3. Assessment of microfinance institutions and their impact: evidence from a scientometric study

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INTRODUCTION

The provision of microcredits—small loans for people excluded from financial markets—has been part of development strategies in recent years. One of the recurring goals of microfinance institutions (MFIs) is to help eradicate poverty, which is the first of the Sustainable Development Goals adopted by the United Nations Member States in 2015. At least, so far, MFIs have been improving financial inclusion by serving people previously unable to access financial services (Brown et al., 2015). The assessment of MFIs is complex because they try to be sustainable and efficient, but given their social purpose, they have to avoid drifting from their mission and charging unfair interest rates. Among development initiatives, microfinance is probably the most concerned about its impact (Balkenhol, 2018). While Yunus won the Nobel Peace Prize in 2006 for the development of microcredit, the Nobel Prize in Economics went to Kremer, Banerjee, and Duflo in 2019 for their experimental approach to alleviating global poverty, with work on the impact of microfinance among their research contribution (Banerjee et al., 2015a). Little convincing evidence exists that microcredit actually has had a significant positive impact on development (Committee for the Prize in Economic Sciences in Memory of Alfred Nobel, 2019). All stakeholders involved in microfinance—practitioners, investors, donors, regulators, or policymakers, as well as academia—are concerned about the impact of MFIs. This chapter describes the main methodologies and standards for measuring financial and social performance in microfinance. There are many microfinance literature reviews (Cull & Morduch, 2017; Duvendack et al., 2011; Duvendack et al., 2014; Duvendack & Mader, 2020; Hermes & Hudon, 2018; Van Rooyen et al., 2012). We adopt a scientometric approach, based on the keyword co-occurrence analysis and citation network analysis of major academic studies.

An assessment of the performance of MFIs must take into account both their social and financial achievements. This is the so-called double bottom line, proposed by Yaron (1994), which deals with both financial and social aspects. There is still a controversy over how to best measure both the financial and social performance of MFIs (Hermes & Hudon, 2018). The evaluation of the financial performance of MFIs adopts measures and standards of conventional finance used by other financial institutions. These include analysis of accounting information, computing financial ratios, and efficiency measures which then are used to generate financial reports' ratings (Gutiérrez-Nieto & Serrano-Cinca, 2007). On the one hand, MFIs are expected to be self-sustainable and avoid dependence on donations (Hudon & Traca, 2011). On the other hand, MFIs are expected to show that their financial sustainability does not come at the expense of deviating from their outreach mission by charging high-interest rates that penalize the poorest and, thus, worsen their social performance. Although the study of the

relationship between financial and social performance is a fruitful line of research (Hermes & Hudon, 2018), there is no consensus in the literature on how the profit orientation of MFIs affects their social and financial outcomes (Blanco-Oliver & Irimia-Diéguez, 2019).

One of the reasons for the lack of consensus on the relationship between financial performance and social performance is that the social performance of MFIs can be assessed in many ways. One approach is to evaluate outreach from the supply side, that is, by analyzing MFIs' accounting information (Schreiner, 2002). Outreach can be measured in terms of depth, value to users, cost to users, breadth, length, and scope (Navajas et al., 2000). The breadth of outreach is measured using indicators such as the number of active borrowers and the depth of outreach is measured using indicators such as the average loan size. The latter indicator is often used as a measure of mission drift (Copestake, 2007). Indicators such as the percentage of women served by the institution or the percentage of rural clients are also used. Besides, it is expected that MFIs duly serve other stakeholders, remunerate their employees fairly, pay taxes, and adopt appropriate governance practices (Hartarska, 2005; Labie, 2001; Mersland & Strøm, 2009).

Another way of measuring MFIs' social performance focuses on the quality of outreach and consists of impact evaluations that do not analyze the institution itself but its clients, i.e., analyses are carried out from the demand side (Copestake, 2007). Impact studies try to demonstrate whether microfinance improves the well-being of the poor (Hermes & Hudon, 2018), that is, whether microfinance intervention has brought about a specific and positive change in the lives of their clients (Duvendack, 2019). Balkenhol (2018) defined impact as changes in the situation of customers that can be causally attributed to access to micro-financial services. Unfortunately, measuring the impact of microfinance is not easy. Balkenhol (2018) stated that there is controversy in the selection of variables, measurement tools, dimensions, and levels of impact, as well as evaluation methodologies.

There have been different reviews of the literature on microfinance assessment. Brau and Woller (2004) provided a comprehensive review of more than 350 papers, addressing the issues of MFI sustainability, management practices, clientele targeting, regulation, and impact assessment, among others. Hermes and Hudon (2018) systematically evaluated the potential of microfinance to reduce poverty from the supply side, by examining the performance of MFIs in reaching out to the poor by providing the services the poor need. The impact of microcredit was initially based on anecdotal evidence (Gaile & Foster, 1996; Goldberg, 2005; Sebstad & Chen, 1996; Odell, 2010), rather than careful analysis of the impact on poverty. Armendáriz and Morduch (2005) summarized the results from rigorous quantitative evidence on the nature, magnitude, and balance of microfinance impact. Duvendack et al. (2011) performed a meta-analysis of 58 studies, focusing on the technical challenges of conducting precise microfinance impact evaluations. Van Rooyen et al. (2012) performed a systematic review of the evidence of the financial and non-financial impacts of microfinance on poor people in sub-Saharan Africa (Stewart et al., 2010). Duvendack et al. (2014) conducted a new meta-analysis study, this time on the impact of microcredit on household decisions by women. Cull and Morduch (2017) performed an integrative literature review, highlighting the diversity in evidence on impacts and the role of subsidies. Duvendack and Mader (2020) performed a systematic review of reviews; they analyzed 32 meta-studies concluding that impacts are more likely to be positive than negative, but the effects vary.

This chapter aims to analyze the research carried out by the scientific community on the assessment of microfinance with a scientometric approach. Previous literature provides

general reviews of microcredit under systematic review approaches, which attempted to collect all empirical evidence to answer a specific research question (García-Pérez et al., 2017; Hermes & Hudon, 2018; Pinz & Helmig, 2015; Rasel & Win, 2020). Meta-analyses, which use statistical procedures to aggregate and combine the results of independent studies, were also performed (Fall et al., 2018; Reichert, 2018). Finally, the scientometric approach has also been employed, but these studies had different goals (Gutiérrez-Nieto & Serrano-Cinca, 2019; Roy & Goswami, 2013). Roy and Goswami (2013) conducted a scientometric analysis of 71 research papers focusing on the overall performance of microfinance institutions. Their review was carried out along with different parameters: financial performance, social performance, outreach, sustainability, efficiency, productivity, institutional characteristics, and governance. Gutiérrez-Nieto and Serrano-Cinca (2019) studied the time evolution of two research traditions: papers focusing on clients (welfarists) and papers focusing on microfinance entities themselves (institutionalists). This chapter contributes to the literature by studying the assessment of MFIs and especially the impact of microcredit, analyzing bibliographic data following a scientometric approach, with a sample of 3,588 papers. This methodological approach enables obtaining microcredit impact knowledge maps and trends of microfinance impact research, which is the main contribution of the study.

The remainder of the chapter is organized as follows: the second section is on microfinance financial performance. The third section presents some MFIs social assessment methodologies. The fourth section provides the scientometric analysis. The fifth section presents a discussion of the results along with the main conclusions. The chapter closes with the reference list.

FINANCIAL PERFORMANCE

Although with multiple goals, MFIs are financial entities, so their financial performance indicators are standardized and universal. The analysis of their financial performance is based on accounting information used to compute financial ratios. A consortium of 28 public and private development agencies agreed on a set of guidelines on definitions of financial terms, ratios, and adjustments for microfinance to achieve a standardized method of calculating financial indicators in the microfinance sector (CGAP, 2003). These consensus indicators remain valid today and are grouped into four categories: portfolio quality, assets and liability management, profitability and sustainability, and efficiency and productivity. Rating agencies rate the financial performance of MFIs by adapting the financial methodologies offered by agencies such as Standard & Poor's or Moody's or the international rating system used by bank supervisory authorities (Gutiérrez-Nieto & Serrano-Cinca, 2007).

The microfinance business consists of lending money and recovering it, so its portfolio quality is a key aspect. Despite the a priori reluctance to lend to the poor, who do not have collateral, Yunus applied in practice the proverb "the poor always pay back", supported by credit methodologies such as solidarity groups or peer monitoring. These and other novel credit methodologies were developed to keep non-performing loans at levels similar to those of banks (Schreiner, 2000). However, Karim (2008) questioned the overly aggressive loan recovery programs implemented by some MFIs, whose loan officers often put excessive pressure on clients by shaming them or even destroying their properties. Two indicators commonly used in microfinance to measure portfolio quality are portfolio at risk, defined as the proportion of

the loan portfolio in arrears for longer than 30 days, and the proportion of the loan portfolio that is written off and accounted as a loss for the MFI (Zamore et al., 2019).

Asset and liability management is crucial in financial institutions, which have asset-liability committees (ALCO) to manage the financial structure of the institution's balance sheet. In this aspect, the strategic management of liquidity risks and the interest rate spread are analyzed (Kusy & Ziemba, 1986). MFIs have some peculiarities when managing funds, as many of them do not collect deposits, but funds come from investors and donors. Both the term and the price of assets and liabilities need managing, using indicators such as (1) the asset coverage ratio that relates the entity's assets to debt and (2) the net interest margin that measures the difference between the interest paid on deposits and interest earned on loans. The management of net interest margin is a delicate issue for MFIs because setting high-interest rates has an impact on poor clients, who pay more money for their loans than non-poor clients, which leads to a form of poverty penalty (Gutiérrez-Nieto et al., 2017). This is why good asset and liability management can lead to bad social management practices, meaning a low social performance position.

In addition to the traditional profitability ratios, MFIs calculate some specific indicators, such as self-sustainability, measured with a ratio that relates revenues to costs, with adjustments made to account for implicit subsidies. Cull et al. (2018) analyzed 1,335 microfinance institutions to measure how many of them could actually continue operations without external donor funding and found that just over two-thirds of microfinance borrowers are served by MFIs not earning profits, suggesting that there are still substantial subsidies running through the sector.

An important aspect of the evaluation of MFIs is their efficiency, which relates the inputs of MFIs (personnel expenses, operating expenses) to net income (Gutiérrez-Nieto et al., 2007). The efficiency ratio answers the question of how much the MFI needs to spend to obtain $100. Efficiency studies often handle several inputs and outputs, so multi-output approaches such as parametric frontiers and data enveloping analysis (DEA) are used. More recent studies reveal that the efficiency of MFIs has increased over time; however, the level of efficiency of the industry as a whole remains low and should be improved (Fall et al., 2018). The greatest source of inefficiency of MFIs is their high operating expenses (both personnel and administrative), which represent 62 percent of charges to borrowers, while financial expenses represent 23 percent, profits 10 percent, and losses from defaults 5 percent (González, 2007). MFIs focus on the least profitable clients in the financial system, those in the long tail of Pareto's distribution of loans (Serrano-Cinca & Gutiérrez-Nieto, 2014). Operating in such a business environment, profits can only be made by raising the price of the product, i.e., by increasing the lending rate or by using technologies that dramatically reduce management costs, such as electronic banking or mobile applications.

SOCIAL PERFORMANCE

Social performance is the effective translation of an institution's social goals into practice in line with accepted social values (SEEP, 2006). These social values include sustainably serving increasing numbers of poor and excluded people, improving the quality and appropriateness of financial services, improving the economic and social conditions of clients, and ensuring social responsibility to clients, employees, and the community they serve (Hashemi, 2007). The measurement of the social performance of MFIs is more complex than the financial

performance, in terms of the concepts, the diversity of methodologies applied, and the variables to be analyzed.

One of the most widely accepted procedures for assessing social performance has four steps (World Bank, 2007). The first is to identify the social aim of the institution. The second is the evaluation of the institution's internal systems and activities. The third analyzes outputs, assessing whether the institution serves the poor and whether the products meet their needs. The fourth involves the analysis of outcomes, i.e., whether clients have experienced improvements in their social and financial situation, culminating with an impact analysis, which attempts to establish causality between participation in the program and improvement in the conditions of clients. Several social performance assessment tools have been developed such as CERISE, SPA, Social Action, PPI, and FINCA (World Bank, 2007). Besides, there are rating agencies that perform social ratings such as M-CRIL, Microfinance, and Planet Rating. Given the diversity of methodologies, the Social Performance Task Force advocated the creation of a common reporting format for social reporting in microfinance that included organizational and client indicators, which was materialized in the Universal Standards for Social Performance Management (Wardle, 2017). Standardizing social indicators and evaluation procedures is a very necessary task, although in explicit situations it will be necessary to use specific evaluation frameworks and indicators (Sierra et al., 2019).

Mission Drift and Governance

The first step in social performance evaluation is to identify the social aim of the institution and verify the degree of compliance with it. Mission drift in microfinance arises when an MFI finds it profitable to reach out to unbanked wealthier individuals while at the same time crowding out poor clients (Armendáriz & Szafarz, 2011). Serrano-Cinca and Gutiérrez-Nieto (2014) argued that some MFIs have a tendency towards mission drift, by merely applying Pareto's 80/20 Principle, which states that the least profitable customers are placed in the long tail of the wealth distribution function. They conducted an empirical study finding a pattern of a mission-centered MFI: a small NGO, with high labor productivity, receiving donations, and obtaining a high yield. Beisland et al. (2019) explored additional internal reasons for MFIs' mission drift and suggest that changing credit officer behavior over time might explain why MFIs drift from social motivations toward financial motivations.

Several indicators quantify whether the MFI meets its mission statement. If the aim of the MFI is poverty reduction, the number of poor served should be analyzed, and a common indicator of success is the average loan size because it is understood that large loans are not extended to the poorest. If the mission of the MFI is women's empowerment, the percentage of women clients should be analyzed. If the mission is to improve rural financial inclusion, the percentage of rural clients or the percentage of agricultural loans are indicators measuring its performance. Several authors have studied the time evolution of mission drift in the MFI sector, finding a significant increase in the average loan size. This result, however, can also be a symptom of mission expansion, that is, the MFI also lends to additional clients without abandoning the poor (D'Espallier et al., 2017). Most studies indicate that mission drift is not a trend in the whole microfinance sector, although there are institutions that clearly deviated from their mission (Beisland et al., 2019).

An assessment of the social performance of MFIs must include aspects related to their governance, which is closely related to the protection of the mission. Corporate governance involves a set of relationships between a company's management, its board, its shareholders,

and other stakeholders (OECD, 2004). To this end, several indicators have been developed that deal with board composition, employee compensation, donor relations, tax payments, relations with customers and suppliers, the actions that the MFI does to improve the environment, the contributions it makes to the community, and the transparency with which it carries out all its actions. The relationships between governance and performance, both financial and social, have also been studied. Hartarska (2005) found a significant positive relationship between board independence and performance, embracing the idea that independence of the microfinance board should be promoted.

Outreach and Social Efficiency

Outreach is defined as the degree to which an MFI provides financial services to a large number of people, especially the poorest. According to the last edition (10th) of the *Microfinance Barometer* (Convergences, 2019), an annual publication disclosing the main trends of the sector, on a global basis from MIX Market data, microfinance outreach has risen from 98 million borrowers in 2009 to 139.9 million borrowers in 2018, which is a 42.75% growth in ten years. The *Barometer* states that the growth of the sector, measured by its credit portfolio, is $124.1 billion in 2018 with an average annual growth rate of 11.5% in the previous five years. It seems clear that MFIs have succeeded in the financial inclusion of many people (Brown et al., 2015).

It is expected that an MFI not only serves as many clients as possible but also does it efficiently, using few resources. Hence, social efficiency is another step in the study of outreach. Social efficiency considers the same inputs used to calculate financial efficiency, such as personnel expenses and other operating expenses, as well as separate social outputs such as the number of poor served, female clients, or the group on which the mission of the institution is focused (Gutiérrez-Nieto et al., 2009).

Products Offered and Prices

An analysis of social performance should include the review of financial products and services offered by the MFI, which should be designed to meet the needs of the poor. In addition to microcredit, microsavings, and microinsurance; non-financial services, such as social services, business development services, and business training should also be considered. Lensink et al. (2018) found that the provision of social services was associated with improved loan quality and greater depth of outreach. Few doubt the role that technology has in promoting financial inclusion, and access through mobile electronic banking should be valued as an important aspect that affects MFIs service quality. Additionally, the loan methodology—individual lending, group lending, and village banking—is also important because certain methodologies transfer the credit risk to the client. Interest rates can be very high and lead to a poverty penalty, so a social performance assessment should ensure that the institution does everything possible to maintain fair interest rates (Gutiérrez-Nieto et al., 2017). For this purpose, the yield on the gross loan portfolio of the MFI is usually evaluated, but it would be more appropriate to evaluate the interest rates actually paid by the clients in that institution to establish comparisons with what they would pay for the same product in other institutions (Waterfield, 2015).

Evaluation of Outcomes and Impact

The analysis of MFIs outcomes aims to evaluate whether customers have experienced improvements in their social and financial situation. An impact evaluation is the last step of

the social performance analysis aimed to establish a causal relationship between participation in the program and improvement in customers' conditions. Establishing impact means demonstrating that the program causes the observed changes (Rossi et al., 1999), i.e., that changes are more likely to occur with participation in the program rather than without participation.

Early microcredit studies avoided calculations of poverty impact, often treating the fact that small loans are being made as proof that the poor are being reached, and the fact that loans are being repaid as proof that incomes have increased (Mosley & Hulme, 1998). Some researchers even took the financial health of the entity as a proxy indicator of impact, arguing that the popularity of the services offered among people was sufficient to show that they were beneficial (Johnson & Rogaly, 1997). In fact, until the end of the 20th century, most microfinance impact assessment studies were qualitative commentaries and only relied on anecdotal evidence (Duvendack, 2019). For example, the description of a woman, who thanks to a microloan, was able to buy a sewing machine was considered as evidence that she was helped out of poverty. However, even if the sample was extended to include several cases, and even if a microcredit program improves the client's income, this does not mean that the microfinance program is the cause of this better income since correlation does not mean causation. It is essential to properly design the methodology to ensure quality (Duvendack et al., 2011; Graham-Rowe et al., 2011).

Studies in which pre-intervention measures were not recorded are unreliable. Take, for example, an MFI that grants microcredits in a village. Three years later, the MFI claims that the standard of living of its current clients is good enough but the MFI did not even measure the poverty level of its clients before joining the program. In the following stage, we can find studies that recorded pre-intervention measures but did not report data from a control or comparison group, making it difficult to assess the effectiveness of the interventions. This would be an example of a typical study in which an MFI affirms that its clients were poor, and they have been lifted out of poverty three years later, but we do not know if microcredit is the cause in the absence of a control group. Maybe the villagers who did not ask for microcredit reached a better level than microfinance clients did, perhaps microfinance clients would have done even better without the microcredit. The next stage in terms of quality is the cohort-analytic method, that is, an observational study where groups, which have or have not been exposed to intervention are compared, but where intervention exposure is not controlled by the researchers (Graham-Rowe et al., 2011). However, these groups were not randomized or matched, which is a notable shortcoming.

Quasi-experimental designs use matched but not randomized control groups. The selection of the groups is not randomized; the researcher divides the sample by a certain criterion. Then, self-selection by program participants may lead to an overestimation of the beneficial impact of microfinance. For example, it could be the case that applicants for microcredit are better skilled, and have more entrepreneurial spirit than those who choose not to apply for microcredit. Balkenhol (2018) noticed that participants joined microcredit programs for unobserved reasons and that those reasons might explain why their achievements were superior to non-participants.

Randomized controlled trials (RCT) are experimental designs where the investigators randomly allocated individuals to an intervention or control group, overcoming the problem of quasi-experimental designs. Participants in both groups are identical in all but one aspect: their participation (or not) in the microfinance program (Coleman, 1999). Few papers used this methodology in the field of microfinance, although their number has grown in recent years

(Banerjee et al., 2013; Banerjee et al., 2015a, 2015b, 2015c; Banerjee et al., 2019; De Mel et al., 2009; Karlan & Valdivia, 2011; Karlan & Zinman, 2011). Karlan and Valdivia (2011) analyzed the effect of business training on a micro entrepreneurs group, finding little or no evidence of changes in business revenue, income, employment, or subjective well-being; however, they observed business knowledge improvements and increased client retention rates for the MFI. Some impact studies have been useful to contrast the assumption that microcredit was not very useful for poverty alleviation (Banerjee et al., 2015c). Banerjee et al. (2015a) found positive financial impacts (investment and profits) but no significant changes in non-financial aspects (health, education, women empowerment). Banerjee et al. (2015b) studied the impact of a multifaceted program providing a productive asset grant, training, and support, life skills coaching, health information, temporary cash consumption support, and access to savings accounts, finding that it caused lasting progress for the very poor. However, Banerjee et al. (2019) found that the effects of access to formal credit through microfinance are highly heterogeneous, finding positive effects on household businesses and consumption for those individuals with an existing business acumen before their use of microfinance.

Guidelines for conducting impact studies are provided by several initiatives—the International Initiative for Impact Evaluation, the Qualitative Impact Protocol, and the Regulatory Impact Assessment. RCT studies are the most appropriate from a methodological point of view, but they are not exempt from some problems. Let us compare them with medical studies, which profusely use RCT. First, the measurements must be unbiased. Whether or not a person develops cancer is an easily measurable variable. However, poverty has multiple dimensions: financial, economic, social, and environmental, and for each of them, there is a host of indicators (Balkenhol, 2018). We can know precisely the number of cigarettes smoked each day, but it is difficult to pinpoint accurately when we talk about the impact of microfinance because there are very different microfinance products. The type of loans or services offered matters; there are also different loan methods, and different kinds of microfinance institutions, i.e., the list of variables is daunting (Balkenhol, 2018). Odell (2010) stated that given the variety of microfinance tools and local markets it is impossible to answer, in a general way, the question of whether microfinance works or not. Similarly, Morduch (2020) recognized that RCTs are interesting and informative in their own terms and in their own idiosyncratic contexts but fail to answer the biggest questions about microcredit impact.

Following on with the comparison to medical studies, if the RCT study is well done its ability to generalize results can be high. For example, if the study determines the relationship between smoking and lung cancer, the results could be extrapolated to almost all of humanity because people are more or less alike, although there may be immune collectives. In fact, when a drug is approved, its use spreads around the world. However, demonstrating that a microcredit experience was indisputably a success or a failure provides a valid result only in that context, being unsuitable to extrapolate the results. In other words, a result that is true in one place, at one time, and under one set of circumstances, will typically not be true in another place, another time, or under different circumstances (Deaton, 2020). Karlan and Zinman (2011) encouraged the expansion of the number of studies and carried them out themselves in different contexts, to the point where there was sufficient evidence of the impact (or not) of microcredit. Let us point to RCT studies that opened the way, but to demonstrate the direct causal relationship between tobacco and lung cancer, more than a single statistical study is necessary. Increased understanding of the molecular biology of tobacco-related cancers identified 60 carcinogens that are responsible for multiple genetic changes in lung tissue and the

development of lung cancer (Hecht, 2002). In the case of microcredit, even if the statistical evidence becomes irrefutable, it will be necessary to develop a theory that explains the causes, which will hardly be equivalent to the experimental context of genetic science.

Finally, these experimental studies can have an ethical problem: how to justify that an entity with a social mission randomly grants credits for methodological reasons. Hudon et al. (2019) pointed out that randomized studies focus on the methodological aspects and that ethical issues are left aside, suggesting that ethical committees employ a rule known as equipoise, used in medicine, which means that the patient consents to provide ex-ante equally attractive options to the treated and control groups.

Scientometric Analysis of Microfinance Research on the Assessment of Institutional Performance and Impact on Clients

Web of Science (WoS) and Scopus are two world-leading abstract and citation databases. Scopus is increasingly used in academic papers (only a little less than the competitor WoS) and is challenging the dominating role of WoS (Zhu & Liu, 2020). In this section, we analyze all the papers published between 1995 and 2019 in both databases, performing a keywords co-occurrence analysis and a citation network analysis (Radhakrishnan et al., 2017). This type of analysis allows for identifying the main topics of interest for microfinance researchers and for studying the evolution of interest in these topics. The citation networks analysis enables obtaining cognitive maps (Small, 1973) that allow classifying the works, authors, and journals in clusters, and, by analyzing the clusters, drawing relevant conclusions about the microfinance state of the art. The study was carried out chronologically, which additionally allows the analysis of microfinance research trends, analyzing emerging topics by evolving the keywords used in academic articles.

First, we opted for the WoS database. We searched by theme (which includes title, abstracts, and keywords) with the keywords "microfinance" and its synonyms. The following search was used:

> TS = (microfinance) OR TS = ("micro finance") OR TS = (micro-finance) OR TS = (microcredit*) OR TS = ("micro credit*") OR TS = ("micro-credit*") OR TS = (microbank*) OR TS = ("micro bank*") OR TS = ("micro-bank*") OR TS = (microinsurance*) OR TS = ("micro insurance*") OR TS = ("micro-insurance*") OR TS = (microsaving*) OR TS = ("micro saving*") OR TS = ("micro-saving*")

This search returned 3,588 results. Afterward, we performed the same search on the Scopus database, which required a slight change in syntax:

> TITLE-ABS-KEY("microfinance") OR TITLE-ABS-KEY("micro finance") OR TITLE-ABS-KEY("micro-finance") OR TITLE-ABS-KEY("microcredit*") OR TITLE-ABS-KEY("micro credit*") OR TITLE-ABS-KEY("micro-credit*") OR TITLE-ABS-KEY("microbank*") OR TITLE-ABS-KEY("micro bank*") OR TITLE-ABS-KEY("micro-bank*") OR TITLE-ABS-KEY("microinsurance*") OR TITLE-ABS-KEY("micro insurance*") OR TITLE-ABS-KEY("micro-insurance*") OR TITLE-ABS-KEY("microsaving*") OR TITLE-ABS-KEY("micro saving*") OR TITLE-ABS-KEY("micro-saving*")

This search returned 4,371 results. The coverage of WoS and Scopus is different, but scientific studies that opt for one or the other often come to similar conclusions (Harzing & Alakangas, 2016). This is because the most cited articles are usually published in journals with the greatest

impact and these journals are usually included in both databases. However, there may be exceptions. One of the exceptions is Schreiner (2002), a highly cited paper on the concept of microfinance outreach that was published in the *Journal of International Development*. This journal is part of Scopus, but not of WoS. It may even be the case that journals are not indexed in either database, such as the defunct *Journal of Microfinance*; we can find here a highly cited paper on credit scoring in microfinance from the same author: Schreiner (2000). One way to solve this problem is to select the papers indexed in any of the databases but examine the articles that cite those papers. This backward procedure ensures that none of the relevant articles are forgotten. Finally, it is also worth using Scholar Google, which contains by far the largest database of academic publications, although it does not have the quality filters of WoS and Scopus.

From now on, we will use WoS. We removed conference proceedings and books from the search, focusing only on Science and Social Sciences Citation Indexes. The AND operator was subsequently added to find articles dealing with specific assessment topics, one at a time. The chosen topics were experimental designs using RCT, for which the keyword "randomized" was used. Other topics analyzed were: "sustainability", "efficiency", "outreach", "governance", and "mission drift". Variants were identified for each keyword.

Table 3.1 shows the number of articles published for each of the topics analyzed. There may be many publications on a topic but with a low impact, measured as citations per publication. The table shows the number of citations annually received for each topic. It is interesting to study the average number of citations received for each topic. A ratio was calculated by dividing the number of citations received each year by the cumulative sum of the articles on each of the topics. The table shows that in each of the most recent years more than 400 studies were written on microfinance, of which 20 apply RCT, less than the number of studies on governance or efficiency, but higher than topics such as mission drift.

RCT is the topic whose articles receive the highest number of citations per year, about 5.45 in 2019, compared to the 1.95 that microfinance articles receive on average. In addition to a great deal of interest in the topic, two factors explain it. The first is that some of the articles are published in medical journals, which have higher impact factors than economic journals. For example, *The Lancet* has an impact factor of 59.1 in 2018 compared to 3.9 for *World Development*. Also, the impact of microcredit is a topic of interest not only to microfinance researchers but also to other scientists, so their studies receive citations from outside the microfinance field (Gutiérrez-Nieto & Serrano-Cinca, 2019).

Table 3.2 shows the 15 most cited microfinance articles on impact studies using RCT. The number of citations received by them is displayed, ranked by the number of citations received in 2019. All these papers share the same school of thought, but to Banerjee-Duflo-Karlan we add co-authors such as Giné, Angelucci, Attanasio, Ashraf, and Crépon (Angelucci et al., 2015; Ashraf et al., 2010; Attanasio et al., 2015; Banerjee et al., 2015a, 2015b, 2015c; Crépon et al., 2015; Giné & Karlan, 2014; Giné & Yang, 2009; Karlan & Valdivia, 2011; Karlan & Zinman, 2009; Karlan & Zinman, 2011). Among them, the three most cited papers (Banerjee et al., 2015a, 2015b, 2015c) stand out as very recent because they were published in 2015. Winning the Nobel Prize may lead to an increase in citations because of the Matthew effect, which means that established researchers are extremely successful in obtaining citations (Merton, 1968). The name of the effect comes from the Bible's Matthew 25:29, "For whoever has will be given more, and they will have an abundance"; in other words, the rich get richer and the poor get poorer. However, there is no Matthew effect because Banarjee and Duflo won in October

Table 3.1 *The number of articles published for each of the topics analyzed, as well as the number of citations and a ratio showing the average number of citations received annually for each topic*

Keyword		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Microfinance	Papers	21	35	23	53	40	38	48	73	120	121	171	170	199	212	234	371	382	436	427	414
	Citations	17	62	71	129	119	236	333	403	549	812	1,266	1,405	1,906	2,447	2,995	3,870	4,153	5,622	6,701	7,066
	Ratio	0.27	0.63	0.58	0.74	0.55	0.93	1.11	1.08	1.11	1.32	1.61	1.47	1.65	1.79	1.87	1.96	1.76	2.02	2.08	1.95
Sustainability	Papers	3	6	3	11	7	2	3	12	13	16	26	24	21	16	32	64	52	74	74	84
	Citations	2	12	11	29	21	51	66	65	63	123	177	205	329	403	503	643	741	1,014	1,271	1,284
	Ratio	0.15	0.63	0.5	0.88	0.53	1.21	1.47	1.14	0.9	1.43	1.58	1.51	2.1	2.33	2.45	2.39	2.31	2.57	2.71	2.32
Efficiency	Papers	—	2	1	1	1	1	—	3	3	6	6	11	8	15	27	37	33	49	49	48
	Citations	3	3	2	1	2	13	6	13	18	29	41	66	103	182	243	338	405	565	844	792
	Ratio	1	0.6	0.33	0.14	0.25	1.44	0.67	1.08	1.2	1.38	1.52	1.74	2.24	2.98	2.76	2.7	2.56	2.73	3.3	2.61
Mission drift	Papers	—	-—	—	—	—	—	—	2	2	2	2	1	—	1	3	2	7	14	6	15
	Citations	—	—	—	—	—	—	—	1	1	2	12	13	17	57	28	66	54	84	134	154
	Ratio	—	—	—	—	—	—	—	0.5	0.25	0.33	1.5	1.44	1.89	5.7	2.15	4.4	2.45	2.33	3.19	2.7
Governance	Papers	—	—	—	2	3	1	—	2	4	7	7	8	10	10	10	16	14	38	31	27
	Citations	2	2	1	1	2	15	27	31	27	42	66	65	104	109	179	231	235	304	437	380
	Ratio	1	1	0.5	0.25	0.29	1.88	3.38	3.1	1.93	2	2.36	1.81	2.26	1.95	2.71	2.82	2.45	2.27	2.65	1.98
Outreach	Papers	2	—	—	6	1	1	3	4	—	10	7	10	8	12	20	33	28	43	52	47
	Citations	—	2	5	4	2	17	18	21	28	46	74	94	169	193	214	388	372	537	837	743
	Ratio	—	0.5	1.25	0.4	0.18	1.42	1.2	1.11	1.47	1.59	2.06	2.04	3.13	2.92	2.49	3.26	2.53	2.83	3.46	2.57
Randomized	Papers	—	—	—	—	—	—	1	1	8	3	9	9	5	1	11	21	8	21	18	19
	Citations	—	—	—	—	—	—	—	12	41	75	123	136	164	250	305	388	435	605	699	736
	Ratio	—	—	—	—	—	—	—	6	4.1	5.77	5.59	4.39	4.56	6.76	6.35	5.62	5.65	6.17	6.03	5.45

Table 3.2 The 15 most cited articles on RCT in microfinance

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Banerjee et al. (2015a)	—	—	—	—	—	—	—	—	13	25	35	44	55	**172**
Banerjee et al. (2015c)	—	—	—	—	—	—	—	—	6	15	35	36	46	**138**
Banerjee et al. (2015b)	—	—	—	—	—	—	—	—	5	23	29	38	45	**140**
Pronyk et al. (2006)	12	28	39	40	37	34	47	49	44	42	42	48	35	**497**
Kim et al. (2007)	—	7	11	13	15	14	21	27	29	27	32	30	25	**251**
Giné & Yang (2009)	—	—	—	7	11	8	17	14	12	21	21	16	25	**152**
Angelucci et al. (2015)	—	—	—	—	—	—	—	—	7	8	17	14	25	**71**
Karlan & Zinman (2009)	—	—	—	5	8	12	22	18	22	13	19	20	20	**159**
Crépon et al. (2015)	—	—	—	—	—	—	—	—	11	8	15	16	20	**70**
Attanasio et al. (2015)	—	—	—	—	—	—	—	—	10	8	13	15	19	**65**
Karlan & Zinman (2011)	—	—	—	—	2	12	12	13	13	17	15	13	19	**116**
Karlan & Valdivia (2011)	—	—	—	—	3	6	16	33	30	20	19	36	16	**179**
Ashraf et al. (2010)	—	—	—	—	1	4	7	7	6	15	9	21	16	**86**
Pronyk et al. (2008)	—	3	6	16	22	10	12	16	12	13	12	16	16	**154**
Giné & Karlan (2014)	—	—	—	—	—	—	—	1	8	8	14	9	15	**55**

2019 so the award cannot be the driving force behind the citations. Finally, the articles that investigated the health effects of microfinance through RCT are relevant contributions (Kim et al., 2007; Pronyk et al., 2006, 2008).

We then generated knowledge maps using the Vosviewer software, which aggregates references and illustrates the progress of a research field over time (Van Eck & Waltman, 2017). We took the 135 microfinance studies conducted using RCT, that is, which used the keyword "randomized" and its synonyms. Figure 3.1 shows the knowledge map. These maps are similar to road maps in which two nearby cities appear close to each other. Anyone can simply use a ruler to measure the distances between several cities to obtain a distance chart. Performing the opposite process, that is, creating a map from a distance chart is complicated but fortunately, there are several mathematical algorithms capable of doing so. For example, a multidimensional scaling algorithm converts information about the pairwise distances among a set of *n* objects into a configuration of *n* points mapped into a Euclidean space, usually a plane (Torgerson, 1952). The measure of distance (similarity) is a unit of length in the case of road maps. In the scientometrics area, the measure of distance can be obtained from a co-citation analysis to obtain the knowledge maps of a discipline. A citation link is a link between two items where one item cites the other. By contrast, a co-citation link is a link between two items that are both cited by the same document. If two documents are co-cited by a third article, they can be similar, so that the more co-cites they share, the greater the affinity between them, and the closer they appear on the knowledge map. In the figures generated by the software, the volume of the sphere is proportional to the number of citations, which were normalized to correct for the fact that older documents have had more time to receive citations than more recent documents.

Figure 3.1 visualizes two clusters, which are clearly not bibliographically coupled. The authors of the cluster on the right carry out studies that analyze the impact of microcredit on health (Kim et al., 2007; Pitt & Khandker, 1998; Pronyk et al., 2006; Sherman et al., 2010; Ssewamala et al., 2010; Weiser et al., 2015). The cluster on the left contains studies on the impact of microcredit. In that part, Karlan and Valdivia (2011) and Banerjee et al. (2015a) stand out, compared to the other articles (Angelucci et al., 2015; Attanasio et al., 2015;

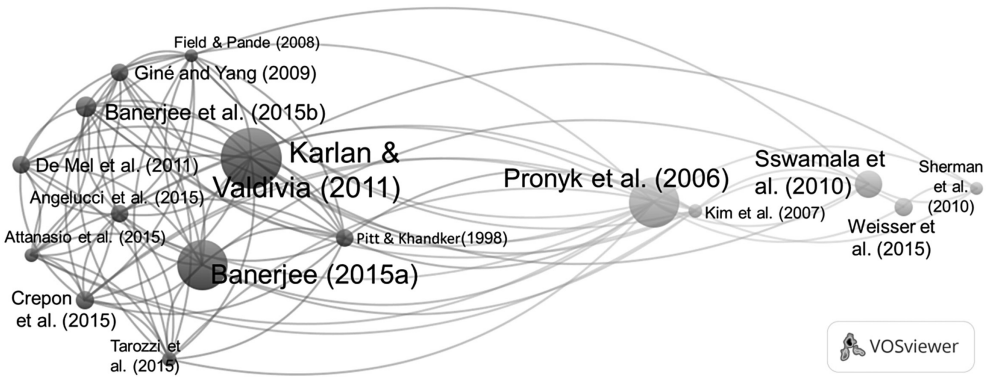

Figure 3.1 *Knowledge maps obtained from co-citation analysis of microfinance publications using RCT. Unit of analysis: authors*

Banerjee et al., 2015b; Crépon et al., 2015; De Mel et al., 2011; Field & Pande, 2008; Giné & Yang, 2009; Tarozzi et al., 2015).

Figure 3.2 illustrates the origins of the authors of the citations. The absolute predominance of the USA is noteworthy, and a very small cluster with some other countries, mostly European.

Figure 3.3 illustrates the authors' universities and research centers. Three clusters can be seen; the one on the left is the hard core with authors Banerjee and Duflo (MIT), Karlan (formerly at Yale, and now at Northwestern), and Zinman (Dartmouth College). The presence of universities outside the US orbit is very limited.

Figure 3.4 presents the results of the citation analysis applied to journals. Again, two clusters appear that clearly distinguish the publications on the health area from those on economics. In the latter case, the *American Economic Journal: Applied Economics*, which published a special issue in January 2015, *American Economic Review*, *World Development*, and *Journal of Development Economics* stand out.

Figure 3.5 shows the microfinance governance knowledge map, with a selection of the ten most cited papers (Barry & Tacneng, 2014; Beisland et al., 2014; Galema et al., 2012; Hartarska, 2005; Hartarska & Mersland, 2012; Mersland, 2009; Mersland & Strøm, 2009; Périlleux et al., 2012; Servin et al., 2012; Strøm et al., 2014). In this case, the bibliography is grouped around several seminal papers. The green cluster contains papers related to ownership and leadership; the red cluster papers analyze external governance mechanisms, while the blue cluster papers are focused on outreach and clients.

Figure 3.6 shows the microfinance efficiency knowledge map created from the ten most cited papers (Caudill et al., 2009; D'Espallier et al., 2017; Gutiérrez-Nieto et al., 2007; Hartarska et al., 2013; Hermes et al., 2011; Hermes & Hudon, 2018; Hudon & Traca, 2011;

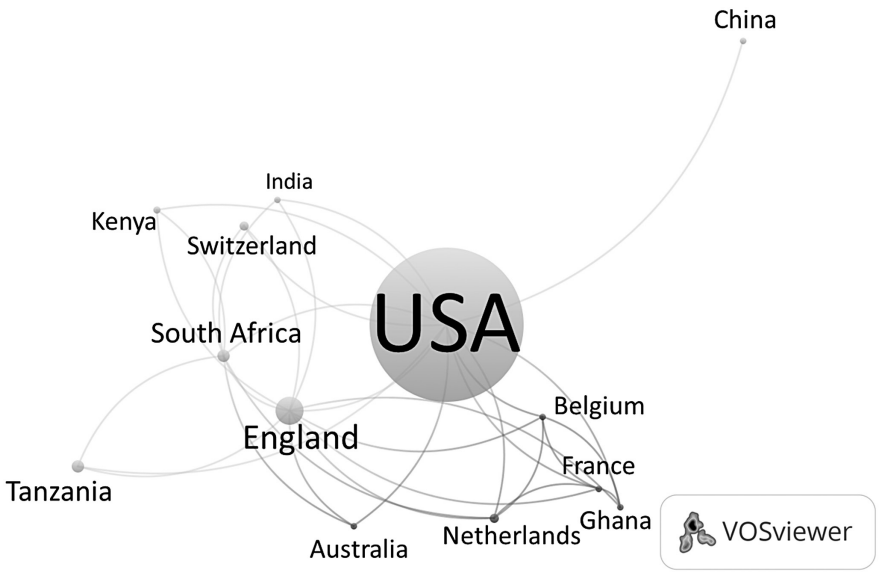

Figure 3.2 *Knowledge maps obtained from a citation analysis of microfinance publications using RCT. Unit of analysis: countries*

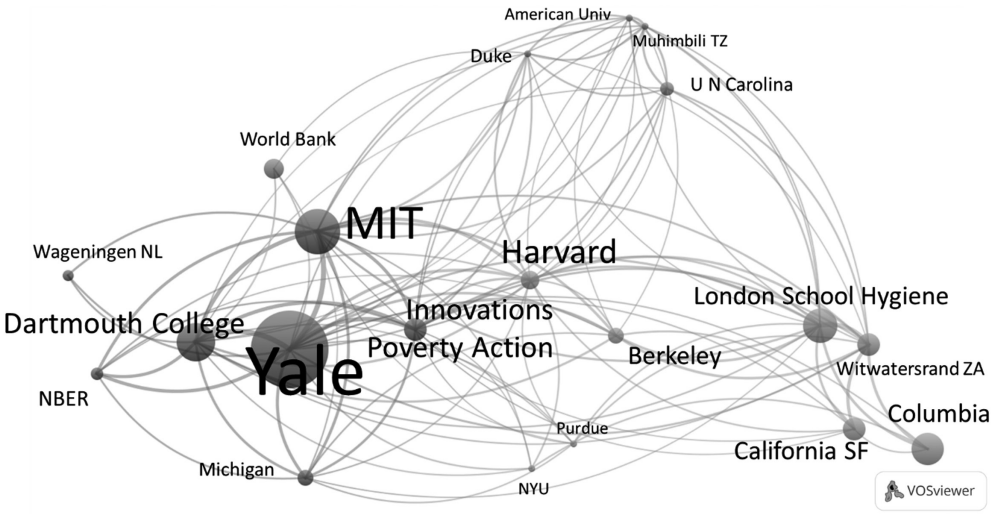

Figure 3.3 *Knowledge maps obtained from a citation analysis of microfinance publications using RCT. Unit of analysis: organizations*

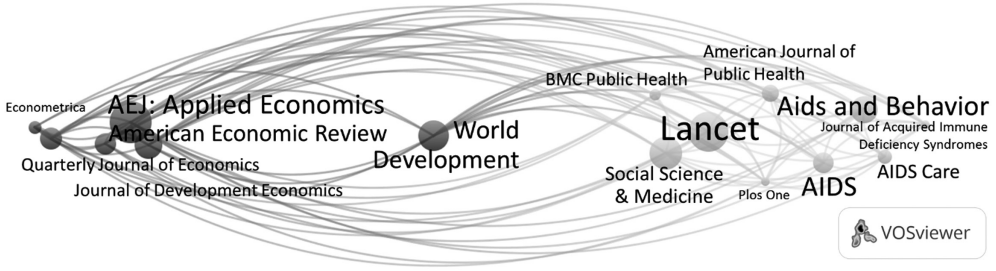

Figure 3.4 *Knowledge maps obtained from a citation analysis of microfinance publications using RCT. Unit of analysis: journals*

Louis et al., 2013; Servin et al., 2012). The green cluster represents social efficiency papers, the red cluster includes papers focused on inputs and costs and the blue cluster papers deal with the funding sources of MFIs, with a special emphasis on subsidies.

Figure 3.7 shows the microfinance mission drift knowledge map with the ten most cited papers on this topic (Ault, 2016; Chahine & Tannir, 2010; Copestake, 2007; D'Espallier et al., 2017; Kar & Swain, 2014; Mersland & Strøm, 2010; Mia & Lee, 2017; Serrano-Cinca & Gutiérrez-Nieto, 2014; Serrano-Cinca et al., 2016; Vanroose & D'Espallier, 2013). The papers in the green cluster contain mission drift models, whereas the papers in the red cluster are focused on the role of transformation and commercialization of MFIs.

Knowledge maps can also be obtained from the similarities among keywords in order to visualize groups of a network of co-occurring terms. The number of co-occurrences of two keywords is the number of publications where both keywords appear together in the title, abstract, or keyword list (Van Eck & Waltman, 2017). If two keywords are included in many publications, their co-occurrence is high and, hence, they will appear close together on the

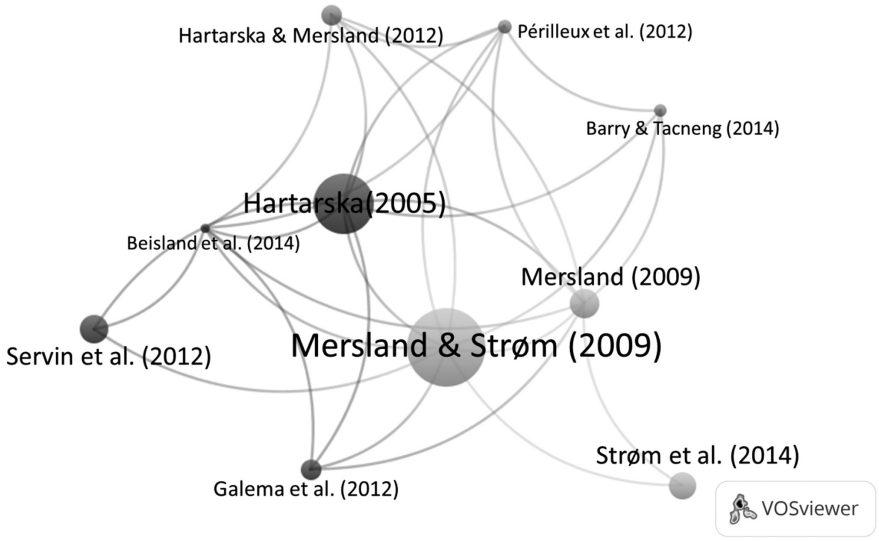

Figure 3.5 *Knowledge maps obtained from a citation analysis of microfinance publications on governance. Unit of analysis: documents*

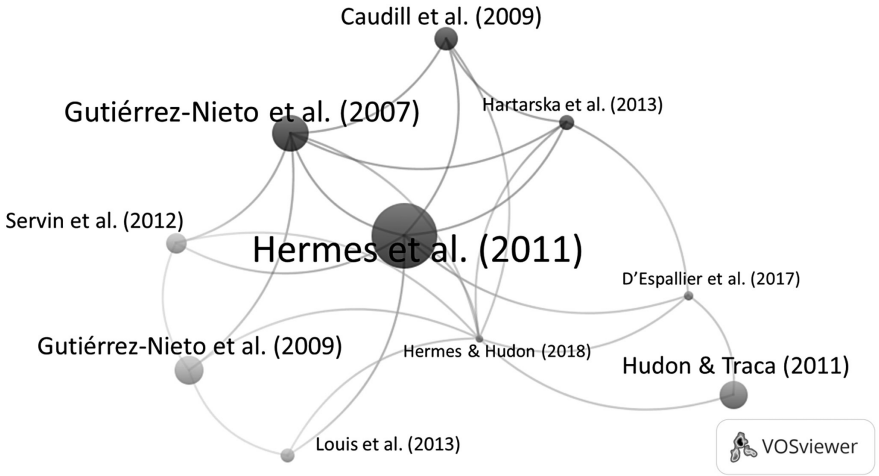

Figure 3.6 *Knowledge maps obtained from a citation analysis of microfinance publications on efficiency. Unit of analysis: documents*

knowledge map. The size of the circle in the map is proportional to the number of publications that have the corresponding term in their title or abstract or keywords. Three maps were generated. Figure 3.8 shows the map created from all articles on microfinance published until 2007, the year when the boom in microfinance research began after Yunus won the Nobel Prize. The keywords reflect the topics of interest to academics. Two main groups are appreciated. The first cluster, in red, focuses on the study of microfinance institutions, the lending

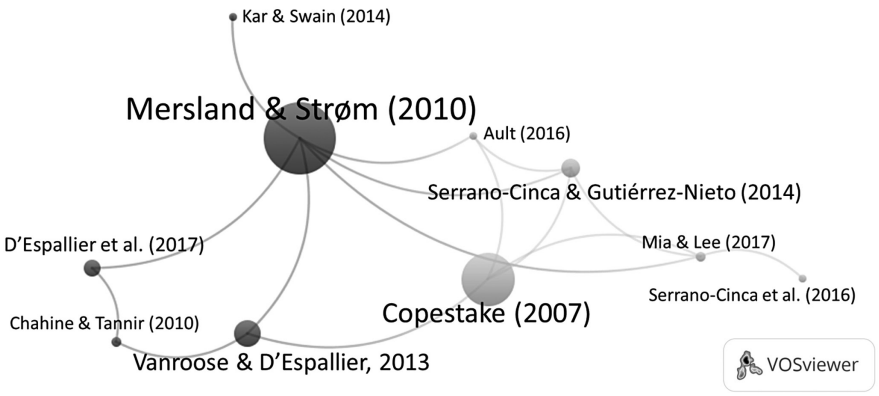

Figure 3.7 *Knowledge maps obtained from a citation analysis of microfinance publications on mission drift. Unit of analysis: documents*

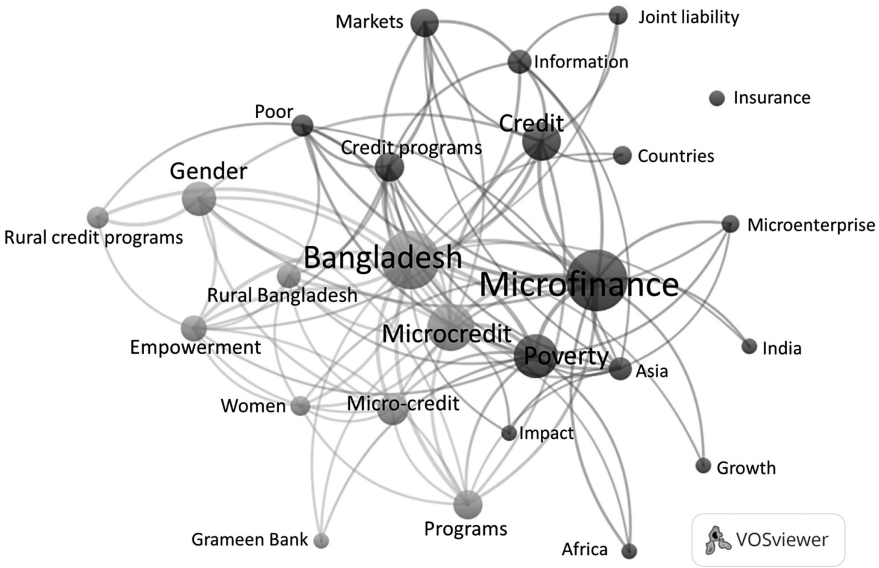

Figure 3.8 *Visualizing a network of co-occurring terms from microfinance publications. Unit of analysis: documents. Years: 1997–2007*

methodologies they use, and the impact of these programs on poverty alleviation. The second cluster, in green, focuses on research on microcredit and its clients, especially rural credit programs and women empowerment. In this cluster, the most used keyword is "Bangladesh". Therefore, the division between welfarism and institutionalism is evident between clusters. It is noteworthy that "impact" was the only word related to assessment until 2007. Concepts such as sustainability, outreach efficiency, or governance were incipient and did not appear as keywords until later.

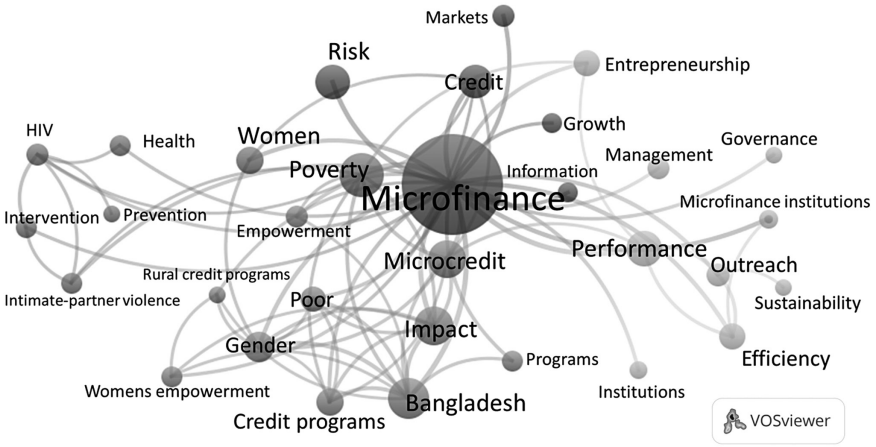

Figure 3.9 *Visualizing a network of co-occurring terms from microfinance publications. Unit of analysis: documents. Years: 2008–2018*

Figure 3.9 shows the map created using the articles published from 2008 to 2018. Each of the two previous clusters was split into two groups. The most striking issue is that in the block that studies microfinance institutions, the interest in assessing MFIs can be clearly seen, with keywords such as performance, sustainability, outreach, efficiency, or governance. Also, in the welfarist cluster, an important research topic emerges in this period: microfinance and health.

Figure 3.10 shows the map created using only the articles published in 2019 and 2020. There is continued interest in the assessment of microfinance institutions as well as studies evaluating the impact of microcredit on poverty alleviation. This third map serves to detect the most recent trends in the sector. "Financial inclusion" (the new mantra in the industry) is emerging as a widely used keyword.

DISCUSSION AND CONCLUSIONS

The dual nature of MFIs, social and financial, is a source of conflicts that are difficult to solve. MFIs aim to "kill several birds with one stone": achieve financial self-sustainability and increase the income and employment of beneficiaries and reduce poverty (Hulme & Mosley, 1996). Depending on how financial performance and social performance are defined, a positive, negative, or no relationship between them can be found. It is sometimes difficult to find entities with outstanding behavior in several aspects because it is logically impossible to maximize in more than one dimension at the same time unless the dimensions are monotone transformations of one another (Jensen, 2001). For example, MFIs cannot simultaneously maximize the financial margin (to get the maximum benefit) and minimize the financial margin (to avoid the poverty penalty). There is a great deal of ongoing debate in the literature about the trade-off between the two main dimensions of microfinance performance, and which one should prevail (Reichert, 2018). Assessment of microfinance social performance should monitor whether the institution has improved in self-sustainability by deviating from its mission, charging very high-interest rates, or both. It should also investigate loan recovery practices,

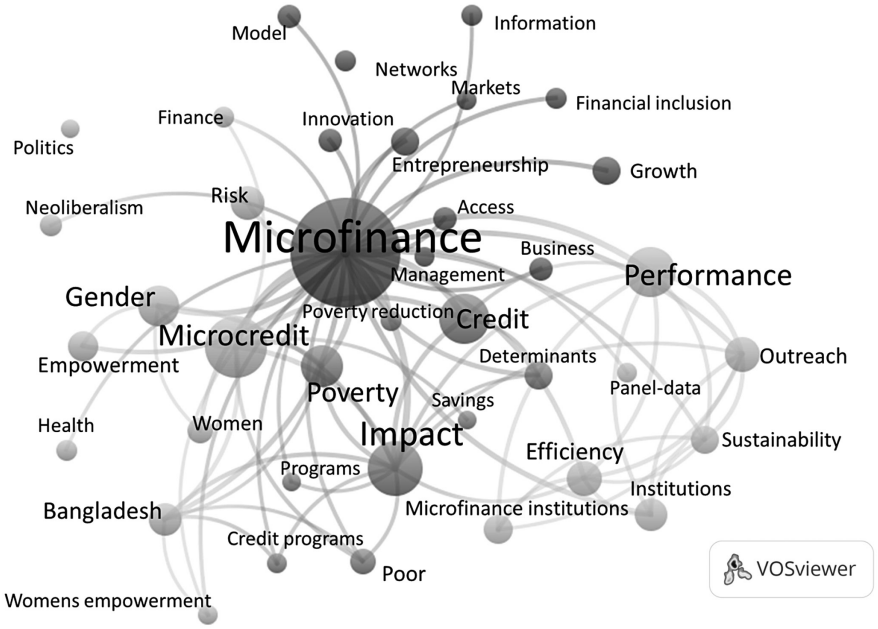

Figure 3.10 *Visualizing a network of co-occurring terms from microfinance publications. Unit of analysis: documents. Years: 2019–2020*

and whether efficiency gains are achieved through improvements in technology and reduction of redundant costs or by having employees underpaid and overworked. A complete evaluation of microfinance performance would require a cost-benefit or a cost-effectiveness analysis to compare the social value with social cost in general equilibrium (Navajas et al., 2000).

A key aspect of the performance of MFIs is their impact on clients. It is a process of determining whether microcredit helps the poor to be less poor, or only adds debt as one more problem to their existing problems. Duvendack et al. (2011) performed a meta-analysis on the impact of microcredit, reviewing 58 studies, and found that almost all impact evaluations of microfinance suffered from weak methodologies and inadequate data, concluding that it remains unclear under what circumstances, and for whom, microfinance has been and could be of real, rather than imagined, benefit to poor people. Roodman and Morduch (2014) claimed that we have little solid evidence that microfinance improves the lives of its clients in a measurable way. Many of the studies on the impact of microcredit suffered from methodological challenges until RCT was used (Banerjee et al., 2015a, 2015c, 2019; Karlan & Valdivia, 2011; Karlan & Zinman, 2011). These studies found that microfinance programs did not have the development effects that many had claimed when these programs were introduced on a large scale (Committee for the Prize in Economic Sciences in Memory of Alfred Nobel, 2019); although some programs showed some positive effects (Banerjee et al., 2019). Yet even RCTs are not exempt from dangers and drawbacks underscoring the challenges to study the impact of microfinance (Deaton, 2020; Morduch, 2020).

In short, in spite of the proliferation of research over the past 30 years, the literature is far from offering a unified conclusion about the impact of microfinance (Duvendack, 2019). The

challenge is to find the characteristics of MFIs and the external circumstances under which microcredit can have a positive impact on clients and to identify the conditions under which microcredit works best (Gutiérrez-Nieto & Serrano-Cinca, 2019). Nevertheless, a final comment should be made about the number of studies and their length. The Surgeon General's report by the US Department of Health and Human Services (2014) reviewed hundreds of articles conducted with RCT before presenting its findings on the health consequences of smoking. By contrast, only about 20 studies a year are carried out on the impact of microcredit in all its forms, most of them by the same group of researchers. One of the studies that determined the relationship between smoking and lung cancer lasted 50 years, from 1951 to 2001 (Doll et al., 2004). Without the material possibility of going to such extremes, the fact is that studies on the impact of microcredit have a short duration while it would be advisable to capture the possible long-term effects. With the recognition by the Nobel Committee of the RCT use in economics, it is expected that the number of studies that use RCT will grow. The hegemony of impact studies through RCT in the USA is striking, compared to the rest of the world, even though the net official development assistance by European donors doubles that provided by the USA. We encourage other researchers from other research centers to develop more impact measurements using RCT.

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