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Poverty and wellbeing impacts of microfinance: What do we know?

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Abstract: Over the last 35 years, microfinance has been generally regarded as an effective policy tool in the fight against poverty. Yet, the question of whether access to credit leads to poverty reduction and improved wellbeing remains open. To address this question, we conduct a systematic review of the quantitative literature of microfinance's impacts in the developing world, and develop a theory of change that links inputs to impacts on several welfare outcomes. Overall, we find that the limited comparability of outcomes and the heterogeneity of microfinance-lending technologies, together with a considerable variation in socio-economic conditions and contexts in which impact studies have been conducted, render the interpretation and generalization of findings intricate. Our results indicate that, at best, microfinance induces short-term dynamism in the financial life of the poor; however, we do not find compelling evidence that this dynamism leads to increases in income, consumption, human capital and assets, and, ultimately, a reduction in poverty.

Keywords: microfinance, poverty, wellbeing, impact evaluation, developing countries, systematic review

JEL classification: D04, D14, I32, O12, O17

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1 Introduction

Poverty will remain one of the most pressing global development challenges for years to come. With a substantial part of the world's poor relying on limited financial resources that are often unreliable and expensive (Collins et al. 2009), the idea of microfinance as a powerful antipoverty policy tool became mainstream, mobilizing actors within and outside the development industry (Hulme and Mosley 1996; Otero and Rhyne 1994). The underlying assumption was simple: providing credit (and other financial services such as savings and insurance) to the poor would boost their income-generating capacity, unbridle their entrepreneurial spirit, support the development of businesses, and ultimately alleviate poverty (Ledgerwood and White 2006; Morduch 1999).

Over the last three decades, microfinance institutions (MFIs, henceforth) have taken centre stage in the provision of credit to the poor, with a widespread expansion of the microfinance industry (Ledgerwood and Gibson 2013; Robinson 1996). This trend in the development sector was often nourished by anecdotal evidence and a handful of influential studies that reported positive poverty impacts of microfinance.

More recently, a growing number of impact studies have raised questions about the capacity of MFIs to alleviate poverty (Angelucci et al. 2015; Banerjee et al. 2015; Ghosh 2013; Hulme and Maitrot 2014; Roodman and Morduch 2014) and, together with the rise of the evidence-based policy agenda, have put the microfinance industry increasingly under scrutiny. Rigorous impact evaluations of microfinance have also put a greater emphasis on the causal mechanisms and channels through which credit impacts household and individual wellbeing. Yet, the critical question of whether the provision of small loans to nearly 204 million poor borrowers significantly reduced their poverty status remains open.

Previous review studies (e.g. Duvendack et al. 2011; Stewart et al. 2010; Vaessen et al. 2014) have focused on specific world regions, targeted groups or outcome measures, and have often overlooked multiple factors that can influence the impact of microfinance. For once, the diversity in types of financial products (e.g. credit, savings, micro-insurance); the supplementary services that are often offered (e.g. livelihoods, business and financial training, income-generating activity support); the delivery mechanisms (individual lending versus group lending, loans for women versus loans for men); the type of repayment schedules (monthly, weekly); the size and progressivity of loans; and the duration of contracts, can yield different welfare impacts.

Furthermore, it is problematic to generalize in a meta-regression framework, the direction, size effect, and statistical significance of microfinance impacts, due to the heterogeneity in outcome measures examined in most impact studies and the diversity of socio-economic conditions in which MFIs operate, and which are closely intertwined with poverty dynamics and vulnerabilities.

In this paper, we aim to contribute to the existing microfinance literature in at least two important ways. First, we develop a theory of change that provides the analytical framework to connect the provision of credit with changes in household and individual wellbeing. Second, we provide a rigorous and systematic synthesis of the literature of microfinance impacts in the developing world, running from the 1990s to 2015. We focus on poverty and various dimensions of wellbeing. There are strong arguments for taking a broader perspective. Distinguishing the effects of microfinance beyond income poverty not only recognizes the multidimensional nature of poverty, but also helps us understand the complexities and possible routes through which credit impacts the poor.

Overall, we find inconclusive evidence of microfinance impacts on per capita income, non-land asset value, and poverty, with one-half of studies reporting positive impacts and the other half reporting either insignificant or even detrimental effects. Inconclusive evidence is also found in the literature that focuses on other welfare dimensions including food and non-food consumption, medical expenditures, health, nutrition, and education. Experimental studies report, on average, insignificant or negative impacts whereas quasi-experimental studies more predominantly report positive results, and particularly so in the context of South Asia and Southeast Asia. The synthesis of evidence also indicates that positive poverty impacts of microfinance are largely driven by studies conducted in South Asia and specifically in Bangladesh, whereas a considerable number of studies show that microfinance seems to benefit the vulnerable non-poor more than the extreme poor.

The remainder of the paper is organized as follows. Section 2 presents a theory of change that depicts the mechanisms through which credit and different lending methods adopted by MFIs are expected to reduce poverty and increase wellbeing. Section 3 presents the systematic review methodology adopted in this paper, with a description of the search protocol and the criteria for inclusion of studies. Section 4 provides a synthesis of evidence of microfinance impacts. The section groups welfare outcomes into two groups: i) income, consumption, and poverty; and ii) household investment in education, health, and productive assets. Section 5 discusses the main findings, whereas Section 6 concludes with reflections on policy.

2 Poverty and wellbeing impacts of microfinance: a theory of change

The transmission channels through which microfinance is expected to impact poverty are intricate. They involve inputs, outputs, and outcomes. This is often referred to in the literature as 'theory of change': how 'the intervention is expected to have its intended impact' (White 2009: 274). Theory of change relies on theoretically grounded underlying assumptions that connect causal relationships from policy to outcomes. The effect of microfinance on poverty is, in that perspective, assumed to be observed in contexts of credit rationing and sub-optimal allocation of labour resources (Khandker 2005; Lensink and Sterken 2002; Liverpool and Winter-Nelson 2010). Figure 1 shows the theory of change of microfinance impacts from credit products and services offered to the poor in the form of capital inputs, through outputs and outcomes which lead to changes in income, poverty status, and wellbeing (impacts).

Outputs result from the deployment of inputs, primarily labour and capital, given by a technological parameter and a factor of entrepreneurial efficiency. Besides an increase in production, outputs may include increases in savings, acquisitions of productive assets, and improved knowledge of finance and marketing skills. Outputs are expected to generate positive changes in wellbeing outcomes.

Capital inputs from microfinance are, as depicted on the left-hand side of the theory of change flow diagram in Figure 1, heterogeneous in terms of contract design. Indeed, MFIs have been distinctive for their innovations to tackle the problems of moral hazard and adverse selection, particularly in contexts characterized by fragmented credit markets.[1] They may, for example, rely

[1] The moral hazard problem reflects the difficulty of lenders to monitor, and establish with certainty, whether the borrowers' actions are sufficient enough to repay their loans. Similarly, the adverse selection problem arises when the lender cannot differentiate *a priori* between risk-averse borrowers (with high probability of loan repayment) and risk-loving borrowers (with low probability of loan repayment). For a classical discussion on the moral hazard and adverse selection problems, see Akerlof (1970), Besley and Coate (1995), Stiglitz (1990), and Stiglitz and Weiss (1981). See also

on 'joint liability' in group lending contracts, in what Besley and Coate (1995) also refer to as social collateral, which acts as a substitute for physical collateral.

In traditional group lending models, 'periodical repayment schedules' are used as screening and enforcement devices to reduce the expected rate of loan default. This is done through the obligation of group members to attend 'compulsory meetings' that take place on a weekly, fortnightly, or monthly basis. Group lending contracts, based on either solidarity groups (e.g. the Grameen Bank model) or village banking (e.g. the FINCA model), take advantage of the informational flows that emerge through peer monitoring to screen out risky borrowers and reduce the probability of loan defaults. Ghatak and Guinnane (1999) have shown that the effectiveness of group lending is in part due to self-selection, which leads to a homogenous matching within group formation, resulting in an improvement in the pool of applicants with an increasing probability of loan repayment.

Another important microfinance innovation is what Hulme and Mosley (1996) refer to as 'progressive lending', which consists of lenders giving borrowers small loans at the beginning of the contract with a promise of larger loans if repayments are satisfactory. Progressive lending is an effective device that allows screening out 'bad' borrowers before loans get bigger, and can also facilitate the formation of long-term contractual relationships between lenders and borrowers based on trust, with positive effects on market efficiency (Stiglitz and Weiss 1983).

As in the case of savings and credit cooperatives, savings and credit associations, and credit unions, compulsory savings have also been extensively used by MFIs as loan insurance to alleviate the moral hazard problem. These periodic deposits are usually set as a percentage of loan instalments, and are made on a regular basis, often simultaneously with loan repayments.[2]

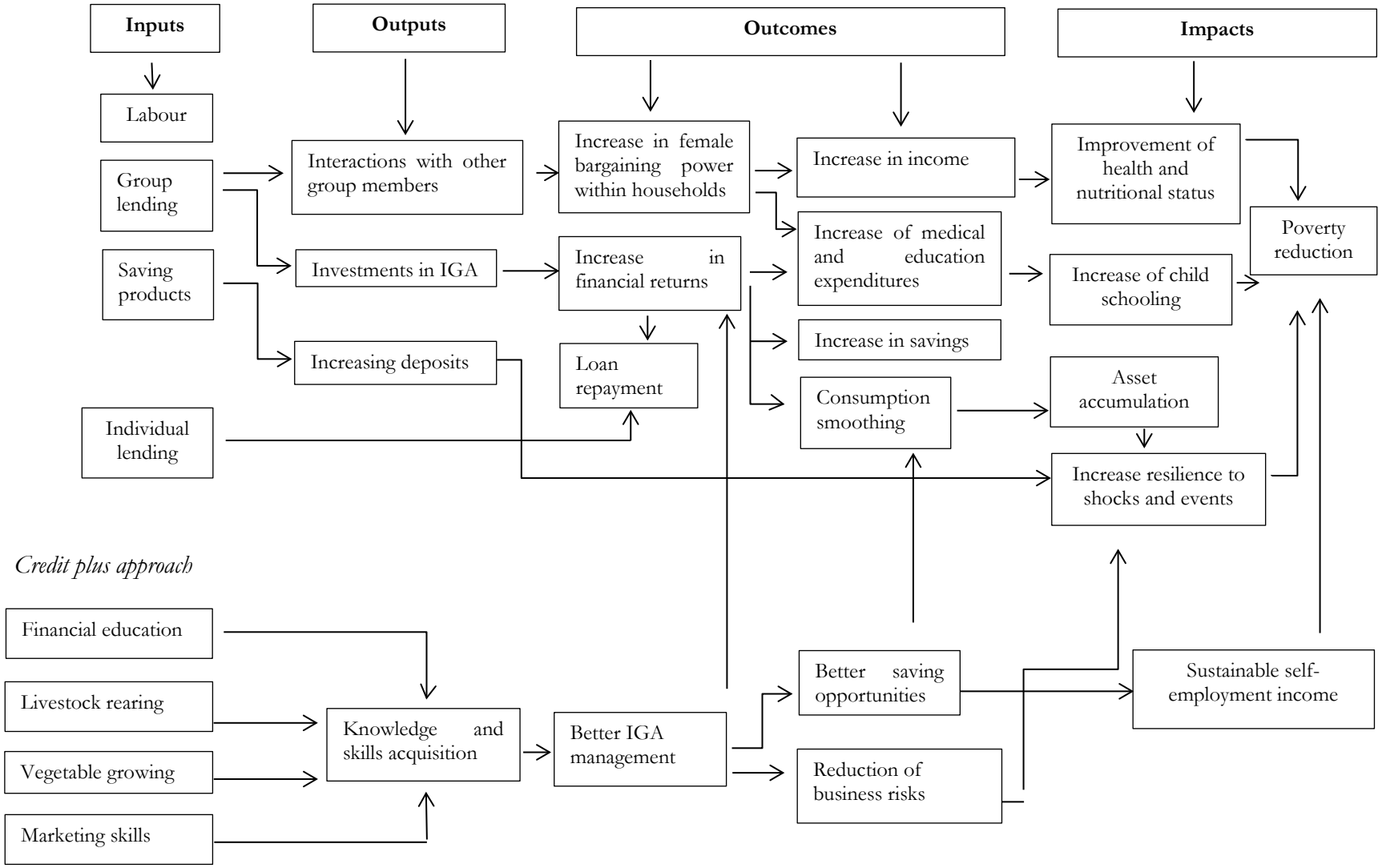
Although group lending microfinance has received much of the attention in the literature, there is an increasing number of programmes that combine group lending with individual lending contracts. For instance, Huppi and Feder (1990) and Niño-Zarazúa (2009) have studied types of contracts in which group formation provided critical information about applicants' creditworthiness, although individual members were accountable for their own loans. Bhatt and Tang (1998) analysed microfinance schemes implemented by the Economic and Employment Development Centre in Los Angeles, California, where the Asian minority were targeted as beneficiaries. Individual lending contracts have increasingly been incorporated and adapted to the socio-economic conditions under which microfinance organizations usually operate.[3]

Hoff and Stiglitz (1990) and Niño-Zarazúa (2009) for a discussion on screening, incentives, and enforcement devices commonly used by MFIs to tackle these problems.

[2] For a historical discussion on the role of savings in the credit co-operative movement in nineteenth-century Europe, see Hollis and Sweetman (1998), and also MacPherson (1999) for the case of credit unions.

[3] For a discussion on individual lending microfinance, see Armendáriz de Aghion and Morduch (2000).

Figure 1: Microfinance and poverty impacts: theory of change flow diagram



Source: Authors.

In our theory of change, outcomes largely determine the nature and magnitude of the impacts of microfinance. The underlying proposition here is that the screening, incentive, and enforcement devices discussed above, and which tackle moral hazard and adverse selection problems, have facilitated the accessibility of credit to the poor and help them to take advantage of business opportunities and to allocate their labour resources more efficiently, with important effects on income, consumption smoothing, savings, and asset accumulation. This in turn improves wellbeing outcomes that ultimately lead to poverty reduction and positive impacts on health, nutritional status, education, resilience to shocks, and assets (see far right-hand side of Figure 1).

More formally this can be expressed by a Cobb-Douglas production function such as $y = aA, L^{\beta}, K^{\alpha}$, where a represents the factor of entrepreneurial efficiency and which captures the efforts and abilities of an enterprising household; A is a technological parameter for factor productivity, which is held constant to account for the fact that it is unlikely to change, at least in the short term Pitt and Khandker (1998a); L and K measure the quantity of labour and capital input, respectively, whereas β and α are the output elasticities for labour and capital, respectively. For simplicity, we assume that the enterprising household faces diminishing marginal productivity of labour and capital, so that $0 \prec \beta, \alpha \prec 1$.

In the production of *y*, the enterprising household will supply an amount of labour, restricted to a maximum time endowment of hours-work, *h,* conditional upon the number of household members of working age. Since we assume that $A = 1$, we derive a production function in intensive form that equals

$$y = L^{\beta}, k^{\alpha} \tag{1}$$

where *k* is the loan provided by the microfinance organization. From equation (1) we obtain a welfare function, *W* that results from the difference between household earnings and the cost of borrowing as follows:

$$W = pwk^{\alpha} - i \tag{2}$$

where p and w are the price of output and the wage rate of labour, respectively, while *i* is an additive component comprised of the interest factor, *r*, paid to the MFI and other indirect costs—or informational premium, μ—associated with joint liability, periodical compulsory meetings, and other screening and enforcement devices implemented by group lending contracts, so that $i = r + \mu$. Assuming a full utilization of labour resources, the maximum household income or welfare level W^* is given by $W^*(i, p, w) = \max\left[pw - i\right]$. Now, if we keep the rate of interest constant, and apply the envelop theorem, we observe that under favourable scenarios, $\partial W^* / \partial k \geq 0 \text{ for } \forall k \in \left(0, k^*\right)$ (Quibria 2012).[4] This implies that the provision of microcredit would lead to an increase in household income and improved welfare via positive changes in productive capital.

[4] Quibria (2012) presents a formal discussion on the impact of microfinance across different types of households and economic environments.

For households with incomes below the poverty line, $W^* < z$, any positive change in income from the utilization of labour and financial resources will lead to a reduction in the poverty gap, $g = W^* / z$, until the point of poverty exit. Any negative change in the value of *g* would contribute to a reduction in the poverty headcount and improvements in other welfare dimensions. Clearly the poverty impact of microcredit will not only depend on the allocation of labour and capital by the borrowing household, but also on the size of the loan, relative to the level of initial endowments, and the indirect costs that emerge from borrowing from MFIs. In Section 4, we present a synthesis of the evidence of microfinance impacts grouped by type of welfare outcomes and the world regions in which the studies were conducted.

3 Systematic review methodology

3.1 The search protocol

The study followed the principles outlined in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins and Green 2008) and the PICOS (population, intervention, comparator, outcome, and study design) framework, to systematically assess the impact of microfinance on poverty and wellbeing. Cook et al. (1995) define systematic reviews as being 'the application of scientific strategies that limit bias by the systematic assembly, critical appraisal and synthesis of all relevant studies on a specific topic'. Applying rigorous systematic criteria in the search for evidence thus mitigates the threats of bias from narrative reviews (Wright et al. 2007).

The search protocol for the identification and selection of studies followed three stages. First, key search terms such as 'MICROCREDIT' * 'MICROFINANCE' * 'POVERTY' * 'HOUSEHOLD INCOME' * 'HOUSEHOLD CONSUMPTION' * 'IMPACT' * 'EFFECT' were combined using Boolean operators in EBSCO and ISI Web of Knowledge, SCOPUS, and JSTOR databases. In addition to these academic search platforms, we also conducted a search of the 'grey literature' (e.g. working papers) through Google Scholar and other bibliographic repositories of relevant institutions, including the World Bank, UK Department for International Development, United States Agency for International Development, the Abdul Latif Jameel Poverty Action Lab, Innovations for Poverty Action, Massachusetts Institute of Technology, Consultative Group to Assist the Poor, European Bank for Reconstruction and Development, and Asian Development Bank.

We included peer-reviewed journal articles, conference proceedings, working papers, book chapters, and doctoral dissertations. Non-academic documents such as reports, policy briefings, and master's dissertations were excluded from the review. When articles had several versions, the latest published version was selected for analysis. After the identification of relevant studies through the databases, we adopted a 'snowballing' search technique to inspect the reference lists of three previous reviews conducted on the impact of microfinance (Duvendack et al. 2011; Goldberg 2005; Stewart et al. 2010) to verify our sample. We also undertook a hand search of academic journals in the field of development studies and development economics, to identify any omitted study for the review. From this process, we identified 5,311 studies on microfinance.

3.2 PICOS framework

The second stage of the search protocol consisted of selecting papers according to their titles and abstracts. A convenient way to break down the components of the review is the PICOS framework (Higgins and Green 2008), which, together with the search protocol, form the set of criteria adopted in this study. Based on the PICOS framework, we undertook a screening process based

on the abstracts to assess the suitability of the studies for review. We included studies that focused on households both in rural and urban contexts; measured microfinance impacts on income, consumption, poverty, health, education, and assets; and adopted quasi-experimental or experimental research designs (see Table 1). From that process, we excluded 5,219 studies that did not fulfil our inclusion criteria. In the end, 92 papers written in English were selected for a full-text analysis with the aid of the Review Manager 5 software and EndNote.

Table 1: Dimensions of the PICOS framework

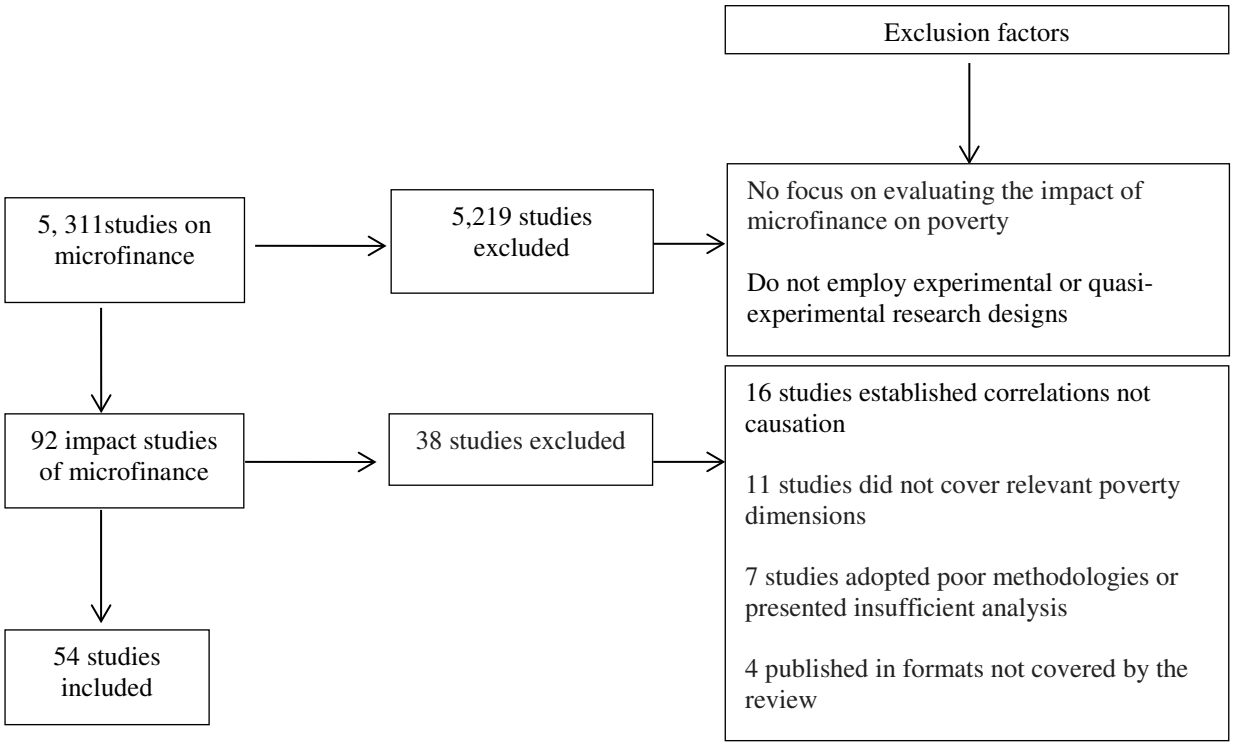
Dimensions	Inclusion/exclusion criteria
Types of population	Included: impact studies that focused on households and micro-entrepreneurs. Excluded: impact studies that focused on specific populations (widows, HIV patients, pregnant women, unemployed youths).
Types of intervention	Included: microfinance organizations using group lending and/or individual lending contracts, organizations operating in urban and/or rural areas: organizations targeting women and/or men. Excluded: other financial services such as micro-insurance remittances and savings.
Types of outcomes	Included: income (measured by monthly household income, per capita income, sources of income, agricultural income); health, food security, and nutrition (measured by the body mass index, weight-for-age Z-scores, number of health shocks experienced in past x years/months, frequency of food consumption, food expenditures, per capita food consumption, and medical expenses); education (measured by education expenditure, school attendance rate); assets (measured by purchases of productive assets and variation in asset value); and poverty (measured by the headcount index and the poverty gap). Excluded: social capital, female empowerment, violence against women, labour outcomes, business sales.
Types of research design	Included: 44 quasi-experimental studies—11 from Africa, 3 from Latin America, and 30 from Asia— (based on instrumental variables, propensity score matching and difference-in-differences (DD) estimators), and 11 experimental studies (mainly randomized controlled trials (RCTs)) – 5 from Africa, 4 from Asia, and 1 from Latin America and Europe, respectively. Excluded: non-experimental and qualitative studies.

Source: Authors.

The third stage of the search protocol consisted of carefully reviewing the analysis presented in the selected studies. At the end of this process and before data extraction, any duplicated study and those articles without a clear description of the data, research design, and methods were excluded. The search identified a total of 54 studies. The overall review process is illustrated in Figure 2.[5]

[5] For the full list of papers see Table A1 in the Appendix.

Figure 2: Systematic review search process and study selection



Source: Authors.

4 Synthesis of evidence

This section presents a synthesis of evidence on the impact of microfinance. The section is divided into two subsections: section 4.1 summarizes the results on income, poverty, and expenditures, whereas 4.2 presents the results on health, education, and asset investments. In each section, we have grouped the impact studies into regional clusters—Africa, Latin America, Asia, and Europe—to account for the fact that there may be stronger spillover and replication effects in policy design within regions than between regions.

4.1 Income, consumption (food and non-food expenditures), and poverty

In Africa

Eleven quasi-experimental and five experimental studies looking at the impacts of microfinance on income and non-food expenses conducted in the context of Africa were reviewed, and all report mixed results (see Table 2). In the context of Malawi, Diagne (1998), found that the intervention of three MFIs using group lending technology (the Malawi Rural Finance Company (MRFC), the Promotion of Micro-Enterprises for Rural Women (PMERW), and the Malawi Mudzi Fund (MMF)) and one organization using individual lending (the Malawi Union of Savings and Credit Cooperatives (MUSCCO)) had no significant impact on per capita income of borrowing households. Three years later, studying the same MFIs and relying on a larger sample of 4,699 rural Malawians but using similar econometric methods, Diagne and Zeller (2001) found insignificant effects for PMERW and MUSCCO borrowers, and significant negative impacts on the per capita income of MRFC and MMF borrowers.

In urban Kenya, Erulkar and Chong (2005) used a longitudinal dataset covering 300 borrowing households matched with a comparison group from the same neighbourhood, and reported significant positive effects of microfinance on per capita income. The group lending model used by the organization integrated savings, credit, and business support for borrowers living in urban areas. Borrowing households reported statistically significant higher incomes in the order of 20 per cent relative to the control group at endline. Also in Kenya, but in the rural context, Kiiru (2007) followed both quasi-experimental and experimental designs to study group lending contracts provided by the Kenya Women Finance Trust, KRep Bank, and the Kenya Agency for Development of Enterprise and Technology. Using pooled least squares with village and individual fixed-effects (FE), and difference-in-difference (DD) estimators, Kiiru (2007) reported no measurable effect on income and vulnerability to poverty.

In South Africa, Kim et al. (2009) evaluated the microfinance component of the Small Enterprise Foundation. Using adjusted risk ratios (ARR) and a cluster randomized control trial (RCT), they found significant improvements in the capacity of borrowers to meet their basic consumption needs relative to the control group. For all the economic variables assessed, the intervention effects 'were in the same direction', with a reported ARR between 1.22 and 3.38 for the treatment and control groups, respectively.

In Egypt, the study by Abou-Ali et al. (2010) used propensity score matching (PSM) estimators on a large sample of 47,095 borrowers to assess the impact of the Egyptian Social Fund for Development (SFD). Their results showed significant differences between urban and rural areas, indicating that SFD was associated with higher levels of income and consumption expenditure in urban areas and with lower levels in rural areas. The authors also reported measurable effects of SFD on per capita monthly food expenditure in metropolitan areas and urban Lower Egypt; although they did not find significant impacts in the rest of the country. Overall, the authors reported evidence of positive impacts of microfinance on headcount poverty rates but constrained to metropolitan areas and urban Lower Egypt.

In the context of Ethiopia, evidence is also inconclusive. For example, the small longitudinal study by Berhane and Gardebroek (2011) reported significant and positive impacts of the Debit Credit and Saving Institution on both household income and per capita consumption. Using FE estimators, the authors found a yearly increase in per capita annual consumption of approximately US$9.6 after controlling for both time-invariant and time-varying effects.

The experimental study by Tarozzi et al. (2015) of 6,284 rural households in Oromiya and Amhara, Ethiopia, assessed the impact of the Oromiya Credit and Savings and Share Company and the Amhara Credit and Savings Institute. The authors found no significant impact on sources of income, including wages and transfers from other sources, or on medical and health-related expenditures. The authors found that microcredit areas experienced larger revenues and expenses growth for self-employment activities, but these estimates were 'noisy' and the null of no impact could not be rejected at conventional levels. They also found that although the impacts on wages were positive they were statistically insignificant.

Evidence from small studies conducted in Ghana reported more positive effects of microfinance. Dadson et al. (2012) conducted a small study (300 respondents) in five districts of the country (Agona, Cape Coast Metropolis, Effutu and Mfantsiman Municipalities, and Upper Denkyira East District) to measure the impact of group lending on women's income from business activities. Using average treatment effects on the treated estimates, based on propensity scores (ATT-PSM), Dadson et al. (2012) found that female borrowers reported statistically significant higher incomes relative to the control group. Similarly, the study by Annim and Alnaa (2013) that examined the impact of microfinance on 500 women engaged in agro-processing businesses, found that

microfinance contributed to a 40 per cent increase in household consumption expenditures. Using average treatment effects (ATE) and probit estimators, they also found a small but significant poverty-reducing effect of microfinance.

In Mali, Koloma (2013) resorted to PSM estimators and found that access to credit from various microfinance programmes produced positive and significant impacts on poverty reduction, with women exhibiting higher effects than men. Finally, in Morocco, Crépon et al. (2015) used a dataset of 5,551 rural households to assess the impact of Al Amana's group and individual lending products. After two years of programme participation, the intention to treat (ITT) estimates indicated that the intervention's effect on average household monthly consumption was 'a precisely estimated zero' and therefore no effect on poverty, measured by consumption per capita, was observed. The authors estimated that the increase in self-employment profits was offset by a significant decrease in employment income. Overall the authors found small, negative, and insignificant impacts on monthly consumption per capita, insignificant impacts on income, poverty, and on medical and education-related expenditures.

Table 2: Synthesis of evidence of microfinance impacts on poverty, income, and expenditures in Africa

Study	Country	Peer review	Lending method	Poverty headcount	Income	Non-food exp.	Food exp.	Medical exp.	Education-related exp.
Diagne (1998)	Malawi	No	GL and IL	n.a.	=	n.a.	n.a.	n.a.	n.a.
Diagne and Zeller (2001)	Malawi	No	GL and IL	=	- for GL = for IL	n.a.	=	n.a.	n.a.
Erulkar and Chong (2005)	Kenya	No	GL +business support	n.a.	+	n.a.	n.a.	n.a.	n.a.
Kiiru (2007)	Kenya	Yes	GL	n.a.	=	n.a.	n.a.	n.a.	n.a.
Kim et al. (2009)	South Africa	Yes	GL with gender and HIV training	n.a.	n.a.	+	n.a.	n.a.	n.a.
Abou-Ali et al. (2010)	Egypt	Yes	GL	+ urban - rural	+ urban - rural	n.a.	+ urban - rural	n.a.	n.a.
Berhane and Gardebroek (2011)	Ethiopia	Yes	IL and GL	n.a.	+	+	+	n.a.	n.a.
Dadson et al (2012)	Ghana	No	GL	n.a.	+ for women with small businesses	n.a.	n.a.	n.a.	n.a.
Annim and Alnaa (2013)	Ghana	Yes	IL	+	n.a.	+	+	n.a.	n.a.
Koloma (2013)	Mali	No	GL	+ especially on women	n.a.	n.a.	n.a.	n.a.	n.a.
Tarozzi et al. (2015)	Ethiopia	Yes	GL	n.a.	=	=	n.a.	n.a.	n.a.
Crépon et al. (2015)	Morocco	Yes	GL	=	=	=	=	=	=

Note: To keep the large number of variables under study, the impact of microfinance is illustrated by +, = and - which indicate significant positive impact, insignificant impact, and significant negative impact, respectively, whereas n.a. indicates that the study did not report impacts on this indicator or not in a rigorous manner. GL stands for Group Lending; IL for Individual Lending; VB for Village Banking; and SHG for Self-Help Groups.

Source: Authors.

In Asia

In Bangladesh, the birthplace of microfinance, all studies included in the review adopted quasi-experimental designs and focused on assessing group lending contracts, primarily in rural contexts. Nine of them drew their analysis from a household survey collected in 1991–92 that covered 1,798 households (borrowers and non-borrowers) in 87 villages of rural Bangladesh where flagship MFIs such as the Grameen Bank, Building Resources across Communities (BRAC), and the Bangladesh Rural Development Board's (BRDB) Rural Development programme RD-12 operate (see Table 3).

Pitt and Khandker (1998a, 1998b), probably the most widely cited and influential studies of microfinance impacts in Bangladesh, used a limited information maximum likelihood framework. They found a positive and significant impact of microcredit on the total expenditure of female borrowers, but an insignificant impact for male borrowers; annual household expenditure increased by 18 Bangladeshi taka (BDT18), approximately US$0.40, for every additional BDT100 borrowed by women, compared with BDT11 borrowed by men. For households with less than 0.5 acres of land, the results obtained from Grameen and BRDB borrowers indicated an increase in consumption levels by 7 per cent; however, results from BRAC were not statistically significant. Similar findings were reported by Hoque (2004), who found insignificant effects of BRAC on total food and non-food consumption. These results were, however, at odds with Husain (1998), who found that per capita monthly non-food expenditures of BRAC clients increased in the peak season, spending 27 per cent more than non-clients.

Morduch (1998) replicated the original study of Pitt and Khandker (1998b) using the same data but employing DD estimators and found no significant effects of microfinance on per capita consumption and poverty, although he found a reduction in consumption volatility among the poor. Similar to Morduch (1998), but using PSM and stratification and kernel methods on the same dataset, Chemin (2008) found evidence of a consumption-smoothing effect of microfinance, although the effect was insignificant. He also found a positive impact on per capita expenditure, significant at the 1 per cent level, which suggested that participants spent 3 per cent more on average than non-participants in control villages. These results are in line with those of Husain (1998), who found that per capita monthly non-food expenditures of BRAC clients increased in what he called the 'peak season', in February, compared to the lean season, in October, spending 27 per cent more than non-clients. This points to a seasonality-smoothing effect.

Some years later, Khandker (2005) used village and household FE estimators based on a follow-up survey (1998–99) of the original Grameen–BRAC–BRDB dataset (1991–92) and found that microfinance had, in general, a positive and significant impact on women's per capita expenditures and income at a 1 per cent level. He found that microfinance had a poverty-reducing effect at the individual and village levels that was slightly higher for the extreme poor than for the moderate poor.[6] Also based on the same dataset, but employing DD-PSM estimators, Imai and Azam (2012) analysed the impact of microfinance on per capita income. They reported positive although small effects: a 100 per cent increase in a productive loan raised borrowers' per capita income by only 0.69 to 1.09 per cent.

Using a subsequent follow-up survey to cover the 1991–92, 1998–99, and 2010–11 periods of the same dataset, (Khandker and Samad 2013) examined the longer-term (20 years) impacts of microfinance. They concluded that microfinance had a significant and positive effect overall on

[6] Khandker (2005) estimated that microfinance can account for 40 per cent of the reduction in moderate poverty in Bangladesh (1 percentage point out of the 2.5 point reduction each year).

borrowers' income, consumption, and poverty reduction, with those continuing to participate in microfinance programmes benefiting much more. They also estimated that the impact of microfinance on the reduction of extreme poverty could be as high as 9 per cent of the total poverty reduction observed in the previous decade in Bangladesh.

More recently, Roodman and Morduch (2014) replicated the study of Pitt and Khandker (1998b) and found no impacts on poverty after controlling for the effects of outliers and when using robust linear estimators. These claims, however, have since then been duly refuted by Pitt (2014) on econometric and data grounds.

Also in Bangladesh, Razzaque (2010) employed a longitudinal dataset collected by the Palli Karma Shohayok Foundation (PKSF) to assess the impact of microfinance on households that owned less than 50 decimals (half an acre) of land. The dataset included a sample of 3,026 households—291 from 11 control villages, and 2,735 from 80 programme villages borrowing from PKSF, Association for Social Advancement, Proshika, Society for Social Service, and Thengamara Mohila Sabuj Sangha. The dataset covered four rounds in 1999, 2000, 2001, and 2004–05. The author found that only female participation in microfinance had a significant positive impact on per capita income, poverty incidence, and vulnerability to poverty. Between 1998 and 2004-05, the headcount poverty ratio for female borrowers dropped by 1.3 percentage points on average versus 0.7 percentage points among non-borrowers.

Using the same data while employing DD-PSM estimators, Islam (2011) found positive and significant effects on: i) general sources of income (an increase of 28.1 per cent); ii) self-employment income (an increase of 5.5 per cent); and iii) non-food expenditures (an increase of 12.4 per cent). He concluded that the longer-term impacts of microfinance on income were overall in the order 13 per cent. He also reported that after eight years of participation in microfinance, food expenditures of borrowers increased by 6 per cent.

In Pakistan, Zaidi et al. (2007), used a sample of 3,393 urban, peri-urban, and rural households, borrowing from seven microfinance organizations which offered different credit products: Akhuwat (in Punjab); Orangi Charitable Trust (OCT); Asasah and Kashf (in Lahore); the Sindh Agricultural and Forestry Coordination Organization; National Rural Support Programme (NRSP) (in Punjab and Sindh); and the NRSP's Urban Poverty Alleviation Project. The study found significant and positive effects of OCT on household income, whereas the insignificant impact of Akhuwat on income was attributed to the fact that the organization had been established just a few years before the study was conducted. The authors also found a positive impact of NRSP on active borrowers' per capita income and expenditure in the order of 40 per cent, while the effects of Asasah on household income, per capita income, and total expenditure were positive and significant with a caveat. Female-headed households reported a negative impact from the programme, suggesting that its effectiveness was underpinned by an important gender dimension.

Also in Pakistan, Ghalib et al. (2011) examined 1,132 households living in seven rural districts of Punjab and borrowing from eight microfinance organizations. Based on ATT-PSM estimators, they reported positive and significant effects on income; borrowers' monthly income exceeded non-borrowers' income by Rs.1,221 (approximately US$19.4) and Rs.1,301 (US$20.6), depending on the matching method, although no significant effects were found on monthly expenditure. Similarly, Setboonsarng and Parpiev (2008) reported insignificant impacts on consumption expenditure among households borrowing from Khushhali Bank, results which are in line with those reported by Montgomery (2005), who also found insignificant impacts on food expenditures.

In India, Imai et al. (2010) used data from the microfinance organization partners of the Small Industries Development Bank of India (SIDBI), covering 5,260 households, and applied PSM,

Tobit, and Heckman sample selection models to assess the impact of productive and non-productive loans. They found a significant positive effect of productive microfinance loans on wellbeing in urban and rural areas. Tobit and PSM estimators indicated that in urban areas, access to credit had a larger average poverty-reducing effect than taking loans for productive purposes, whereas in rural areas the poverty-reducing effect was larger when households took loans for productive purposes.

Similarly, Arun et al. (2006) employed longitudinal data from self-help groups (SHGs) borrowing from SIDBI and found positive poverty-reducing effects using PSM estimators on a set of indices-based ranking indictors, but with a larger effect in urban areas versus rural areas. Also using PSM estimators, the study of SHGs by Swain and Floro (2012) used a small dataset of 840 rural Indian households to evaluate the impact of the National Bank for Agriculture and Rural Development. They found insignificant impacts on per capita food expenditure.

The experimental studies of Waelde (2011) and Banerjee et al. (2015) examined the impact of group lending contracts offered by Spadana, a non-banking financial company. Waelde (2011) reported significant negative impacts on all expenditures for the very poor. Banerjee et al. (2015) reached similar conclusions with ITT estimators, indicating that monthly per adult equivalent expenditure was not different for treatment and control groups though the results also suggested that clients reduced their spending on 'temptation goods' such as alcohol, tobacco, betel leaves, gambling, and food consumed outside the home by nine rupees per capita per month. Very poor clients reduced 'temptation expenditures' and private expenditures to run businesses and repay loans. The authors also found insignificant impacts on: i) food consumption for those households that did not have a business at the start of the scheme; ii) education-related expenditures; and iii) medical expenditures. These results are in line with those of Waelde (2011) who also found insignificant average impact of microfinance. However, he also found that the very poor actually experienced a significant negative time-trend effect, indicating that very poor borrowers were shifting food and other household expenditures into business activities, casting doubts about microfinance being the right policy instrument against extreme deprivation.

In Sri Lanka, two large-scale studies reported a significant positive impact of individual lending (Thibbotuwawa et al. 2012) and group lending (De Silva 2012) on the per capita income of urban and rural borrowers. Thibbotuwawa et al. (2012) used household data from the Household Income and Expenditure Survey (HIES 2006–07), of which 8 per cent of a sample of 20,681 households were participants of Samurdhi Bank, the largest state-sponsored MFI in the country. Propensity score matching estimators showed that borrowers of the Samurdhi Bank had, on average, higher agricultural income than non-participants. They found that participants of the programme were worse off than non-participants in terms of food expenditures. Using data from the 2003–04 Consumer Finance and Socio-Economic Survey, conducted by the Central Bank of Sri Lanka and administered to 11,722 households, and applying ATT-PSM and ATE-PMS estimators, De Silva (2012) found positive results of microfinance on household per capita savings and household per capita monthly income, although the results varied depending on the matching estimator used.

In the Philippines, one experimental study (Karlan and Zinman 2011) and one quasi-experimental study (Kondo et al. 2008) have been conducted. Karlan and Zinman (2011) conducted a RCT combined with a credit scoring to analyse 1,113 households living in peri-urban areas of Manila who took up individual loans from the First Macro Bank. Employing ITT estimates, they found no significant impacts on income. They also found that microfinance led to a decline in business activities and lower subjective wellbeing. Kondo et al. (2008), on the other hand, found a modest but significant positive impact (at 10 per cent level) of the Rural Microenterprise Finance Project on per capita income and per capita total expenditure. Overall, their findings suggested that for every PhP100 (about US$2.30) borrowed, income increased by PhP47 (US$1.00) and per capita

expenditure by PhP38 (US$0.88). The impact was, however, heterogeneous: negative for poorer households and positive only for households in the richest quartile (Kondo et al. 2008).

In Indonesia, Takahashi et al. (2010) investigated the impact of a group lending microcredit scheme run by Bank Perkreditan Rakyat (BPR), using a sample of 447 households. They provided evidence of significant and positive short-term impacts on clients' school expenditures, but found an insignificant impact on their medical expenses. Their results are at odds with those of DeLoach and Lamanna (2011), who showed positive and significant impacts of MFIs on food expenditures.

In Malaysia, Al-Mamun et al. (2011) and Al-Mamun et al. (2012) used cross-sectional time-series and panel data econometric methods, and before-after comparisons between 161 existing borrowers and 172 new borrowers to assess group lending contracts from Amanah Ikhtiar Malaysia (AIM). Al-Mamun et al. (2012), in particular, showed that participation in AIM reduced poverty among the 'hard-core' poor clients, although their conclusions were based on a simple comparison between poverty rates among new and old clients which cast questions about the internal validity of the findings.

Studies conducted in China, Thailand, Vietnam, and Mongolia reported evidence of a modest or insignificant impact of microfinance (see Table 3). In China, Li et al. (2011) employed DD with FE and ATT estimators to assess the impact of individual loans from Rural Credit Cooperative. The results showed that the average annual income of borrowing households increased by 5.3 per cent at the 10 per cent level, while the DD estimations on consumption were statistically insignificant. The size of the individual loan and the time of participation appeared to impact positively on income and consumption. Li et al. (2011), however, cast doubts on the poverty-reducing potential of microfinance, as such positive results came primarily from non-poor participants.

In Thailand, Kaboski and Townsend (2011) used the method of simulated moments on pre-programme data collected in 2002–03, covering 960 households in 64 villages in Buriram, Srisaket, Lopburi, and Chachoengsao provinces, to assess the impact of the Thai Million Baht Village Fund programme that offered individual lending products. The authors reported a marginal but significant increase in clients' income in the second year of participation. They found very heterogeneous effects, with relatively large increases in consumption as a result of borrowing for very specific households: liquidity-constrained households used credit to finance current consumption, whereas among liquid households access to credit lowered savings decisions. For some households, access to credit led to productive investments, although some supplemented credit with reduced consumption. However, as very low investment rates were found among borrowers, the study concluded that microfinance was less beneficial than a cash transfer programme, in particular among liquidity-constrained, presumably poorer, households, whereas it was potentially more beneficial for those more entrepreneurial households with the highest marginal valuation of liquidity.

Also in Thailand, Coleman (1999) employed FE estimators on a small quasi-experiment conducted in Northeast Thailand in 1995–96, to assess the impact of Rural Friends Association and the Foundation for Integrated Agricultural Management, which adopted village banking lending methodology. He reported that after controlling for self-selection and non-random programme placement, no measurable effects of microfinance were found on income, savings, sales or household expenses.

By contrast, in rural Vietnam, using ordinary least squares (OLS) and DD-PSM estimators, Nghiem et al. (2012) studied the impact of group lending credit products offered by a group of non-governmental organizations (NGOs). They found no statistically significant impacts of the

programmes on household income and consumption, and concluded that microfinance programmes 'may not be as effective as some anecdotal evidence had indicated'. In Mongolia, Attanasio et al. (2015) reported evidence from a randomized field experiment among 1,148 poor women who owned less than 1 million Mongolian togrog (MNT) (US$869) in assets, and earned less than MNT 200,000 (US$174) in monthly profits from business activities in rural settings. The authors reported that access to group loans through XacBank had a significant positive impact on total consumption, but an insignificant impact on individual lending and general insignificant effects on income.

Table 3: Synthesis of evidence of microfinance impacts on poverty, income, and expenditures in Asia

Study	Country	Peer review	Lending method	Poverty headcount	Income	Non-food exp.	Food exp.	Medical exp.	Education-related exp.
Morduch (1998)	Bangladesh	No	GL	n.a.	n.a.	=	=	n.a.	n.a.
Pitt and Khandker (1998b)	Bangladesh	Yes	GL	n.a.	n.a.	+ for women = for men	n.a.	n.a.	n.a.
Husain (1998)	Bangladesh	No	GL	+	n.a.	+	+	n.a.	n.a.
Coleman (1999)	Thailand	Yes	VB	n.a.	n.a.	n.a.	=	-	=
Hoque (2004)	Bangladesh	Yes	GL	=	n.a.	=	=	n.a.	n.a.
Montgomery (2005)	Pakistan	No	GL and IL	n.a.	n.a.	n.a.	=	+	=
Arun et al. (2006)	India	No	GL and IL	+ in urban = in rural	n.a.	n.a.	n.a.	n.a.	n.a.
Zaidi et al. (2007)	Pakistan	No	GL and IL	n.a.	+	n.a.	+	+	n.a.
Setboonsarng and Parpiev (2008)	Pakistan	No	GL	n.a.	n.a.	=	=	+	n.a.
Kondo et al. (2008)	Philippines	Yes	GL	n.a.	+	+ for better-off = for the poorest	+ for better-off = for the poorest	+ for better-off = for the poorest	+ for better-off = for the poorest
Chemin (2008)	Bangladesh	Yes	GL	n.a.	=	n.a.	n.a.	n.a.	n.a.
Takahashi et al. (2010)	Indonesia	Yes	GL	n.a.	=	n.a.	n.a.	=	+
Razzaque (2010)	Bangladesh	Yes	GL	+	+	n.a.	n.a.	n.a.	n.a.
Imai et al. (2010)	India	Yes	SHG (productive loans only)	+	+	n.a.	n.a.	n.a.	n.a.
Li et al. (2011)	China	Yes	IL	n.a.	+	=	=	n.a.	n.a.
Karlan and Zinman (2011)	Philippines	Yes	IL	n.a.	=	n.a.	n.a.	+	n.a.
DeLoach and Lamanna (2011)	Indonesia	Yes	GL and IL	n.a.	n.a.	+	n.a.	n.a.	n.a.
Islam (2011)	Bangladesh	Yes	GL	n.a.	+ on self-employment income	n.a.	n.a.	n.a.	n.a.

Waelde (2011)	India	No	GL	n.a.	n.a.	- for very poor households	- for very poor households		
Al-Mamun (2011)	Malaysia	Yes	GL	n.a.	+	n.a.	n.a.	n.a.	n.a.
Kaboski and Townsend (2011)	Thailand	Yes	VB and IL	n.a.	=	n.a.	=	n.a.	n.a.
Imai and Azam (2012)	Bangladesh	Yes	GL	n.a.	+	+ for productive loans = for unproductive loans	+	n.a.	n.a.
Swain and Floro (2012)	India	Yes	SHG	- for poverty headcount = for poverty incidence	n.a.	=	=	n.a.	n.a.
Nghiem et al. (2012)	Vietnam	Yes	GL		=	=	=	n.a.	n.a.
Al-Mamun et al. (2012)	Malaysia	Yes	GL	+	+	n.a.	n.a.	n.a.	n.a.
Thibbotuwawa et al. (2012)	Sri Lanka	No	IL	n.a.	+ on agricultural income only	=	-	n.a.	n.a.
De Silva (2012)	Sri Lanka	Yes	GL	n.a.	+	n.a.	n.a.	n.a.	n.a.
Khandker and Samad (2013)	Bangladesh	No	GL	= on moderate poor +on extreme poor	+	+	=	n.a.	n.a.
Ghalib et al. (2015)	Pakistan	Yes	GL	n.a.	+	=	n.a.	n.a.	n.a.
Attanasio et al. (2015)	Mongolia	Yes	GL and IL for women	n.a.	=	+ for GL = for IL	+ for GL = for IL	n.a.	n.a.
Banerjee et al. (2015)	India	Yes	GL	n.a.	n.a.	=	=	=	n.a.

Note: To keep the large number of variables under study, the impact of microfinance is illustrated by +, = and - which indicate significant positive impact, insignificant impact, and significant negative impact, respectively, whereas n.a. indicates that the study did not report impacts on this indicator or not in a rigorous manner. GL stands for Group Lending; IL for Individual Lending; VB for Village Banking; and SHG for Self-Help Groups.

Source: Authors.

In Latin America

In Latin America, we found four studies assessing the impact of microfinance on income, consumption expenditure, and poverty, three of which were conducted in Mexico (see Table 4). Bruhn and Love (2009) adopted a DD approach to compare municipalities with and without Banco Azteca before and after the opening of branches. They showed that Banco Azteca had statistically positive effects on clients' per capita income with a positive time trend. In contrast, Niño-Zarazúa (2007) and (Angelucci et al. 2015) found insignificant and even negative impacts of microfinance on income and consumption. Niño-Zarazúa (2007) examined the impact of three microfinance organizations operating in urban Mexico—Fincomun, CAME, and Pro-Mujer—which employ individual lending, village banking, and group lending methodologies, respectively. Using a quasi-experimental design and sample selection models, he found that group-based MFIs were more effective in reducing the poverty gap but, in doing so, they achieved insignificant impacts on the poverty incidence. By contrast, organizations adopting individual lending contracts reported positive (but small) poverty impacts among the moderately poor, but insignificant impacts on the poverty gap. Niño-Zarazúa (2007) found the poverty impact in urban areas of Mexico to be marginal and only significant among those above the poverty line.

Angelucci et al. (2015) conducted a RCT using a sample of 16,560 urban, peri-urban, and rural households in Mexico, who were both clients and non-clients of Compartamos. The study found no significant impacts on total household income or on weekly expenditure items, including non-durables, food, medical, school, and family events. Using ATT and quantile treatment effects (QTE) estimators, the authors found that programme participants experienced, on average, a significant reduction in consumption of durable goods by five percentage points and led to a statistically significant reduction in temptation goods expenditures in the order of 6 per cent, a finding that corroborates results from India (Banerjee et al. 2015; Waelde 2011).

Aroca and Hewings (2009) used PSM and probit models to assess two Chilean MFIs (Bandesarrollo and Propesa) and five Brazilian MFIs (Microcred, Socialcred, CEAPE, Bancri, and Bco Povo Sto Andre). Evidence from Brazil showed a positive impact on income, especially from banking institutions. In the case of Chile, the results were mixed: positive for Bandesarrollo in terms of mean income growth, although weaker than in the Brazilian cases, but negative for households borrowing from NGOs.

In Europe

Finally, in the European context, Augsburg et al. (2015) conducted an RCT in Bosnia and Herzegovina on a sample of nearly 1,200 borrowers, to assess the impact of large MFIs offering individual lending products to 'marginal' clients.[7] After an observation period of 14 months the authors found no significant impact on household income. Although they reported evidence of a significant increase in the labour supply of 16- to 19-year-olds, they detected a significant decrease in weekly food and non-food consumption and savings (including 'temptation goods' such as alcohol and tobacco).[8]

[7] A segment of the population that they would normally reject, but to whom they would consider lending if they were to accept slightly more risk.

[8] This result is individually significant at the 10 per cent level. Between the baseline and follow-up, clients spent 16 per cent less on alcohol and cigarettes than the control group due to the loan.

Table 4: Synthesis of evidence of microfinance impacts on poverty, income, and expenditures in Latin America and Europe

Study	Country	Peer review	Lending method	Poverty headcount	Income	Non-food exp.	Food exp.	Medical exp.	Education-related exp.
Latin America									
Niño-Zarazúa (2007)	Mexico	Yes	GL, VB, and IL	+ on moderate poor = on extreme poor	= for GL and VB and + for IL	n.a.	n.a.	n.a.	n.a.
Bruhn and Love (2009)	Mexico	Yes	IL	n.a.	+	n.a	n.a.	n.a.	n.a.
Aroca and Hewings (2009)	Brazil and Chile	Yes	GL	n.a.	+ in Brazil - in Chile	n.a.	n.a.	n.a.	n.a.
Angelucci et al. (2015)	Mexico	Yes	GL	n.a.	n.a.	=	=	n.a.	n.a.
Europe									
Augsburg et al. (2015)	Bosnia and Herzegovina	Yes	IL to marginal clients	n.a.	=	-	-	n.a.	n.a.

Note: To keep the large number of variables under study, the impact of microfinance is illustrated by +, = and - which indicate significant positive impact, insignificant impact, and significant negative impact, respectively, whereas n.a. indicates that the study did not report impacts on this indicator or not in a rigorous manner. GL stands for Group Lending; IL for Individual Lending; VB for Village Banking; and SHG for Self-Help Groups.

Source: Authors.

4.2 Household investment in education, health, and assets

In this section, we discuss the evidence of microfinance's effects on children's health and education, and asset investments.

In Africa

In Malawi, Diagne (1998) and Diagne and Zeller (2001) reported insignificant impacts of microfinance on nutritional outcomes. Diagne's (1998) study found no sizable direct (or indirect spillover) effects from group lending or individual lending products on food security and protein intake. Pre-school-age children in households who never participated in a microfinance programme had a lower prevalence of stunting measured by height-for-age Z-scores (39 per cent) versus participants (53 per cent). However, estimates for wasting, measured by weight-for-age Z-scores, showed a slight difference between non-borrowing and borrowing households (15 per cent and 17 per cent respectively). The authors concluded that microfinance had no effect in improving food security and the nutritional status of credit programme members. A few years later, Diagne and Zeller (2001) did not detect any statistically significant effects of microfinance on food security or on nutritional status (measured by calorie and daily protein intake per capita). On the contrary, they found that households who had never participated were more food secure and less chronically and acutely malnourished than those who had (Diagne and Zeller 2001).

In Ethiopia, Doocy et al. (2005) measured the effects of WISDOM community banking and group lending on nutritional outcomes. They found no significant differences in mean mid-upper arm circumference, food insecurity, or prevalence of acute malnutrition in the sample as a whole. However, they found in Sodo, a rural survey site, that female borrowers and their children had significantly better nutritional status than the control groups: the odds of malnutrition in control sites were higher by 3.2 points versus treatment sites, whereas the odds of acute malnutrition in children aged 6–59 months were 1.6 times greater in community controls. Household food security among female borrowers was also significantly better than in other comparison groups. The

authors concluded that under certain conditions, microfinance may have positive impacts on the nutritional status and wellbeing of female clients and their families.

In addition, an experimental study by Tarozzi et al. (2015), found that increasing access to credit had an insignificant effect, at conventional levels, on productive assets such as livestock. Tarozzi et al. (2015) reported that the impact of OCSSC and the ACSI on school attendance among children aged 6 to 15 years was very small and insignificant, and they did not find evidence of changes in school attendance among older cohorts (aged 16 to 20 years). Furthermore, they also found that microcredit had insignificant effects on household members' propensity to experience serious illnesses (see Table 5). Also in Ethiopia, the study by Berhane and Gardebroek (2011) of the Debit Credit and Saving Institution showed that the intervention had a significant and positive long-term effect on clients' quality of housing.

In contrast, Crépon et al. (2015) reported that in rural Morocco, Al Amana microcredit products generated a significant increase in asset investment, including livestock used for self-employment activities, although no significant impacts were detected on children's education.

In urban Kenya, Erulkar and Chong (2005) found that participants of the Tap and Reposition Youth (TRY) programme significantly increased the likelihood of borrowers owning more assets compared to the control group. The TRY initiative targeted out-of-school adolescent girls and young women aged 16 to 22 residing in low-income and urban slum areas of Nairobi and at risk of contracting HIV/AIDS. Finally, in the context of South Africa, Kim et al. (2009) found that participants in the microfinance programme implemented by the Small Enterprise Foundation significantly improved various dimensions of economic wellbeing, including household asset value. They also reported that both microfinance-only groups and groups that received credits in combination with interventions designed to address HIV/AIDS and gender inequalities, improved their economic conditions relative to the control group.

Table 5: Synthesis of reported microfinance impact on education, health, and asset investment in Africa

Study	Country	Review	Lending method	Daily intake	Education of children	Food insecurity	Weight-for-age	Height-for-age	MUAC	Asset value	Live-stock
Diagne (1998)	Malawi	No	GL and IL	=	n.a.	=	=	=	n.a.	n.a.	n.a.
Diagne and Zeller (2001)	Malawi	No	GL and IL	=	n.a.	=	=	=	n.a.	n.a.	n.a.
Erulkar and Chong (2005)	Kenya	No	GL +business support	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	+	n.a.
Doocy et al. (2005)	Ethiopia	Yes	GL	+ for women clients	n.a.	=	n.a.	n.a.	=	n.a.	n.a.
Kim et al (2009)	South Africa	Yes	GL with HIV training	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	+	n.a.
Tarozzi et al. (2015)	Ethiopia	Yes	GL	n.a.	=	-	n.a.	n.a.	n.a.	=	=
Crépon et al. (2015)	Morocco	Yes	GL	n.a.	=	n.a.	n.a.	n.a.	n.a.	+	+

Note: To keep the large number of variables under study, the impact of microfinance is illustrated by +, = and - which indicate significant positive impact, insignificant impact, and significant negative impact, respectively, whereas n.a. indicates that the study did not report impacts on this indicator or not in a rigorous manner. GL stands for Group Lending; IL for Individual Lending; VB for Village Banking; and SHG for Self-Help Groups. MUAC stands for children's mid-upper arm circumference.

Source: Authors.

In Asia

In Asia, evidence of microfinance's impacts on welfare outcomes was inconclusive (see Table 6). In Pakistan, Montgomery (2005) found that access to and participation in microfinance had a strong positive effect on the probability of getting treatment for both children and adults. Setboonsarng and Parpiev (2008) found insignificant impacts of microfinance on dietary intake but, like in Montgomery (2005), they reported evidence of significant and positive impacts on access to medical treatment with a strong association with the length of programme participation (number of loan cycles).

In contrast, in terms of children's education, Montgomery (2005) and Zaidi et al. (2007) did not find any sizable impact, with the former study reporting a negative time-trend effect whereby borrowers with longer memberships were less likely to have their children enrolled in school. In fact, with regards to investment in assets, Zaidi et al. (2007) found that among six MFIs included in their study, only Kashf reported significant increases in the value of assets held by active borrowers relative to non-borrowers. For non-land asset value and non-farm asset ownership rates, the effect of microfinance was largely insignificant. This confirms the evidence from Ghalib et al. (2015) of six MFIs operating in rural areas of Punjab, Pakistan, which also reported no sizable effects of microfinance on livestock, vehicles, and household assets such as electronics and appliances.

In India, the study of the National Bank for Agriculture and Rural Development SHG programme by Swain and Floro (2012) showed that, while the programme was found to have a positive short-term impact on average food expenditure per capita, because loans are often used for consumption purposes, a longer-term participation in the programme would not be associated with an average food expenditure increase or a reduction in households' vulnerability. These findings diverge from the results of a study by Imai et al. (2010) of 20 SIDBI partner microfinance institutions, who found that for both urban and rural borrowing households, food security significantly improved.

In Bangladesh, Pitt et al. (2003) studied the effects of the Grameen Bank, BRAC, and BRDB-12 on three measures of nutritional wellbeing of children under 15 years of age: body mass index (BMI), height-for-age, and arm circumference. They found that only credit to women had a statistically significant impact. Overall, they reported that a 10 per cent increase in the loan to women led to an increase in the arm circumference of children by 6.3 per cent for daughters, versus 3.1 per cent with men's credit, and also in the height-for-age of girls and boys by 0.37 and 0.46 centimetres, respectively. This was in stark contrast to the reduction in daughters' and sons' height-for-age by 0.16 and 0.10 centimetres, respectively, found among children of male borrowers. The results for children's BMI were statistically insignificant.

With regard to food consumption, some non-experimental and quasi-experimental studies reported positive and statistically significant impacts of microfinance (see Table 6). For example, Husain (1998) reported that BRAC members had a higher calorie intake and consumed more nutritious foods than non-members. He estimated that seasonal variation in per capita monthly food expenditure was significantly lower for borrowers (3 per cent) than for non-borrowers (18 per cent). The same study also reported that at the endline survey, BRAC borrowers enjoyed higher asset value and net-worth—measured as the sum of assets and savings minus outstanding loans—than non-clients.

With regards to other welfare dimensions, Chemin's (2008) study of Grameen Bank, BRAC, and BRDB-12 showed that microfinance had a modest consumption-smoothing effect by reducing the

variation in the log of per capita expenditure. He also found positive effects on school enrolment. School enrolment for girls was, in particular, positively affected by microfinance, whereas weaker results were found for boys. Chemin (2008) attributed the results to gender differences in the initial conditions of schooling: 60 per cent of boys were enrolled in school versus 56 per cent of girls. He also found increases in non-land assets but only when women borrowed. This result echoes Razzaque (2010), who found that the PKSF only had a significant and positive impact on asset accumulation in the case of female participation. And in the longer term, Khandker and Samad (2013) found that microfinance had a significant positive effect on girls' school participation after ten years of programme participation.

Results from Sri Lanka and Indonesia are mixed. Studying the Samurdhi Bank in Sri Lanka, Thibbotuwawa et al. (2012) found that participants were worse off than non-participants in terms of daily calorie intake, but found a positive and significant impact on children's primary education, although it turned out to be insignificant for secondary and tertiary levels.

In Thailand, Kaboski and Townsend (2011) found that asset levels, including liquid assets such as savings, declined as result of the programme, whereas Coleman (1999) found insignificant impacts on assets, health, and education outcomes.

In Malaysia, two small observational studies (Al-Mamun et al. 2011; Al-Mamun et al. 2012) reported positive effects of the AIM microcredit programme on non-land asset value. In Indonesia, Takahashi et al. (2010) reported insignificant impacts of BPR asset values including savings, durables, and livestock, based on DD-PSM estimators. The capacity of households to invest in children's health and nutrition seems to have been improved significantly over time as DeLoach and Lamanna's (2011) longitudinal study reported positive and significant impacts on children's height-for-age.

Table 6: Synthesis of reported microfinance impact on health, education, and asset investment in Asia

Study	Country	Review	Lending method	Education of children	Food insecurity	Height-for-age	BMI	MUAC	Asset value	Livestock
Morduch (1998)	Bangladesh	No	GL	=	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Pitt and Khandker (1998a)	Bangladesh	Yes	GL	n.a.	n.a.	n.a.	n.a.	n.a.	+ for women = for men	n.a.
Pitt et al. (2003)	Bangladesh	No	GL	n.a.	n.a.	+	=	+	n.a.	n.a.
Pitt and Khandker (1998b)	Bangladesh	Yes	GL	+ women clients	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Husain (1998)	Bangladesh	No	GL	n.a.	n.a.	n.a.	n.a.	n.a.	+	n.a.
Coleman (1999)	Thailand	Yes	GL	n.a.	n.a.	n.a.	n.a.	n.a.	=	=
Montgomery (2005)	Pakistan	No	GL and IL	-	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Zaidi et al. (2007)	Pakistan	No	GL and IL	=	n.a.	n.a.	n.a.	n.a.	=	n.a.
Setboonsarng and Parpiev (2008)	Pakistan	No	Microcredit	n.a.	n.a.	n.a.	n.a.	n.a.	+	+
Kondo et al. (2008)	Philippines	Yes	IL	=	=	n.a.	n.a.	n.a.	=	=
Chemin (2008)	Bangladesh	Yes	GL	+	n.a.	n.a.	n.a.	n.a.	= men clients + women clients	n.a.
Takahashi et al. (2010)	Indonesia	Yes	GL	n.a.	n.a.	n.a.	n.a.	n.a.	=	=
Imai et al (2010)	India	Yes	SHG	n.a.	+	n.a.	n.a.	n.a.	n.a.	n.a.
Razzaque (2010)	Bangladesh	Yes	GL	n.a.	n.a.	n.a.	n.a.	n.a.	+	n.a.
DeLoach and Lamanna (2011)	Indonesia	Yes	GL and IL	n.a.	n.a.	+ on children	n.a.	n.a.	n.a.	n.a.
Islam (2011)	Bangladesh	Yes	GL	n.a.	n.a.	n.a.	n.a.	n.a.	+	n.a.
Al-Mamun et al. (2011)	Malaysia	Yes	GL	n.a.	n.a.	n.a.	n.a.	n.a.	+	n.a.
Imai and Azam (2012)	Bangladesh	Yes	GL	n.a.	n.a.	n.a.	+ women for non-productive loans	n.a.	n.a.	n.a.
Swain and Floro (2012)	India	Yes	SHG	n.a.	=	n.a.	n.a.	n.a.	n.a.	n.a.

Thibbotuwawa et al. (2012)	Sri Lanka	No	IL	+ primary education = sec. and tert. education	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Khandker and Samad (2013)	Bangladesh	No	GL	+ girls	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Attanasio et al. (2015)	Mongolia	Yes	GL and IL	= children + teenagers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Banerjee et al. (2015)	India	Yes	GL	=	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Ghalib et al. 2015)	Pakistan	Yes	GL	n.a.	n.a.	n.a.	n.a.	n.a.	=	=

Note: To keep the large number of variables under study, the impact of microfinance is illustrated by +, = and - which indicate significant positive impact, insignificant impact, and significant negative impact, respectively, whereas n.a. indicates that the study did not report impacts on this indicator or not in a rigorous manner. GL stands for Group Lending; IL for Individual Lending; VB for Village Banking; and SHG for Self-Help Groups. MUAC stands for children's mid-upper arm circumference while BMI stands for Body Mass Index.

Source: Authors.

In the Philippines, evidence about microfinance treatment effects is not particularly encouraging. The experimental study of the First Macro Bank by Karlan and Zinman (2011) showed that microfinance had a negative effect on the capacity of clients to mitigate risks, notably health risks. In particular, loans became a substitute for insurance and precautionary saving. More specifically, the authors found a 3.5 percentage point reduction in the likelihood of clients having a health insurance, and a 7.9 percentage point reduction in the use of life, home, property, fire, and car insurances. Beyond the risk-mitigating effect, microfinance was found to be detrimental for business growth and subjective wellbeing, at least in the short term.

In the same country, a quasi-experimental study of 38 MFIs, part of the Rural Microenterprise Finance Project (Kondo et al. 2008) found that borrowing from microfinance only had a small effect on per capita food expenditures, but an insignificant impact on child health and on the incidence of hunger. The effects were, however, found to be negative on poorer borrowers and only positive among borrowers in the richest quartile. Kondo et al. (2008) reported insignificant impacts on household assets.

In Latin America

Angelucci et al. (2015) reported negative effects of Compartamos on asset purchase and value (see Table 7). The authors found a statistically significant 9 per cent decrease in the number of assets purchased between the treated and the control group over two years. They also reported a statistically significant 18 per cent drop in the value of purchased assets: a -1,534 pesos change from a control group mean of 8,319 pesos. In addition to the negative treatment effects on consumption, the authors found a positive and significant effect on reducing 'asset fire sales'. They found the effects of loans on children's school enrolment and the health status of household members to be insignificant.

In Europe

Finally, in Europe, Augsburg et al. (2015) found no impact of loans on the schooling of children below 16 years of age (see Table 7). However, they reported an 8.9 percentage point decline for 16- to 19-year-olds, as they increasingly engaged with the household enterprise. While this decline was individually significant at the 10 per cent level, it was not significant when adjusting for multiple hypotheses testing. The authors concluded that poorer households had to resort to their own resources to top up small loans that were insufficient to satisfy investment needs optimally. This highlights the constraints that progressive lending can generate to the borrower.

Table 7: Synthesis of reported microfinance impact on health, education, and asset investment in Eastern Europe and Latin America

Study	Country	Review	Lending method	Education of children	Height-for-age	BMI	MUAC	Asset value	Livestock
Angelucci et al. (2015)	Mexico	Yes	GL	=	n.a.	n.a.	n.a.	-	n.a.
Augsburg et al. (2015)	Bosnia and Herzegovina	Yes	IL to marginal clients	- for 16–19-year-olds	n.a.	n.a.	n.a.	n.a.	n.a.

Note: To keep the large number of variables under study the impact of microfinance is illustrated by +, = and - which indicate significant positive impact, insignificant impact, and significant negative impact, respectively, whereas n.a. indicates that the study did not report impacts on this indicator or not in a rigorous manner. GL stands for Group Lending; IL for Individual Lending; VB for Village Banking; and SHG for Self-Help Groups. MUAC stands for children's mid-upper arm circumference while BMI stands for Body Mass Index.

Source: Authors.

5 Discussion

Drawing from the synthesis of evidence presented in the previous sections, what can we infer about the effect of microfinance on poverty and wellbeing? In Table 8, we summarize the main findings regarding the expected changes in the welfare outcomes included in this study, based on the theory of change depicted in Section 2.

The table distinguishes positive impacts (+) from insignificant (=) or negative (-) impacts. The bottom rows of the table report the average number of studies that find positive, negative, or insignificant effects of microfinance on the welfare dimensions of interest across continents and by type of research design, which, for simplicity, we clustered in two groups: experimental (EX) and quasi-experimental (QE).[9]

At first glance, we do not find overwhelming evidence of positive and significant impacts of microfinance on the outcomes of interest. In fact, across all world regions, evidence of impacts on per capita income, asset value, and poverty is inconclusive although with a degree of heterogeneity, with experimental studies more likely to report, on average, insignificant or even negative impacts, versus QE studies that in general report more positive results. The synthesis of evidence also suggests that the poverty impacts of microfinance are largely driven by studies conducted in South Asia and in Bangladesh, in particular, relative to the existing evidence available for Southeast Asia, Eastern Europe, and Latin America.

However, the overall positive impacts on income reported from South Asia, seem to be offset by the insignificant or even negative effects found on household expenditures including food, non-food, medical, and education-related expenses. Interestingly, many of the studies that report significant positive effects on health, nutrition, and educational outcomes have also been conducted in Bangladesh and have used the same dataset.

Overall, studies that focus on the health, nutrition, and education impacts of microfinance find important gender dynamics at play either concerning the sex of the client or that of children with differentiated gendered impacts (see e.g. Chemin 2008; Khandker 2001; Khandker and Samad 2013; Li et al. 2011; Pitt et al. 2003).[10]

A small number of experimental studies find that poorer borrowers often resort to coping strategies, such as cuts in the consumption of food, education, medical expenditures, and temptation goods, to comply with regular loan repayments (Angelucci et al. 2015; Augsburg et al. 2015; Waelde 2011), which in turn can be detrimental for the wellbeing of household members. Household consumption is a particularly interesting outcome to consider. While under our analytical framework consumption is expected to increase with sustained access to microcredit, as a result of the mitigation of liquidity constraints, changes in consumption, both in positive and negative directions, may also be the result of short-term business cycles and seasonal variation in prices that do not necessarily reflect changes in permanent income. Similarly, medical expenditures could signal either a greater capacity to afford medical care or an increased likelihood of illness, depending on life-cycle effects and outcome measures. If microloans are used at least partly to finance medical expenses, they may smooth short-term household consumption, but at the

[9] A full description of the research designs and methodologies is given in Table A1 in the Appendix.

[10] In addition, Tarozzi et al. (2015) also reported on the gendered effect of group lending contracts on children's education, favouring sons over daughters.

expense of permanent income. Productive investments may also require funding above and beyond what MFIs usually lend, leading borrowers to cut back on spending as well.

Furthermore, while most studies predominantly report short-term impacts of microfinance, the very few studies that report longer-term effects rely on longitudinal data mainly from Bangladesh (Berhane and Gardebroek 2011; DeLoach and Lamanna 2011; Khandker and Samad 2013). The econometric models used by these studies mainly follow linear functional forms that provide no further information about potential non-linear causal relationships.

Finally, a growing number of studies show that microfinance seems to benefit the vulnerable non-poor more than the extreme poor, who are reported to experience insignificant or even negative impacts (Banerjee et al. 2015; De Silva 2012; Kondo et al. 2008; Niño-Zarazúa 2007; Swain and Floro 2012; Waelde 2011).[11]

[11] An exception is the study by Khandker and Samad (2013), who reported a positive impact on the poverty status of the extreme poor and an insignificant impact on the moderate poor.

Table 8: Microfinance impact on welfare dimensions by continents and methodologies

World region and Research design	Income[/1]		Expenditure[/2]		Health[/3]		Education[/4]		Assets[/5]		Poverty[/6]	
	+	- / =	+	- / =	+	- / =	+	- / =	+	- / =	+	- / =
Africa	3	8	4	5	0	6	1	3	3	2	3	3
QE	3	4	4	2	n.a.	3	n.a.	n.a.	2	n.a.	3	2
EX	n.a.	4	n.a.	3	n.a.	3	1	3	1	2	n.a.	1
Asia	13	8	8	18	3	2	5	9	7	7	7	4
QE	13	6	7	15	3	2	4	7	7	7	7	4
EX	n.a.	2	1	3	n.a.	n.a.	1	2	n.a.	n.a.	n.a.	n.a.
Latin America	2	2	0	1	0	0	0	1	0	1	1	1
QE	2	2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1	1
EX	n.a.	n.a.	n.a.	1	n.a.	n.a.	n.a.	1	n.a.	1	n.a.	n.a.
Europe	0	1	0	1	n.a.	n.a.	0	1	0	0	0	0
QE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
EX	n.a.	1	n.a.	1	n.a.	n.a.	n.a.	1	n.a.	n.a.	n.a.	n.a.
Average	18	19	12	24	3	8	6	14	10	10	11	8
QE	18	12	11	17	3	5	4	7	9	7	11	7
EX	n.a.	7	1	8	n.a.	3	2	7	1	3	n.a.	1

Note. n.a. indicates that the study did not report impacts on this indicator or not in a rigorous manner; + refers to positive and statistical significant effects; - refers to negative and significant effects both at the minimum of $p<0.10$ level, and = refers to statistically insignificant impacts at conventional levels.

1/ refers to studies that focus on changes in household or per capita income from income-generating activities.

2/ refers to studies that focus on changes in food and non-food consumption, and medical and education-related expenses.

3/ refers to studies that focus on changes in height-for-age and weight-for age Z-scores, BMI, MUAC, and food insecurity.

4/ refers to studies that focus on changes in measures of educational achievement and school attendance.

5/ refers to studies that focus on changes in land tenure, livestock, farm, and household assets.

6/ refers to studies that focus on changes in the poverty headcount index and poverty gap.

Source: Authors.

6 Conclusion

As the debates on microfinance's poverty and welfare impacts remain polarized, producing robust evidence becomes all the more crucial. Policy makers and development agencies have an obligation to invest public resources in effective development interventions, so addressing the fundamental question of whether microfinance works is imperative.

In this paper we provide a rigorous synthesis of the literature on microfinance impacts in the developing world, and discuss the findings in terms of the depth and breadth of knowledge that have been generated so far in the field.

The considerable variation in socio-economic conditions and contexts in which impact studies have been conducted makes the interpretation and generalization of findings intricate. This is coupled with a degree of uncertainty about the internal validity of a considerable number of studies that adopt non-experimental research designs and which, overall, tend to report positive impacts of microfinance. In addition, most evidence reflects short-term linear effects and, therefore, there are significant knowledge gaps about the long(er)-term effects of microfinance.

Taking stock of the empirical evidence, we conclude that, at best, microfinance can induce short-term dynamism in the financial life of the poor and vulnerable non-poor; however, we do not find compelling evidence that this dynamism in itself leads to increases in permanent income, human capital and assets, and, ultimately, poverty reduction. However, while microfinance may not be the effective antipoverty policy tool that it was argued to be, it is still an important policy instrument that can support, within a broader development framework, global efforts in the quest to end poverty.

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Appendix

Table A1: Summary of included studies

Country and world region	Authors	Lending method	Estimation method
Africa			
Malawi	Diagne (1998)	GL and IL	Manski-Lerman weighted maximum likelihood estimator and two-stage least squares (2SLS) estimators
Malawi	Diagne and Zeller (2001)	GL and IL	limited information maximum likelihood (LIML)
Kenya	Erulkar and Chong (2005)	Modified GL model to extend integrated savings, credit, business support, and mentoring to out-of-school adolescents and young women	Longitudinal study with a matched comparison group
Ethiopia	Doocy et al. (2005)	Community banking and GL	Analysis of variance (ANOVA)
Kenya	Kiiru (2007)	Joint liability GL	Fixed effects (FE) and difference-in-differences (DD) estimators
Egypt	Abou-Ali et al. (2010)	GL	Propensity score matching (PSM)
South Africa	Kim et al. (2009)	GL with a 12-month gender and HIV training	Adjusted risk ratios (ARRs), cluster randomized trial
Ethiopia	Berhane and Gardebroek (2011)	IL and GL	FE, pooled OLS and DD estimators
Ghana	Dadson et al (2012)	Small-scale collateral-free GL	ATT-PSM
Mali	Koloma (2013)	GL and IL	PSM
Ghana	Annim and Alnaa (2013)	GL	ATE and probit regression
Morocco	Crépon et al. (2015)	Joint liability GL and IL	PSM with intention to treat (ITT) estimates
Ethiopia	Tarozzi et al. (2015)	GL	ITT

Asia			
Bangladesh	Morduch (1998)	GL	DD estimators
Bangladesh	Pitt and Khandker (1998b)	GL	LIML and weighted exogenous sampling maximum likelihood
Bangladesh	Pitt and Khandker (1998a)	GL	LIML and weighted exogenous sampling maximum likelihood
Bangladesh	Husain (1998)	GL	FE estimates
Thailand	Coleman (1999)	Group lending (6-month loan cycles and identical beginning loans of 1,500 baht and loan ceilings of 7,500 baht)	FE estimates
Bangladesh	Hoque (2004)	GL	OLS regression analysis
Pakistan	Montgomery (2005)	GL and IL	Comparisons with prospective clients who have not yet accessed loans, OLS analysis and logit estimation techniques
India	Arun et al. (2006)	GL and IL	PSM
Pakistan	Zaidi et al. (2007)	GL and IL	DD and multivariate regression analysis
Pakistan	Setboonsarng and Parpiev (2008)	GL and IL	ATT-PSM
Philippines	Kondo et al. (2008)	GL	DD and random effects (RE) estimates
Bangladesh	Chemin (2008)	GL	PSM
Indonesia	Takahashi et al. (2010)	Small-scale collateral-free GL microcredit scheme	DD-PSM; ATT; OLS
Bangladesh	Razzaque (2010)	GL	OLS and tobit models
India	Imai et al. (2010)	SHG: productive loans only	Tobit and PSM and sample selection Heckman models
China	Li et al. (2011)	IL	DD with FE and ATT
Philippines	Karlan and Zinman (2011)	IL	ITT estimates
Bangladesh	Islam (2011)	GL	DD-PSM
Indonesia	De Lloach and Lamanna (2011)	GL and IL	FE and first difference estimators
India	Waelde (2011)	GL	DD; and quantile treatment effect (QTE) estimators

Malaysia	Al-Mamun, et al. (2011)	GL	Non-parametric matching methods
Thailand	Kaboski and Townsend (2011)	Village bank and IL	Method of simulated moments (MSM)
Bangladesh	Imai and Azam (2012)	GL	PSM-DD
India	Swain and Floro (2012)	SHG	PSM- ATT
Vietnam	Nghiem et al. (2012)	GL	Regression analysis
Malaysia	Al-Mamun et al. (2012)	GL	Non-parametric matching methods
Sri Lanka	Thibbotuwawa et al. (2012)	IL	PSM and probit models
Sri Lanka	De Silva (2012)	GL	PSM; ATT and ATE
Bangladesh	Khandker and Samad (2013)	GL	PSM
Pakistan	Ghalib et al. (2015)	GL	PSM
Mongolia	Attanasio et al. (2015)	Joint liability GL and IL without regular meetings and to women only	ITT
India	Banerjee et al. (2015)	GL	ITT
Latin America			
Brazil and Chile	Aroca and Hewings (2009)	Microcredit programme	PSM, with probit models
Mexico	Niño-Zarazúa (2007)	GL and IL	Non-equivalent, post-test-only quasi-experiment
Mexico	Bruhn and Love (2009)	IL	DD
Mexico	Angelucci et al. (2015)	GL at 110% APR	Average intent-to-treat (AIT)
Europe			
Bosnia and Herzegovina	Augsburg et al. (2015)	IL	ITT

Note: GL stands for Group Lending; IL for Individual Lending; VB for Village Banking; and SHG for Self-Help Groups.

Source: Authors.