\ 22$. In that way, the Burt matrix is a more efficient method for our MCA analysis.

D.4 Full list of the Global Ranking of Financial Inclusion

Table D.6. The Global Ranking of Financial Inclusion (GRFI)

Rank	GRFI 2011	Score	GRFI 2014	Score	GRFI 2017	Score
1	Sweden	1	Norway	1	Norway	1
2	New Zealand	0.96096832	New Zealand	0.94831634	Canada	0.93925679
3	Finland	0.94250089	Canada	0.93279457	New Zealand	0.88149965
4	Australia	0.9352718	Sweden	0.92034501	Sweden	0.88137692
5	Canada	0.91992617	Finland	0.88955343	Luxembourg	0.8646971
6	Denmark	0.90344626	Australia	0.86555076	Finland	0.84391421
7	Netherlands	0.87696278	United Kingdom	0.85406357	Australia	0.84148878
8	Luxembourg	0.87541926	Luxembourg	0.84831798	Denmark	0.82942843
9	United States	0.82916677	Denmark	0.83552569	United States	0.82450575
10	Belgium	0.81719321	Israel	0.81867319	United Kingdom	0.81950557
11	United Kingdom	0.81629759	United States	0.81045282	Netherlands	0.80449718

12	Ireland	0.81413764	Spain	0.80914938	Switzerland	0.80398142
13	Germany	0.7965371	Japan	0.80450153	Belgium	0.78008246
14	Kuwait	0.78893507	Netherlands	0.79477501	Japan	0.77604544
15	Austria	0.78590292	Germany	0.7886911	Singapore	0.77421969
16	Malta	0.74763733	Belgium	0.78656203	Germany	0.7639876
17	France	0.7442714	Switzerland	0.78238755	Spain	0.76288992
18	Korea, Rep.	0.73844951	Singapore	0.75634569	Korea, Rep.	0.75242078
19	Hong Kong SAR, China	0.73831952	Ireland	0.7510131	Austria	0.73134565
20	Spain	0.70270562	France	0.73900843	Ireland	0.72926533
21	Slovenia	0.69991827	Korea, Rep.	0.72935116	Israel	0.7271834
22	Estonia	0.69368589	Austria	0.72837126	Hong Kong SAR, China	0.70971853
23	Cyprus	0.64723516	Hong Kong SAR, China	0.70550483	France	0.70648521
24	Singapore	0.64637637	Estonia	0.70103687	Taiwan, China	0.69398451
25	Japan	0.63565397	Taiwan, China	0.68726677	Malta	0.69273674
26	Israel	0.61907375	Slovenia	0.68567157	Estonia	0.68559504
27	Taiwan, China	0.61199307	Croatia	0.67272925	Slovenia	0.66750938
28	Portugal	0.60734564	Malta	0.66722333	Italy	0.66681468
29	Croatia	0.58701515	Bahrain	0.63264894	United Arab Emirates	0.62745428
30	Slovak Republic	0.56502759	United Arab Emirates	0.62449825	Slovak Republic	0.61776465
31	Czech Republic	0.54856116	Latvia	0.59872383	Portugal	0.60751122
32	Latvia	0.5315972	Slovak Republic	0.59299129	Bahrain	0.58664274
33	Qatar	0.51654863	Italy	0.58415282	Czech Republic	0.57543921
34	Trinidad and Tobago	0.50384617	Czech Republic	0.57993633	Iran, Islamic Rep.	0.57345146
35	Oman	0.49550769	Mongolia	0.57589823	Poland	0.56337851
36	Mauritius	0.49397266	Portugal	0.5618881	Croatia	0.54796529
37	United Arab Emirates	0.49397257	Mauritius	0.54165119	Latvia	0.52800918
38	Turkey	0.48098776	Kuwait	0.5372805	Malaysia	0.5267356
39	Hungary	0.47468939	Cyprus	0.5229646	Kuwait	0.5199967
40	Bahrain	0.47434029	Malaysia	0.50507802	Mauritius	0.512734

41	Mongolia	0.47251955	China	0.47311586	Mongolia	0.50862461
42	Lithuania	0.46399641	Lithuania	0.47108299	Trinidad and Tobago	0.49614418
43	Thailand	0.44469702	Puerto Rico	0.46933654	Cyprus	0.49046832
44	Greece	0.41529971	Thailand	0.46548614	China	0.48918739
45	Jamaica	0.40991077	Poland	0.45972592	Turkey	0.48424283
46	Malaysia	0.39760131	South Africa	0.45740616	Belarus	0.48403424
47	Poland	0.39690471	Brazil	0.45023739	Lithuania	0.4820742
48	Italy	0.39568463	Chile	0.44777459	Thailand	0.47021911
49	Macedonia, FYR	0.38820237	Hungary	0.44555631	Namibia	0.45244986
50	China	0.38146341	Macedonia, FYR	0.44174486	Chile	0.44856235
51	Brazil	0.36063302	Saudi Arabia	0.4406527	Bulgaria	0.43778038
52	Saudi Arabia	0.36016682	Greece	0.44059163	Hungary	0.4362646
53	Serbia	0.35669553	Jamaica	0.43168354	Venezuela, RB	0.42537856
54	South Africa	0.35139075	Serbia	0.43029857	Uruguay	0.42266437
55	Belarus	0.34145316	Costa Rica	0.42107627	Saudi Arabia	0.41851676
56	Costa Rica	0.32201701	Belarus	0.41381541	Russian Federation	0.41788104
57	Sri Lanka	0.31803155	Russian Federation	0.41371772	Greece	0.41109794
58	Bosnia and Herzegovina	0.309847	Uruguay	0.40895012	Macedonia, FYR	0.39762917
59	Montenegro	0.29164797	Turkey	0.40437108	Brazil	0.39142197
60	Bulgaria	0.29155305	Bulgaria	0.40033787	Serbia	0.3865419
61	Kenya	0.27620241	Montenegro	0.39027551	Costa Rica	0.37650499
62	Chile	0.27502376	Sri Lanka	0.37997124	Kazakhstan	0.36557913
63	Russian Federation	0.27201539	Kenya	0.37630805	Ukraine	0.35789499
64	Ukraine	0.26252007	Venezuela, RB	0.35933563	Sri Lanka	0.34642801
65	Kazakhstan	0.26182249	Romania	0.35420743	Romania	0.33945182
66	Venezuela, RB	0.25928202	Namibia	0.35260212	Montenegro	0.33325347
67	Lebanon	0.25637752	Botswana	0.34440362	Georgia	0.33168852
68	Romania	0.25582463	Ukraine	0.34081453	Dominican Republic	0.32081565
69	Angola	0.24272709	Dominican Republic	0.33671626	Kenya	0.31835681

70	Swaziland	0.23971531	Lebanon	0.33468232	India	0.29989016
71	Zimbabwe	0.23771937	Argentina	0.3286452	South Africa	0.29988062
72	Dominican Republic	0.23501337	Kazakhstan	0.31658539	Lebanon	0.29417101
73	Kosovo	0.23228769	Bosnia and Herzegovina	0.31110099	Bosnia and Herzegovina	0.28984755
74	Argentina	0.2263739	Bolivia	0.30465129	Armenia	0.27813569
75	Ecuador	0.21999465	Belize	0.29743445	Bolivia	0.26354578
76	Colombia	0.21202242	Mexico	0.27925128	Argentina	0.2633214
77	Morocco	0.21171096	Nigeria	0.27834114	Libya	0.25325578
78	Uruguay	0.20564911	Colombia	0.27808127	Indonesia	0.2520397
79	Botswana	0.19306757	Kosovo	0.27603966	Kosovo	0.2513822
80	Bolivia	0.19269742	Panama	0.2727749	Ecuador	0.23321585
81	Bangladesh	0.19189334	Ecuador	0.26465815	Colombia	0.22597498
82	Nigeria	0.1910523	Georgia	0.26460409	Tajikistan	0.22306877
83	Panama	0.18793948	El Salvador	0.24691129	Moldova	0.22225054
84	Georgia	0.17970614	Indonesia	0.24364223	Panama	0.22201839
85	Albania	0.1796457	India	0.22749662	Jordan	0.22000778
86	Syrian Arab Republic	0.17537706	Guatemala	0.21988212	Peru	0.21496899
87	Philippines	0.17503527	Vietnam	0.21548529	Vietnam	0.20506708
88	Lao PDR	0.1674588	Algeria	0.21460278	Botswana	0.20015088
89	Mexico	0.16719061	Uganda	0.21426903	Ghana	0.19636932
90	Ghana	0.16220956	Peru	0.21065201	Nigeria	0.19308834
91	Guatemala	0.15418194	Albania	0.19948435	Tunisia	0.19181061
92	Peru	0.1540442	Nepal	0.19429953	Nepal	0.18970467
93	India	0.15340784	Philippines	0.19208443	Albania	0.18253383
94	Zambia	0.15153426	Azerbaijan	0.19185382	Turkmenistan	0.18129578
95	Vietnam	0.15090699	Ghana	0.19152927	Honduras	0.18071052
96	Nepal	0.14991188	Rwanda	0.19070219	Guatemala	0.17481612
97	Rwanda	0.14783908	Bhutan	0.18403405	Uganda	0.17442027
98	Algeria	0.14536755	Zambia	0.17932135	Zambia	0.16780618
99	Paraguay	0.14299443	Gabon	0.17591932	Mexico	0.16161413
100	West Bank and Gaza	0.14231104	Honduras	0.17292187	Ethiopia	0.15942949

101	Uganda	0.14114372	Jordan	0.17142873	Mozambique	0.15591694
102	Jordan	0.14052431	Tunisia	0.1707871	Algeria	0.15180664
103	Honduras	0.12916216	Armenia	0.16267568	Haiti	0.14704004
104	Uzbekistan	0.12291671	Angola	0.15456079	Kyrgyz Republic	0.14280415
105	Armenia	0.12288269	Uzbekistan	0.15273209	Azerbaijan	0.14254785
106	Azerbaijan	0.12235593	Cambodia	0.14317246	Philippines	0.14220303
107	Tanzania	0.12073816	Bangladesh	0.13955806	Gabon	0.14218831
108	Indonesia	0.11980094	Mauritania	0.13751817	Paraguay	0.1375798
109	Iraq	0.11466344	Nicaragua	0.13510107	El Salvador	0.13543274
110	El Salvador	0.11461792	Moldova	0.12488277	Benin	0.12894543
111	Liberia	0.10875637	West Bank and Gaza	0.12324434	Lao PDR	0.12881601
112	Malawi	0.10660087	Myanmar	0.11680176	Bangladesh	0.12879111
113	Lesotho	0.10520069	Tanzania	0.11485886	Togo	0.12865184
114	Haiti	0.10153848	Kyrgyz Republic	0.1061644	Rwanda	0.1284568
115	Moldova	0.09481389	Ethiopia	0.10427323	Cambodia	0.12700839
116	Sierra Leone	0.09257607	Malawi	0.10121818	Egypt, Arab Rep.	0.12692249
117	Mauritania	0.08945227	Haiti	0.09795293	Nicaragua	0.12383792
118	Nicaragua	0.08667465	Zimbabwe	0.09122999	Lesotho	0.12205341
119	Chad	0.08515136	Congo, Rep.	0.08921291	Burkina Faso	0.11439942
120	Comoros	0.08236081	Sierra Leone	0.08767383	Uzbekistan	0.10673666
121	Djibouti	0.07931998	Benin	0.08699986	Cameroon	0.10297137
122	Afghanistan	0.07432321	Egypt, Arab Rep.	0.0867934	Zimbabwe	0.10108162
123	Gabon	0.07340191	Iraq	0.08415885	Myanmar	0.09554914
124	Sudan	0.06982932	Senegal	0.07588271	Malawi	0.09127819
125	Cameroon	0.06176766	Ivory Coast	0.07162809	Morocco	0.08925539
126	Congo, Rep.	0.05576349	Burkina Faso	0.06993922	West Bank and Gaza	0.08518209
127	Pakistan	0.05261227	Sudan	0.06991885	Mauritania	0.07954754
128	Burkina Faso	0.04952682	Somalia	0.0577886	Liberia	0.07940972
129	Cambodia	0.04926754	Togo	0.05757565	Tanzania	0.07210979
130	Egypt, Arab Rep.	0.04388884	Cameroon	0.05622087	Congo, Rep.	0.07113567
131	Kyrgyz Republic	0.03992744	Pakistan	0.05397604	Mali	0.07110111
132	Yemen, Rep.	0.03981394	Afghanistan	0.05324388	Senegal	0.07027806

133	Togo	0.03730064	Congo, Dem. Rep.	0.04325277	Guinea	0.04372271
134	Benin	0.03665847	Mali	0.04298539	Central African Rep.	0.03535364
135	Mali	0.03013374	Tajikistan	0.04245162	Iraq	0.03373666
136	Turkmenistan	0.02776752	Chad	0.04008637	Pakistan	0.03308754
137	Senegal	0.02726529	Guinea	0.03515873	Cote d'Ivoire	0.02857214
138	Tajikistan	0.02328606	Yemen, Rep.	0.03467888	Sierra Leone	0.02465378
139	Central African Repub.	0.01278288	Turkmenistan	0.03171131	Congo, Dem. Rep.	0.02385792
140	Madagascar	0.01253937	Burundi	0.02189513	Afghanistan	0.02131184
141	Burundi	0.0112908	Madagascar	0.01899051	South Sudan	0.01085947
142	Guinea	0.00959252	Niger	0	Chad	0.00848196
143	Congo, Dem. Rep.	0.00620072			Madagascar	0.0062731
144	Niger	0			Niger	0

Appendix E

E.1 Existing econometrical studies on the relationship among FI, poverty and income inequality

Table E.1 The effects of income and income inequality on FI

Study	Method	FI variable	Explanatory variables	Years	Sample	Observations	Comparable results
Park and Mercado (2018)	NA	Macro-level data; range 0-100 (Sarma, 2008)	GNI per capita; Rule of Law; Dependency ratio; Population; Education completion; Literacy	2004-2012	176 countries	166	GNI per capita is not statistically significant (s.s.)

Note: NA represents non-applicable, as the information was not available on the study

Table E.2 The effects of FI on income and income inequality

Study	Method	FI variable	Dependent variable	Explanatory variables	Years	Countries	Obs.	Comparable results
Park and Mercado (2018)	NA	Macro-level data; range 0-100; (Sarma, 2008)	Poverty headcount ratio (national poverty line)	FI; Share of highest to lowest income; Inflation; Education completion; Bank claims growth; GDP growth; Rule of Law; GNI*FI; LIC dummy	2004-2012	176	120	FI is negatively correlated to poverty by -0.595 at the 1% s.s. level
	NA		Gini coefficient				131	FI is not s.s.
Kim (2016)	OLS	Macro-level data; range 0-100; (Sarma, 2008)	Gini coefficient	FI; unemployment; inflation; population growth; income tax to total tax revenue ration; government social expenditure to GDP	2004-2011	40	318	FI reduces income inequality by -0.056 at the 5% level
	GMM						160	FI reduces income inequality by -0.107 at the 10% level
Aslan et al. (2017)	OLS	FI inequality index based on the Findex 2011	Gini coefficient	FI inequality; GDP per capita; agricultural production to GDP ratio; Openness to trade; Inflation; Average years of schooling; Gender inequality index; Access to electricity in rural areas	2011	140	76	Inequality in financial access increases income inequality by 0.271 at the 1% level

Le et al. (2019)	2SLS	PCA/Distance-based index of macro-level data (ATM; bank branches; depositors and borrowers); Range 0-1	Gini coefficient	FI index; rule of law; GDP per capita; unemployment; domestic credit to GDP ratio	2005-2015	22	NA	FI reduces income inequality by -18.316 (PCA) and -9.655 (Sarma) at the 1% and 5% level
	Pooled OLS						NA	NA
Dahir (2019)	NA	Macro-level data; range 0-100; (Sarma, 2008)	Gini coefficient	FI; education level; education*FI; openness; unemployment; population growth; GDPPC; digital inclusion	NA	190	689	FI increases income inequality by 0.91 at the 5% level
Sethi and Acharya (2018)	Panel OLS	Macro-level data; range 0-100; (Sarma, 2012)	GDP per capita	FI; human capital index and openness	2004-2010	31	NA	FI and GDPPC are cointegrated and display a long-run equilibrium relationship;

Turegano and Garcia-Herrero (2018)	Pooled or Panel OLS	Macro-level data (Sarma, 2008)	Gini coefficient	FI; GDP per capita; Government consumption to GDP ratio; trade openness to GDP ratio; credit to private sector to GDP ratio	2004,2011	41	61	FI reduces income inequality by -0.1 at the 5% level
		Mixed-level data (Camara and Tuesta, 2014)			2011	37	37	FI reduces income inequality by -2.4 at the 10% level

Note: NA represents non-applicable, as the information was not available on the study.

E.2 Selection criteria for income inequality variable

A problem we faced was to consistently select a measure for income inequality based on the Gini coefficient. Several countries had observations for the same year, as these were measured differently or by different agencies. In order to clarify the selection, we present our decision method in Table E.3:

Table E.3: Gini coefficient decision criteria

Order	Coverage area	Resource	Scale
1	All	Net income	Per capita
2	Urban	Gross income	Equivalized
3	Rural	Net/gross income	No adjustment
4	Part	Earnings	
5		Consumption	

After this first round, still remained 453 duplicated variables. We then select by quality of data (keep highest quality score), which leaves us with 135 duplicates. We then keep the latest revised version “New 2019” or the years before that. We then reach countries that have very specific measures. Azerbaijan (select second observation); GBR (select with North Ireland); HKG (pre-tax); MOZ (World Bank study); PSE (more precise population count); VEN (World Bank study).

E.3 Handling missing values

Table E.4 Added values of central bank interest rate (CBINT)

Country	Variable	Year	CBINT	Source
ARE	Repo	2011	1.00	Trading Economics
ARE	Repo	2014	1.00	Trading Economics
ARE	Repo	2017	1.00	Trading Economics
ARG	Lebac	2011	12.78	Central Bank
ARG	Lebac	2014	27.69	Central Bank
CHE	Interest on sight deposits	2017	-0.75	Central Bank
CZE	2 week repo	2011	0.75	Central Bank
CZE	3 week repo	2014	0.05	Central Bank
CZE	4 week repo	2017	0.18	Central Bank
GBR	Bank of England base rate	2017	0.29	Central Bank
HKG	Discount window base rate	2011	0.50	Central Bank
HKG	Discount window base rate	2014	0.50	Central Bank
HKG	Discount window base rate	2017	1.35	Central Bank
HRV	On Lombard credit	2011	8.54	Central Bank
HRV	On Lombard credit	2014	5.00	Central Bank
HRV	Overnight Credit Rate	2017	2.50	Central Bank
HUN	Base rate	2011	6.13	Central Bank
HUN	Base rate	2014	2.33	Central Bank
HUN	Base rate	2017	0.90	Central Bank
JPN	Base rate	2011	0.10	Central Bank
JPN	Base rate	2014	0.00	Central Bank
JPN	Base rate	2017	-0.10	Central Bank
KWT	Discount rate	2011	2.50	Central Bank
KWT	Discount rate	2014	2.00	Central Bank
KWT	Discount rate	2017	2.69	Central Bank
LTU	Overnight repurchase	2011	2.00	Central Bank
LTU	Overnight repurchase	2014	0.53	Central Bank
LVA	Refinancing rate	2011	3.50	Central Bank
NOR	Key policy rate	2014	1.49	Central Bank
NOR	Key policy rate	2017	0.50	Central Bank
OMN	Repo	2011	2.00	Central Bank
PAN	Deposit Interest Rate	2011	2.32	World Bank
PAN	Deposit Interest Rate	2014	2.16	World Bank

PAN	Deposit Interest Rate	2017	2.16	World Bank
POL	Reference rate	2011	4.25	Central Bank
POL	Reference rate	2014	2.38	Central Bank
POL	Reference rate	2017	1.50	Central Bank
SWE	Reference rate	2017	-0.50	Central Bank
TTO	Repo rate	2011	3.21	Central Bank
URY	Base rate	2014	9.25	Central Bank
URY	Base rate	2017	9.25	Central Bank
BDI	Interest rate of marginal lending facility	2011	11.01	Central Bank
BDI	Interest rate of marginal lending facility	2014	9.63	Central Bank
BIH	Deposits in KM and indexed to EUR (2years)	2012	4.41	Central Bank
BIH	Deposits in KM and indexed to EUR (2years)	2014	2.97	Central Bank
BIH	Deposits in KM and indexed to EUR (2years)	2017	1.46	Central Bank
BOL	Reference rate (MN)	2011	1.38	Central Bank
BOL	Reference rate (MN)	2014	2.94	Central Bank
BOL	Reference rate (MN)	2017	2.62	Central Bank
BTN	Deposit Interest Rate	2011	4.50	Trading Economics
BTN	Deposit Interest Rate	2014	4.00	Trading Economics
BTN	Deposit Interest Rate	2017	2.80	Trading Economics
BWA	Bank rate	2011	9.50	Central Bank
BWA	Bank rate	2014	7.50	Central Bank
BWA	Bank rate	2017	5.42	Central Bank
CHN	Rediscount rate	2011	2.25	CEIC
CHN	Rediscount rate	2014	2.25	CEIC
COM	Avance a l'Etat	2011	2.37	Central Bank
DJI	Average lending rate	2011	11.50	Trading Economics
DZA	Discount rate	2011	4.00	Trading Economics
DZA	Discount rate	2014	4.00	Trading Economics
DZA	Discount rate	2017	3.50	Trading Economics
ECU	Tasa activa referencial	2011	8.35	Central Bank
ECU	Tasa activa referencial	2014	8.12	Central Bank
ECU	Tasa activa referencial	2017	7.92	Central Bank
ETH	Bank's savings rate	2014	5.00	Trading Economics
ETH	Bank's savings rate	2017	5.50	Trading Economics
GIN	Key rate	2011	22.00	Trading Economics
GIN	Key rate	2014	16.00	Trading Economics
GIN	Key rate	2017	12.50	Trading Economics

HTI	Taux nominal sur Bons BRH	2011	7.00	Central Bank
HTI	Taux nominal sur Bons BRH	2014	10.75	Central Bank
HTI	Taux nominal sur Bons BRH	2017	20.00	Central Bank
IRN	Bank Profit rates for lending and borrowing	2017	18.00	Trading Economics
KHM	Saving deposit rate	2011	1.35	Trading Economics
KHM	Saving deposit rate	2014	1.40	Trading Economics
KHM	Saving deposit rate	2017	1.55	Trading Economics
LAO	Short-term lending interest rate	2011	5.00	Trading Economics
LAO	Short-term lending interest rate	2014	5.00	Trading Economics
LAO	Short-term lending interest rate	2017	4.25	Trading Economics
LBN	Deposit Interest Rate	2011	5.88	Trading Economics
LBN	Deposit Interest Rate	2014	5.91	Trading Economics
LBN	Deposit Interest Rate	2017	6.26	Trading Economics
LBR	Deposit Interest Rate	2011	3.03	CEIC
LBR	Deposit Interest Rate	2014	4.16	CEIC
LBR	Deposit Interest Rate	2016	3.85	CEIC
LBY	Repo 28 days	2019	2.35	Central Bank
LKA	Standing Deposit Facility Rate	2011	7.00	Central Bank
LKA	Standing Deposit Facility Rate	2014	6.50	Central Bank
LKA	Standing Deposit Facility Rate	2017	7.25	Central Bank
LSO	Policy rate	2017	6.88	Central Bank
MAR	Deposit Interest Rate	2011	3.76	Trading Economics
MAR	Deposit Interest Rate	2014	3.89	Trading Economics
MAR	Deposit Interest Rate	2017	3.10	Trading Economics
MDG	Taux directeur	2011	9.50	Trading Economics
MDG	Taux directeur	2014	9.50	Central Bank
MDG	Taux directeur	2017	8.78	Central Bank
MKD	Interest rate on the Central Bank bill	2011	4.00	Central Bank
MKD	Interest rate on the Central Bank bill	2014	3.25	Central Bank
MKD	Interest rate on the Central Bank bill	2017	3.27	Central Bank
MMR	Central bank rate	2011	12.00	Trading Economics
MMR	Central bank rate	2014	10.00	Trading Economics
MMR	Central bank rate	2017	10.00	Central Bank
MNE	Lending rate	2011	9.75	World Bank
MNE	Lending rate	2014	9.22	World Bank
MNE	Lending rate	2017	6.81	World Bank
MOZ	Facilidade Permanente de Cedência	2011	16.17	Central Bank

MOZ	Facilidade Permanente de Cedência	2014	8.19	Central Bank
MOZ	Facilidade Permanente de Cedência	2017	22.75	Central Bank
MRT	Discount rate	2011	9.00	Trading Economics
MRT	Discount rate	2014	9.00	Trading Economics
MRT	Discount rate	2017	9.00	Trading Economics
MWI	Reference rate	2011	15.00	Trading Economics
MWI	Reference rate	2014	24.38	Trading Economics
MWI	Reference rate	2017	20.33	Trading Economics
NAM	Repo rate	2011	6.00	Central Bank
NAM	Repo rate	2014	5.75	Central Bank
NAM	Repo rate	2017	6.90	Central Bank
NIC	Deposit Interest Rate	2011	1.85	Trading Economics
NIC	Deposit Interest Rate	2014	1.05	Trading Economics
NIC	Deposit Interest Rate	2017	1.25	Trading Economics
PAK	Key rate	2011	13.13	Trading Economics
PAK	Key rate	2014	9.92	Trading Economics
PAK	SBP Policy rate	2017	5.75	Central Bank
PSE	Deposit Interest Rate	2011	0.53	World Bank
PSE	Deposit Interest Rate	2014	0.83	World Bank
PSE	Deposit Interest Rate	2017	1.39	World Bank
ROU	Policy rate	2011	6.21	Central Bank
ROU	Policy rate	2014	3.31	Central Bank
ROU	Policy rate	2017	1.75	Central Bank
RWA	Repo	2011	6.08	Trading Economics
SDN	Murabaha Profits Margin Rate	2011	10.00	Trading Economics
SDN	Murabaha Profits Margin Rate	2014	12.00	Trading Economics
SWZ	Bank rate	2011	5.50	Central Bank
SYR	Deposit interest rate	2010	6.22	Trading Economics
TUN	Key rate	2014	4.63	Central Bank
TUN	Key rate	2017	4.79	Central Bank
TZA	Discount rate	2011	8.48	Central Bank
TZA	Discount rate	2014	16.00	Central Bank
TZA	Discount rate	2017	11.42	Central Bank
UGA	Central bank rate	2011	18.17	Central Bank
UGA	Central bank rate	2014	11.21	Central Bank
UGA	Central bank rate	2017	10.46	Central Bank
UKR	Key policy rate	2011	7.75	Central Bank

UKR	Key policy rate	2014	10.19	Central Bank
UKR	Key policy rate	2017	13.23	Central Bank
UZB	Refinancing Rate	2011	12.00	Trading Economics
VEN	Discount rate	2011	29.50	Central Bank
VEN	Discount rate	2014	29.50	Central Bank
VEN	Discount rate	2017	29.50	Central Bank
XKX	Lending rate	2011	13.78	World Bank
XKX	Lending rate	2014	10.62	World Bank
XKX	Lending rate	2017	6.83	World Bank
YEM	Deposit interest rate	2011	20.00	Trading Economics
YEM	Deposit interest rate	2014	15.00	Trading Economics
ZMB	Weighted lending base rate	2011	18.91	Central Bank
ZMB	Policy rate	2014	11.57	Central Bank
ZMB	Policy rate	2017	12.69	Central Bank
XKX	Lending rate	2011	13.78	World Bank
XKX	Lending rate	2014	10.62	World Bank
XKX	Lending rate	2017	6.83	World Bank
YEM	Deposit interest rate	2011	20.00	Trading Economics
YEM	Deposit interest rate	2014	15.00	Trading Economics
ZMB	Weighted lending base rate	2011	18.91	Central Bank
ZMB	Policy rate	2014	11.57	Central Bank
ZMB	Policy rate	2017	12.69	Central Bank

E.4 Estimations with simultaneity bias

In order to visualise this issue, we select the random-effects between-within (REBW) estimator (Mundlak, 1978; Schunck, 2013; Bell et al., 2019).[119] In this model, we are able to estimate both the between and within estimator and understand the relationship between our variables within a country and between countries. The new equations will contain both the demeaned explanatory variable (within-effect) and its mean (between-effect), so that:

$$FI_{it} = \beta_0 + \beta_{1W}(pov_{it} - \overline{pov_i}) + \beta_{2B}(\overline{pov_i}) + \beta_{3W}(ineq_{it} - \overline{ineq_i}) + \beta_{4B}(\overline{ineq_i}) + \beta_{kW}(a_{itk} - \overline{a_{ik}}) + \beta_{kB}(\overline{a_{ik}}) + u_1 \quad \text{(E.1)}$$

As stated before, we assume that there is a simultaneous relationship among our three key variables. This means that, while FI may affect poverty and income inequality, the latter two variables may also determine the level of FI. We confirm this hypothesis by performing an endogeneity test. Under the null hypothesis that specified endogenous regressors can be treated as exogenous, the test provides results that are robust to violations of conditional homoscedasticity (Baum et al., 2007). We reject the null hypothesis in our tests, which means that poverty and income inequality are, indeed, endogenous. Therefore, an OLS estimator will yield biased results, as we will see next.

Let's first estimate Eq. E.1 using a REBW GLS method. Based on our hypotheses in Chapter 3, we consider that there are differences between HICs and LMICs. Therefore, we perform a Chow test to ascertain this hypothesis. With two restrictions, 12 parameters and 371 observations, our test result was 162.88. Comparing to the critical value of 4.66 at the 1% statistical significance, we reject the null hypothesis that both groups follow the same regression function. Thus, we estimate both groups together and separately (Table E.5). Model (1) display the results of the full sample (FS), where Model (2) show the results for LMICs and Model (3) for HICs. Here, de*variable corresponds to the within-effect, while variable*mean is the between-effect of each variable on FI.

[119] Also referred as hybrid model.

Table E.5: The relationship between poverty, income distribution and FI

FI	(1) FS	(2) LMICs	(3) HICs
depov	-0.33	-0.26	7.65*
	(0.22)	(0.19)	(4.00)
povmean	0.06	-0.13**	0.45
	(0.10)	(0.06)	(3.58)
degini	-0.14	-0.01	-0.76
	(0.23)	(0.23)	(0.57)
ginimean	-0.58***	0.17	-0.87
	(0.16)	(0.11)	(0.62)
decbint	-0.06	-0.11	0.09
	(0.18)	(0.18)	(0.54)
cbintmean	-0.62***	0.24	-0.17
	(0.23)	(0.17)	(0.47)
debcon	0.06	0.01	0.11
	(0.06)	(0.06)	(0.17)
bconmean	0.06	-0.13**	0.17
	(0.08)	(0.06)	(0.15)
deself	-0.85***	-1.01***	0.12
	(0.27)	(0.27)	(0.68)
selfmean	-0.85***	-0.28***	-0.75**
	(0.08)	(0.07)	(0.37)
dework	0.55*	0.92***	0.29
	(0.29)	(0.33)	(0.48)
workmean	0.73***	0.22**	0.61
	(0.13)	(0.09)	(0.38)
Constant	47.53***	21.75***	63.06**
	(10.90)	(7.66)	(26.02)
Observations	371	256	115
Number of cty	135	96	39

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

To start, we notice that demeaned variables have low explanatory power (with exception of poverty in HICs, self-employment and work). This was expected as the low variation of variables within countries does not enable a proper measurement of such relationships. In sum, this suggests that HICs which had an increase in poverty levels also display higher levels of FI. Moreover, LMICs with increasing self-employment rates present lower levels of FI.

In turn, the mean values of each explanatory variable display more meaningful results. For instance, among LMICs, those with higher levels of poverty display lower levels of FI. Likewise, considering HICs and LMICs, countries with higher inequality levels have also lower levels of FI.

E.5 Instrument selection

Table E.8: Instrument selection for poverty and income inequality (Eq. 6.1), Full sample

Step	Instruments	Sargan test (joint validity)	F-stat in first stage (pov)	F-stat in first stage ($ineq$)
1	$soc, tax, gkf, urb, pov_{t-1}, gini_{t-1}, lit, gdpgrowth, gdppc$	0.0000	3109.55	266.88
2	$soc, gkf, urb, pov_{t-1}, gini_{t-1}, lit, gdpgrowth, gdppc$	0.0000	4757.32	484.54
3	$lit, pov_{t-1}, gini_{t-1}$	0.3089	8214.49	826.10
4	$soc, pov_{t-1}, gini_{t-1}$	0.0000	9945.33	926.73
5	$urb, pov_{t-1}, gini_{t-1}$	0.0021	10384.68	1003.37
6	urb, soc, lit	0.6769	18.67	2.24

Table E.9: Instrument selection for poverty and income inequality (Eq. 6.1), LMICs

Step	Instruments	Sargan test (joint validity)	F-stat in first stage (pov)	F-stat in first stage ($ineq$)
1	$soc, tax, gkf, urb, pov_{t-1}, gini_{t-1}, lit, gdpgrowth, gdppc$	0.0013	1993.82	180.55
2	$soc, gkf, urb, pov_{t-1}, gini_{t-1}, lit, gdpgrowth, gdppc$	0.0004	3294.62	358.16
3	$lit, pov_{t-1}, gini_{t-1}$	0.1270	6013.64	623.39
4	$soc, pov_{t-1}, gini_{t-1}$	0.2014	5561.72	553.48
5	urb, soc, lit	0.8505	1.24	11.96
6	$urb, pov_{t-1}, gini_{t-1}$	0.9237	6067.82	634.78
7	$tax, pov_{t-1}, gini_{t-1}$	0.0084	4201.46	307.73

Table E.10: Instrument selection for poverty and income inequality (Eq. 6.1), HICs

Step	Instruments	Sargan test (joint validity)	F-stat in first stage (pov)	F-stat in first stage ($ineq$)
1	$soc, tax, gkf, urb, pov_{t-1}, gini_{t-1}, lit, gdpgrowth, gdppc$	0.4755	170.40	223.22
2	$soc, gkf, urb, pov_{t-1}, gini_{t-1}, lit, gdpgrowth, gdppc$	0.3658	199.12	276.22
3	$lit, pov_{t-1}, gini_{t-1}$	0.4758	238.04	262.80
4	$soc, pov_{t-1}, gini_{t-1}$	0.0185	220.04	218.45
5	urb, soc, lit	0.8585	1.70	1.69
6	$urb, pov_{t-1}, gini_{t-1}$	0.0109	229.22	218.04

Note: In some of the estimations there was perfect collinerity with the time variables, so they had to be dropped in order to proceed with the Sargan test.

Table E.11: Instrument selection for financial inclusion (Eq. 6.2), FS

Step	Instruments	Sargan test (joint validity)	F-stat in first stage (FI)
1	$cbint, bcon, work, FI_{t-3}$	0.0023	192.81
2	$cbint, bcon, work$	0.0080	17.51
3	$bcon, work$	0.5643	18.18
4	$cbint, bcon$	0.2329	17.90
5	$cbint, work$	0.0075	18.92

Note: In the first estimation there was perfect collinerity with the 2017 dummy variables, so it was dropped in order to proceed with the Sargan test.

Table E.12: Instrument selection for financial inclusion (Eq. 6.2), LMICs

Step	Instruments	Sargan test (joint validity)	F-stat in first stage (FI)
1	$cbint, bcon, work, FI_{t-3}$	0.0132	97.45
2	$cbint, bcon, work$	0.2240	8.11
3	$bcon, work$	0.0763	8.86
4	$cbint, bcon$	0.0193	8.83
5	$cbint, work$	0.3774	9.24

Table E.13: Instrument selection for financial inclusion (Eq. 6.2), HICs

Step	Instruments	Sargan test (joint validity)	F-stat in first stage (FI)
1	$cbint, bcon, work, FI_{t-3}$	0.2833	11.37
2	$cbint, bcon, work$	0.7222	1.38
3	$bcon, work$	0.8167	1.37
4	$cbint, bcon$	0.4332	1.65
5	$cbint, work$	0.7620	1.70

Table E.14: Instrument selection for financial inclusion (Eq. 6.3), FS

Step	Instruments	Sargan test (joint validity)	F-stat in first stage (FI)
1	$cbint, bcon, work, FI_{t-3}$	0.4697	376.28
2	$cbint, bcon, work$	0.4141	75.13
3	$bcon, work$	0.9492	83.56
4	$cbint, bcon$	0.8724	82.50
5	$cbint, work$	0.1817	84.27
6	$cbint, FI_{t-3}$	0.1307	467.02

Table E.15: Instrument selection for financial inclusion (Eq. 6.3), LMICs

Step	Instruments	Sargan test (joint validity)	F-stat in first stage (FI)
1	$cbint, bcon, work, FI_{t-3}$	0.1132	109.05
2	$cbint, bcon, work$	0.4641	8.43
3	$bcon, work$	0.3352	8.57
4	$cbint, bcon$	0.6915	8.95
5	$cbint, work$	0.2200	9.07
6	$cbint, FI_{t-3}$	0.0152	133.17

Table E.16: Instrument selection for financial inclusion (Eq. 6.3), HICs

Step	Instruments	Sargan test (joint validity)	F-stat in first stage (FI)
1	$cbint, bcon, work, FI_{t-3}$	0.6904	64.46
2	$cbint, bcon, work$	0.9475	9.53
3	$bcon, work$	0.7325	10.84
4	$cbint, bcon$	0.9573	10.87
5	$cbint, work$	0.7368	10.87
6	$cbint, FI_{t-3}$	0.2789	78.42