

Jos Vaessen
Ana Rivas
Maren Duvendack
Richard Palmer-Jones
Frans Leeuw
Ger van Gils
Ruslan Lukach
Nathalie Holvoet
Johan Bastiaensen
et al.

The effects of microcredit on women's control over household spending

A systematic review

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The effects of microcredit on women's control over household spending: a systematic review

Jos Vaessen
Maastricht University

Ana Rivas
University of Antwerp

Maren Duvendack
University of East Anglia

Richard Palmer Jones
University of East Anglia

Frans Leeuw
Maastricht University

Ger van Gils
Independent consultant

Ruslan Lukach
University of Antwerp

Nathalie Holvoet
University of Antwerp

Johan Bastiaensen
University of Antwerp

Jorge Garcia Hombrados
International Initiative for Impact Evaluation (3ie)

Hugh Waddington
3ie

3ie Systematic Review 4

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Executive summary

Background

Over the past three decades, microfinance activities have spread across the globe, reaching tens of millions of poor households with tailored financial services. Microfinance can best be described as a field of intervention rather than a particular instrument. Initially, microfinance usually meant microcredit for working capital and very small investments, but increasingly it has been broadened to include savings/deposits, a limited range of micro-insurance and payment services (including micro-leasing) as well as a somewhat broader range of credit products for more substantial investments. In this study we focused on *microcredit activities*, constituting the bulk of microfinance activities across the globe.

Microcredit activities have affected the lives of clients and others in multiple ways. The most frequently reported types of effects of credit at individual, enterprise and household level are the following: income, expenditure smoothing, and poverty alleviation effects; business growth and employment effects; schooling effects; and effects in terms of women's empowerment.

Despite the diversity in microcredit schemes, many share two characteristics: they target poor women and often rely on some type of group-based lending. Women's empowerment in relation to microcredit has been studied extensively within the context of this type of microcredit scheme. Most of these studies have been carried out in the context of microcredit group schemes in South Asia. It has been argued that access to microcredit can foster changes in individual attitudes of women (e.g. increased self-reliance), power relations within the household (e.g. control over resources) and social status.

An important dimension of empowerment concerns women's control over household spending. The main assumption is that by providing credit to poor women, their direct control over expenditures within the household increases, with subsequent implications for the status of women and the well-being of women and other household members. Women's control over household spending is a frequently recurring aspect analyzed within the context of microcredit interventions, which allows us to study whether microcredit targeted at women affects women's control over household spending decisions and the circumstances in which this occurs. Despite the central and recurrent role across studies of this aspect of women's empowerment in relation to microcredit activities, there has been no previous review on this topic.

The growing importance of microcredit has resulted in a vast number of research and evaluation studies, including impact studies. Consequently, the microfinance literature harbors a substantial number of synthesis studies which discuss a set of microcredit interventions and aim to generate overall conclusions on their effects. However, most of these studies face limitations in terms of depth of empirical assessment and the extent to which the identified effects can be attributed to microcredit. Moreover, methodological principles regarding comprehensive searches and principles of selection, coding, extraction and aggregation are often lacking in review studies.

Partial exceptions are three recent systematic reviews which all differ in scope from the present one (Stewart et al., 2010; Duvendack et al. 2011; Stewart et al., 2012). The reviews respectively focus on microfinance (credit and savings) in Sub-Saharan Africa, microcredit

worldwide, and microfinance worldwide (credit, saving and leasing). Overall, these reviews suggest that the effects of microcredit on women's empowerment are at best mixed. In part this can be explained by the heterogeneity in microcredit interventions, contexts and target groups. However, the existing reviews did not use statistical meta-analysis to synthesise evidence of effects, nor context-mechanism-outcome synthesis to understand the variation in effects.

Objectives

The main objective of this study was to provide a systematic review of the evidence on the effects of microcredit on women's control over household spending in developing countries. More specifically, we aimed to answer two related research questions: 1) what does the impact evaluative evidence say about the causal relationship between microcredit and specific dimensions of women's empowerment (women's control over household spending); and 2) what are the mechanisms which mediate this relationship. We prioritise depth of analysis over breadth, thus the scope of this review is narrower than previous systematic reviews on microfinance (Stewart et al., 2010; Duvendack et al. 2011; Stewart et al., 2012). We focused on specific aspects of women's empowerment which allowed us to combine statistical meta-analysis and realist (context-mechanism-outcome) synthesis.

Criteria for considering studies for this review

We included studies that analyzed the effects of microcredit schemes targeting poor women in low and middle income countries, as defined by the World Bank. Studies that did not include analysis on microcredit and the effect on one or more dimensions (specified in main body of the report) of women's control over household expenditures were excluded. Studies which gave evidence of addressing the attribution problem either through randomised design, quasi-experimental matching, or regression analysis, were included. In practice, women's control over household spending (as a key dimension of empowerment) is influenced by many different factors. By focusing on those studies which explicitly addressed the challenge of separating the effect of microcredit from other influencing factors, we developed what we consider to be the most credible evidence base for drawing conclusions about the effects of microcredit on women's control over household expenditures in different contexts.

Search strategy

We conducted a comprehensive search covering all relevant academic databases, internet search engines and web sites with published and unpublished research, and also carried out extensive manual searches of books and additional journals not included in electronic data bases (searches were concluded on December 31, 2011). We used back-referencing from recent studies as well as citation-tracking to identify additional relevant studies. Finally, authors of studies which we were unable to retrieve were contacted. In addition, we contacted experts on microcredit and women's empowerment for additional references which we might have missed.

Search strategies in databases and journals were adapted for each source. Where possible we used the existing keyword indices of particular databases. In addition, we applied our own list of combinations of keywords covering all relevant terms relating to the independent variable (i.e. credit and its variations) and the dependent variable (i.e. dimensions of women's control over household spending, empowerment).

Data collection and analysis

From the different searches we identified an initial number of 310 papers that were selected for full text examination. Eventually, 29 papers were retained for further analysis, corresponding to 25 unique studies. These 25 independent findings were included in the synthesis. However, based on a systematic risk of bias assessment we found that more than half of the included studies had high threats to internal validity. Moreover, only about half of the studies show a clear and coherent link between a theoretical framework on microcredit and women's control over household spending and empirical data analysis.

It should be noted that reviewing and synthesizing quantitative results from studies is only one side of the coin. The other side is to understand what makes them work, or what prevents them from working. Consequently, we conducted a qualitative synthesis of the included studies, which focused on identifying the mechanisms which underlie the causal relationship between microcredit and women's control over household spending.

Results

The results of the meta-analysis indicated that the effect sizes from experimental studies examining effects of microcredit on women's control over household spending are not statistically significantly different from zero. The effects from quasi-experimental studies are statistically insignificant overall, and at best of small magnitude for those studies assessed of being of high risk of bias. We conclude that there is no consistent evidence for an effect of microcredit on women's control over household spending.

In the qualitative analysis, using Coleman's (1986, 1990) typology of mechanisms, we identified five different situational mechanisms and eight different action-formation mechanisms. Due to the combination of substantial heterogeneity in contexts (e.g. existing gender relations) and interventions (e.g. microcredit versus microcredit and additional services), and the lack of information in the studies on this heterogeneity, it was not possible to go beyond the identification of mechanisms, in terms of generating empirically tested articulated theories of change which are representative beyond a specific study context.

Authors' conclusions

In line with three recent other reviews on microfinance (Stewart et al., 2010; Duvendack et al., 2011; Stewart et al. 2012) we found that the microcredit evidence base is extensive, yet most studies are weak methodologically. From those studies deemed comparable and of minimum acceptable quality, we concluded that overall there is no evidence for an effect of microcredit on women's control over household spending.

Women's control over household resources constitutes an important intermediary dimension in processes of women's empowerment. Given the overall lack of evidence for an effect of microcredit on women's control over household resources it is therefore very unlikely that, overall, microcredit has a meaningful and substantial impact on empowerment processes in a broader sense. While impacts on empowerment may appear to have occurred in particular studies, the high risk of bias of studies providing positive assessments suggests that such findings are of limited validity. Our conclusions on the effects of microcredit on empowerment are also in line with previous systematic reviews by Duvendack et al. (2011) and Stewart (et al. 2010) who report to a limited extent on empowerment effects.

Consequently, there appears to be a gap between the often optimistic societal belief in the capacity of microcredit to ameliorate the position of women in decision-making processes within the household on the one hand, and the empirical evidence base on the other hand.

However, our review markedly differs from previous reviews in two regards. First, we specifically focused on microcredit and women's empowerment captured through women's control over household expenditures. Second, as a result of this narrower focus, we were able to conduct statistical meta-analysis and extract behavioral mechanisms which can help to explain why and how microcredit can make a difference. The advantage of our approach was that the identified mechanisms all stem from studies which show evidence of addressing the attribution problem. Consequently, we can be quite confident of the insights that they provided on the effects of microcredit on women's control over household spending for particular populations of microcredit female clients and their families.

Those studies that showed evidence of addressing the attribution problem were relatively weak on underlying theory. Moreover, they often lacked essential information such as the nature of the intervention and how it related to empowerment (e.g. how solidarity groups affect empowerment processes) or the slowly evolving gender relations in different contexts (e.g. the evolution of societal norms and the relationship with power relations in the household). A next logical step would be to undertake a systematic review of qualitative studies which often provide rich and context-specific information on microcredit and women's decision-making power in the household. Such a review should ideally build on the mechanisms identified in the present review and would bring us closer to uncovering credible theories of microcredit and the circumstances in which it may change women's decision-making power.

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1. Background

1.1. Introduction

Over the past three decades, microfinance activities have spread across the globe, reaching tens of millions of poor households with tailored financial services. Current estimates vary between 133 and 190 million microfinance clients worldwide¹. This growing importance has resulted in a vast number of research and evaluation studies, including impact studies. Microfinance can best be described as a range of financial services rather than a particular instrument. Initially, microfinance usually meant microcredit for working capital and very small investments, but increasingly it has been broadened to include savings and deposits, a limited range of micro-insurance and payment services (including micro-leasing), as well as a somewhat broader range of credit products for more substantial investments. In this study we focus on microcredit activities, constituting the bulk of microfinance activities across the globe.

For millions of poor and very poor households microcredit can constitute a potentially powerful tool for development and an escape from the poverty trap. Claims and supporting evidence can be found in the literature on microcredit – provided with or without complementary services – resulting in a range of positive effects, from income growth and consumption smoothing effects to gender and social empowerment (e.g. Armendariz de Aghion and Morduch, 2005). At the same time, concerns about the independence of some of the impact studies commissioned by microfinance organizations², the fact that certain aspects such as employment effects are under-analyzed (Balkenhol, s.d.), the limited macro-economic impact (Honohan, 2004) and an increasing body of evidence on the negligible and even negative effects (mainly on the extreme poor) as well as lack of rural outreach of microfinance, are some of the more recent critical signals emerging in the debates (e.g. Dichter and Harper, 2007).

The number of studies addressing the role of microcredit in development processes at micro- and meso-scales, as well as more specific studies addressing the impacts of credit on livelihood processes and small enterprise development has increased substantially over the years. Microcredit activities have affected the lives of clients and others in multiple ways. The most frequently reported types of effects of credit at individual, enterprise and household level are the following: income, expenditure smoothing, and poverty alleviation effects; business growth and employment effects; schooling effects; and effects in terms of women's empowerment.

One of the first comparative studies addressing effects of microfinance using quasi-experiments was Hulme and Mosley's (1996) *Finance against Poverty*, bringing a new critical voice to the debate by showing the limitations of microfinance in bringing about poverty alleviation. Subsequently, more and more quasi-experimental and regression-based

¹ Number of microcredit borrowers according to several sources, see at CGAP: <http://www.cgap.org/p/site/c/template.rc/1.11.1792/1.26.1301/> (last consulted 14.03.2011).

² The microfinance sector counts an increasing number of mid-size and big microfinance organizations many of which continue to depend in part on development assistance, private capital and other sources of finance to fund their growing portfolios.

analyses have followed (e.g. Pitt and Khandker, 1998; Khandker, 2003)³. More recently, randomised controlled trials (RCTs) have been used to assess particular aspects of microcredit activities (e.g. Giné and Karlan, 2008; Banerjee et al., 2009).

Despite the diversity in microcredit schemes, many share two characteristics: they target poor women and often rely on some type of group-based lending⁴. Women's empowerment in relation to microcredit has been studied extensively within the context of this type of microcredit scheme⁵. Most of these studies have been carried out in the context of microcredit group schemes in South Asia. Women's empowerment can be broadly defined as an "expansion in the range of potential choices available to women" (Kabeer, 2001: 81). It has been argued that access to microcredit can foster changes in individual attitudes of women (e.g. increased self-reliance), power relations within the household (e.g. control over resources) and social status (Malhotra et al., 2002).

Mayoux (2006) argues that the inter-linkages between microcredit and women's empowerment are delineated differently by existing paradigms. The financial sustainability paradigm as well as the feminist empowerment paradigm emphasise women's income-earning activities, whereas the poverty alleviation paradigm emphasises the effects on household expenditures and particularly the use of loans for consumption purposes. Consequently, one can identify a wide range of measures that try to capture the effect of microcredit on women's empowerment in the literature (Kabeer, 2001).

An important dimension of empowerment concerns women's control over household spending (Pitt et al., 2003). The main assumption is that by providing credit to poor women, their direct control over expenditures within the household increases, with subsequent implications for the status of women and the well-being of women and other household members. Women's control over household spending is a frequently recurring aspect analyzed within the context of microcredit interventions, which allows us to study whether microcredit targeted at women affects women's control over household spending decisions and the circumstances in which this occurs.

1.2. The effectiveness of microcredit

The microfinance literature harbors a substantial number of synthesis studies which discuss a set of microcredit interventions intended to generate claims on impact with a certain degree of external validity. However, most of these studies face limitations in terms of addressing the attribution problem of effects microcredit – that is, the extent to which changes can be attributed to microcredit as opposed to other influencing factors. There are also concerns as to the extent to which findings can be generalised beyond particular

³ USAID founded a special group called 'Assessing the Impact of Microenterprise Services' (AIMS) which among others focused on quasi-experimental impact analysis of microfinance.

⁴ This term refers to a microcredit modality in which clients are organised in groups. Transaction costs for selection of clients and enforcement of repayment are transferred from the microfinance institution to the group. Regarding the latter, repayment is often based on principles of joint liability (i.e. if one of the group members cannot pay back a loan other members have to step in) or contingent renewal (i.e. no new loans will be issued to group members if one or more members are in arrears).

⁵ See for example the special issue of ADA Dialogue (nr 37, 2007): *Microfinance and gender: new contributions to an old issue*.

contexts. Moreover, methodological principles regarding comprehensive searches and principles of selection, coding, extraction and aggregation are often lacking in these studies. Examples of studies with cross-intervention perspectives on impact are Hulme and Mosley (1996), Snodgrass and Sebstad (2002), Goldberg (2005), Armendariz de Aghion and Morduch (2005) and EBI (2007).

Recently, three systematic reviews on the effects of microfinance have been published. Stewart et al. (2010) in their study on microcredit and micro-savings effects in sub-Saharan Africa concluded that microcredit has mixed effects. With respect to empowerment they conclude that there is some evidence of empowering effects of microcredit but it is inconsistent across studies. Duvendack et al. (2011) provide a detailed assessment of the methodological quality of the global evidence on microcredit. In their analysis they observe that there are only very few randomised controlled trials that are of relevance to the review's objectives, which is to assess the impact of microfinance on the well-being of poor people. They also highlight a number of methodological biases and problems in the existing RCTs in the field of microfinance as well as studies relying on other designs (e.g. pipeline-studies). The two RCTs included in their study (Banerjee et al., 2009; Karlan and Zinman, 2007) were found to show several methodological flaws which potentially compromise their findings. With respect to empowerment they conclude that there is no robust evidence of positive impacts of microcredit on women's status. Finally, Stewart et al. (2012) employ a broader scope to microfinance, explicitly looking at global evidence on microcredit, micro-savings and micro-leasing. The review confirms the findings about microcredit of the first review conducted by some of the same authors (Stewart et al., 2010) and highlights the difficulties in drawing generalizable conclusions about the effects of microcredit. It does not draw any conclusions on microcredit and empowerment.

From Stewart et al. (2010) and Duvendack et al. (2011) we can conclude that the effects of microcredit on women's empowerment are at best mixed. In part this can be explained by the heterogeneity in microcredit interventions, contexts and target groups. With respect to women's empowerment Kabeer (2001) argues that the divergence in results between different impact studies is mainly due to differences in methodology as well as conceptualization and measurement of the concept of empowerment. Regarding the latter, the literature on microcredit and empowerment has covered such diverse aspects as participation in household decision-making (e.g. Mizan, 1993; Kabeer, 2001), control over assets (e.g. Goetz and Sen Gupta, 1996), women's relative physical mobility, political and legal awareness and participation in public protests and political campaigns (Hashemi et al., 1996; Zaman, 1998) and knowledge of accounting practices (Ackerly, 1995) (see section 1.4.). The diversity in conceptualization of the construct of empowerment makes it more difficult to generate generalizable findings through a systematic review. In line with the diversity in outcome variables which are commonly associated with women's empowerment, the literature also refers to multiple potential causal pathways.

A commonly studied causal relationship is the potential link between microcredit as a resource and the opportunity space for women receiving loans to act more independently from men. Credit can potentially strengthen the bargaining position of a woman vis-à-vis a man within the household and hence provide the basis for gradual changes in the power balance within the household, the social status of the woman within the household and the community and ultimately gender relations. Thus, bargaining power or decision-making power, often studied in the context of decisions on household expenditures, is a key

intermediate variable which lies at the basis of many manifestations of empowerment. This is one of the main reasons why we have chosen to focus on women's control over household expenditures in this review. Despite the central and recurrent role across studies of this aspect of women's empowerment in relation to microcredit activities, there has been no in-depth systematic review of empowerment outcomes. The existing reviews which do aim to synthesise impacts of microcredit neither employ statistical meta-analysis to synthesise quantitative findings on effects, nor undertake context-mechanism-outcome synthesis to understand mediating factors.

Methodological quality of microcredit impact studies has often been contested (e.g. Armendariz de Aghion and Morduch, 2005; Karlan and Goldberg, 2006; Odell, 2010). The few RCTs conducted in the context of microcredit interventions that cover aspects of women's empowerment (e.g. Banerjee et al., 2009; Kim et al., 2007) in fact examine different outcomes. Banerjee et al. (2009) look at the effect of microcredit on women's control over household spending, whereas Kim et al. (2007) cover a much larger set of empowerment indicators ranging from changes in self-confidence, to changes in gender norms and partner relationships.

There is also a substantial number of quasi-experimental and regression-based studies studying the relationships between microcredit and women's empowerment, including women's control over household spending. Quasi-experiments and, even more so, regression-based analyses have been criticised regarding their limitations in addressing selection bias issues. Selection bias is likely to arise in microcredit programmes targeting the poor, as it may be expected that women who choose to participate in the programme are on average more empowered than those who do not (Goldberg, 2005). An example of a methodological critique comes from a paper by Roodman and Morduch (2009) who replicate what was long considered to be the most rigorous study on microcredit impact in the field: Pitt and Khandker's (1998)⁶ study on microcredit in Bangladesh. While Roodman and Morduch's (2009) paper does not arrive at substantially different findings, they do point out several methodological flaws endemic to quasi- and non-experimental impact studies on microcredit. A major methodological challenge is endogeneity. In the case of microcredit this often refers to a situation in which both access to credit and a particular outcome variable (e.g. change in income) are not necessarily causally related but both depend on a third variable, e.g. educational level. This is a key element of the attribution problem, often not adequately addressed in microcredit studies (see Roodman and Morduch, 2009)⁷.

In light of the above, the present review starts out from two basic premises. First, advances in methodology (and computing technology) have led to an increase in evaluations of the impact of microfinance. It is important to distinguish studies with a high degree of internal validity of findings, in terms of being able to attribute findings to microcredit controlling for other factors. In generalizing about 'what works' across studies, internal validity is a prerequisite for external validity. Second, women's empowerment is a multidimensional concept; comparison across interventions and contexts requires a clear delimitation and focus on aspects of empowerment which are recurrent and more universal than others. Nevertheless, any comparison is inherently constrained by the fact that empowerment

⁶ Including a few other related publications such as Khandker (2003).

⁷ A newer version of this paper (2011) is available at www.cgdev.org.

processes are embedded in gender relations which are very context-specific and diverse across regions and countries.

Keeping in mind these qualifications, in this review we extract quantitative effect size information from included studies on variables that relate to women's control over household spending. On the basis of these data, we undertake statistical meta-analysis. In addition, in line with the theory-based approach to impact evaluation (Pawson, 2006; 2010; Astbury and Leeuw, 2010) it should be noted that reviewing and synthesizing quantitative results from studies with a high level of internal validity is only one side of the coin. The other side is to understand what makes them work, or what prevents them from working. This means that the question about what mechanisms are believed to make the programme work has to be addressed. Consequently, this review is inspired by the synthesis approach discussed in Van der Knaap et al. (2008) which combines a focus on synthesizing high internal validity studies with theory-based evaluation principles of 'opening the black box'⁸ to examine the mechanisms underlying processes of change.

1.3. Objectives of the review

The main objective of this study is to provide a systematic review of the evidence on the effects of microcredit on women's control over household spending in developing countries. More specifically, we aim to answer two related research questions:

- 1) what does the impact evaluative evidence say about the causal relationship between microcredit and a specific dimension of women's empowerment: women's control over household spending?; and
- 2) what are the mechanisms which mediate the relationship between microcredit and women's empowerment?

We prioritise depth of analysis over breadth, thus, unlike the existing systematic reviews on microfinance (Stewart et al., 2010; Duvendack et al. 2011; Stewart et al., 2012), the review focuses on empowerment outcomes. The review undertakes analysis of the relationship between microcredit and empowerment in greater depth than existing reviews, by conducting both statistical meta-analysis and context-mechanism-outcome synthesis. We focus on specific aspects of women's empowerment which allows us to combine these two methods of synthesis.

1.4. Theoretical model and delimitation

In the last three decades, a large number of studies have looked at the effects of microcredit on women's empowerment. Different studies often generate widely different findings. Some of these diverging findings are summarised below (see Table 1).

⁸ The 'black box' is a metaphor used in this context to indicate that the causal relationships between an intervention and its effects are all too often hidden and not made explicit.

TABLE 1: POSITIVE AND NEGATIVE EMPOWERMENT OUTCOMES AS A RESULT OF MICROCREDIT INTERVENTIONS

Positive	Negative
<ul style="list-style-type: none"> • ↑ access to financial resources (= credit) • ↑ control over financial resources (=credit) • ↑ control over other resources (beyond the credit) • changes in household allocation of resources • ↑ access/control to savings' opportunities • ↑ access to emergency fund • ↑ participation in household decisions (↑ individual agency) • ↑ female (self)-employment • ↑ job mobility • changes in local gender relations <p>E.g. Amin et al. (1998); Hashemi and Schuler (1994); Kabeer (2001); Kaboshi and Townsend (2005); Zaman (2000); Holvoet (2006)</p>	<ul style="list-style-type: none"> • women do not control the financial resources (access ≠ control) but the repayment obligation remains • ↓ consumption women and children • no increased access and control over other resources (tangible and intangible) • increase of double/triple working day • increase of domestic violence <p>E.g. Brett (2006); Goetz and Sen Gupta (1996); Mayoux (1999); Lessinger (1990); Rahman (1998); Yaqub (1995); Holvoet (2005; 2006)</p>

Several factors have been identified which can explain these differences (see for example Kabeer, 2001). First of all, studies were conducted in different settings, for example different regions, countries, rural and urban settings. Empowerment is highly context-specific and existing gender relations, norms and beliefs differ widely across regions and countries. Gender relations are shaped by a complex interplay of religious, cultural and socio-economic factors. Consequently, what in one case could be called 'empowering' in other cases is not, which has implications for the external validity of findings of individual studies as well as synthesis across studies. For example, it is more likely that microcredit of any type will have an effect on women's participation over household spending in a context where the existing gender norms are not extremely male-biased. In a situation where general gender norms are extremely pro-male, it is less likely that microcredit will be enough to increase women's agency inside the household.

Second, there are differences in the methodologies used to study microfinance impacts, ranging from experimental, quasi-experimental to non-experimental. These studies are likely

to produce different impact estimates due to the internal validity of findings – that is, the extent to which it has been established beyond doubt that there is a causal relationship between intervention and outcome – and the different types of estimation procedure used (Duvendack et al., 2012).

Third, studies cover different time spans and lengths of follow-up. Some studies may be based on one data collection moment or a data set of one particular moment in time only, while other studies may include multiple data collection points with months or years in between these points. In case of empowerment, a longer time span is warranted for changes to be observed. Changes in some aspects of empowerment may take a long time to materialise; if one implements an impact study after three years, it is unlikely that some of the intended changes (e.g. changes in local gender relations) have already taken place.

Two final aspects relate to the construct validity of findings – that is, the extent to which particular variable(s) used in a study adequately represent a specific phenomenon. There are differences in the way in which the construct of ‘empowerment’ is operationalised in the different studies. Different findings to a large extent reflect the fact that empowerment was measured differently across studies, which again is in part related to the context-specificity of gender relations and empowerment. There are also differences in the microfinance programmes under study, which in part relates to schools of thought on microfinance and empowerment. Most microfinance programmes, particularly those targeted at women, use ‘group intermediation’. While these programmes look very similar at first sight, there are important differences from a gender perspective in the way group intermediation is used which might explain differential impacts on women’s empowerment (see Appendix 1).

The impact of microcredit on women’s control over household spending can be meaningfully studied within the framework of the intra-household allocation literature (see for example Holvoet, 2004, 2005; Pitt and Khandker, 1998; see also Appendix 2). In this context, microcredit is an external factor, a resource made available to one or more household member, which might influence the individuals inside the household and thus their control over or participation in household spending decisions. A useful way to unpack the construct of empowerment is based on Kabeer (1999, 2001) who distinguishes among three different interrelated dimensions of empowerment: resources, agency and achievements (Figure 1).

Figure 1. Basic causal chain - dimensions of empowerment



From the perspective of an individual woman and intra-household relations, the three concepts in Figure 1 can be explained as follows. The first aspect concerns access and control over resources (inputs) which potentially changes the balance of intra-household decision-making power of the woman vis-à-vis the man.

The second dimension of empowerment relates to agency (process). Women’s control over household spending could be classified under this heading and will be further discussed

below; 'control' is in itself a vague construct and could be operationalised through 'participation in decision-making'. Control over small household expenditures is mostly a very time-consuming task where not much real decision-making power is involved as small household expenditures are very similar day-to-day; having control over small household expenditures is in most cases also in line with the existing gender norms and gendered division of responsibilities over household spending. Nevertheless, an increase in decision-making power of the woman in the household on these issues can be considered as increased 'individual agency' and is part of the broader process of women's empowerment. A broad range of different areas of decision-making has been analyzed in the literature on household decision-making (e.g. Acharya and Bennett, 1982; Allen and Strauss, 1984; Douglas and Wind, 1978; Hashemi and Schuler, 1994; White, 1984), including both small and large expenditures, time and task allocation, family and kinship matters, among others. Consequently, we have chosen to broaden our scope to all intra-household decision-making related to expenditures.

The third dimension is linked to outcomes, which broadly can be classified in two categories. First are outcomes in terms of changes in the socio-cultural construct of 'gender' itself (achievements). Proxies here will by definition be highly context-specific, as gender is a socio-cultural construct; for example in those cases where there are strict gender norms regarding female mobility, which essentially refers to the possibility for women to participate in activities beyond the household. Increased female mobility could therefore be a good proxy for empowerment. Second, there may be economic outcomes, in terms of increased spending on education, health, nutrition, with corresponding developmental effects on household well-being. Regarding the latter, it is important to distinguish between a simple gender division in spending – e.g. the practice that a woman tends to spend relatively more on consumption and less on productive activities than the man – and an empowerment effect, in terms of women having a greater say in household spending, which caused the change in expenditures.

This difference has been adequately worded by Pitt et al. (2006: 818; italics added). "In summary, the finding that the effect of women's program participation on outcomes such as child health differs from the effect of men's program participation *cannot be taken to necessarily imply that women have gained power in the household*. This result can, in principle, reflect standard income and substitution effects. However, our analysis of the relationship of subjectively measured empowerment to microcredit adds another piece of evidence suggesting that program-induced changes in women's empowerment may be a powerful mechanism underlying the differential welfare impacts by gender of participant." It is obvious that those studies which operationalise empowerment in terms of 'access to resources' will more easily find positive outcomes (almost a tautology as microfinance is opening up the access to financial resources), as compared to studies which look at the increase of individual agency and actual changes in the socio-cultural construct of 'gender'. As a result, one cannot simply accept conclusions such as *women have been empowered by microcredit* as this may mean very different things across studies and is much more easily achieved if empowerment is equated to access. Consequently, this constitutes another important reason why this review focuses on a particular dimension of empowerment.

As explained above, in order to enhance the comparability of studies on empowerment and the generalizability of findings we focus on a common recurrent dimension of women's empowerment, women's control over household expenditures, which is an important proxy of agency. The basic causal chain in Figure 1 provides a useful basis for further developing our theoretical framework. Given the context-specificity of gender relations, the differences across contexts with regard to the underlying determinants of gender relations and empowerment, and the implications for the differences in significance of aspects of women's control over household expenditures as key aspects of processes of women's empowerment, we have not produced a detailed theory of change on women's empowerment which is generalizable to all contexts across the globe. Consequently, we start out from the simple model presented in Figure 1 and connect this model to several explanatory mechanisms.

Mechanisms are the "cogs and wheels that have brought the relationship [between policies and outcomes] into existence" (Elster, 1989: 3; 2007: 36). Hedstrom (2005: 181) defines a mechanism as "a constellation of entities and activities that are linked to one another in such a way that they regularly bring about a particular type of outcome." Mechanisms operate at a deeper level than input-throughput-output-outcome process variables: "We must go below the 'domain of empirical' surface level descriptions of constant conjunctions and statistical correlations to identify the underlying mechanisms that account for regularities in the joint-occurrence of events" (Astbury and Leeuw, 2010: 368). Based on Coleman (1990), Hedstrom (2005) and Elster (2007) we distinguished between three types of mechanisms: situational, action-formation mechanisms and transformational (Box 1).

BOX 1 Typology of three types of mechanisms

Situational mechanisms operate at the macro-to-micro level. This type of mechanism shows how specific social situations or events shape the beliefs, desires, and opportunities of individual actors. An example is the opportunity structure by which a community, village or city is characterised; the more there are opportunities e.g. for crime, for employment, the larger the chance that crimes will be committed and jobs will be found. Another example has to do with the demographic composition of families or societies. The Easterlin- effect links the size of birth cohorts to among other things job opportunities but also levels of crime.

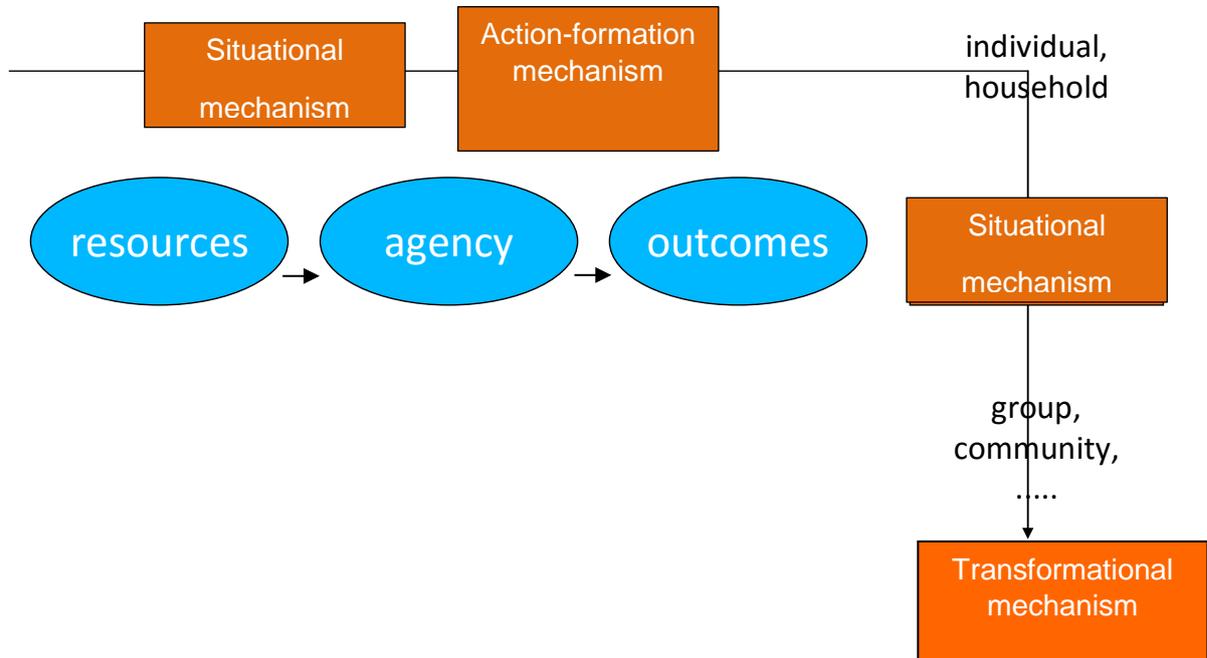
Action-formation mechanisms operate at the micro-to-micro level. This type of mechanism looks at how individual choices and actions are influenced by specific combinations of (individual) desires, beliefs, and opportunities. Cognitive dissonance, the fundamental attribution error and other cognitive processes and biases are examples, but also crowding out, relative deprivation or the working of the incentives are examples.

Transformational mechanisms operate at the micro-to-macro level and show how a number of individuals, through their actions and interactions, generate macro-level outcomes. An example is "cascading," by which people influence one another so much that people ignore their private knowledge and rely instead on the publicly stated judgments of others. Threshold effects, also known as 'tipping points' or 'critical mass models of collective action' are other examples. In economics, an example could be a movement from a bull market to a bear market; in sociology, it could be the spread of political dissent culminating in rebellion (Granovetter, 1983).

Sources: See for example Coleman (1986); Hedstrom (2005); Astbury and Leeuw, (2010).

The link between the three types of mechanisms and the simple causal chain between microcredit and empowerment is presented in Figure 2.

Figure 2. Mechanisms underlying the microcredit – empowerment causal chain



For microcredit, the meaning of the different types of mechanisms can be summarised through the following example questions:

- Situational mechanism: To what extent and in what ways does the existing opportunity structure of a region/area affect the chances for women to receive microcredit? How do changes in the opportunity structure through microcredit affect the behavior of women vis-à-vis men in the household, and under which conditions?
- Action-formation mechanism: which social, cultural, and behavioral mechanisms underlie processes of empowerment (e.g. an increase in women’s decision-making power within the household) of women receiving microcredit?
- Transformational mechanism: which mechanisms explain how changes in the behaviour of individuals contribute to changes at a ‘macro’ level (e.g. at community or regional level)?

2. Approach

2.1. Criteria for considering studies for the review

2.1.1. Types of studies

The primary focus of the review is on studies with an acceptable level of internal validity of findings with respect to the causal link between microcredit and women's control over household expenditures. The minimum criterion for inclusion was that studies should show evidence of addressing the attribution problem in a systematic manner, either through randomised design or quasi-experimental approaches, for example statistical matching or regression analysis. This means that the causal analysis between microcredit and relevant proxies of women's control over household expenditures controlled for other confounding factors either through experimental or quasi-experimental design, or statistical controls.

Studies based on the following designs were eligible for inclusion:

- 1) Randomised designs
- 2) Quasi-experimental designs
 - Pipeline approach
 - Propensity score matching
 - Cohort design
 - Ex post only measurements (with matching)
 - Regression discontinuity
- 3) Regression-based approaches
 - Cross-section data
 - Panel data (cross-section plus multiple observation points in time; including fixed effects and difference-in-differences analysis)
 - Instrumental variables analysis

All included studies employed treatment and comparison groups. Studies with analyses referring to our variables of interest based on comparisons between clients and non-clients, or other group-based comparisons, without further explanation or treatment of how differences between groups were addressed, were excluded. Non-experimental studies without counterfactual analysis were excluded (e.g. pre-post or single ex post measurement of microcredit beneficiaries only).

Given the breadth of studies designs included in the literature and our analysis, it was important to assess selection bias and confounding, as has been highlighted by several authors. For example, Husain et al. (2010:6) assert that “[g]iven that enrolment in SHGs [self-help groups] is voluntary, self-selection emerges as an important issue. Self-selection occurs when members of a group have a predisposition to choose certain outcomes. Since women have the choice to join a SHG or not, the movement is more likely to attract women who are already economically active, or are more empowered than others. In this case, for instance, ‘empowered’ women will join DWCUA [Development of Women and Children in

Urban Areas⁹] members, while those who are not ‘empowered’ are less likely to join such groups”. We therefore conducted detailed design-based risk of bias assessment and sensitivity analysis (see section 3.3.1). It should be noted that several of the studies included in the review rigorously address the issue of selection bias, although this is not necessarily the case. For example, whereas a randomised design may effectively rule out selection bias issues, a simple regression analysis based on observational data is unlikely to do so.

We took into account studies that were published later than 1980¹⁰. Searches included studies published up to July 31, 2011. In terms of type of publication, we included studies in peer reviewed and non-peer reviewed journals, articles in books, grey literature (e.g. policy reports, study documents) and PhD theses.

2.1.2. Types of participants

We included studies that analyzed the effects of microcredit schemes targeting poor women in low and middle income countries, as defined by the World Bank.

2.1.3. Types of interventions and comparisons

Microcredit interventions targeting women differ in several characteristics. First, there is a difference between group-based schemes and schemes providing individual loans. Some microcredit institutions use both modalities. Group-based credit schemes usually refer to a system in which credit is provided to women organised in solidarity groups. Within these groups women receive individual loans. Repayment is enforced through mechanisms of group pressure based on principles such as joint liability and contingent renewal. Individual loans are directly provided to the female client.

Second, in many cases credit is linked to other services (‘credit-plus’) such as training or financial services such as savings. Comparisons in primary studies usually concern women with credit versus women without credit. Comparisons were also eligible which included comparisons between different types of microcredit beneficiaries distinguishing them by specific characteristics, such as young versus older women, or recent versus mature clients. Finally, comparisons were eligible which compared female clients to male clients.

2.1.4. Types of outcome measures

We included studies estimating the impact of micro-credit interventions on women’s control over household spending, including women’s decision-making power, women’s bargaining power, or women’s control over expenditures with respect to small purchases or large purchases. These include expenditures relating to any type of consumption good, productive investment or acquiring of assets, for example clothing, education, health, food, house repairs, small livestock, large livestock and land.

Proxies of women’s empowerment beyond the control over household expenditures were excluded. For instance, there is not always a gender division in the control over household expenditures. In such contexts microcredit may affect women’s empowerment in alternative

⁹ DWCUA aims at helping groups of urban poor women in taking up self-employment ventures.

¹⁰ Most microfinance institutions were founded in the 1980s or later. A few were founded in the 1970s. The roots of the Grameen Bank, a pioneer institution in the field of microfinance, can be traced back to 1976, but it became an independent microfinance institution in 1983.

ways. Moreover, some studies measure empowerment by looking only at changes in household expenditures. While such changes may be outcomes of empowerment processes – for example, changes in decision-making power (see section 1.4) – they may also simply be a reflection of a gender division in income use. For example, women may have a tendency to spend more on consumption rather than productive activities, whereas men may show the reverse tendency. In case a study only focused on changes in expenditures, but made no references to any changes in decision-making, then it was excluded from our selection.

2.2. Literature screening process

In order to identify studies with the relevant focus in terms of outcome variables, we applied an appraisal sequence which ultimately led to a selection of a batch of studies to be used for further data extraction and synthesis. This sequence principally relied on two dimensions, assessment of relevance (this section) and assessment of the strength of internal validity and construct validity of studies (next section).

Titles and abstracts identified in the search process described above which appeared to meet the inclusion criteria were entered (where possible) in ProCite and subsequently in an Excel sheet. If not possible studies were directly entered into Excel. Subsequently, all studies were independently coded by two reviewers (AR and JV) on the basis of the following classification:

- Priority 1: study is on the impact of microcredit on women's empowerment; involves original empirical analysis.
- Priority 2: study is on the impact of microcredit, covering multiple outcome measures which include aspects of women's empowerment; involves original empirical analysis.
- Priority 3: study is on the impact of microcredit and women's empowerment but does not rely on original empirical analysis.
- Priority 4: all other studies.

Where necessary full-text copies were obtained to facilitate coding. Full-text copies were obtained for all priority 1 and 2 studies.

After the first pre-selection of studies the following selection sequence was applied (AR and JV, independently):

- All priority 1 and 2 papers were screened and purely qualitative studies were discarded.
- Subsequently, all remaining studies were screened for the nature of outcome measures. Studies that did not include causal analysis on microcredit and the effect on one or more dimensions of women's control over household expenditures were dropped. We refer to this step as being an assessment of the construct validity of findings (whether or not a particular study covers specific aspects or multiple aspects of women's control over household expenditures). In fact, this exercise constitutes only a first step in what could be referred to as the construct validity assessment of eligible studies. A second step is presented in section 2.3, where we outline coding and data extraction with respect to the theoretical framework of individual studies. Finally, the remaining studies were screened for methodological design. This generated a batch of studies which provided the basis

for our data extraction and synthesis work. Figure 3 summarises the sequence of steps leading to the inclusion or exclusion of studies identified in the search (see next section).

Figure 3. Sequence of inclusion and exclusion of studies

STEP 1: Screening (of title and abstract or in case the latter was unavailable the full text) of studies identified through the search strategy (see section 2.2.). Classification of all studies into four priorities (see section 2.1.5).

STEP 2: Select studies of priority 1&2.

STEP 3: Select studies with quantitative analysis covering at least one random representative sample of microcredit clients.

STEP 4: Select studies with outcome variables that relate to women's control over household spending.

STEP 5: Select studies that show evidence of addressing the attribution problem.

2.3. Search strategy

We searched databases of published literature, conducted internet searches for published and unpublished research, and manually searched books and journals (AR and JV). Searches were concluded on 31 December 2011. Previous searches on microcredit impact studies by team members generated close to 300 studies (see Vaessen et al., 2009) and approximately 60 studies from this database which related to women's empowerment were assessed for inclusion in the review. Searches were performed mainly in English and where possible in Spanish and French. See Appendix 3 for the full search strategy.

Database search of published literature:

The following databases were included in the search process:

- EBSCO Business Source Premier
- Econlit (EBSCO)
- Econpapers
- IBSS (EBSCO)
- JSTOR
- PsycINFO (EBSCO)
- SocINDEX (EBSCO)
- Source OECD
- ISI Web of Knowledge

Web-based:

- JOLIS: jolis.worldbankimflib.org/
- BLDS: <http://blds.ids.ac.uk/>
- LILACS: <http://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/>
- Googlescholar: scholar.google.com

Relevant portals and institutions (internet):

Portals:

- CGAP: www.cgap.org
- Microbanking Bulletin: www.themix.org
- Microfinance Gateway: www.microfinancegateway.org
- Microfinance Network: www.mfnetwork.org
- SEEP: <http://www.seepnetwork.org>

Multilateral and bilateral and non-governmental donor organizations: African Development Bank, Asian Development Bank, DFID, EBI, Inter-American Development Bank, USAID, World Bank.

Research institutes, foundations and networks: Center for Global Development, Grameen Foundation, BRAC Research and Evaluation Division, IDS, IDEAS, IFPRI, J-PAL, 3ie.

Manual searches:

We conducted separate online keyword searches for selected journals, some of which are not covered by the electronic databases mentioned above, covering all volumes, starting from 1980 or from the first volume onwards if the journal was founded later, until July 31, 2011. The following journals were searched:

- African Development Review
- Development in Practice

- Journal of Development Entrepreneurship
- Journal of Development Effectiveness
- Journal of Development Studies
- Journal of International Development
- ESR Review (previously Journal of Microfinance)
- Microcredit review
- Savings and development
- Enterprise Development and Microfinance (previously Small Enterprise Development)
- World Bank Research Observer
- World Bank Economic Review
- World Development

In addition, we screened the tables of contents of books on microfinance for relevant chapters. Book collections from Maastricht University, University of Antwerp as well as other university libraries in The Netherlands and Belgium were consulted.

We used back-referencing from recent studies (including (systematic) reviews) as well as (where possible) citation-tracking to identify additional relevant studies.

Finally, authors of studies which we were unable to retrieve were contacted. In addition, we contacted experts on microcredit (and women's empowerment) for additional references, which we might have missed.

Keywords

Search strategies in databases and journals were adapted for each source. Where possible we used the existing keyword indices of particular databases. In general, the following keywords were used:

- a) microcredit
- a) microfinance
- a) microlending
- a) *credit
- a) *finance
- a) *lending
- a) *loans
- b) women
- b) gender
- c) control

- c) decision-mak*
- c) empower*
- c) bargain*
- c) expense*
- c) expenditure*
- c) spend*

Keyword combinations relating individual words from a + b and a + c and a + b + c were used, depending on the keyword search limitations of the database.

2.4. Coding and data extraction

We systematically extracted the following information from included studies. We recorded data on the following:

- Descriptive information (AR, JV, GG):
 - Publication data (title, author, year, type of publication)
 - Geographical location
 - Type of intervention
 - Credit independent variable (specification)
 - Solidarity group mechanism (yes/no)
 - Characteristics of clients
- Information concerning inclusion and exclusion criteria (AR, JV, MD, RPJ, HW):
 - Study characteristics (see above)
 - Methodological design
 - Effect size variables relating to women's decision-making and control over household expenditures
 - Theoretical mechanisms underlying changes in outcomes
- Quality assessment (see section 2.5) (GG, MD, RPJ, HW, JV)

The coding forms are presented in Appendix 4. Three authors coded the effect sizes for included RCTs (HW, JH, MD); each study was coded independently by two authors who reached agreement. Effect sizes for the quasi-experiments were estimated jointly but not independently and agreed by two authors (MD & RPJ).

2.5. Quality assessment of studies

In the quality assessment of selected studies, we distinguished between assessment of methodological quality (MD, RPJ and HW) and the quality of the theoretical framework of selected studies (GG and FL).

We built a database of the included studies containing information on study design, method of analysis, country, type of intervention, effect size calculation formulae, measures of statistical significance, and other relevant quantitative information. This database was used in the methodological quality (risk of bias) assessment and subsequent meta-analysis.

We determined whether studies were independent, ensuring only one study from each collection of papers on a single dataset was included in the analysis.

We assessed risk of bias based on study design and methods of analysis, and implementation of the methodology. We used the scheme developed by Duvendack et al. (2011) to categorise each of the studies according to their reported research design and analytical method, and coded criteria relating to implementation of the research, including the approach to addressing selection bias and confounding, spillover effects and contamination, outcome reporting bias, analysis reporting bias, and other risks of bias¹¹. Appendix 5 presents the signaling questions used in the risk of bias assessment.

In addition to methodological quality, we also assessed the quality of the theoretical framework on microcredit and women's control over household spending, looking at the following aspects:

- Availability of theoretical framework on women's empowerment and more specifically women's control over household spending;
- Coherence between theoretical framework and empirical data collection;
- Discussion and data collection on control over and use of credit.

The main reason for this assessment was to develop an understanding of the quality of theoretical reasoning underlying the quantitative data analysis. For the three aspects covered in the assessment, we developed specific semantic scales, which are presented along with the results in Table 5.

2.6. Quantitative Synthesis

In order to combine different analyses we first put treatment estimates on a common scale. Given the diversity of estimation methods found in the selected studies, we used 12 different effect size formulae (see Appendix 7), in each case measuring improvements in empowerment variables as an increase in the intervention group over the comparison. Further discussion is provided in section 3.4.

Steps in meta-analysis

Our meta-analysis (conducted by MD, RPJ and HW) consists of the following steps:

- Extraction of parameters to be used in effect size calculation
- Selection of effect size formula to be used for each study/construct combination
- Effect size calculation

¹¹ None of the studies in this systematic review reported ex-ante power calculations. Ex-post power calculations (included in Masset et al., 2011) are controversial (Ellis, 2010; Hoenig and Heisey, 2001).

- Collation of effect sizes and merging with study characteristics
- Description of diversity of studies
- Initial calculation of 'synthetic' effect size to compute each study's overall effect size (Borenstein et al., 2009; Chapter 24)
- Meta-analysis across studies by subgroups and/or meta-regression

The long list of possible effect size calculations was narrowed down depending on the data reported in the studies that were included in the systematic review. Several of these were included in the selected studies, reporting results in great number, and variety, often in non-standard forms. The biggest problems relate to studies which report estimates using logit, multinomial logit, probit, ordered probit, linear probability, and tobit estimates for which Lipsey and Wilson (2001) do not provide readymade effect size calculation methods; the study reporting tobit results (Lastarria-Cornhiel and Shimamura, 2008) was dropped from the meta-analysis due to difficulties in calculating the effect size. There are almost equivalent problems due to the diversity of outcome indicators (of empowerment) and their metrics, and incomplete and erroneous reporting of statistical results¹².

2.6.1. Effect size calculations

In this section we describe our procedures for computing effect sizes. We first describe the effect size (ES) calculation for continuous outcome variables, and then for categorical outcome variables. Finally, we describe the methods for pooling dependent effect size estimates.

Continuous outcome variables

Effects on continuous outcome variables were estimated from mean and regression estimates. For regression estimates we used SMD effect sizes rather than share of outcome 'explained' effect sizes¹³, because we find the translation of r type ES to d type ES unreliable at the time of writing (for a possible reason for this, see McGrath and Meyer, 2006).

¹² We wrote our own STATA code to calculate the effect sizes, compute appropriate variance for studies reporting multiple dependent effect sizes, describe the studies and their diversity as well as generate forest plots (using Stata user written routines).

¹³ use <http://www.ats.ucla.edu/stat/data/hsb2>, clear

```
xi: regress write female read math i.prog
```

```
* now compute eta-sq etc.
```

```
regeffectsizes
```

```
* reghedges.do (available from authors' computes Hedges g along with eta etc).
```

```
* now partial r2
```

```
xi: pcorr2 write female read math i.prog
```

```
* compare semiP^2 with eta^2
```

We have adapted regeffectsizes to also compute Hedges g for each RHS variable. This demonstrates the problem translating between r and d type effect sizes, and is available on request.

Means-based estimates of bivariate effect size such as Cohen's d , Hedges' g , Glass's d and Δ are the difference in means normalised by the variation in the data and hence are variations on the z-score. They vary in the way the variation is estimated, and the differences between these measures are generally small except for small sample sizes. These measures can be calculated from a range of the statistics commonly reported in research results. We found five ways to compute Cohen's d from the combinations of data provided in means-based studies. When data for more than one method are available the different methods yield identical results. These methods are described in Appendix 7 as SMD1-5.

Estimation of partial effect sizes from regression results is less well developed and more problematic than for mean based results (Becker and Wu, 2007; Fritz, Morris and Richler, 2011). Several effect size estimates are available including r oriented estimates and d oriented estimates. Consensus on methods for extracting effect sizes from multiple regression estimates has seemingly not been reached¹⁴. The methods we have used are described as SMD 7, 8 and 9 in Appendix 7¹⁵.

Categorical outcome variables

Several studies employed categorical variables as outcome indicators, analysing them as either contingency tables or using logistic regression. Estimates of effect size from the former was widely reported; for the latter, logistic regression, we took the exponent of the logit beta coefficient as an estimate of the odds ratio, and transformed the coefficient into SMD estimates using the method of Chinn (2000) in meta-analysis. We did not produce estimates of effect sizes for multinomial logit, probit, ordered probit as we have found no guidance in the literature.

2.6.2. Unit of analysis

We assessed unit of analysis for the randomised controlled trials included in the review. All randomised controlled trials included in the review used appropriate unit of analysis to estimate study precision. One study randomly allocated participants at the individual level (Karlan and Zinman, 2007). The three remaining RCTs used cluster-allocation (Banerjee et al., 2009; Crepon et al., 2011; Kim et al., 2007). All used regression-adjustment with cluster robust standard errors to estimate effects.

2.6.3. Dependent Effect sizes

This section discusses approaches to resolving within study dependent effect sizes (for discussion of dependency across studies, see above and section 3.2). Most of the studies reported multiple dependent estimations, meaning that they are not independent estimates. There appear to be five alternative approaches to dealing with the issue of multiple outcome estimates – to include all estimates, to drop some for which there can be a clear justification, to drop 'outliers' based on an arbitrary rule (e.g. observations which are more than +/- 2 standard deviations of the weighted mean), pool the estimates in some way, or to model the diversity (Higgins and Green, 2011). As far as possible one can take the average of different

¹⁴ The limitations of pooling partial effect sizes are discussed in the review limitations (section 4.2).

¹⁵ SMD 7, 8 and 9 compute d using both standardised beta as in Wilson's calculator and g using the formulae given in Keef and Roberts, 2004; these estimates are highly correlated.

effect size calculations, following Lipsey and Wilson (2001); however, this requires adjustment to the variance.

We made two pooling calculations, estimating the average point estimate based on inverse variance weights, and adjusting the variance for dependency among outcomes (Borenstein et al., 2009: 230). Since most studies published more than one result that could be used to compute an effect size, and none specified a preferred result, we had multiple dependent estimates. To avoid bias due to this dependence (Lipsey and Wilson, 2001: 105, 125), we averaged effect sizes over study and dimension of empowerment using inverse variance weights (within study * dimension * treatment indicator).

The method of adjusting variance for dependency among effect size estimates described in Borenstein et al. (2009:230) requires knowledge of the correlation among the outcome estimates. Since none of the studies reported intra-outcome correlations (r), we reviewed the studies and allocated a value of r depending on the anticipated degree of correlation. A study in which the different outcomes are based on the same treatment and control cases was assigned a high correlation ($r=0.8$); one in which the treatment and control groups differ were given low values of r (0.2). Other studies were given an intermediate value (0.5).

2.7. Qualitative synthesis

Combining systematic reviews and meta-analysis of quantitative effects with qualitative synthesis has become more popular in the literature. Van der Knaap et al. (2008) discuss a systematic review process which combines a focus on synthesizing high internal validity studies with theory-based evaluation principles of opening the black box by looking at the mechanisms underlying processes of change. In line with studies by Coleman (1986, 1990), Hedstrom and Swedberg (1998) and Astbury and Leeuw (2010) we looked at three types of mechanisms (see section 1.4.): situational mechanisms; action-formation mechanisms; and transformational mechanisms.

Given the focus of the review on aspects of agency and women's control over household expenditures as a set of proxies for women's empowerment, our search was aimed at action-formation mechanisms. Due to the particular inclusion and exclusion criteria applied in this study, the review aimed to generate a comprehensive and unbiased overview of the available evidence on this type of mechanism in the context of microcredit and women's control over household expenditures.

Two members of the research team (GG and FL) independently searched for the mechanisms explaining the causal relationship between microcredit and aspects of women's control over household spending. We followed the following sequence for extracting and synthesizing mechanisms.

1. First we inventoried which of the studies in the final batch (see section 3.1.) include a *theoretical framework on microcredit and women's control over household spending*. In order to find out the number of studies in which a theoretical framework on microcredit and women's control over household spending is used, we used a broad definition of what a theoretical framework is. The definition not only includes a set of (deductively-structured) propositions on the relationship between microcredit and empowerment, but also the presentation of one or a few hypotheses about this relationship as well as a discussion on 'theoretical aspects' of microcredit and empowerment. Usually, such a discussion is part of a review of the (largely) empirical literature.

2. Subsequently, we searched in the studies for information on mechanisms. Sometimes authors explicitly refer to 'mechanisms', more often they do not although. By reading between the lines, one is able to detect statements alluding to mechanisms. Using insights from argumentational analysis¹⁶ (Toulmin, 1958; Leeuw, 2003) helped us to find these statements. The search activity focused on the empirical part of the papers. Statements include both confirmation of hypotheses or assumptions and refutations.
3. Finally, we summarised authors' statements alluding to mechanisms into a narrative overview per type of mechanism.

It should be added that the demarcation lines between the different types of mechanisms are not always clear-cut. In case of doubt between the two reviewers, findings were discussed and a decision was made on classification (e.g. as either a situational or action-formation mechanism). In case this did not generate a clear decision, a third reviewer (JV) arbitrated.

¹⁶ Argumentational analysis can be used for analyzing chains of arguments and it helps to reconstruct and "fill in" argumentations. A central concept is the warrant, which is the "because" part of an argument: it says that B follows from A because of a (generally) accepted principle. The "because" part of such an argument is often not made explicit. Consequently, these warrants must be inferred by the person performing the analysis (Leeuw, 2003).

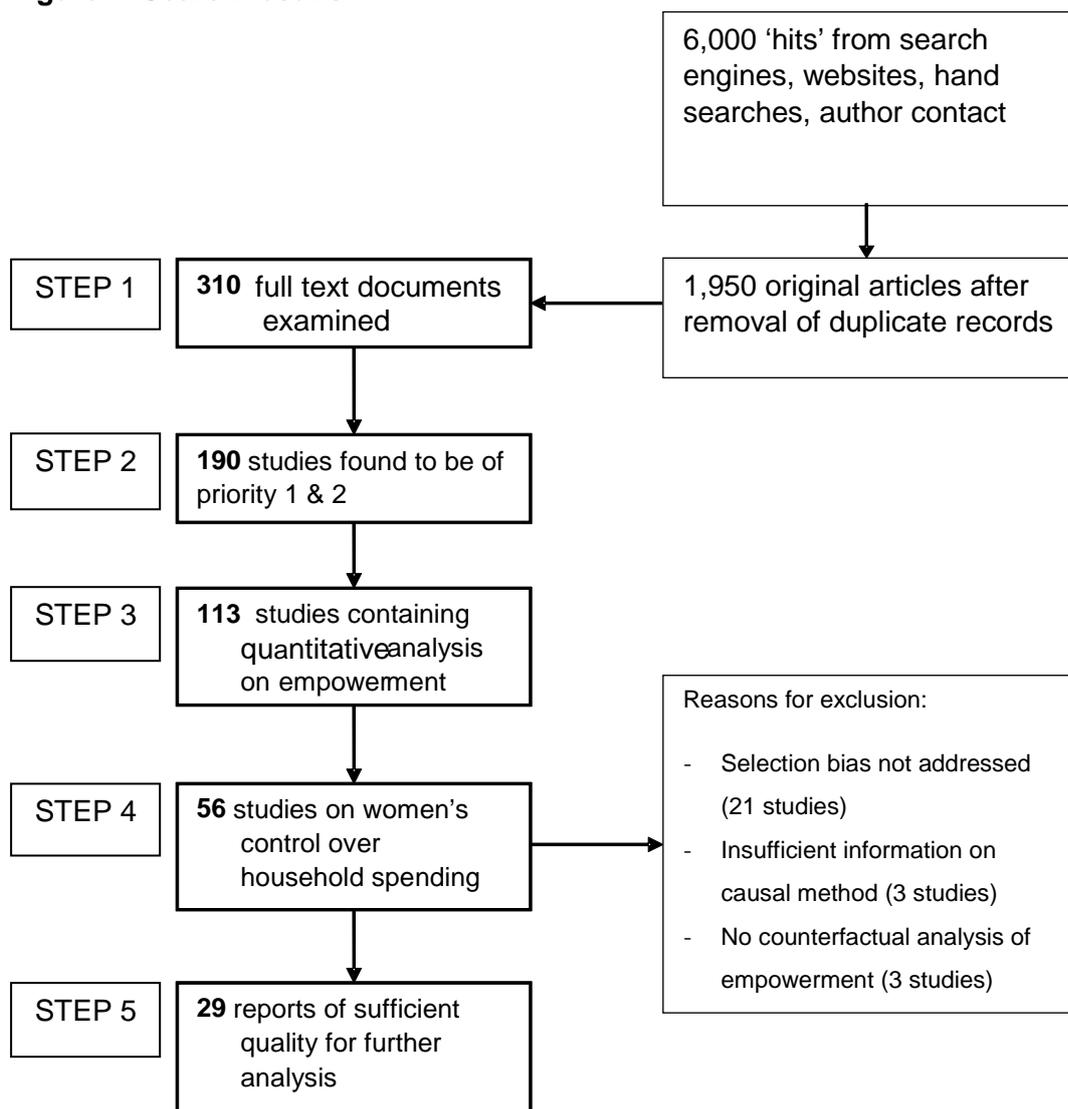
3. Results

3.1. Search results

Figure 4 shows the results of the search. Of 6,000 hits in web-based search engines, targeted searches in journal and books, backward and forward tracking of references and author contact, we identified an initial number of 310 papers that were selected for full text examination. Of these, 190 studies were found to be of priority 1 and 2, meaning that they focused on the relationship between microcredit and women's empowerment and included original empirical analysis. Of these, 113 studies included quantitative analysis on microcredit and empowerment. Purely qualitative studies (77) were excluded. Of the 113 quantitative studies, 56 were considered to be of relevance to our scope, meaning that they focused on the relationship between microcredit and women's empowerment as a dependent variable, as expressed through one or more aspects of women's control over household spending. After subsequently applying the final methodological quality inclusion criterion¹⁷, we selected 29 reports describing 25 unique studies to be included in the review (see also Figure 3 explaining the steps in the inclusion process).

¹⁷ Meaning that there is evidence that the study has attempted to address the attribution problem.

Figure 4. Search results



Note 1: For a description of steps see Figure 3.

Note 2: Duplicates were identified with the programme EndNote as well as manually through title screening. Appendix 3 Table A3.1 provides the reasons for each study's exclusion at step 4.

Note 3: The 29 reports identified in Step 5 corresponded to 25 unique studies (see Section 3.3.1).

3.2. Description of included studies

Table 2 gives a descriptive overview of the 29 reports (representing 25 independent studies; see Section 3.3.1), which presents, in a summarised format, the findings of the studies with respect to causal relationships between microcredit and aspects of women's control over household resources (which differ per study). Appendix 6 elaborates on the design features and provides further information on the specific variables of women's control over household expenditures and the possible causal relations with microcredit.

Study designs varied across the studies, with three estimating results from experimental designs (randomised assignment to intervention) and the remaining employing a range of different quasi-experimental and multivariate regression approaches.

A range of outcome measures were used in the studies to measure control over household spending decisions (Appendix 6). A summary of the outcome variables recorded in each study is provided in Table A5.2. Studies generally collected self-reported outcomes from survey questionnaires over a range of expenditure items, which were grouped into a composite index. Some studies used simple trichotomous responses (1=wife makes decision alone, 0.5=decision made jointly, 0=husband alone) for each expenditure category (e.g. Amin et al., 1998; Husain et al., 2010) while others assessed women’s relative contribution to decision-making control using a Likert scale (e.g. Sharif 2002, 2004). The method of measuring the outcome variable varied, some studies using a continuous outcome (measured as the weighted average across categories) (e.g. Crepon et al., 2011) while others employed a threshold to determine a dichotomous outcome measuring whether a woman was ‘empowered’ or not (e.g. Schuler and Hashemi, 1994; Hashemi et al., 1996).

A naïve reading of Table 2 would suggest that, in a majority (15) of the 25 included (independent) studies), there is a positive and statistically significant relationship between microcredit and one or more aspects of women’s control over household expenditures. At the same time, the table suggests 10 studies did not find any statistically significant relationship between microcredit and women’s control over household spending. Moreover, in most studies that did find some effect, many of the studied relationships between microcredit and aspects of women’s control over household resources turned out to be statistically insignificant, depending on the nature of the credit independent variable, the type of outcome measure and the specific sample of (female) clients covered by particular analyses.

While one might conclude that many studies do find some type of positive effect, this assessment does not take into account the inclusion of findings regarding the same data reported in multiple papers (dependent studies), characteristics of methodological design and implementation (risk of bias), and the magnitude of effects and study sample size (effect size and statistical precision). A critical appraisal of the evidence base, including assessment of study independence and risk of bias, together with a statistical meta-analysis, weighted by the inverse of study variance, are needed before we can confidently conclude whether this indication truly reflects an overall positive effect of microcredit on women’s control over household spending.

Table 2. Summary results from 29 reports representing the 25 unique included studies

Study	Short description of findings	Included in meta-analysis
Amin et al. (1995)	Positive relation between microcredit and women’s decision-making power regarding purchase of household items and health decisions	Yes

Study	Short description of findings	Included in meta-analysis
Amin et al. (1998)	Positive relation between microcredit and women's autonomy and decision-making power on a range of spending decisions (e.g. saving, education, health)	Yes
Asim (2008)	No statistically significant relation	Yes
Banerjee et al. (2009)	No statistically significant relation	Yes
Crepon et al. (2011)	No statistically significant relation	Yes
Garikipati (2008)	No statistically significant relation	Yes
Hashemi et al. (1996)	Positive relation between microcredit and women's ability to make spending decisions regarding small and large purchases and major investments (e.g. renovate house)	Yes
Holvoet (2005)	Positive relation between microcredit and women's participation in decision-making on use of loan	No
Holvoet (2006)	Positive relation between microcredit and women's control over assets	Yes
Hoque and Itohara (2009)	Positive relation between microcredit and women's participation in family decisions	Yes
Husain et al. (2010)	No statistically significant relation	Yes
Jamal (2008)	Positive relation between microcredit and women's control over assets	No
Karlan and Zinman (2007)	No statistically significant relation	Yes
Kim et al. (2007)	Positive relation between microcredit women's autonomy in decision-making (e.g. small and large purchases, health)	Yes
Lakwo (2007)	Positive relation between microcredit women's decision-making power regarding small purchases	Yes

Study	Short description of findings	Included in meta-analysis
Lastarria-Cornhiel and Shimamura (2008)	No statistically significant relation	No
Mizan (1993)	Positive relation between microcredit women's decision-making power regarding a range of decisions (e.g. food, education, productive investments, assets)	No
Mohindra et al. (2008)	Positive relation between microcredit and women's decision-making power regarding household expenditures and education	Yes
Ngo (2008)	No statistically significant relation	Yes
Pitt et al. (2003)	Positive relation between microcredit and women's capacity to make a range of purchasing decisions independently (e.g. food, household items) and women's decision-making regarding major transactions (e.g. land, house, credit)	No
Pitt et al. (2006)	Positive relation between microcredit and women's capacity to make a range of purchasing decisions independently (e.g. food, household items) and women's decision-making regarding major transactions (e.g. land, house, credit)	Yes
Rahman et al. (2009)	No statistically significant relation	Yes
Schuler and Hashemi (1994)	Positive relation between microcredit and women's ability to make small and large purchases and major (investment) decisions on her own	No
Setboonsarng and Parpiev (2008)	No statistically significant relation	Yes
Sharif (2002)	The relationships identified in the study concern comparisons between younger and older women; older women were found to benefit more from microcredit than younger women; it is concluded that empowerment comes with age (including, possibly, a longer history with credit)	Yes

Study	Short description of findings	Included in meta-analysis
Sharif (2004)	Positive relation between microcredit and women's participation in decision-making in small and large purchases, education and health decisions	No
Wakoko (2003)	Positive relation between microcredit and women's decision-making on income use (selling produce, using income, saving)	Yes
Zaman (1998)	Positive relation between microcredit and women's control over assets (e.g. livestock, jewelry, savings)	No
Zaman (1999)	Positive relation between microcredit and women's control over assets (e.g. livestock, jewelry, savings)	No

Note 1: Descriptions refer to statistically significant relationships.

Note 2: Studies were included in meta-analysis where independent effect sizes and standard errors were calculable. Four pairs of the above reports were identified as providing dependent findings (Holvoet, 2005 and 2006; Pitt et al., 2003 and 2006; Sharif, 2002 and 2004; Zaman, 1998 and 1999) – see section 3.3.1.

Note 3: The independent variable may slightly differ between studies (e.g. receiving credit, membership of a credit solidarity group; see Appendix 6). Due to lack of information in studies it was difficult to determine the exact intervention(s) targeted to female clients. Microcredit is a consistent and predominant element of the independent variable (see Appendix 8).

Note 4: Further information on the dependent variables can be found in Annexes 6 and 8.

3.3. Critical appraisal

3.3.1. Study independence

A number of the reports listed in Table 2 shared more or less important parts of their content, with respect to the inventions studied and participant data. This led to questions as to whether or not they should be considered as independent findings, and therefore included in the same meta-analysis. The studies suggesting possible overlap were the following:

- Amin et al. (1995) and Amin et al. (1998) used different data sets measured at different times for different groups in Bangladesh (the first uses nationally representative data from 1992 the second using data collected from particular areas in 1995) and (partly) different measures of dependent variables. The studies covered different target populations. As a result they were considered as independent findings and both were included in the meta-analysis.
- Holvoet (2005) and Holvoet (2006) share the same underlying dataset. More specifically, Holvoet (2006) is based on a sub sample of the larger sample that was used in Holvoet (2005). We were only able to extract effect sizes for Holvoet (2006) which was included in the meta-analysis.
- Pitt et al. (2003) and Pitt et al. (2006) are, respectively, the working paper and journal publication of the same study for Bangladesh. The papers used the same dataset, the same measures of dependent variables and analysis, but differ somewhat in their

discussions of the literature and the implications of their findings, mainly the welfare impacts for families in the context of women's empowerment. We were only able to extract effect sizes for Pitt et al. (2006) which were included in the meta-analysis.

- Sharif (2002) and Sharif (2004) used the same data set to deal with two different, albeit related questions: one on the impact of participation in microcredit programmes on the decision-making status of poor Bangladeshi women, and the other on the role that microcredit programmes can play in enabling women to develop human capital as well as sustainable livelihoods, with a special emphasis on young women. We were only able to extract effect sizes for Sharif (2002) which was included in the meta-analysis.
- Zaman (1998) and Zaman (1999) are versions of the same analysis, using the same dataset, measures of dependent variables and analysis to reach the same estimates of impact of women's control over household assets. The study did not report sufficient information to estimate confidence intervals and was therefore excluded from meta-analysis.

In sum, in case of Pitt (2003, 2006), Sharif (2002, 2004), Holvoet (2005, 2006), and Zaman (1998, 1999) there are indeed overlaps between samples used in studies by the same author. Consequently, we did not consider them as independent findings. Only one study from each pair was included in the quantitative synthesis analysis.¹⁸ In case of Amin (1995, 1998), these are two independent findings. Thus, there are a total of 25 independent findings eligible for inclusion in the quantitative review of effects, of which we were able to extract effect sizes from 20 studies which were included in the statistical meta-analysis.

¹⁸ While the quantitative analysis effectively covered 25 studies (to avoid any double-counting), the qualitative synthesis included all 29 studies as it did not involve any counting or quantitative aggregation of any kind.

3.3.2. Risk of bias

Table 3 presents a summary overview of the study design and methods of analysis used in the 25 independent studies. Table 4 provides an overall assessment of risk of bias for each study incorporating the design- and analysis-based assessment reported in Table 3, together with categories based on threats to validity arising from implementation of the design and methods of analysis.

Table 3. Distribution of studies according to research design and statistical methods of analysis

		Statistical Methods of Analysis		
		IV,PSM,2SLS/LI ML,DID, RD	Multivariate	Tabulation
Research Design				
RCT			4	
Pipeline		1	1	0
Panel or b/a and w/wo		0	1	0
Either b/a or w/wo		6	10	2
Natural Experiment		0	0	0
Legend	Low threat to validity	11	High threat to validity	12
	Medium threat to validity	2		

Note: IV instrumental variables, PSM propensity score matching, 2SLS two-stage least squares, LIML limited information maximum likelihood, DID difference in differences, RD regression discontinuity. Source: Duvendack et al. (2011).

The analysis scheme reflected in Table 3, based on Duvendack et al. (2011), assessed studies on two dimensions – research design and method of statistical analysis – from low threat to validity to high threat to validity. Studies using randomised assignment and credible quasi-experimental methods such as regression discontinuity, difference in differences, statistical matching and instrumental variables are assessed as using methods which create low threat to validity. Pipeline studies using multivariate or bivariate methods, and panel studies using simple multivariate methods only, are classified as having medium threat to validity. All other studies, including cross-sectional with/without studies which use multivariate regression and tabular methods, are classified as having high threat to validity. As indicated in Table 3 just under half of the included studies (12 out of 25 independent findings) used methods of analysis which are considered of high threat to validity based on study design and method of analysis.

The assessment of risk of bias (Table 4) assessed implementation of the study methodology according to risks of bias due to confounding, spill-overs and contamination, and reporting

biases. We used a transparent decision-rule to reach an overall assessment of risk of bias (see Table 4 notes). From the table it can be concluded that none of the studies included in this systematic review were assessed as having low risk of bias, while the majority (16) have high risk of bias; the remaining 9 were assessed as having medium risk of bias.

Table 4. Risk of bias assessment

Study	Design and analysis based assessment: study design, method of analysis (Table 3)	Risk of selection bias and confounding								Risk of spill-overs and contamination	Risk of outcome reporting bias	Risk of analysis reporting bias					Other risk of bias	Overall assessment
		RCTs		Quasi-experiments								RCTs	PSM	IV	OLS	Other		
		PSM / CVM	IV	OLS	Logit/ Probit	Bi-variate	Panel	Other										
Amin et al., 1995	High threat to validity: cross-section observational data, multivariate regression analysis			Uc						Yes	No			No		Uc	High risk	
											No			No		Uc	High risk	
Amin et al., 1998	High threat to validity: cross-section observational data, bivariate analysis									Yes	No				No	Uc	High risk	
Asim, 2008	Low threat to validity: cross-section observational data, IV regression / PSM analysis	Yes								Yes	No		No			Uc	High risk	
			Yes								No			No		Uc	High risk	
Banerjee et al., 2009	Low threat to validity: RCT experimental data, ITT multivariate regression analysis	Uc								Yes	No	No				Uc	Moderate risk	
Crepon et al., 2011	Low threat to validity: RCT experimental data, ITT multivariate regression analysis	Uc								Yes	No	No				Uc	Moderate risk	
Garikipati, 2008	Low threat to validity: cross-section observational data, IV regression analysis			Uc						Yes	No			No		Uc	Moderate risk	

Study	Design and analysis based assessment: study design, method of analysis (Table 3)	Risk of selection bias and confounding							Risk of spill-overs and contamination	Risk of outcome reporting bias	Risk of analysis reporting bias					Other risk of bias	Overall assessment
		RCTs	Quasi-experiments								RCTs	PSM	IV	OLS	Other		
			PSM / CVM	IV	OLS	Logit/ Probit	Bi-variate	Panel									
Hashemi et al., 1996	High threat to validity: cross-section observational data, multivariate regression analysis				Uc				Yes	No				No	Uc	High risk	
Holvoet, 2006	High threat to validity: cross-section observational data, bivariate tables						Uc		Yes	Uc				Uc	Uc	High risk	
Hoque and Itohara, 2009	High threat to validity: cross-section observational data, multivariate regression analysis				Uc				Yes	Uc				No	Uc	High risk	
Husain, Mukherjee and Dutta, 2010	Medium threat to validity: pipeline study, cross-section observational data, multivariate regression analysis			Yes					Yes	Uc			Uc		Uc	High risk	
Jamal, 2008	Low threat to validity: pipeline study, individual panel data, DID multivariate regression analysis							Uc	Yes	No				Uc	Uc	Moderate risk	
Karlan and Zinman, 2007	Low threat to validity: RCT, ITT multivariate regression analysis	Uc							Yes	No	No				Uc	Moderate risk	
Kim, et al., 2007	Low threat to validity: pipeline RCT	Uc							Yes	No				Uc	Uc	Moderate risk	

Study	Design and analysis based assessment: study design, method of analysis (Table 3)	Risk of selection bias and confounding							Risk of spillovers and contamination	Risk of outcome reporting bias	Risk of analysis reporting bias					Other risk of bias	Overall assessment
		RCTs	Quasi-experiments								RCTs	PSM	IV	OLS	Other		
			PSM / CVM	IV	OLS	Logit/ Probit	Bi-variate	Panel									
Lakwo, 2007	High threat to validity: cross-section observational data, multivariate regression analysis			Yes					Yes	Uc			Uc	Uc	Uc	High risk	
Lastarria-Cornhiel and Shimamura, 2008	Low threat to validity: cross-section observational data, PSM / Tobit regression analysis	Yes							Yes	No		No		Uc	High risk		
				Uc					Yes	No		No		Uc	Moderate risk		
					Uc				Yes	No			No	Uc	Moderate risk		
Mizan, 1993	High threat to validity: cross-section observational data, multivariate regression analysis			Uc					Yes	No		No		Uc	High risk		
Mohindra et al., 2008	High threat to validity: cross-section observational data, multivariate regression analysis				Uc				Yes	No			No	Uc	High risk		
Ngo, 2008	Low threat to validity: cross-section observational data, covariate matching, multivariate regression analysis	Uc						Uc	Yes	Uc			Uc	Uc	Moderate risk		

Study	Design and analysis based assessment: study design, method of analysis (Table 3)	Risk of selection bias and confounding							Risk of spill-overs and contamination	Risk of outcome reporting bias	Risk of analysis reporting bias					Other risk of bias	Overall assessment
		RCTs	Quasi-experiments								RCTs	PSM	IV	OLS	Other		
			PSM / CVM	IV	OLS	Logit/ Probit	Bi-variate	Panel									
Pitt et al., 2006	Low threat to validity: cross-section observational data, 2SLS (IV) regression analysis		Uc						Yes	No			No		Uc	Moderate risk	
Rahman et al., 2009	High threat to validity: cross-section observational data, multivariate regression analysis								Yes	No				No	Uc	High risk	
Schuler and Hashemi, 1994	Medium threat to validity: unclear cross-section and two-period observational data, multivariate regression analysis								Yes	Uc				No	Uc	Moderate risk	
Setboonsaeng and Parpiev, 2008	Low threat to validity: cross-section observational data, PSM analysis	Yes							Yes	No			No		Uc	High risk	
Sharif, 2002	High threat to validity: cross-section observational data, multivariate and bivariate analysis								Yes	Uc				Uc	Uc	High risk	
Wakoko, 2003	High threat to validity: cross-section observational data, multivariate and bivariate analysis								Yes	Uc				Uc	Uc	High risk	

Study	Design and analysis based assessment: study design, method of analysis (Table 3)	Risk of selection bias and confounding							Risk of spill-overs and contamination	Risk of outcome reporting bias	Risk of analysis reporting bias					Other risk of bias	Overall assessment
		RCTs		Quasi-experiments							RCTs						
		PSM / CVM	IV	OLS	Logit/ Probit	Bi-variate	Panel	Other			PSM	IV	OLS	Other			
Zaman, 1998, 1999	High threat to validity: cross-section observational data, multivariate and bivariate analysis			Uc					Yes	Uc				Uc	Uc	High risk	
					Uc					Uc				Uc	Uc	High risk	

Notes: 'Unclear' is abbreviated Uc. CVM stands for covariate matching.

Selection bias and confounding: we scored 'no' when study design and analysis were reported and executed adequately, 'yes' if study design and analysis were not reported and executed adequately, and 'unclear' when the evidence was mixed and we could not reach a firm conclusion.

Spill-overs: studies scored 'no' when, based on our judgment, no spill-overs were expected from the treatment to the control group and the groups were isolated from other interventions, 'yes' when spill-overs were likely, and 'unclear' when we could not reach any firm conclusion and had lingering doubts.

Outcome and analysis reporting: a score of 'no' was achieved when the outcomes/analyses discussed in the methods section were also reported in the results/analysis section, scored 'yes' if otherwise and 'unclear' when the paper had no information.

Other risks of bias: 'no' suggests no other sources of bias, 'yes' suggests other potential sources of bias, and 'unclear' when no firm conclusions could be reached.

Overall assessment: the last column reaches an overall conclusion about risk of bias taking into account the design/analysis (as shown by the design-based assessment) and the execution of the analysis (as in the remaining columns). We implemented the following decision rule: if the design-based assessment was 'high threat to validity', all remaining categories needed to be 'no' in order to get a risk of bias assessment better than 'high risk of bias' (i.e. even if we were in the main unclear, we still did not think we were likely to consider any of these designs trustworthy enough to score better than 'high risk'). If the design-based assessment was 'low threat to validity' or 'medium threat to validity', the majority of remaining categories needed to be 'no' in order to get a 'low risk of bias' assessment; if 'yes' against selection bias and confounding then the overall score was 'high risk of bias'. If otherwise mixed, or the majority of remaining categories are 'unclear', then the overall score was 'moderate risk of bias'.

3.3.3. *Quality of theoretical framework*

In this section we look at the quality of information contained in the final batch of studies and subsequently identify underlying mechanisms of causal relationships between microcredit and women's control over household spending. The studies were analyzed following the procedure described in section 2.4. First, we looked at the presence of a theoretical framework on microcredit and women's control over household spending. As shown in Table 5 we found that 10 studies lacked a theoretical framework on microcredit and empowerment, 4 used a theoretical framework or theory that discussed causal relationships between microcredit and empowerment (without explicitly addressing women's control over household spending), and 15 presented a theoretical discussion that also dealt with causal relationships between microcredit and (particular aspects of) women's control over household spending. However, as indicated in section 3.3.1, there were four pairs of studies which provided dependent findings on effects. When we looked at independent findings only, we found that 9 studies lacked a theoretical framework, 3 used a theoretical framework examining empowerment and 13 also presented a theoretical discussion examining women's control over expenditure.

Second, we looked at the link between the theoretical framework and empirical data collection and analysis. Eighteen reports (summarising 14 independent studies) presented no explicit or clearly recognizable relation between the theoretical framework or discussion and empirical data collection, while 11 did (see Table 5).

Third, we looked at the issue of whether studies discuss the use and control over microcredit. The aspect control over the use of loans constitutes an intermediate causal step towards control over household spending (although increased women's control over household spending may occur in households where women do not directly control the use of loans). Given its potential importance in the causal chain we included it in our assessment. Studies including variables relating to women's control over household spending do not necessarily need to include this aspect in order to be selected for this review. However, studies that do include 'control over and use of loans' are more elaborate and precise from a theoretical perspective in their assessment of the relationship between credit and women's control over household spending or women's empowerment in general.

As Table 5 shows, 14 reports (summarising 13 independent studies) dealt with the issue of women's control over loan use and presented and analyzed empirical data on the topic. Two studies only mentioned the issue while another 13 reports (10 independent studies) did not mention it at all.

TABLE 5: ASSESSMENT OF THE THEORETICAL BASIS REGARDING MICROCREDIT AND WOMEN'S CONTROL OVER HOUSEHOLD SPENDING IN SELECTED STUDIES

Question (scaling)	Num. of reports (studies)	References
<i>Is there a theoretical framework on the relationship between microcredit and women's control over household spending?</i>		
0 = study in which no theoretical framework/theory is available on microcredit and empowerment	10 (9)	Crépon et al. 2011, Garikipati 2008, Hashemi et al. 1996, Holvoet 2005, Jamal 2008, Karlan and Zinman, 2007, Lastarria and Shimamura 2008, Mohindra et al. 2008, Rahman et al. 2009, Setboonsarng and Parpiev 2008
1 = study in which a theoretical framework is available that addresses causal relationships between microcredit and empowerment	4 (3)	Amin et al. 1995, Banerjee et al. 2009, Husain et al. 2010, Zaman 1998
2 = study in which a theoretical discussion takes place on the causal relationships between microcredit and (aspects of) women's control over household spending	15 (13)	Amin et al. 1998, Asim 2008, Holvoet 2006, Hoque and Itohara 2009, Kim et al. 2007, Lakwo 2007, Mizan 1993, Ngo 2008, Pitt et al. 2003, Pitt et al. 2006, Schuler and Hashemi 1994, Sharif 2002, Sharif 2004, Wakoko 2003, Zaman 1999
Total:	29 (25)	
<i>Does the paper present a recognizable relation between the theoretical framework/discussion and empirical data collection and analysis?</i>		
0 = empirical data collection and analysis on microcredit and women's control over household spending is <i>not</i> linked to the theoretical framework/discussion on causal relationships between microcredit and (aspects of) women's control over household spending (even if such a framework is discussed in the study)	18 (14)	Amin et al. 1995, Banerjee et al. 2009, Crépon et al. 2011, Garikipati 2008, Hashemi et al. 1996, Holvoet 2005, Holvoet 2006, Husain et al. 2010, Jamal 2008, Karlan and Zinman 2007, Lastarria and Shimamura 2008, Mohindra et al. 2008, Pitt et al. 2003, Pitt et al. 2006, Rahman et al. 2009, Sharif 2004, Setboonsarng and Parpiev 2008, Zaman 1998
1 = empirical data collection and analysis on microcredit and women's control over household spending reflects	11 (11)	Amin et al. 1998, Asim 2008, Hoque and Itohara 2009, Kim et al. 2007, Lakwo 2007, Mizan 1993, Ngo 2008, Schuler and Hashemi

Question (scaling)	Num. of reports (studies)	References
theoretical framework/discussion on microcredit and (aspects of) women's control over household spending		1994, Sharif 2002, Wakoko 2003, Zaman 1999
Total:	29 (25)	

<i>Does the paper discuss and empirically measure the control over the use of loans?</i>		
0 = there is no discussion on women's control over and use of loan in the study	13 (10)	Amin et al. 1998, Banerjee et al. 2009, Crépon et al., 2011, Holvoet 2006, Kim et al. 2007, Mizan 1993, Mohindra et al. 2008, Ngo 2008, Schuler and Hashemi 1994, Sharif 2002, Sharif 2004, Setboonsarng and Parpiev 2008, Zaman 1999
1 = there is discussion on women's control over and use of loan in the study	2 (2)	Rahman et al. 2009, Zaman 1998
2 = there is discussion and empirical data collection and analysis on women's control over and use of loan in the study	14 (13)	Amin et al. 1995, Asim 2008, Garikipati 2008, Hashemi et al. 1996, Holvoet 2005, Hoque and Itohara 2009, Husain et al. 2010, Jamal 2008, Karlan and Zinman 2007, Lakwo 2007, Lastarria and Shimamura 2008, Pitt et al. 2003, Pitt et al. 2006, Wakoko 2003
Total:	29 (25)	

Note 1: The 29 reports summarise the findings from 25 unique studies (see Section 3.3.1). As Table 5 shows, there are sometimes differences in quality (from a theory perspective) between studies that are not independent. In case of differences between two dependent studies, the highest score from each pair of dependent studies was included in the count of independent findings. The number of independent findings is indicated in parentheses.

The differences in nature and relevance of the theoretical framework in part point at a quality issue and in part an issue of focus of the underlying primary study. Not all included studies focused primarily on women's empowerment, let alone the particular proxies covered by the present review. Nevertheless, the fact that more or less half of the studies did not include a proper theoretical discussion on the causal relations studied in the quantitative analysis (with respect to women's control over household spending) reveals an important weakness in the quality of impact studies on this subject. This weakness is particularly problematic given that many also used questionable causal identification strategies.

3.4. Quantitative synthesis of effect sizes

This section presents an account of the effect sizes, subsequent meta-analysis and sensitivity analysis, and analysis of publication bias of the empowerment-related variables

reported in the 25 independent studies. A comprehensive analysis of extraction of effect sizes and subsequent meta-analysis of all empowerment-related variables reported in the studies is presented in Appendix 8. In this section we restrict outcomes to those considered to represent “women’s control over household spending”.

Synthesis through meta-analysis is only possible for studies that can be meaningfully compared. In other words, they need to be comparable on a conceptual level which means that similar constructs and relationships are used and they need to follow similar statistical approaches (Lipsey and Wilson, 2001). The findings from the 25 independent studies included in the meta-analysis were selected on the basis of including particular proxies of women’s control over household expenditures. However, these still vary by treatment indicator, analytical method and bias assessment. Moreover, even though the review focuses on one specific dimension of empowerment, there was heterogeneity in outcome variables across studies. The studies reviewed here are diverse, suggesting the so-called ‘apples and oranges’ problem is likely to arise where studies which are distinctly different in these respects are pooled without concern for sensitivity analysis (Lipsey and Wilson, 2001: 2; Sharpe, 1997). Studies that are methodologically flawed or of low quality should not be included in the same meta-analysis as other studies, since this could adversely affect the overall results (Slavin, 1986).

In our case the ‘apples and oranges’ problem might be an issue and Appendix 8 describes the potential sources of heterogeneity across studies and what this implies for meta-analysis. In addition, while the risk of bias assessment covered threats to validity both of the point effect size and unit of analysis errors in clustered studies, pooled effect size estimates can be biased by non-normality and heteroscedasticity of individual effect sizes (Wilcox, 2008), which are generally not reported in our studies. Studies with low or negative effects may also be under-reported. Hence meta-analysis would be upward biased, necessitating analysis of publication bias.

We also found heterogeneity of treatment. Treatment indicators can be dichotomous (membership, participation¹⁹) or continuous (length of membership, number or amount of loans taken, and so on). We pooled studies with membership and participation treatment indicators, in part because these terms are often used interchangeably; however, it is important to bear in mind that microfinance institution (MFI) members may or may not receive microfinance, and may or may not receive other dimensions of treatment such as group discussions, technical assistance, or social support from peers or the MFI. Hence the estimates from these studies are ‘intention to treat’. We did not include studies with treatment indicators which could not be represented by a dichotomous membership variable, because they were few, and could not be put on a comparable basis. The majority of treatment indicators could be treated as dichotomous (92%).

The meta-analysis aimed to address heterogeneity concerns through sensitivity analysis and publication bias assessment. Due to gaps in available data for effect size calculation we were able to generate effect size estimates for 20 studies (see Table 2). Several studies had more than one treatment variable; 23 effect size estimates could be recovered where the treatment indicator was a binary variable representing membership or participation in a

¹⁹ A member of a group may or may not participate in, for example, microcredit.

microfinance organization. Finally, synthetic effect sizes were calculated for three studies reporting multiple outcome constructs for both decision making and control (Amin et al., 1998; Husain et al., 2010; Garikipati, 2008) (Appendix 8). The synthesis of these 20 effect sizes is presented in the following section.

3.4.1. Meta-analysis of experimental studies

It was possible to extract SMD effect sizes for the four RCTs, two of which were conducted in South Africa (Kim et al., 2007; Karlan and Zinman, 2007) and two more in India (Banerjee et al., 2009) and Morocco (Crepon et al., 2011). All of the studies were assessed as having comparatively high validity (moderate risk of bias), and all reported effects on empowerment outcomes which were not statistically significantly different from zero. The analysis of Kim et al. (2007) uses 8 pair-matched clusters (4 treatment, 4 control). This is rather a small sample size for a cluster randomized experiment – in comparison, the studies of Banerjee et al. (2009) and Crepon et al. (2011) enrolled 104 and 162 villages, respectively – which is likely to explain the lack of statistically significant findings of the study, and therefore the small weighting of the study in the meta-analysis. The study also appears to be unbalanced on baseline outcome characteristics (no significance tests are reported, nor socio-economic characteristics of participants and controls), which may explain the comparatively larger effect size estimated.

The results (Figure 5 and Table 6) suggest there is no evidence for impacts of microcredit on empowerment-related variables either in individual studies or when we estimated a pooled effect size using inverse-variance weighted random effects meta-analysis (SMD=-0.007, 95% confidence interval: -0.041, 0.027). The studies are largely homogeneous in terms of outcome measure: Banerjee et al. measured women's decision-making with respect to household purchases directly using an index of spending items; Karlan and Zinman used an index comprising largely spending items but also including a question on fertility; Kim et al. similarly used an autonomy index regarding decision over household purchases but also including decisions on child health care and visiting family and friends; Crepon et al. used a close proxy of decision-making over household spending (share of household activities managed by women). There were also some differences in measures of treatment variables across the three studies, where Crepon et al., Karlan and Zinman and Kim et al. used a dichotomous variable indicating receipt of credit while Banerjee et al. measured whether the women lived in the intervention area. However, we found no statistical evidence for heterogeneity between studies ($Q=2.72$, $\text{Tau}^2=0.000$, $I^2=0\%$). Given the limited number of studies available for analysis, no further sensitivity analyses were conducted.

Figure 5. Forest plot of effect of women’s control over household spending: RCTs

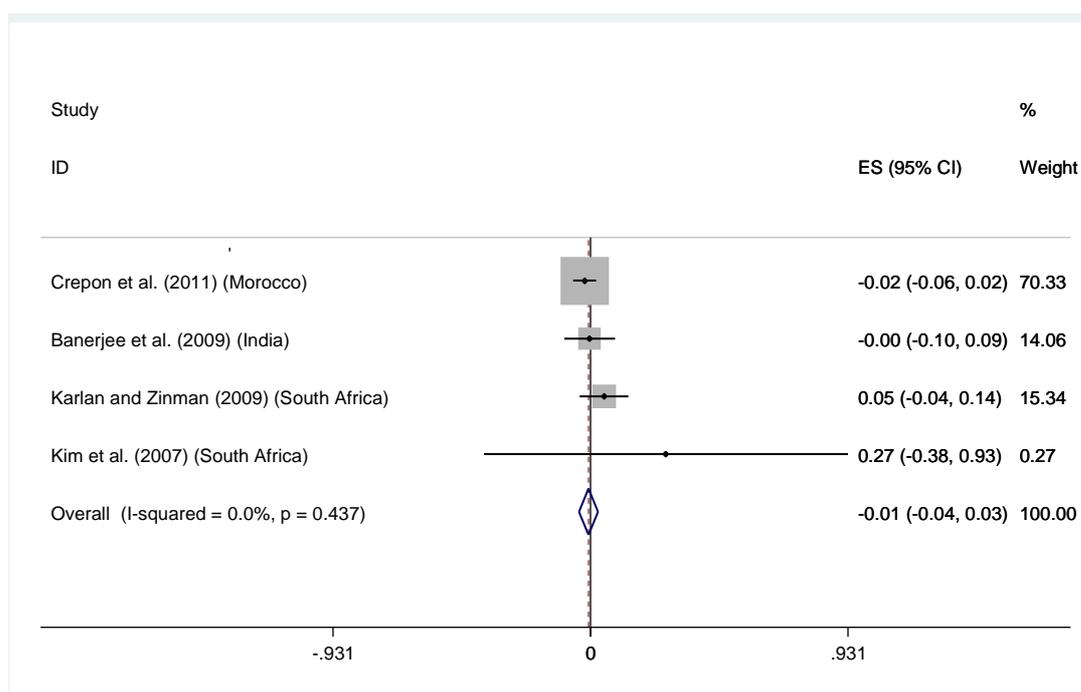


TABLE 6: META-ANALYSIS OF MICROCREDIT AND WOMEN’S CONTROL OVER HOUSEHOLD SPENDING: RCTs

Panel A				
	SMD	95% Confidence Interval		% Weight
Crepon et al. (2011)	-0.021	-0.062	0.020	70.33
Banerjee et al. (2009)	-0.003	-0.095	0.088	14.06
Karlan and Zinman (2007)	0.049	-0.039	0.137	15.34
Kim et al. (2007)	0.273	-0.385	0.931	0.27
D+L pooled ES	-0.007	-0.041	0.027	100.00
Panel B				
Heterogeneity chi-squared	2.72 (d.f. = 3) p = 0.437			
I-squared (variation in ES attributable to heterogeneity)	0.0%			
Estimate of between-study variance Tau-squared	0.0000			
Test of ES=0	z=0.40 p = 0.690			

3.4.2. *Meta-analysis of quasi-experimental studies*

All the studies included in meta-analysis of quasi-experimental and regression (QE) studies estimated effects with and without treatment, where the treatment cases were due to independent interventions.

First, we conducted a meta-analysis for ES estimates using both means and regression based “d” type effect sizes of continuous outcome variables with a dichotomous treatment variable denoting membership of an MFI²⁰. Of the 22 study/construct estimates extracted only 17 were for a membership treatment indicator. Figure 6 and Table 7 show the forest plot and random effects meta-analysis results for all resource control outcomes. The pooled effect size is positive and statistically significant (SMD=0.129, 95%CI=0.035, 0.222 z=2.68, p< .007; 17 studies included), although small in size (SMD< 0.2; Cohen, 1988). Inspection of the forest plot suggested a high degree of heterogeneity which was confirmed by formal statistical tests (chi-square = 169 (df 16), p<.000, Tau-square=0.02, I-square=91%).

²⁰ The analysis was done in Stata 12 using the user written “metan”, “metabias” and “metafunel” commands for random effects analysis.

Figure 6. Forest plot of effect of women’s control over household spending: QE studies

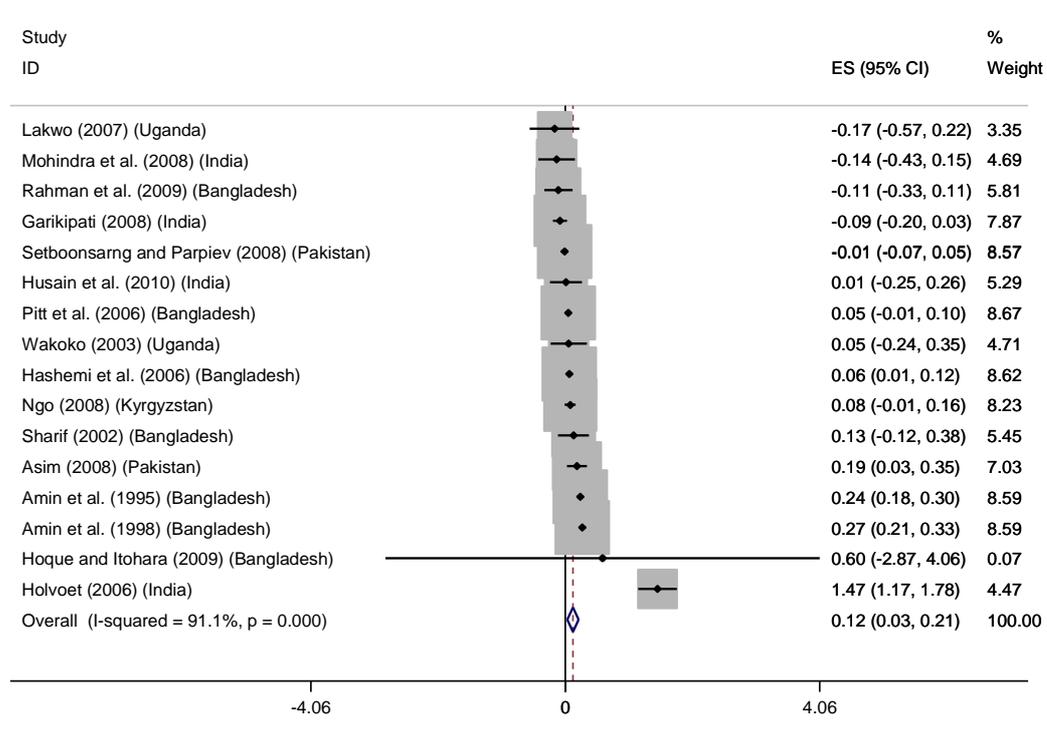


TABLE 7: META-ANALYSIS OF MICROCREDIT AND WOMEN’S CONTROL OVER HOUSEHOLD SPENDING: QE STUDIES

Panel A				
Study	SMD	95% Confidence interval		% Weight
Lakwo (2007)	-0.174	-0.57	0.223	3.35
Mohindra et al. (2008)	-0.139	-0.431	0.153	4.69
Rahman et al. (2009)	-0.110	-0.335	0.115	5.81
Garikipati (2008)	-0.086	-0.198	0.026	7.87
Setboonsarng and Parpiev (2008)	-0.013	-0.074	0.048	8.57
Husain et al. (2010)	0.009	-0.246	0.263	5.29
Pitt et al. (2006)	0.045	-0.005	0.095	8.67
Wakoko (2003)	0.055	-0.236	0.346	4.71

Hashemi et al. (2006)	0.064	0.008	0.120	8.62
Ngo (2008)	0.077	-0.011	0.165	8.23
Sharif (2002)	0.130	-0.115	0.375	5.45
Asim (2008)	0.187	0.028	0.346	7.03
Amin et al. (1995)	0.239	0.18	0.298	8.59
Amin et al. (1998)	0.269	0.210	0.327	8.59
Hoque and Itohara (2009)	0.596	-2.870	4.062	0.07
Holvoet (2006)	1.472	1.165	1.779	4.47
D+L pooled ES	0.125	0.034	0.215	100.00

Panel B

Heterogeneity chi-squared	168.72 (d.f. = 15) p = 0.000
I-squared (variation in ES attributable to heterogeneity)	91.1%
Estimate of between-study variance Tau-squared	0.0247
Test of ES=0	z=2.61 p = 0.009

However, both the positive effect size and to some extent the heterogeneity appear to be driven by two particular studies (Hoque and Itohara, 2009, and Holvoet, 2006), which also showed relatively large positive effect sizes. Hoque and Itohara reported logit odds ratio coefficients which we transformed into logs, and adjusted to standardised mean difference following Chinn (2000). Holvoet seems to be an outlier. We regarded these two studies as outliers and excluded them from the meta-analysis on the basis of an exceptionally large variance (Hoque and Itohara, 2009) and an exceptionally large mean difference (Holvoet, 2006) (see Figure 7 and Table 8). Results indicate that the small positive effect size was not significant by conventional standards (SMD=0.069, 95%CI=-0.003, 0.141), while heterogeneity remained large (Chi-sq=92.64, Tau-sq=0.01, I-sq=85%).

FIGURE 7: FOREST PLOT OF MICROCREDIT AND WOMEN'S CONTROL OVER HOUSEHOLD SPENDING: QE STUDIES EXCLUDING OUTLIERS.

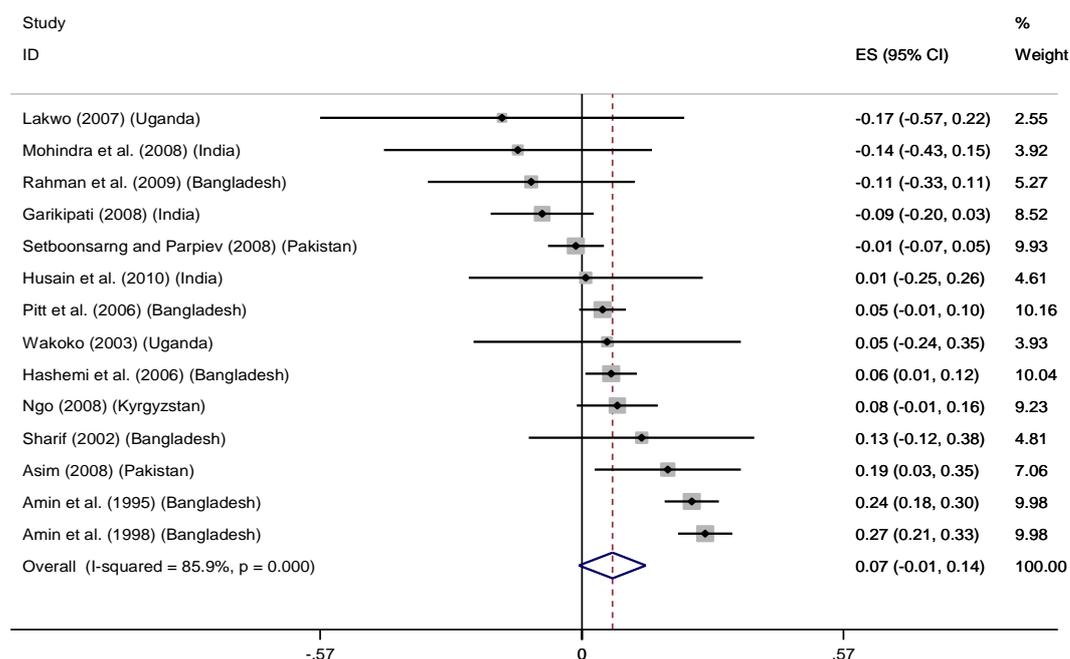


TABLE 8: META-ANALYSIS OF MICROCREDIT AND WOMEN'S CONTROL OVER HOUSEHOLD SPENDING: QE STUDIES EXCLUDING OUTLIERS

Panel A				
Study	SMD	95% Confidence Interval		% Weight
Lakwo (2007)	-0.174	-0.57	0.223	2.55
Mohindra et al. (2008)	-0.139	-0.431	0.153	3.92
Rahman et al. (2009)	-0.11	-0.335	0.115	5.27
Garikipati (2008)	-0.086	-0.198	0.026	8.52
Setboonsarng and Parpiev (2008)	-0.013	-0.074	0.048	9.93
Husain et al. (2010)	0.009	-0.246	0.263	4.61
Pitt et al. (2006)	0.045	-0.005	0.095	10.16
Wakoko (2003)	0.055	-0.236	0.346	3.93
Hashemi et al. (2006)	0.064	0.008	0.12	10.04

Ngo (2008)	0.077	-0.011	0.165	9.23
Sharif (2002)	0.13	-0.115	0.375	4.81
Asim (2008)	0.187	0.028	0.346	7.06
Amin et al. (1995)	0.239	0.18	0.298	9.98
Amin et al. (1998)	0.269	0.21	0.327	9.98
D+L pooled ES	0.066	-0.006	0.139	100.00
Panel B				
Heterogeneity chi-squared	92.38 (d.f. = 13) p = 0.000			
I-squared (variation in ES attributable to heterogeneity)	85.9%			
Estimate of between-study variance Tau-squared	0.0128			
Test of ES=0	z=1.79 p = 0.073			

Finally, given the large number of microcredit impact studies in Bangladesh, and the length and scale of engagement of microcredit organisations in that country, we examined whether there were systematic differences in results by location (Figure 8, Table 9). At first glance, the results suggest Bangladesh studies tended to show significant effects across studies, in contrast to elsewhere. However, few of the Bangladesh studies included in the meta-analysis used low threat to validity methods (and none used randomised assignment) and many were assessed as being of high risk of bias. It is necessary to control for these additional sources of heterogeneity before any conclusions for policy can be made, and indeed when we did control for risk of bias in meta-regression analysis we did not find any significant effects for Bangladesh studies (Table 12).

Figure 8. Forest plot assessing differences in effect by location: QE studies excluding outliers

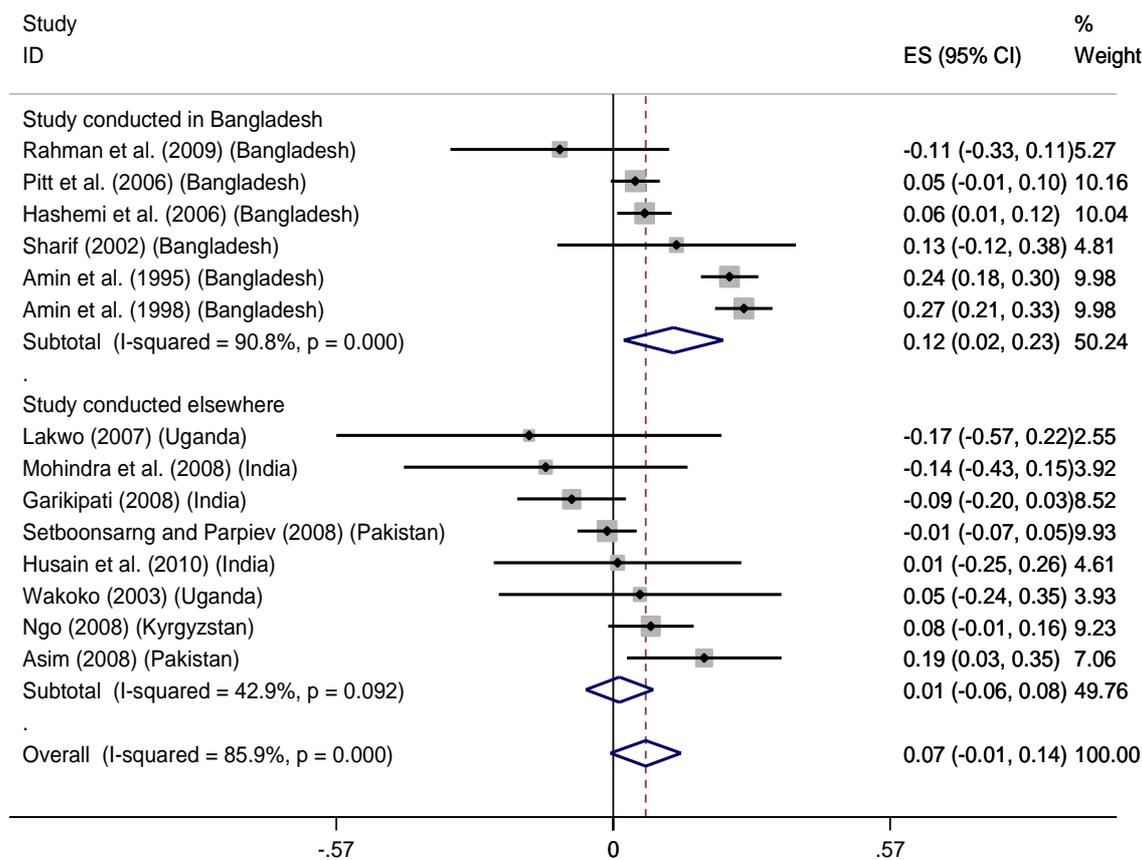


TABLE 9: META-ANALYSIS ASSESSING DIFFERENCES IN EFFECT BY LOCATION (EXCLUDING OUTLIERS)

Panel A				
Study	SMD	95% Confidence Interval		% Weight
Bangladesh studies				
Rahman et al. (2009)	-0.11	-0.335	0.115	5.27
Pitt et al. (2006)	0.045	-0.005	0.095	10.16
Hashemi et al. (2006)	0.064	0.008	0.12	10.04
Sharif (2002)	0.13	-0.115	0.375	4.81
Amin et al. (1995)	0.239	0.18	0.298	9.98
Amin et al. (1998)	0.269	0.21	0.327	9.98

D+L pooled ES	0.124	0.021	0.226	50.24
Other studies				
Lakwo (2007)	-0.174	-0.57	0.223	2.55
Mohindra et al. (2008)	-0.139	-0.431	0.153	3.92
Garikipati (2008)	-0.086	-0.198	0.026	8.52
Setboonsarng and Parpiev (2008)	-0.013	-0.074	0.048	9.93
Husain et al. (2010)	0.009	-0.246	0.263	4.61
Wakoko (2003)	0.055	-0.236	0.346	3.93
Ngo (2008)	0.077	-0.011	0.165	9.23
Asim (2008)	0.187	0.028	0.346	7.06
D+L pooled ES	0.013	-0.057	0.082	49.76

Panel B: Test(s) of heterogeneity:

	Heterogeneity statistic	d.f.	P-value	I-squared	Tau-squared
Bangladesh	54.43	5	0.000	90.8%	0.0128
Other location	12.27	7	0.092	42.9%	0.0035

Significance test(s) of ES=0

Bangladesh: $z = 2.37$, $p = 0.018$

Other location: $z = 0.36$, $p = 0.721$

3.4.3. Sensitivity analysis: risk of bias and study design

We explored the possibility that studies with weaker causal identification strategies tended to produce larger (upwards biased) effect sizes, using sensitivity analysis by risk of bias and study design assessment. We allocated a risk of bias category to each study based on study design, method of analysis, and quality assessment (Table 4). None of the studies from

which we could extract effect sizes could be rated as having a low risk of bias, with the remainder being categorised as either moderate or high risk of bias. Figure 9 and Table 10 present the sensitivity analysis by study design assessment, indicating, as shown previously, that more internally valid designs consistently showed smaller effects, with the evidence from RCTs showing no statistically significant effects.

Figure 9. Forest plot of effects of microcredit on women’s control over household spending by study design assessment

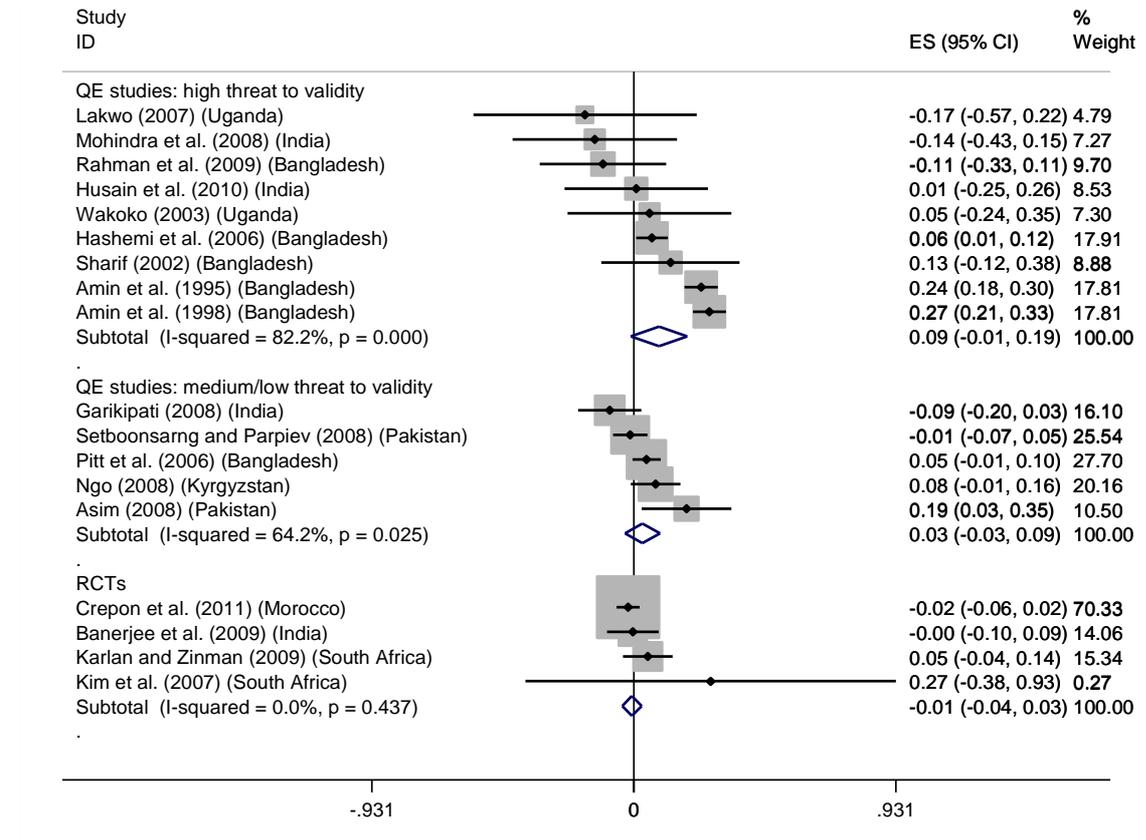


TABLE 10: META-ANALYSIS OF EFFECT OF MICROCREDIT ON WOMEN'S CONTROL OVER HOUSEHOLD SPENDING BY STUDY DESIGN ASSESSMENT

Panel A: Meta-analysis by study design assessment				
Study	ES	95% Confidence Interval		% Weight
QE studies: High threat to validity				
Lakwo (2007)	-0.174	-0.57	0.223	4.79
Mohindra et al. (2008)	-0.139	-0.431	0.153	7.29
Rahman et al. (2009)	-0.11	-0.335	0.115	9.70
Husain et al. (2010)	0.009	-0.246	0.263	8.53
Wakoko (2003)	0.055	-0.236	0.346	7.30
Hashemi et al. (2006)	0.064	0.008	0.12	17.91
Sharif (2002)	0.13	-0.115	0.375	8.88
Amin et al. (1995)	0.239	0.18	0.298	17.81
Amin et al. (1998)	0.269	0.21	0.327	17.81
D+L pooled ES	0.089	-0.011	0.189	
QE studies: Medium/low threat to validity				
Garikipati (2008)	-0.086	-0.198	0.026	15.77
Setboonsarng and Parpiev (2008)	-0.013	-0.074	0.048	25.52
Pitt et al. (2006)	0.045	-0.005	0.095	27.81
Ngo (2008)	0.077	-0.011	0.165	19.91
Asim (2008)	0.187	0.028	0.346	10.17

D+L pooled ES	0.032	-0.028	0.093		
RCTs					
Crepon et al. (2011)	-0.021	-0.062	0.02		8.15
Banerjee et al. (2009)	-0.003	-0.095	0.088		7.09
Karlan and Zinman (2007)	0.049	-0.039	0.137		7.18
Kim et al. (2007)	0.273	-0.385	0.931		0.82
Sub-total					
D+L pooled ES	-0.007	-0.041	0.027		
Panel B: Test(s) of heterogeneity:					
	Heterogeneity statistic	degrees of freedom	P	I-squared**	Tau-squared
QE studies: high	45.05	8	0.000	82.2%	0.0138
QE studies: medium/low	11.18	4	0.025	64.2%	0.0029
RCTs	2.72	3	0.437	0.0%	0.0000
Significance test(s) of ES=0					
High z=1.74 p=0.082					
Medium z=0.96 p=0.336					
Low z=0.40 p=0.690					
Overall z=1.81 p=0.070					

Figure 10 shows the forest plot and Table 11 the corresponding meta-analysis for quasi-experimental studies by risk of bias status. The results confirmed firstly that studies in which we suspected higher risk of bias appeared to systematically inflate effect sizes to the point in which, overall, the findings were marginally statistically significant. Secondly, the results suggested that much of the heterogeneity in effect sizes arose from the inclusion of high risk of bias studies in the analysis.

Figure 10. Forest plot of effects of microcredit on women’s control over household spending by risk of bias for quasi-experiments and regression studies

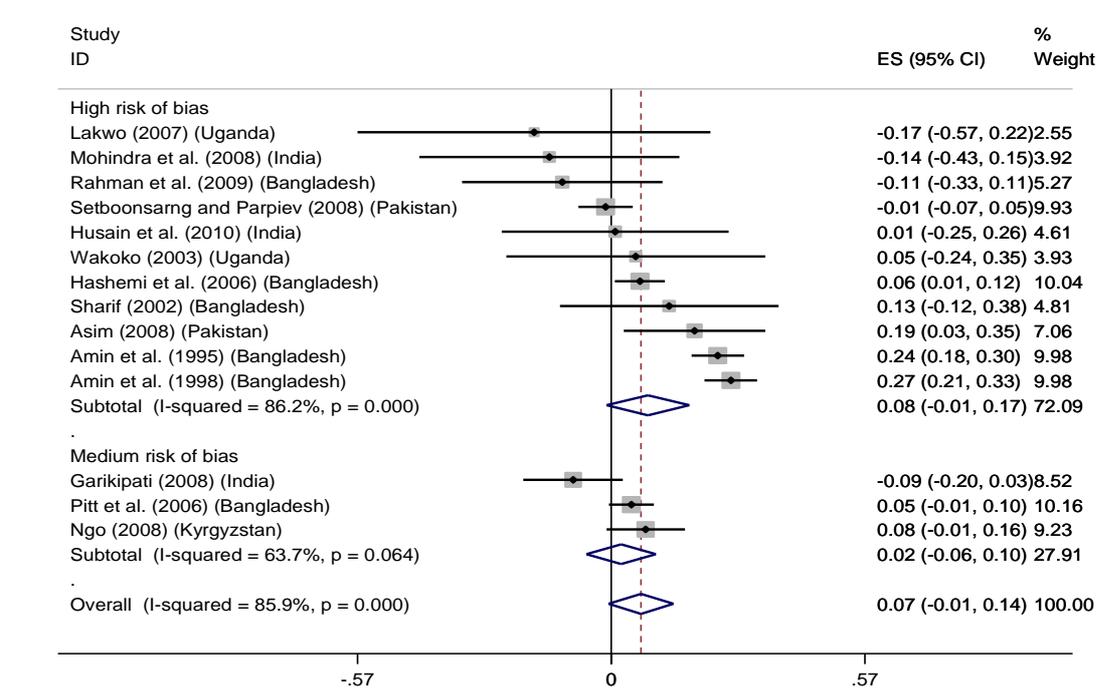


TABLE 11: META-ANALYSIS OF EFFECT OF MICROCREDIT ON WOMEN’S CONTROL OVER HOUSEHOLD SPENDING BY RISK OF BIAS (QUASI-EXPERIMENTS AND REGRESSION STUDIES)

Panel A: Quasi-experimental designs by risk of bias

Study	ES	[95% Conf. Interval]		% Weight
High risk of bias				
Lakwo (2007)	-0.174	-0.57	0.223	2.55
Mohindra et al. (2008)	-0.139	-0.431	0.153	3.92
Rahman et al. (2009)	-0.11	-0.335	0.115	5.27
Setboonsarng and Parpiev (2008)	-0.013	-0.074	0.048	9.93
Husain et al. (2010)	0.009	-0.246	0.263	4.61
Wakoko (2003)	0.055	-0.236	0.346	3.93
Hashemi et al. (2006)	0.064	0.008	0.12	10.04
Sharif (2002)	0.13	-0.115	0.375	4.81

Asim (2008)	0.187	0.028	0.346	7.06
Amin et al. (1995)	0.239	0.180	0.298	9.98
Amin et al. (1998)	0.269	0.210	0.327	9.98
Sub-total				
D+L pooled ES	0.082	-0.010	0.175	72.09
Medium risk of bias				
Garikipati (2008)	-0.086	-0.198	0.026	8.52
Pitt et al. (2006)	0.045	-0.005	0.095	10.16
Ngo (2008)	0.077	-0.011	0.165	9.23
Sub-total				
+L pooled ES	0.022	-0.056	0.100	27.91
Overall				
D+L pooled ES	0.066	-0.006	0.139	100.00

Panel B Test(s) of heterogeneity:

	Heterogeneity statistic	degrees of freedom	P-value	I-squared	Tau- squared
High risk	72.21	10	0.000	86.20%	0.0159
Medium risk	5.51	2	0.064	63.7%	0.0030
Overall	92.38	13	0.000	85.90%	0.0128

Significance test(s) of ES=0

High z=1.74 p=0.082

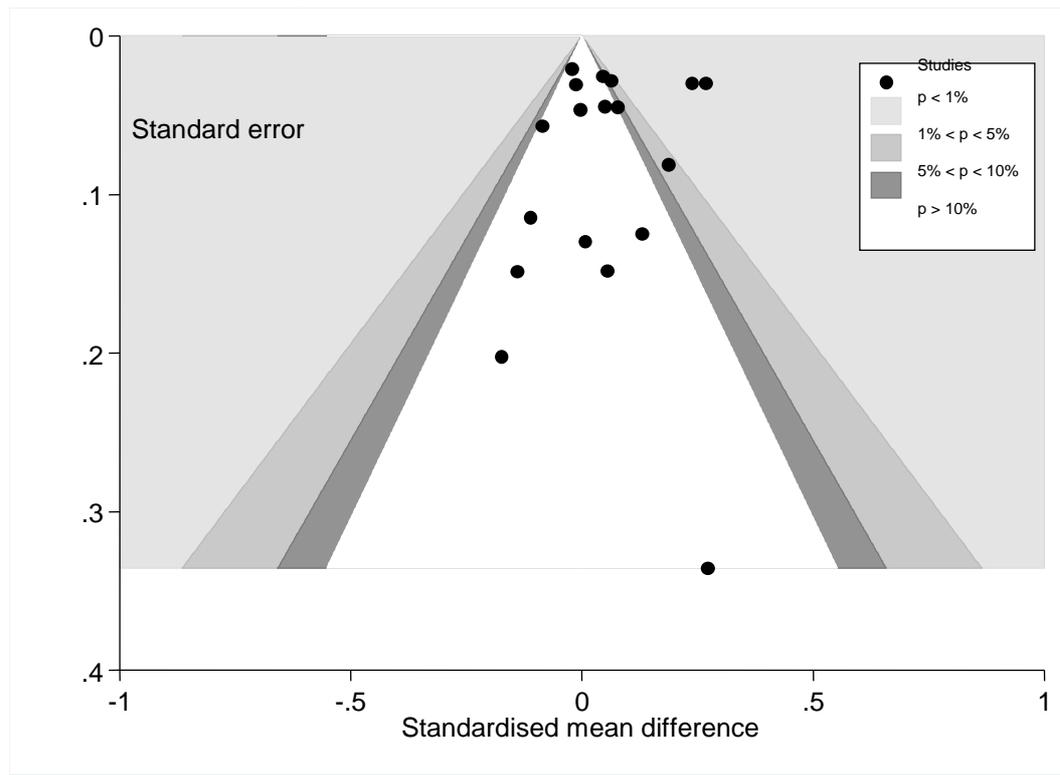
Medium z=0.69 p=0.487

Overall z=1.88 p=0.061

3.4.4. Analysis of publication bias

Examination of a contour-enhanced funnel plot (Figure 11) (Peters et al., 2008) did not suggest that there was asymmetry in the plots, although the effect sizes estimated by Hoque and Itohara are large and of low precision. The analysis therefore did not suggest there was evidence for publication bias due to underreporting of findings according to statistical significance, since the majority of studies are represented in the area of non-significance.

FIGURE 11. CONTOUR-ENHANCED FUNNEL PLOT OF MICROCREDIT AND WOMEN'S CONTROL OVER HOUSEHOLD SPENDING (EXCLUDING OUTLIERS)



Note: plot contains 18 effect sizes, excluding outliers (Hoque and Itohara, 2009; Holvoet, 2006).

Indeed, meta-regression analysis incorporating Egger's test (Egger et al., 1997), which regresses effect size on its standard error, suggested that statistical evidence for publication bias was not present (Table 12, specification 1). The meta-regression also suggested that any asymmetry was likely due to high risk of bias studies overestimating study effects, as indicated by the positive significant coefficient on the 'high risk of bias' dummy variable (Table 12, specification 2). Specification 3 includes a dummy variable for location in Bangladesh, which suggested that once risk of bias is controlled for, microcredit in Bangladesh is not more likely to lead to significant effects on women's control over household spending than in other locations.

TABLE 12: META-REGRESSION ANALYSIS OF SMALL STUDY EFFECTS AND STUDY LOCATION

Panel A									
	(1)			(2)			(3)		
	Coeff	t-stat	P>t	Coeff	t-stat	P>t	Coeff	t-stat	P>t
Standard error	-0.522	-0.85	0.408	-0.829	-1.38	0.188	-0.533	-0.85	0.412
1=high risk of bias				0.101	1.85	0.084	0.062	1.04	0.314
1=Bangladesh study							0.082	1.37	0.193
Constant	0.087	1.88	0.078	0.050	1.09	0.294	0.022	0.45	0.660

Panel B			
Number of obs	18	18	18
Tau-squared	0.010	0.007	0.007
I-squared	86.7%	81.2%	76.1%
Adjusted R-squared	1.25%	26.9%	35.5%
Model F		2.15	2.24
Prob > F		0.151	0.129

Note: analysis conducted using inverse-variance weights.

3.4.5. Concluding remarks on the meta-analysis

Four studies based on randomised design (Banerjee et al., 2009; Crepon et al., 2011; Karlan and Zinman, 2007; Kim et al., 2007) found no statistically significant effect of microcredit on women's control over household spending, individually or when pooled using meta-analysis. Of the remaining studies, the results of the meta-analysis suggest that the effect sizes were generally insignificantly different from zero, and when marginally significant were small. However, an analysis separating studies by design and by risk of bias status showed that results were relatively consistent between the two sets of studies, which could be taken as an indication of a certain degree of robustness of the meta-analytical results, albeit with experimental studies showing smaller effects which were not statistically significantly different from zero. In addition, we did not find robust evidence that studies conducted in Bangladesh where microcredit was pioneered demonstrated bigger effects over other locations.

The experimental studies appeared to be fairly homogenous in terms of between study effects, and we did not suspect there to be important sources of heterogeneity which meta-analysis would need to take into account. In contrast, a high level of heterogeneity within and between studies and the general reliance on observational studies and statistical analyses which were not reported in sufficient detail to enable confident judgment as to their

robustness, limited the confidence that we could place in the findings of the quasi-experimental studies. Quite a number of the studies came from works which were not peer-reviewed, and our general assessment of vulnerability to bias of the majority of studies was high.

While we did not find statistical evidence for publication bias due to small study effects, it is likely that there was a positive bias in the published effect sizes due to internal validity, as the meta-regression suggested. The statistically insignificant results for higher validity studies together with the likely prevalence of researcher bias (also known as researcher allegiance) and any tendency to publish positive and statistically significant results, suggested that the true average effect size across studies would be insignificantly different from zero.

Taking into account the evidence presented in this section, we can conclude that there is no evidence for a significant effect of microcredit on women's control over household spending.

3.5. Qualitative synthesis of included studies

How can we explain the non-existence of effects and heterogeneity in effects found across studies? The most important mechanisms for understanding the effect of microcredit on women's control over household expenditures are situational and action-formation mechanisms.

3.5.1. Situational mechanisms

Situational mechanism: availability and provision of money (i.e. the loan)

The availability and provision of money (as a loan) to women, linking microcredit and women's empowerment, is a situational mechanism. Several of the included studies made the point that an effect of microcredit on empowerment (also) depended on the amount of credit. Amin et al. (1998: 229) reported that "being empowered by their new sources of financial income and related credit-group supports, female recipients of NGO credits may have asserted their autonomy and authority vis-à-vis their husbands' restrictions and dominance in relevant household affairs". Hashemi et al. (1996: 643; 645) found in their data that "women who earn independent incomes and contribute to their families' support are likely to be empowered regardless of whether this is a result of their involvement in a credit program". Schuler and Hashemi (1994: 71) confirmed the idea that credit programmes "affect women's level of empowerment by strengthening their economic roles".

Some researchers like Wakoko (2003:180) suggested that it may not be only the fact that money is available but the amount of resources. "[For] ... women [who] had very small amounts of loans/total personal income ... [this] did not affect their decision-making role in a positive way. Larger loans, more equal to those of men might make a lot of difference in their power. It is possible that women may have received recognition and respect for their role in the home even though we don't observe a change in their decisions". Zaman (1998:17) and Zaman (1999: 21) looked into the access to resources. The results "support the view that greater access to resources in terms of micro-credit enhances female control (i.e. ability to sell these assets without asking consent) over her assets, controlling for a range of other factors". Sharif (2004: 479) also found that credit programmes indeed can increase women's capability but he noticed that "factors other than programme participation (such as age) can have as strong or stronger impacts on decision-making status". However, virtually all studies

in our sample explicitly or implicitly acknowledged the importance of the woman's (independent) financial contribution to the household income and livelihood and the associated steps toward empowerment²¹.

Situational mechanism: the financial situation of the household

Several studies made the point, that, in poor families, any income contribution to the family by a wife is of significant value for subsistence and may enhance her position in the family, give her leverage and increase her power in decision-making (Mizan, 1993; Hashemi et al. 1996; Lastarria-Cornhiel and Shimamura, 2008). The less wealth or income there is, the more welcome or needed is the female financial contribution, and the higher the potential for bargaining power for women. Amin et al. (1995:112) referred to a negative effect of household income and ownership of land on empowerment because of what can be labelled as social pressure (see also action-formation mechanisms), while Lastarria-Cornhiel and Shimamura (2008:49) showed that the "size of landholding has a negative and significant (at 0.05 level) coefficient for joint decision making and an almost equal but positive coefficient for male-head-only decisions. This seems to indicate that bigger landholdings increase male head's decision-making authority (on food consumption) at the expense of joint-decisions".

Rahman et al. (2009:300) found that "assets are positively related to women's empowerment", while Schuler and Hashemi (1994:70) also found that wealth had a significant positive effect on a women's status or level of empowerment in the villages where the Grameen Bank programme operated in their study. In the case of the latter studies, the positive associations may point to the fact that the likelihood that credit adds to an increase in empowerment of women with more assets or income may be lower than in cases where women have less income or assets.

Situational mechanism: the (demographic) composition of the (larger) household and the position of the women

As is the case on a societal level with the Easterlin effect²², the position of women in the household, the age distribution and the composition of the (larger) household are important situational mechanisms, affecting the potential impact of microcredit further down the chain. The number of (school aged) children is an example: having school age children increases a woman's dependence on her husband, because of her needs for financial and emotional support. Another example is that women that live with their husband and her parents in the same household experience more decision-making power than other women (Mizan 1993). According to the study, the presence of the woman's kin or others may affect decision-making power either as bystanders or by encouraging coalition formation. In the context of

²¹ Pitt et al. (2003, 2006) for example argued that credit programme participation leads to women taking a greater role in household decision-making, having greater access to financial and economic resources, having greater social networks, having greater bargaining power vis-à-vis their husbands, and having greater freedom of mobility. And Zaman (1998) stated that strengthening women's economic roles gives them more autonomy and more control over important decisions affecting themselves and their families, as well as contributing to their self-confidence and their ability to plan for the future. Hoque and Itohara (2009) described the following pathway to empowerment. When a woman uses the money (taken as loan from micro-credit NGO) by herself in any productive purpose then she can earn money and contribute to some extent to household income. Due to this contribution she can establish her control over the family decision-making process and other family affairs and thus ultimately improve her position in the family.

²² The Easterlin effect refers to a macro mechanism describing cyclical changes in demographic and social behaviour as the result of fluctuations in birth rates and cohort sizes.

Bangladesh, when a wife's parents live nearer, the woman's control over her share of her family's property becomes better protected. This reflects coalition formation with her kin group and may increase her power^{23 24}. Sharif (2004: 476-477) analyzed family composition and showed that the greater the number of adult sons a woman has, the smaller the likelihood of having decision-making power, other things being equal. Also several other demographic composition variables were investigated like the presence of a second wife.

Situational mechanism: the division of labour, the balance of decision-making power in households and compliance with (traditional) norms

Several studies (Asim, 2008, Mohindra et al., 2008 and Sharif, 2004) argued that an absence of impact or a limited impact of microcredit on empowerment might be the result of the existing "balance of power" within the household. Asim (2008:44) reported that when the role of women in household decision-making is not changed first, obtaining a loan is unlikely to achieve that. This author did not find impact of microcredit programmes because women had already "been given the bargaining power in these decisions commensurate with the prescribed gender norms of the society [...]. However when it comes to decisions relating to major household decisions like purchase of assets, house repairs and sale/purchase of house, women do not have much say. [...] The unconditional mean values for those decisions have a value of about 2 on a scale of 5 suggesting that female preferences are rarely or never considered for these household decisions" (Asim, 2008:48). He also suggests "that on average women in the treatment group are no more independent or autonomous than the control units, even when it comes to decisions relating to small household purchases. This further reinforces our earlier findings that women have reached a certain threshold level of independence within the structural norms of the society and microcredit has no marginal impact on all such indicators" (Asim, 2008:49). These findings point to a ceiling (or threshold) phenomenon. Mohindra et al. (2008) argued that initial levels of decision-making agency have to be taken into account; as it is relatively easy for women to move toward "joint" decision-making, it is much more difficult going beyond that, except for those who are at this level to begin with.

Ngo (2008: 86) mentioned a similar threshold phenomenon. "If programme beneficiaries come from households where women enjoy high levels spousal cooperation or are already 'empowered', the impact on the intra-household allocation of resources [...] is likely to be small". Ngo (2008) also observed that in case loans were small in size and mostly used to finance activities that were traditionally controlled by men, there was little effect on empowerment. The primacy of married life and limited options for women outside marriage were drivers. If economic opportunities lie outside the traditional realm of the female spouse and exit options for women are severely limited, then she will be better-off ignoring them in order to preserve her social ties within the community. Thus, the empowering potential of microfinance is necessarily circumscribed by prevailing gender norms, unless alternatives

²³ This can also be linked with the different household models and threat points (see Appendix 2).

²⁴ Another demographic characteristic that influences the chances of microcredit having an impact is the age of women. Mizan (1993) found that older women in the family are more empowered; it was explained by the alleged increased strength and self-confidence achieved by older women. He added that this should be understood in the context of rural Bangladesh where traditional norms predominate and the elderly are unquestionably revered. Also, in Bangladesh, age may reflect other critical life cycle factors such as motherhood and becoming a mother-in-law which may work as a cultural resource in decision-making power.

are offered to women that strengthen their outside options in a credible manner (Ngo, 2008:90-91). The same author (2008: 92) “showed that the intra-household sharing rule [i.e. of credit/loans] may become more biased against the disempowered spouse if the initial distribution of resources within the household is highly unequal”. This could strengthen inequalities between men and women. In Asim’s (2008) study on membership in credit organizations, it was also found that when women have reached a certain threshold level of independence and autonomy within the structural norms of the society, microcredit has no marginal impact on these aspects, even when it comes to decisions relating to small household purchases. They have been given the bargaining power in these decisions commensurate with the prescribed gender norms of the society²⁵.

Situational mechanisms: the opportunity structure related to other activities

Amin et al. (1998:232) found that “when asked to discuss the benefits that people are deriving from NGOs, most of the loanees pointed out their various positive elements. According to them, NGOs not only provide loans, but also provide *various other welfare services*”. This finding highlights that the presence of microfinance organizations in many contexts presents opportunities for women that go beyond the availability and use of loans²⁶.

In our initial theoretical model ‘resources’ constitutes one of the three central elements. The availability and use made of resources is to some extent dependent upon situational mechanisms, like the ones we found in this review. *Availability of money* is one of these, but when money is available, other situational mechanisms like the *financial situation* of the household prior to obtaining microcredit and its *demographic composition*, together with the existing *division of labour and gender relations* in the household, can shed more light on the relationship between the available ‘resources’ in terms of microcredit, the use made of it and the level of empowerment. Threshold effects can also play a role²⁷.

3.5.2. Action-formation mechanisms

Action-formation mechanism: awareness-raising of women (through media exposure)

Access to media is believed to make women aware about their rights and scopes and women having access to media will be more empowered compared to the women who do not have such access. Zaman (1999: 23) for example found that “there is a positive effect of (BRAC’s) credit on [two of the] knowledge/awareness indicators even after controlling for female education variables. Whilst an obvious limitation of the data is not knowing whether any of the ‘knowledge’ is actually put into practice, greater legal and political awareness is

²⁵ Regarding the capacity of networks to exclude members, see Aviram (2003: 63) who put it as follows: “the network wields a significant sanction over its members, in the form of exclusion (or suspension) from the network..... A network is in excellent position to coordinate members’ sanctions, and through exclusion denies from the offending party the network benefits conferred by the other members”.

²⁶ We did not study this aspect in detail. In fact, in most studies it was impossible to determine whether credit was the only intervention at work (in tandem with credit). Membership of a solidarity group, the social interaction among peers as well as the social pressures, can have a significant effect on empowerment processes. See also below in the discussion on action formation mechanisms.

²⁷ In one of the studies (Amin et al., 1998:229) attention was drawn to the role of Islamic religion as a restricting factor for empowerment. Although the authors found that “[the] heavy concentration of NGO activities in the central and north-central regions may have raised women’s empowerment, ... it is also well known that the relatively higher’ female autonomy in the northern region may result from less Islamic influence”. As we did not find similar cases of constraining or restricting situations discussed, we have not gone into detail.

argued to be an important first step towards raising female consciousness of her rights within the household and in the community at large". In other words, the confluence of having access to credit and to media is more likely to affect decision-making power within the household.

Action-formation mechanism: education of husbands encouraging women's empowerment

Rahman et al. (2009) found a positive relationship between the education of the husband and empowerment of the wife. According to the study this may be interpreted as an indication that a younger and educated male (could be husband or father) encourages a female to be empowered. Amin (1995:108) also found a relationship with the husband's (and wife's) education, assuming that "these proxies are the causes rather than the effects of women's empowerment". See also Rahman et al. (2009:300): "the most interesting finding is the age and education of the male partner. It appears that young and educated males encourage females to be more empowered". An unresolved issue is the direction of causality as suggested by Amin (1995). Whereas credit may have a positive effect on decision-making when in fact the husband is more open to such a change (e.g. as reflected in a higher level of education), it may also be the case that educated men marry more empowered women in the first place.

Action-formation mechanism: entrepreneurial drive ('spirit')

"Among households who did not own a business when the programme began, those households with low predicted propensity to start a business do not increase durables spending, but do increase nondurable (e.g. food) consumption, consistent with using microcredit to pay down more expensive debt or borrow against future income. Those households with high predicted propensity to start a business, on the other hand, reduce nondurable spending, and in particular appear to cut back on temptation goods, such as alcohol, tobacco, lottery tickets and snacks eaten outside the home, presumably in order to finance an even bigger initial investment than could be paid for with just the loan" (Banerjee et al., 2009: 20). This "entrepreneurial spirit mechanism" consists of combining opportunity recognition, risk tolerance, and self-confidence; the more women are characterised by such a spirit, the larger the chances are that they start new businesses²⁸.

Action-formation mechanism: women's pride, self-esteem and 'self-efficacy'

According to many studies gainful employment will impart pride and self-esteem in female borrowers. Lakwo (2007) explored how microfinance affected women's reflection of themselves. It was found that women were generally proud of who they are, given the assets they acquired. They had proudly taken up hitherto socially accepted roles of men, such as making direct cash contributions to their household's well-being and paying for poll tax for their husbands and for the bride price both for themselves and their natal brothers. Equally, they were proud of creating jobs for their husbands and gaining in functional money management skills like calculating profits and keeping separate business from household money. Hoque and Itohara (2009) found, in line with this, that when a woman uses the money (taken as a loan from a microfinance organization) by herself on behalf of a productive purpose, she not only can earn money and contribute to some extent to

²⁸ Entrepreneurs are individuals who are more likely than others to be "alert" to the identification and exploitation of profit opportunities (Kirzner (1973).

household income, but can also establish her control over the family decision-making process and other family affairs and thus ultimately improve her position in the family. The (social) psychological mechanism that is at stake is 'self-efficacy': the larger the belief in one's capabilities to organise and execute the courses of action required to manage prospective situations (or, in other words, the more a person believes in his or her ability to succeed in a particular situation), the more this person is able to realise the behaviour. In Zaman's studies (1998, 1999), it was suggested that credit programmes affect women's levels of empowerment by strengthening their economic roles, and in other ways as well. Strengthening their economic roles gives them more autonomy and more control over important decisions affecting themselves and their families, as well as contributing to their self-confidence and their ability to plan for the future.

Action-formation mechanism: microcredit programmes can help women to participate in the outside world and interact with others, and by doing so create social capital which in turn may lead to new ideas and insights and a change in power relations

A necessary condition to be able to work outside the household is to be allowed a greater mobility and freedom to move outside the immediate vicinity of the home independently and to interact with strangers. This is an important condition for empowerment in cultures that confine the woman to the home, like in Bangladesh, where the majority of the studies in our batch of included studies have been conducted. Participation in credit solidarity groups gives the women socially legitimate reasons to move outside the home and to associate with one another in public spaces (Schuler and Hashemi, 1994). This is of particular importance in cultures that restrict women's movements outside the home. The group's activities create new social contacts and they might create a new "shared" identity and identification with the group. These might be the first of participants' associations apart from marriage or the household. This new bond makes it easier for the women to resist the tight strictures of the traditional family and to adhere to the regulations of the program. They become a new source of social support and a kind of countervailing power against pressures from the family.

Amin et al. (1995:108) and Amin et al. (1998: 233) linked the exposure to the outside world to an increase in women's self-confidence and self-reliance, enhancing their empowerment. Schuler and Hashemi (1994: 73) added that when a microcredit programme gives the women socially legitimate reasons to move about and to associate with one another in public spaces, these meetings will increase their mobility and visibility, which will, subsequently, expose them to new ideas, which will then help them to become more confident and more skilful at interacting in the public sphere. Hashemi et al. (1996: 641) also reported that "the longer a woman is a member of either BRAC or Grameen Bank, the greater the likelihood that she will be empowered based on these indicators, and the more likely she is to make a substantial contribution to her family's support". Pitt et al. (2006: 817) suggested that "credit programs lead to women taking a greater role in household decision making, having greater access to financial and economic resources, having greater social networks, having greater bargaining power vis-à-vis their husbands, and having greater freedom of mobility". The underlying mechanism was outlined by Burt (2004): people with cohesive social networks tend to think and act the same and in the long run. People who reach outside their social network not only are often the first to learn about new and useful information, but they are also able to see how different kinds of groups solve similar problems. The new social

contacts, allegiances and information are also a new source of support in intra-household bargaining power.

Action-formation mechanism: skill-building and developing new competences as a result of outside employment and participation in (credit) groups and networks

Participation in work and credit organizations not only can increase social capital but can also increase human capital: knowledge and skills. Women can use these resources in marital decision-making. Mizan (1993) argued that participation in bank activities “imparts expert bases of power”, through which the borrower can bring skills, expertise and competence in decision-making into the family. Specifically, through their occupational activities, the female borrowers might gain functional money management skills like calculating profits and keeping separate business from household money (Lakwo, 2007)²⁹. Lakwo (2007:143) also described how women, as they receive loans, enter into the world of “added obligations with both their group members and the bank, which requires them to adopt or adapt their livelihood strategies in order to ably meet their loan obligations. By so doing, they experience changes in their gender relations due to the changing claim-making rights in regards to access to, ownership over, and participation in decision-making on livelihood assets and strategies.

Within these different domains, the various facets of power operate. For instance, driven by the ‘power to’ engage in business, women use their ‘power with’ other actors to identify and invest in the existing markets while taking into consideration stocking and profit gains. By so doing, they gain ‘power over’ their investments. This gain in turns changes their ‘power within’ as they become able to do what they were not able to do before³⁰. The new world they have entered and the very fact of learning how to accomplish dealing with financial situations is believed to stimulate women to participate effectively in power activities and games of a *broader nature*³¹. Amin et al. (1995:108) also stressed the importance of being a member of a credit organization. Holvoet (2005:96) referred to the role that enhanced awareness (training) can have. “Whereas direct credit delivery to women by itself is not sufficient to produce a substantial impact on decision-making patterns, the opposite is true when credit is channelled through women’s groups and combined with technical and social awareness training. Comparing effects of IRDP Female and TNWDP Myrada Young credit schemes shows major shifts in decision-making patterns from norm-following and men deciding alone towards more bargaining and women deciding alone.....Our data further suggest that more frequent meetings, more intensive training and more investment in building groups create more additional effects than longer group membership [on women’s decision-making power]. The duration of being a group member also is reported to be an important factor. [.....] These effects are even more striking when women have been members of a group for a longer period and in particular when more attention is given to genuine social intermediation” (Holvoet, 2005:97).

²⁹ See also Holvoet (2005, 2006). On the relationship between extra-household and intra-household bargaining, see also Agarwal (1997) and Wakoko (2003).

³⁰ One could speculate if behind this finding a different mechanism is active, i.e. the creation of obligations outside the family and bonds, which can lead to outside employment which in turns can lead to more bargaining power.

³¹ This is strongly related to the skills mechanism and the enhanced self-esteem mechanism.

Action-formation mechanism: peer pressure, knowing to be monitored and blaming, naming and shaming

Holvoet (2005) argued that peer pressure and the availability of a group fund, which the women see as a lender of last resort for consumptive and emergency purposes, increased the probability that the loans were effectively used for the intended productive purpose. The women also felt that their position in the household had improved as they had secured access to long-term financial resources through their personal savings account and the group fund. Hoque and Itohara (2009) made a point that is related. They highlighted the phenomenon of women *knowing that they are 'monitored' (by the microcredit organization)*. To some extent there also is a *naming, blaming and shaming mechanism* at work. As pointed out by Hashemi et al. (1996:650): "Grameen counsels women to help them hold on to their loan money when their husbands try to take it away from them. Grameen communicates to the men, through the women, that if their wives fail to make loan repayments their names will be mentioned in public, and they may face embarrassment and harassment by visiting Bank staff and members. At the same time, the men see that families who pay their loans on time immediately receive subsequent loans, that if they follow the rules they are ensured continuing access to larger and larger amounts of credit". Pawson (2010) has analysed how this 'pillory mechanism' works in general. This mechanism can have different outcomes for decision-making power of the woman within the household.

Action-formation mechanism: rituals

Schuler and Hashemi (1994:73) analyzed Grameen Bank (GB's) approach to microcredit in which chanting, saluting and other rituals appears to be more effective than BRAC's in strengthening women's autonomy (indicated by difference in effect on contraceptive use) and in performing the rituals the woman develops a strong identification with the group. This bond makes it easier for her to resist the tight strictures of the traditional family and to adhere to the regulations of the program. Hashemi et al. (1996:648) also found that "through the rituals of participation, and the contact with other members of their credit group, the women develop[ed] an identity outside of their families". Rituals (Winthrop, 1991) can be seen as "formalized, socially prescribed symbolic behaviour" and are believed to be relevant in changing behaviour and/or in reinforcing (newly learned) behaviour. According to Turner (1969 quoting Wilson 1954: 241) "rituals reveal values at their deepest level...men express in ritual what moves them most, and since the form of expressions is conventionalized and obligatory, it is the values of the group that are revealed". It is assumed that rituals related to microcredit are an important mechanism that can contribute to the empowerment of women.

A second crucial process referred to in our initial theoretical model is 'agency'. 'Agency', both individual and collective, appears to be a shortcut for jointly operating mechanisms, drawing on cognitive, behavioural and social processes, ranging from on the one hand learning from new insights through social action, being more competent and capable in household negotiations and increased self-efficacy to on the other hand stimulating the entrepreneurial spirit and taking part in microcredit 'rituals'. In that sense one can say that by linking the overall concept of 'agency' to these and other 'action-formation mechanisms', the *'agency black box'* has become more transparent.

3.5.3. Transformational mechanisms

*Transformational mechanism: increased social capital, increased levels of 'personal agency' and selective incentives lead to the "collectivization" of individual problems, "collective agency" and subsequently to collective actions*³²

Holvoet (2005) distinguished microcredit programmes that use groups as financial intermediaries only (little more than a substitute for conventional collateral) from those that consider groups to be genuine social intermediaries. The latter stress their 'transformatory' potential and use access to credit as a selective incentive to mobilise women and to stimulate collective action. In some cases, these types of women's groups gradually evolved into actors of local institutional change. While, female members became increasingly involved in extra-household bargaining with community members, they in fact strengthened their individual fall-back position within the household. Holvoet (2006) claimed that the activities of these women's groups can lead to awareness raising, to more public action, and social change. It is essential in this respect that a social intermediary function should be built upon the mechanism of financial intermediation. By creating a forum for the sharing of everyday life experiences, women may come to realise that most of their experiences are 'collective' rather than 'individual', and they may gradually become aware of a link between their own condition of 'relative deprivation' and broader socio-economic structures. This will essentially lead to the 'collectivization' of individual problems and to the unveiling of such underlying structural causes as 'gender'. This author explicitly referred to the working of the selective incentive mechanism (Olson, 1965), which may thus³³ trigger collective action as a kind of by-product. Credit, for instance, clearly has the potential to act as a 'selective incentive' for women to become involved in women's groups (Holvoet, 2006).

*Transformational mechanism: the 'diffusion' / 'spill over' or demonstration mechanism*³⁴

Three of our included studies discussed a 'diffusion' or 'spill over' effect of microcredit on empowerment. According to Schuler and Hashemi (1994) residence in a village with a microcredit programme had a significant effect on women that did *not* participate in the program. This positive effect of the programme seems attributable to its effectiveness in strengthening women's economic roles through credit and in other ways as well. Amin et al. (1998) found higher levels of empowerment in certain regions of Bangladesh and suggests that a diffusion effect might be in play. Rahman et al. (2009: 301) referred to a 'demonstration effect' to 'explain' absence of (discernible) impact, suggesting "intensive microcredit intervention in the rural economy is leaving a demonstration effect on every person, thereby making even non-borrowers as empowered as borrowers". To some extent this may even be the prelude to a tipping point mechanism.

Transformational mechanism: the achievements of using microcredit loans in terms of women's empowerment in household decision-making

Achievements at individual and household levels are in the realm of action-formation mechanisms. An additional dimension is how these achievements translate into collective

³² It is clear that the action-formation mechanism 'social capital' is related to this mechanism.

³³ It may, however, also train respondents in studies on microcredit and empowerment to become more complacent or become more aware of "correct" answers.

³⁴ The Demonstration Effect theory is not applicable here because it refers to a different mechanism (see Mitrut and Wolff, 2009).

effects. Here 'transformational mechanisms' are important (Opp, 2011). In our batch of selected studies only a few of these mechanisms were referred to³⁵: i.e. collective efficacy through selective incentives of a social nature and the diffusion and demonstration mechanism.

3.5.4. Conclusion

To conclude, we found an interesting array of behavioural mechanisms at work, most importantly five different situational mechanisms and eight different action-formation mechanisms, in the context of causal relationships between microcredit and women's control over household spending. Due to several factors – different contexts (e.g. gender relations), differences and lack of clarity regarding independent variables (e.g. credit versus participation in a solidarity group) and, despite our review's focus and selection of studies, different outcome proxies – we were not able to construct more complete causal theories at the level of microcredit around the world.

³⁵ This in part has to do with the focus of our review, i.e. on situational and action-formation mechanisms.

4. Conclusions

4.1. Summary and concluding remarks

Women's empowerment in relation to microcredit has been studied extensively within the context of microcredit schemes. Most of these studies have been carried out in South Asia. An important dimension of empowerment concerns women's control over household spending. This review focused on the impact of microcredit interventions on this aspect of women's empowerment and the circumstances under which this occurs. It contributes to an existing number of systematic reviews of the effects of microcredit (Stewart et al., 2010; Duvendack et al., 2011; Stewart et al., 2012).

The main objective of this review was to assess the effects of microcredit on women's control over household spending in developing countries. We adopted an approach in which we emphasised the construct validity of our analysis and the opening of the 'black box' of microcredit in relation to women's empowerment. At the same time we ensured that only studies of reasonable quality in terms of the internal validity of findings were included in the review, on the basis of rigorous assessment of internal validity. As a result, the review included not just randomised experiments but also quasi-experimental (e.g. propensity score matching) and regression-based studies (e.g. panel data regressions). We also looked at the question of how microcredit interventions might affect outcomes. We focused on the theoretical mechanisms that are believed to make microcredit programmes work. We brought in existing theoretical research about this issue, which provided a basis for searching for key mechanisms in the empirical studies that were selected in this review.

Of the 6,000 hits (or 1,950 individual studies after duplicates were removed) in web-based search engines, targeted searches in journal and books, backward and forward tracking of references, and so on, we identified an initial number of 310 papers that were selected for full text examination. Of these, 56 were considered to be of relevance to our scope, meaning that they focused on the relationship between microcredit and women's empowerment (as dependent variable) as expressed through one or more aspects of women's control over household spending. After subsequently applying methodological quality criteria, we selected 29 papers to be included in the review, covering 25 independent studies.

We subsequently performed an in-depth quality assessment of the included studies. Overall, both in terms of the methodological quality and quality of the theoretical framework, most of the included studies showed serious weaknesses, an aspect which inevitably compromised the level of depth and generalization we could achieve in the synthesis phase.

After collecting descriptive information on all included studies and the quality assessment we proceeded with the synthesis phase. The results of the meta-analysis suggest that the effect of microcredit on women's empowerment as measured by control over household spending was not statistically significantly different from zero. Those studies which did find an effect were assessed as being of high risk of bias and produced effect sizes which were in any case small. Consequently, we can conclude that overall there is no evidence for an effect of microcredit on women's control over household spending.

As discussed in Chapter 1, women's control over household resources constitutes an important intermediary dimension in processes of women's empowerment. Given the overall lack of effect of microcredit on women's control over household resources it is very unlikely

that microcredit has a meaningful and substantial impact on empowerment processes in a broader sense. While the latter type of impact may have occurred in particular contexts, overall the evidence suggests that this is not the case³⁶. As a result, there appears to be a gap between the often optimistic (societal) belief in the capacity of microcredit to ameliorate the position of women in decision-making processes within the household on the one hand, and the empirical evidence base on the other hand.

Our conclusions on the effects of microcredit on empowerment are also in line with those by Duvendack et al. (2011) and Stewart (et al. 2010) who reported to a limited extent on empowerment effects. The previous three systematic reviews included broader interventions (microcredit, micro-savings and micro-leasing) and outcome measures. However, the focus of the present review on empowerment enabled us to perform statistical meta-analysis (albeit subject to challenges as described in section 4.2³⁷), and a search for behavioral mechanisms underlying programme impacts.

Figure 12 summarises the mechanisms identified in the synthesis phase. It should be noted that our review was optimised towards uncovering action-formation mechanisms (and to a somewhat lesser extent situational mechanisms), as this type of mechanism is most directly related to the causal linkages between microcredit and women's control over household expenditures. Our search was comprehensive and unbiased, given our inclusion and exclusion criteria, with respect to this type of mechanism. The other two types of mechanisms helped situating the action-formation mechanisms in a broader context. Our review was not set up to cover transformational mechanisms comprehensively.

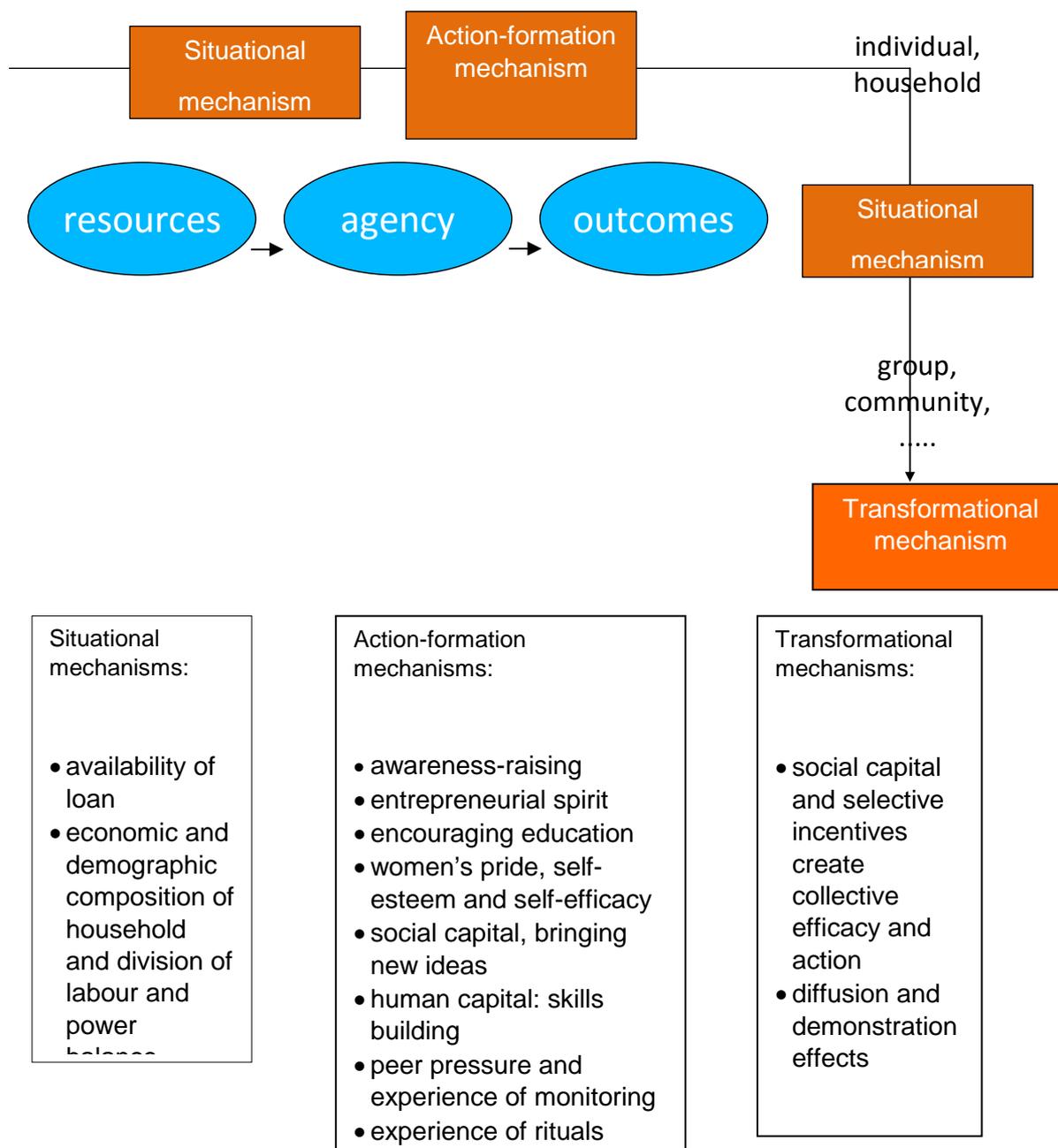
What Figure 12 shows is that microcredit, in order to lead to women's empowerment through women's control over household spending, has to trigger behavior through a diversity of mechanisms. These are not only those that deal with situational factors like the demography and poverty levels of female clients and their households, but also sociological ones like social capital and peer pressure and psychological ones such as self-efficacy and self-esteem. Mechanisms of a more hybrid nature like the ritualization women go through when they obtain microcredit are also assumed to play a (positive) role. However, microcredit programmes not only focus on changing individual behavior but also on making a difference at a more macro level (communities, regions). These processes are guided by transformational mechanisms that resemble the tipping point mechanism, diffusion of innovation and (Olson's) 'selective incentives'.

From the identified mechanisms at work we can conclude that the way in which microcredit is delivered, in combination with the given gender relations context, seem to determine to a large extent whether or not microcredit can make a difference for women's decision-making power and control over resources in the household. To address this issue in more detail, and to develop generalizable conclusions about how microcredit affects women's decision-making power across different contexts, a different (complementary) review approach is needed.

³⁶ See also Appendix 1 for the underlying theoretical discussion on when to expect particular processes of empowerment.

³⁷ Despite a narrow focus on one outcome dimension (women's control over household spending), there was still quite a lot of heterogeneity in the underlying proxies used in the different studies included in this review.

Figure 12. Key mechanisms with respect to microcredit, women’s control over household expenditures and wider processes of empowerment



4.2. Limitations

Some discussion is warranted of the extent to which our analysis has generated valid conclusions about the effect of microcredit on women’s control over household spending. Both the topic of review and the nature and quality of the evidence base have made this review particularly complicated. Limitations of the studies constrained both the quantitative and qualitative part of the synthesis and can be summarised under the following points:

- Our general assessment of vulnerability to bias of included studies was high. Under these circumstances meta-analysis (or other methods of synthesis such as ‘vote counting’) without rigorous risk of bias assessment and sensitivity

analysis would have risked inflating statistical significance by combining relatively poor quality studies each of which at best yielded only marginally significant results. At the same time these studies are vulnerable to unknown biases which are likely to inflate both effect sizes and confidence levels, as the meta-analysis of higher validity studies demonstrated.

- The context-specificity of gender relations and correspondingly of empowerment processes made it difficult to generalise beyond the study context.
- There was a bias in the literature in terms of regional coverage and therefore externality validity of findings for other regions; about two thirds of the included studies were conducted in Bangladesh and India.
- There was substantial diversity across studies in terms of operationalizing the construct of women's empowerment, even within the confines of our cross-cutting focus on women's control over household spending.
- There is a lot of diversity in microfinance organizations and the exact intervention delivered to microfinance clients (including microcredit and linkages with other interventions)³⁸. These factors are only very partially captured by impact studies.
- The potential 'dark side' of microcredit is under-researched. Impact studies and especially those containing quantitative analysis underreport (or mostly do not report) on the negative aspects of microcredit such as the psychological stress of carrying debt or the use of microcredit as a tool for men to strengthen their power over women (see for example Goetz and Sen Gupta, 1996).

The review approach used in this review is in line with common practices in systematic review and meta-analysis, but essentially differs in two aspects. First, we included experimental, quasi-experimental and regression-based studies in the statistical meta-analysis, provided studies used methodological design criteria to address attribution issues.³⁹ As noted in Becker and Wu (2007), multivariate effect sizes from different which use different regression specifications are not strictly comparable. All studies included in the analysis used regression adjustment. However, the studies do not control for the same covariates which means that the effect sizes may differ where there is any correlation between treatment status and these covariates.

Secondly, we were able to identify behavioral mechanisms from a relatively large batch of studies which at the same time show evidence of addressing the attribution problem. Following Van der Knaap et al. (2008) we applied a review approach that combines the idea

³⁸ We were unable to isolate the credit effect from other associated 'interventions' on the independent variable side. In fact, in most studies it was impossible to determine whether credit was the only intervention at work. However, several of the identified mechanisms highlight the importance of membership of a solidarity group in triggering change, as the social interaction among peers can have a significant effect on empowerment processes.

³⁹ In addition, one aspect of analysis typically incorporated in Campbell reviews was not followed: we used Cohen's *d* rather than Hedges' *g* (small sample corrected) SMD estimator, given the large sample sizes used in studies in the review (mean sample size=1,470; median=787; minimum=100; see Appendix 6).

of hierarchy of evidence (i.e. selecting studies with a credibility in terms of internal validity of findings) with a theory-based ('realist') review approach, focused on unpacking the causality between microcredit and empowerment. However, we did not attempt to articulate an overall theory of change. Instead we focused on capturing patterns of regularity, mechanisms, which explain part of the causality between microcredit in a broad sense and aspects of women's control over household spending. In our exercise of identifying and articulating mechanisms we only focused on the information to be found in explicit statements by authors of primary studies on causal relations. An alternative more accurate approach would have been to reconstruct patterns of regularity by systematically collecting any information from studies that could provide insights into the nature of the intervention, the context, the target group, and so on, in order to infer the 'how' and 'why' of proven (absence of) causal relationships. This task would not only have been more cumbersome, it would also likely have proven to be unproductive, especially given the lack of detail on these issues in the more rigorous impact studies (e.g. those based on randomised designs). As in other fields, there is an 'evidence paradox' where the most rigorous studies in terms of internal validity often provide the least information on the nature of causality.

However, the study was limited by the exclusion of qualitative studies in examining the causal mechanisms component of the synthesis. We excluded these studies because, while in general they provide more detail about the nature of causal processes, they lack the appropriate basis for generalizable causal inference. While it would have been useful to take into account purely qualitative studies, overcoming the hurdles of obtaining an unbiased and comprehensive selection of studies and to properly match these with the quantitative studies remained a challenge that was beyond the scope of the review.

4.3. Deviations from protocol

The following deviations from protocol were made:

- The detailed assessment procedures for assessing study design and risk of bias were not provided in the protocol; the approach follows the tool developed by 3ie in 2012.
- Sensitivity analyses that were not noted in the protocol, include the removal of two outlier observations, and the analysis of heterogeneity by location.

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Appendix 1: The relationship between credit and women's empowerment⁴⁰

The rationale for the use of group intermediation is mostly based upon financial profitability and sustainability reasons (see e.g. Hoff and Stiglitz, 1990; Huppi and Feder, 1990). Group intermediation leads to a decline of transaction costs and information costs (particularly important in the context of widely scattered rural populations who lend small amounts) and to an increase of repayment rates (as a result of peer pressure). Group intermediation through the use of women's groups even has the tendency to further increase repayment rates (and financial profitability and sustainability). This is particularly the case where group intermediation is used in a context (e.g. rural areas in developing areas) where gender norms (of female obedience and female compliance to repayment rules) are very strictly applied. In fact, from a perspective of financial profitability and sustainability the existing gender norms are very useful for microfinance programmes as they guarantee strict compliance to the repayment rules of the program. These microfinance programmes might adopt an 'empowerment discourse' but it is unlikely that they will add to their financial intermediation any other type of activity which increases individual and collective agency and which lead to changes in gender relations as this might simultaneously reduce financial profitability⁴¹. While it is not impossible that these microfinance programmes generate 'empowerment' effects beyond access to productive resources (in particular financial resources) and non-sensitive areas of individual agency (such as control over small household expenditures), it is not likely and one can certainly not assume that it will happen automatically. In gender/development terminology, the distinction among practical and strategic gender needs is also useful here. When these microfinance programmes add to their financial intermediation any activities in the area of gender and development, it is expected that these activities will be strictly confined to addressing practical gender needs⁴² (such as provision of water and fuel); these activities do not really question gender norms (such as the existing division of labor) but rather re-confirm them. While addressing practical gender needs could affect strategic gender issues, this is not necessarily the case. From a feminist (economics) perspective, one would refer to these microfinance programmes as those that adopt an instrumentalist (versus transformatory, see below) use of women's intermediation (i.e. women's groups are used for other objectives than women's well-being and/or empowerment, in this case financial sustainability and possibly poverty reduction).

When one looks at these microfinance programmes through the angle of the different women/gender and development policy approaches, one could classify these as Women in Development (WID) anti-poverty/efficiency approaches⁴³. WID approaches consider poverty as the cause of inequality between men and women and poverty reduction through an

⁴⁰ This section largely relies on Holvoet (2006).

⁴¹ There is for example an interesting study which has revealed that increasing levels of women's empowerment led to a decrease of repayment rates (see Yaqub, 1995).

⁴² See for example Moser (1993) for an explanation on the difference between practical gender needs and interests and strategic gender needs and interests.

⁴³ A distinction is usually made between welfare approaches (classified as pre-WID), equity, anti-poverty and efficiency approaches (these three are classified as WID) and empowerment and gender-efficiency approaches (classified as gender and development approaches: GAD) (see Moser, 1993).

increased participation of women in the production process as the solution for the inequality between men and women. In order for women to participate in the production process they need access to production factors, one of them being financial services. The underlying idea of the WID anti-poverty/efficiency approach is that access to production factors will give women the opportunity to participate in the production process, which will lead to an increased efficiency and productivity, to a reduction of poverty and to more equality between men and women. WID approaches disregard the importance of underlying gender norms and mainly consider human behavior as completely free agency. In practice, access does not necessarily mean control; increased women's participation in productive activities does not automatically generate a redistribution of labor inside the household and often results in an increased workload for women.

In sharp contrast to the abovementioned microfinance programmes are those microfinance programmes which have among their central objectives women's empowerment (and particularly beyond access and more towards strategic gender needs). These microfinance programmes combine financial intermediation with social intermediation (see Edgcomb and Barton, 1998) and use the women's intermediaries for 'transformatory' purposes (compared to 'instrumentalist' use)⁴⁴. These are the typical "credit+" programmes (investment in group building and maturing, training, organizational capacities, networking, etc.). Groups may evolve and become local institutional entrepreneurs which engage in collective agency⁴⁵ (Holvoet, 2005). As involvement in extra-household bargaining is one of the ways in which women increase their bargaining position inside the household (see Agarwal, 1997), it also often leads to an increase of intra-household agency (and this also highlights the interdependence among the different empowerment levels).

From an institutional (feminist) economics approach, you may consider those women's groups as instances of collective action which have the capacity to change 'institutions' and norms (in this case gender norms is one of the mechanisms to bring about institutional change (see for example Lin and Nugent, 1995)). Credit has a specific function in this regard, it functions as the selective incentive through which women are mobilised to become a member of a women's group. Processes which take place once women become member of a women's group are described as 'collectivization of individual problems'⁴⁶, awareness of the changeability of norms, changes in the perception of cost-benefits of non-conform behavior (i.e. if one behaves non-conform the norms as an individual the costs may be very high; non-conform behavior as a group lowers the cost; finally, the perception of effectiveness of change increases when one realises that there is a critical mass to change norms).

In terms of women/gender and development policy approaches, one can classify these microfinance programmes as Gender and Development (GAD) programs, a sub-category of empowerment approaches.

⁴⁴ See Molyneux (1985) for a discussion on the difference between 'instrumentalist' and 'transformatory' use of women's groups.

⁴⁵ Also referred to as extra-household bargaining in local political and economic decision-making bodies.

⁴⁶ The understanding that one's deprivation is not individual but collective and related to 'structures and institutions' (see for example Kabeer, 1995).

From an individual microfinance program's perspective, it is more rational to adhere to the instrumentalist use of women's intermediation. However, from a society's point of view, the second type of programme is more optimal. Increased women's agency within the household for example has shown to increase investments in the human capital of different household members (which increases productivity and economic growth in the subsequent next period). From a policy point of view, one may then think about compensating those microfinance programmes for their positive spill-over effects (compensation for the production of public goods).

Appendix 2: Microcredit and intra-household allocation

There are mainly two schools of thought when it comes to intra-household resource allocation:

1. The household is a unit and the household utility function the utility function of the household head (see for example Becker, 1981). Allocation is the result of maximization of utility of the household head and determined by factors outside the household (for example the case of price incentives: if female wages are higher than male wages, then women will work outside the household). The policy implication of this approach is that there is no need to target specific individuals inside the household. It is nowadays acknowledged that the household does not necessarily function as a unit.

2. The household may be conceptualised as a place where there is both cooperation and conflict, individuals have different preferences and through bargaining the outcome (allocation of consumption and production) will be determined (for example, if the woman prefers to do work outside the household and she wins the bargain, she will engage in work outside the household, even in those cases where the male wage is higher). Under this approach, collective preference models are used to model and predict outcomes. A diversity of different models exist, depending on whether cooperative or non-cooperative bargaining models, or symmetric or non-symmetric bargaining models are used. What is essential is the idea that threat points determine the bargaining position inside the household and the final allocative outcomes. Threat points refer to the maximum utility that a person can obtain in case of non-cooperation with the partner. Threat points are determined by exogenous factors (factors which are not determined inside the household; for example participation in the labor market is not a factor which determines the threat point because it is something which is determined inside the household (endogenous)). Exogenous factors are for example inheritances, pensions and extra-household environmental parameters (for example laws and norms⁴⁷). In most developing countries, it is particularly the extra-household environmental parameters and more particularly the strong male bias therein which strongly affect threat points. The policy implication of this type of household models is targeting, if one wants to achieve specific outcomes beneficial to either men or women. If men for example have a higher preference for education and one wants to promote education then it is necessary to target men and try to increase their threat point so that their preferences prevail in the household bargaining process.

⁴⁷ Examples are the following. Land laws regarding male/female ownership have an effect on threat points; the strict inside/outside dichotomy or female purdah will heavily reduce a women's threat point; laws which forbid women to ask for divorce reduces women's threat point to almost zero as women have no real exit option in that case.

Appendix 3: Search results and reasons for study exclusion

The global search strategy is discussed in Section 2.2. Here we provide three examples of source-specific searches, and reasons for exclusion of quantitative studies at the final stage (priority 1 and 2 studies assessed at step 5 in Figure 3).

SCIENCE DIRECT

Method:

First login, for more search options, and to save searches, etc. Use the advanced search menu. Search term in abstract, title, keywords. Include journals and all books. Search all sources and sciences. Limit the search period to 1980-2011. Once all searches have been performed the duplicates can be filtered out by using the Combing with OR option. Then you can select the relevant articles and export these to EndNote. During export, make sure to select to export both the citation and the abstract. ScienceDirect does provide URLs in the downloaded reference. In addition, all PDFs can be downloaded at once.

The search can be done all at once using the Boolean command listed below:

Boolean: (pub-date > 1979 and TITLE-ABSTR-KEY(Rural credit evidence)) OR (pub-date > 1979 and TITLE-ABSTR-KEY(Rural credit effect)) OR (pub-date > 1979 and TITLE-ABSTR-KEY(Rural credit impact)) OR (pub-date > 1979 and TITLE-ABSTR-KEY(Access to credit evidence)) OR (pub-date > 1979 and TITLE-ABSTR-KEY(Access to credit impact)) OR (pub-date > 1979 and TITLE-ABSTR-KEY(Group lending evidence)) OR (pub-date > 1979 and TITLE-ABSTR-KEY(Group lending result*))OR (pub-date > 1979 and TITLE-ABSTR-KEY(Group lending effect)) OR (pub-date > 1979 and TITLE-ABSTR-KEY(Group lending impact))OR (pub-date > 1979 and TITLE-ABSTR-KEY(Microfinanc* evidence))OR (pub-date > 1979 and TITLE-ABSTR-KEY(Microfinanc* outcome))OR (pub-date > 1979 and TITLE-ABSTR-KEY(Microfinanc* result*))OR (pub-date > 1979 and TITLE-ABSTR-KEY(Microfinanc* effect))OR (pub-date > 1979 and TITLE-ABSTR-KEY(Microfinanc* impact))OR (pub-date > 1979 and TITLE-ABSTR-KEY(Microcredit evidence))OR (pub-date > 1979 and TITLE-ABSTR-KEY(Microcredit result*))OR (pub-date > 1979 and TITLE-ABSTR-KEY(Microcredit impact))

The boolean command retrieved 291 results which all have been exported to EndNote. Because of the Boolean command these results contained no duplicates.

IDEAS

Go to the search page: <http://ideas.repec.org/search.html>

Method:

You can search for the term, but only separately in abstract/keyword/title. This will generate overlap in the results, so it is probably better to search for the 'whole record'. Restrict the search to articles, papers, chapters and books. Limit the publication date.

Keywords (hits):

Microfinance impact (110)

Microfinance outcome (18)

Microfinance evidence (62)

Microcredit impact (22)

Microcredit evidence (25)

Microcredit effect (27)

(Rural) finance impact (61)

(Rural) finance effect (80)

(Rural) credit effect (168)

(Rural) credit evidence (121)

(Rural) lending impact (22)

(Rural) lending evidence (36)

In total 752 results were obtained in the keyword search process. After title and abstract selection 14 new results were found and included in the EndNote database.

GOOGLE ACADEMICO (We also performed this search in other languages)

We repeated the search protocol in a more simplified manner (limited number of search options) for documents in Spanish. Only a few of the academic search engines allow for Spanish language document searches. Mostly, we focused on internet searches through the portals and using Googlescholar. All processes are recorded in a similar way as above.

Method:

Use the advanced search menu for the search process. Select under preferences to only look at websites written in English. Limit the search to publication between 1980 and 2011. Further select to return articles from all subject areas. Results can be exported to EndNote individually. Google scholar is very broad, so the search terms will have to be more focused in order to obtain potentially relevant results. This means that the search only returns results where all keywords appear in the title.

Keywords (hits):

Microfinanzas	(364)
Microfinanzas impacto	(9)
Microfinanzas resultados	(1)
Microfinanzas efecto	(0)
Microfinanzas evidencia	(1)
Micro-credito	(6)
Microcredito impacto	(0)
Microcredito efecto	(0)
Microcredito evidencia	(0)

Micro prestamo impacto	(0)
Micro prestamo evidencia	(0)
Micro prestamo	(0)
Rural finanzas	(6)
Rural finanzas impacto	(0)
Rural credito impacto	(2)
Rural credito efecto	(0)
Rural credito evidencia	(0)
Rural prestamo impacto	(0)
Rural prestamo evidencia	(0)

In total 389 results were obtained with the keyword combinations, but after checking for overlap and existing articles only 79 were included in Endnote.

The justification for exclusion of priority 1 and 2 studies not meeting minimum methodological requirements is given below.

Table A3 1: Quantitative studies that did not meet the minimum methodological quality threshold: priority 1 and 2 studies excluded at step 5 (see figure 3)

Authors	Title	Year	Description method	Reason exclusion
Aruna and Jyothirmayi	The role of microfinance in women empowerment: a study on the SHG bank linkage programme in Hyderabad (Andhra Pradesh)	2011	Simple client - non-client comparison	Selection bias not addressed
Bali Swain	Microfinance and Women's Empowerment Evidence from the Self Help Group Bank Linkage Programme in India	2006	Pipeline matching (weak)	Insufficient information on selection bias
Banu et al.	Empowering Women in Rural Bangladesh: Impact of BRAC's programme	2001	Group-based comparison membership duration and empowerment	Weak counterfactual, insufficient information on method
Barnes et al.	The impact of three microfinance programmes in Uganda	2001	Simple client - non-client comparison	Selection bias not addressed
Barua and Sulaiman	Impact Evaluation and Client Satisfaction of Northwest Microfinance Expansion Project	2007	Simple mature clients- intermediate clients- newly clients comparison	Simple description
Creevey	Tanzania food Processing in: Changing Women's Lives and Work. An Analysis of the Impact of Eight Microenterprises	1996	Simple client - non-client comparison	Selection bias not adequately addressed
Driouchi et al.	Women Empowerment through Microcredit in the Rural Areas of Khénifra	2005	Simple before-after comparison	Selection bias not addressed
Garikipati	Microcredit and women's empowerment: Have we been looking at the wrong indicators	2010	Simple description	No counterfactual analysis
Hoque	Micro-credit and empowerment of women: Evidence from Bangladesh	2005	Simple association membership duration and empowerment	Weak counterfactual

Hoque and Itohara	Participation and Decision Making Role of Rural Women in Economic Activities: A Comparative Study for Members and Non-Members of the Micro-Credit Organizations in Bangladesh	2008	OLS	Weak specification of model on decision-making
Huda and Mahmud	Women's control over productive assets: role of credit-based Development Interventions	1998	Simple client - non-client comparison	Selection bias not addressed
Jameela, V. A.	Microcredit, empowerment and diversion of loan use	2009	Simple before after comparison in one SHG	Weak counterfactual
Kabeer and Noponen	Social and Economic Impacts of PRADAN's Self Help Group Microfinance and Livelihoods Promotion Program: Analysis From Jharkhand, India	2005	Simple client - non-client comparison	Selection bias not adequately addressed
Kumar	Impact of Microfinance through SHG-Bank Linkage in India: A Micro Study	2007	Group-based comparison membership duration and empowerment	Weak counterfactual, insufficient information on method.
Lafontaine	Impact Survey - MUCREFAB program	2001	Simple client - non-client comparison	Selection bias not addressed
Larocque and Kalala	The Impact of Savings and Credit Cooperatives in Burkina Faso	2002	Simple before after comparison	Weak counterfactual
Mahmud	Actually How Empowering is Microcredit?	2003	Simple client - non-client comparison	Selection bias not addressed
Mourji	Impact Study of the Zakoura Microcredit Program	2000	Simple client - non-client comparison, judgmental matching	Selection bias not adequately addressed
Murthy et al.	Towards women's empowerment and poverty reduction, lessons from the participatory impact assessment of SAPAP India	n.d.	Simple client - non-client comparison	Selection bias not addressed

Mustafa et. al.	Beacon of Hope. An Impact Assessment Study of BRAC's Rural Development Programme	1996	Simple description	No counterfactual analysis
Noponen	The Internal Learning System - a Tool for Tracking and Enhancing Empowerment Outcomes and Wider Social Impacts of Microfinance	2003	Group-based comparison membership duration and empowerment	Weak counterfactual
Osmani	Impact of Credit on Relative Well-Being of Women: Evidence From the Grameen Bank	1998	2SLS regression	Insufficient information in study
Osmani	The Grameen Bank Experiment: Empowerment of Women Through Credit. In: Women and Empowerment b, Afshar H.	1998	Simple client - non-client comparison	Selection bias not adequately addressed
Sharma et al.	Impact Assessment of SACCOSs in Nepal's Hill Districts.	2005	Simple client - non-client comparison	Selection bias not addressed
Steele et al.	Savings/Credit Group Formation and Change in Contraception	2001	Simple programme -non programme villages comparison	Selection bias no adequately addressed
Sinha et al.	The maturity of Indian microfinance: Findings and policy implications from a national study	2005	Simple client - non-client comparison	Selection bias not addressed
UNPF and RAFAD	Exploring linkages: Women's empowerment, microfinance and health education	2010	Pipeline matching (weak)	No counterfactual analysis (on empowerment variables)

Appendix 4: Coding forms

Table A4 1: Search and screening

Variable	Type of information
Screening of full text documents and determination of priority for (possible further examination and analysis)	<p>Priority 1: study is on the impact of microcredit on women's empowerment; involves original empirical analysis.</p> <p>Priority 2: study is on the impact of microcredit, covering multiple outcome measures which include aspects of women's empowerment; involves original empirical analysis.</p> <p>Priority 3: study is on the impact of microcredit and women's empowerment but does not rely on original empirical analysis.</p> <p>Priority 4: all other studies.</p>
Contains quantitative analysis on microcredit and women's empowerment	Yes/no
Contains dependent variables relating to women's control over household spending	Yes/no
Evidence of addressing the attribution problem (through design or statistical controls)	Yes/no

Table A4 2: Description of studies

Variable	Type of information
Title	Open
Author	Open
Year	Open
Type of publication	Journal article, Book Chapter, working paper, PhD dissertation, other
Type of intervention	Open (e.g. microcredit alone or in combination with microsavings and/or other interventions etc.)
Microcredit(-related) independent variable	Open (e.g. client yes/no, member yes/no, duration membership, etc.)
Location (area of study)	Country/countries

Description of data sample	Open
Characteristics of clients	Open
Solidarity group mechanism	Yes/no
Dependent variable description (plus description of components if relevant)	Open
Empowerment dimensions covered in study	Decisions, control, other

Table A4 3: Methodological design and risk of bias assessment⁴⁸

Variable	Type of information
Research design	Randomised controlled trial, panel or before/after and with/without, either before/after or with/without, natural experiment
Statistical method	Instrumental variables, propensity score matching, two-stage least squares, limited information maximum likelihood estimation, difference in differences, regression discontinuity, other multivariate method of analysis, tabulation
Method of allocation of treatment	Self-selection, randomised assignment, cluster-randomised assignment
Data collection moment	Single data point measurement; two data point measurement
Risk of selection bias and confounding bias	Yes/no/unclear
Risk of spill-overs and contamination	Yes/no/unclear
Risk of outcome reporting bias	Yes/no/unclear
Risk of analysis reporting bias	Yes/no/unclear
Other risk of bias	Yes/no/unclear
Theoretical framework on the relationship between microcredit and women's control over household spending	0 = study in which no theoretical framework/theory is available on microcredit and empowerment; 1 = study in which a theoretical framework is available that addresses causal relationships between microcredit and empowerment; 2 = study in which a theoretical discussion takes place on the causal relationships

⁴⁸ See also Appendix 5 for risk of bias signaling questions.

	between microcredit and (aspects of) women's control over household spending
Link between theoretical framework and empirical data collection and analysis	0 = empirical data collection and analysis on microcredit and women's control over household spending is not linked to the theoretical framework/discussion on causal relationships between microcredit and (aspects of) women's control over household spending (even if such a framework is discussed in the study); 1 = empirical data collection and analysis on microcredit and women's control over household spending reflects theoretical framework/discussion on microcredit and (aspects of) women's control over household spending
Empirical measurement and discussion of use of loan	0 = there is no discussion on women's control over and use of loan in the study; 1 = there is discussion on women's control over and use of loan in the study; 2 = there is discussion and empirical data collection and analysis on women's control over and use of loan in the study

Table A4 4: Synthesis (general)

Variable	Type of information
Statistically significant relation between independent and dependent variables of interest	Yes/no
Description of relation	Open
Study included in meta-analysis	Yes/no
Effect size calculation formulae and data requirements	Table A8.1 (see also Appendix 7 and Appendix 8 Table A8.5).
Mechanisms	Open (using key publications as a reference for mechanism detection: Elster (1997, 2007), Hedstrom (2005), Hedstrom and Swedberg (1998), Coleman (1986, 1990).

Table A4 5: Coding for Effect Sizes

Variable	Type of information
Year data collection	Year of (first) data collection
Country	Country of data collection

Location type	Rural/urban/both
Product	Credit/credit plus
Group lending?	Yes/no/both
Design Code	Before/after; panel; pipeline; pipeline (old vs. new members); with/without; before/after repeated; young vs. old (pseudo with/without); RCT (not clustered); RCT (clustered)
Design Score	See Table 3
Analysis Code	2sls; tables; DID; ITT; IV; logit; t-test; multivariate; multivariate/OLS/logit; OLS and logit; probit; tables & probit; PSM
Analysis Score	See Table 3
Overall Score	See Table 3
Outcome	See Table A5.2.
treat indicator	Duration of membership of MFI; membership (0/1); loanee from MFI (0/1); cumulative (deflated) amount borrowed from MFI; MFI member (non-borrower); old participant; new participant
treat dimension	Amount of credit; live in area with access to credit; borrower from MFI; member (non-borrower)
Effect size formula	See Tables A6.1. and A6.2.
N treat	Number of treated
N control	Number of controls
No obs regression/total N	Number of observations in estimation data set
all mean outcome	Mean outcome for whole sample
all sd outcome	Standard deviation of outcome for whole sample
treat mean outcome	Mean outcome for treated
treat sd outcome	Standard deviation of outcome for treated
ctl mean outcome	Mean outcome for controls
ctl sd outcome	Standard deviation of outcome for controls

mean treat var	Mean of the treatment variable
sd treat var	Standard deviation of the treatment variable
R2	Coefficient of determination
adj R2	Adjusted coefficient of determination
unstand beta	Unstandardised beta coefficient of treatment variable
stand beta	Standardised beta coefficient of the treatment variable
Chi2	Chi-square
p-val of Chi2	p-value of chi-square
Odds ratio	Odds ratio of treated to controls
Confidence level	Confidence level (0.90; 0.95; 0.999, etc.)
Loci	Low confidence level (lower bound of confidence interval)
Hici	High confidence level (upper bound of confidence interval)
Logit	Beta coefficient of treatment variable of logit estimation
Probit	Beta coefficient of treatment variable of probit estimation
Tobit	Beta coefficient of treatment variables of tobit estimation
se_prob_tob_it	Standard error of beta coefficients of logit/probit/tobit estimations
Wald test	Wald test statistic
ATT Stratification	PSM average treatment effect (stratification matching)
ATT NN	PSM average treatment effect (nearest neighbour matching)
ATT Kernel	PSM average treatment effect (kernel matching)
ATT Radius	PSM average treatment effect (radius matching)
SE - full sample	Standard error of outcome variable whole sample

t-value	t-value of treatment effect
p-value of t-test	p-value of t-test
z_value	z-value of z test
f_value	f-value of anova analysis
No cov	Number of covariates
Comment	Source (table/page) in study
Effect_size_formula_3	See Tables A6.1. and A6.2.
Construct	Preliminary classification of outcome variables
Dimension	Reduced classification of outcome variables (control of resources; participation in decisions; other empowerment dimensions)
Peer reviewed	Whether source peer reviewed (0/1)
Cluster design	Has cluster design (yes/no)
Cluster analysis	Uses cluster adjustment in analysis (yes/no)

Appendix 5: Risk of bias signaling questions⁴⁹

1. Mechanism of assignment: was the allocation or identification mechanism able to control for selection bias?

a) For Randomised assignment (RCTs),

Score “YES” if:

- a random component in the sequence generation process is described (e.g. referring to a random number table)⁵⁰;
- and if the unit of allocation was at group level (geographical/ social/ institutional unit) and allocation was performed on all units at the start of the study;
- or if the unit of allocation was by beneficiary or group and there was some form of centralised allocation mechanism such as an on-site computer system;
- and if the unit of allocation is based on a sufficiently large sample size to equate groups on average.

Score “UNCLEAR” if:

- the paper does not provide details on the randomization process, or uses a quasi-randomization process for which it is not clear has generated allocations equivalent to true randomization.

Score “NO” if:

- the sample size is not sufficient or any failure in the allocation mechanism could affect the randomization process⁵¹.

b) For discontinuity assignment (Regression Discontinuity Designs)

Score “YES” if:

- allocation is made based on a pre-determined discontinuity on a continuous variable (regression discontinuity design) and blinded to participants or;
- if not blinded, individuals reasonably cannot affect the assignment variable in response to knowledge of the participation decision rule;

⁴⁹ The signalling questions were developed by Jorge Hombrados and Hugh Waddington, drawing on existing tools, in particular EPOC (n.d.) ‘Suggested risk of bias criteria for EPOC reviews’; Coalition for Evidence-Based Policy (2010) ‘Checklist for reviewing a randomized controlled trial of a social programme or project, to assess whether it produced valid evidence’; and Higgins and Green (2011).

⁵⁰ If a quasi-randomised assignment approach is used (e.g. alphabetical order), you must be sure that the process truly generates groupings equivalent to random assignment, to score “Yes” on this criteria. In order to assess the validity of the quasi-randomization process, the most important aspect is whether the assignment process might generate a correlation between participation status and other factors (e.g. gender, socio-economic status) determining outcomes; you may consider covariate balance in determining this (see question 2).

⁵¹ If the research has serious concerns with the validity of the randomization process or the group equivalence completely fails, we recommend to assess the risk of bias of the study using the relevant questions for the appropriate methods of analysis (cross-sectional regressions, difference-in-difference, etc.) rather than the RCTs questions.

- and the sample size immediately at both sides of the cut-off point is sufficiently large to equate groups on average.

Score “UNCLEAR” if:

- the assignment variable is either non-blinded or it is unclear whether participants can affect it in response to knowledge of the allocation mechanism.

Score “NO” if:

- the sample size is not sufficient or;
- there is evidence that participants altered the assignment variable prior to assignment⁵².

c) For assignment based non-randomised programme placement and self-selection (studies using a matching strategy or regression analysis, excluding IV),

Score “YES” if:

- participants and non-participants are either matched based on all relevant characteristics explaining participation and outcomes, or;
- all relevant characteristics are accounted for^{53 54}.

Score “UNCLEAR” if:

- it is not clear whether all relevant characteristics (only relevant time varying characteristics in the case of panel data regressions) are controlled.

Score “NO” if:

- relevant characteristics are omitted from the analysis.

d) For identification based on an instrumental variable (IV estimation),

Score “YES” if:

- an appropriate instrumental variable is used which is exogenously generated: e.g. due to a ‘natural’ experiment or random allocation.

Score “UNCLEAR” if:

- the exogeneity of the instrument is unclear (both externally as well as why the variable should not enter by itself in the outcome equation).

⁵² If the research has serious concerns with the validity of the assignment process or the group equivalence completely fails, we recommend assessing risk of bias of the study using the relevant questions for the appropriate methods of analysis (cross-sectional regressions, difference-in-difference, etc.) rather than the RDDs questions.

⁵³ Accounting for and matching on all relevant characteristics is usually only feasible when the programme allocation rule is known and there are no errors of targeting. It is unlikely that studies not based on randomization or regression discontinuity can score “YES” on this criterion.

⁵⁴ There are different ways in which covariates can be taken into account. Differences across groups in observable characteristics can be taken into account as covariates in the framework of a regression analysis or can be assessed by testing equality of means between groups. Differences in unobservable characteristics can be taken into account through the use of instrumental variables (see also question 1.d) or proxy variables in the framework of a regression analysis, or using a fixed effects or difference-in-differences model if the only characteristics which are unobserved are time-invariant.

Score “NO” otherwise.

2. Group equivalence: was the method of analysis executed adequately to ensure comparability of groups throughout the study and prevent confounding?

a) For randomised control trials (RCTs) and quasi-RCTs,

Score “YES” if⁵⁵:

- baseline characteristics of the study and control/comparisons are reported and overall⁵⁶ similar based on t-test or ANOVA for equality of means across groups;
- or covariate differences are controlled using multivariate analysis;
- and the attrition rates (losses to follow up) are sufficiently low and similar in treatment and control, or the study assesses that loss to follow up units are random draws from the sample (e.g. by examining correlation with determinants of outcomes, in both treatment and comparison groups);
- and problems with cross-overs and drop outs are dealt with using intention-to-treat analysis or in the case of drop outs, by assessing whether the drop outs are random draws from the population;
- and, for cluster-assignment, authors control for external cluster-level factors that might confound the impact of the programme (e.g. weather, infrastructure, community fixed effects, etc.) through multivariate analysis.

Score “UNCLEAR” if:

- insufficient details are provided on covariate differences or methods of adjustment;
- or insufficient details are provided on cluster controls.

Score “NO” otherwise.

b) For regression discontinuity designs (RDDs),

Score “YES” if:

- the interval for selection of treatment and control group is reasonably small;
- or authors have weighted the matches on their distance to the cut-off point;
- and the mean of the covariates of the individuals immediately at both sides of the cut-off point (selected sample of participants and non-participants) are overall not statistically different based on t-test or ANOVA for equality of means;
- or significant differences have been controlled in multivariate analysis;
- and, for cluster-assignment, authors control for external cluster-level factors that might confound the impact of the programme (e.g. weather, infrastructure, community fixed effects, etc.) through multivariate analysis.

⁵⁵ Please note that when a), b) or f) score no or large differences in baseline characteristics, we suggest assessing risk of bias considering other study design (Diff-in-Diff, cross-sectional regression, instrumental variables)

⁵⁶ Even in the context of RCTs, when randomization is successful and carried out over sufficiently large assignment units, it is possible that small differences between groups remain for some covariates. In these cases, study authors should use appropriate multivariate methods to correcting for these differences.

Score “UNCLEAR” if:

there are covariate differences across individuals at both sides of the discontinuity which have not been controlled for using multivariate analysis, or if insufficient details are provided on controls;

- or if insufficient details are provided on cluster controls.

Score “NO” otherwise.

c) For non-randomised trials using difference-in-differences methods of analysis,

Score “YES” if:

- the authors use a difference-in-differences (or fixed effects) multivariate estimation method;
- the authors control for a comprehensive set of time-varying characteristics⁵⁷;
- and the attrition rate is sufficiently low and similar in treatment and control, or the study assesses that drop-outs are random draws from the sample (e.g. by examining correlation with determinants of outcomes, in both treatment and comparison groups);
- and, for cluster-assignment, authors control for external cluster-level factors that might confound the impact of the programme (e.g. weather, infrastructure, community fixed effects, etc.) through multivariate analysis.

Score “UNCLEAR” if:

- insufficient details are provided;
- or if insufficient details are provided on cluster controls.

Score “NO” otherwise.

d) For statistical matching studies including propensity scores (PSM) and covariate matching⁵⁸,

Score “YES” if:

- matching is either on baseline characteristics or time-invariant characteristics which cannot be affected by participation in the programme; and the variables used to match are relevant (e.g. demographic and socio-economic factors) to explain both participation and the outcome (so that there can be no evident differences across groups in variables that might explain outcomes);
- in addition, for PSM Rosenbaum’s test suggests the results are not sensitive to the existence of hidden bias;
- and, with the exception of Kernel matching, the means of the individual covariates are equated for treatment and comparison groups after matching;

⁵⁷ Knowing allocation rules for the programme – or even whether the non-participants were individuals that refused to participate in the programme, as opposed to individuals that were not given the opportunity to participate in the programme – can help in the assessment of whether the covariates accounted for in the regression capture all the relevant characteristics that explain differences between treatment and comparison.

⁵⁸ Matching strategies are sometimes complemented with difference-in-difference regression estimation methods. This combination approach is superior since it only uses in the estimation the common support region of the sample size, reducing the likelihood of existence of time-variant unobservable differences across groups affecting outcome of interest and removing biases arising from time-invariant unobservable characteristics.

- and, for cluster-assignment, authors control for external cluster-level factors that might confound the impact of the programme (e.g. weather, infrastructure, community fixed effects, etc.) through multivariate or any appropriate analysis.

Score “UNCLEAR” if:

- relevant variables are not included in the matching equation, or if matching is based on characteristics collected at endline;
- or if insufficient details are provided on cluster controls.

Score “NO” otherwise.

e) For regression-based studies using cross sectional data (excluding IV)

Score “YES” if:

- the study controls for relevant confounders that may be correlated with both participation and explain outcomes (e.g. demographic and socio-economic factors at individual and community level) using multivariate methods with appropriate proxies for unobservable covariates;
- and a Hausman test⁵⁹ with an appropriate instrument suggests there is no evidence of endogeneity;
- and none of the covariate controls can be affected by participation;
- and either, only those observations in the region of common support for participants and non-participants in terms of covariates are used, or the distributions of covariates are balanced for the entire sample population across groups;
- and, for cluster-assignment, authors control particularly for external cluster-level factors that might confound the impact of the programme (e.g. weather, infrastructure, community fixed effects, etc.) through multivariate analysis.

Score “UNCLEAR” if:

- relevant confounders are controlled but appropriate proxy variables or statistical tests are not reported;
- or if insufficient details are provided on cluster controls.

Score “NO” otherwise.

f) For instrumental variables approaches,

Score “YES” if:

- the instrumenting equation is significant at the level of $F \geq 10$ (or if an F test is not reported, the authors report and assess whether the R-squared (goodness of fit) of the participation equation is sufficient for appropriate identification);
- the identifying instruments are individually significant ($p \leq 0.01$); for Heckman models, the identifiers are reported and significant ($p \leq 0.05$);

⁵⁹ The Hausman test explores endogeneity in the framework of regression by comparing whether the OLS and the IV approaches yield significantly different estimations. However, it plays a different role in the different methods of analysis. While in the OLS regression framework the Hausman test mainly explores endogeneity and therefore is related with the validity of the method, in IV approaches it explores whether the author has chosen the best available strategy for addressing causal attribution (since in the absence of endogeneity OLS yields more precise estimators) and therefore is more related with analysis reporting bias.

- where at least two instruments are used, the authors report on an over-identifying test ($p \leq 0.05$ is required to reject the null hypothesis); and none of the covariate controls can be affected by participation and the study convincingly assesses qualitatively why the instrument only affects the outcome via participation⁶⁰;
- and, for cluster-assignment, authors particularly control for external cluster-level factors that might confound the impact of the programme (e.g. weather, infrastructure, community fixed effects, etc.) through multivariate analysis.

Score “UNCLEAR” if:

- relevant confounders are controlled but appropriate statistical tests are not reported or exogeneity⁶¹ of the instrument is not convincing;
- or if insufficient details are provided on cluster controls (see category f) below).

Score “NO” otherwise.

3. Hawthorne and John Henry effects: was the process of being observed causing motivation bias?

Score “YES” if either:

- a) For data collected in the context of a particular intervention trial (randomised or non-randomised assignment), the authors state explicitly that the process of monitoring the intervention and outcome measurement is blinded, or argue convincingly why it is not likely that being monitored in ways that could affect the performance of participants in treatment and comparison groups in different ways.
- b) The study is based on data collected in the context of a survey, and not associated with a particular intervention trial, or data are collected in the context of a retrospective (ex post) evaluation.

Score “UNCLEAR” if:

- it is not clear whether the authors use an appropriate method to prevent Hawthorne and John Henry Effects (e.g. blinding of outcomes and, or enumerators, other methods to ensure consistent monitoring across groups).

Score “NO” otherwise.

4. Spill-overs: was the study adequately protected against performance bias?

Score “YES” if:

- the intervention is unlikely to spill-over to comparisons (e.g. participants and non-participants are geographically and/or socially separated from one another and general equilibrium effects are unlikely)⁶².

⁶⁰ If the instrument is the random assignment of the treatment, the reviewer should also assess the quality and success of the randomization procedure in part a).

⁶¹ An instrument is exogenous when it only affects the outcome of interest through affecting participation in the programme. Although when more than one instrument is available, statistical tests provide guidance on exogeneity (see background document), the assessment of exogeneity should be in any case done qualitatively. Indeed, complete exogeneity of the instrument is only feasible using randomised assignment in the context of an RCT with imperfect compliance, or an instrument identified in the context of a natural experiment.

⁶² Contamination, that is differential receipt of other interventions affecting outcome of interest in the control or comparison group, is potentially an important threat to the correct interpretation of study results and should be addressed via PICO and study coding.

Score “UNCLEAR” if:

- spill-overs are not addressed clearly.

Score “NO” if:

- allocation was at individual or household level and there are likely spill-overs within households and communities which are not controlled for in the analysis;
- or if allocation at cluster level and there are likely spill-overs to comparison clusters.

5. Selective outcome reporting: was the study free from outcome reporting bias?

Score “YES” if:

- there is no evidence that outcomes were selectively reported (e.g. all relevant outcomes in the methods section are reported in the results section).

Score “NO” if:

- some important outcomes are subsequently omitted from the results or the significance and magnitude of important outcomes was not assessed.

Score “UNCLEAR” otherwise.

6. Selective analysis reporting: was the study free from analysis reporting bias?

Score “YES” if:

- authors use ‘common’ methods⁶³ of estimation and the study does not suggest the existence of biased exploratory research methods⁶⁴.

Score “NO” if:

- authors use uncommon or less rigorous estimation methods such as failure to conduct multivariate analysis for outcomes equations where it has not been established that covariates are balanced.

See also the following for particular estimation methodologies.

For PSM and covariate matching, score “YES” if:

- where over 10% of participants fail to be matched, sensitivity analysis is used to re-estimate results using different matching methods (Kernel Matching techniques);
- for matching with replacement, no single observation in the control group is matched with a large number of observations in the treatment group.

Where not reported, score “UNCLEAR”. Otherwise, score “NO”.

For IV (including Heckman) models, score “YES” if:

- the authors test and report the results of a Hausman test for exogeneity ($p \leq 0.05$ is required to reject the null hypothesis of exogeneity);

⁶³ ‘Common methods’ refers to the use of the most credible method of analysis to address attribution given the data available.

⁶⁴ A comprehensive assessment of the existence of ‘data mining’ is not feasible particularly in quasi-experimental designs where most studies do not have protocols and replication seems the only possible mechanism to examine rigorously the existence of data mining.

- the coefficient of the selectivity correction term (Rho) is significantly different from zero ($P < 0.05$) (Heckman approach).

Where not reported, score “UNCLEAR”. Otherwise, score “NO”.

For studies using multivariate regression analysis, score “YES” if:

- authors conduct appropriate specification tests (e.g. reporting results of multicollinearity test, testing robustness of results to the inclusion of additional variables, etc).

Where not reported or not convincing, score “UNCLEAR”. Otherwise, Score “NO”.

7. Other: was the study free from other sources of bias?

Important additional sources of bias may include: concerns about blinding of outcome assessors or data analysts; concerns about blinding of beneficiaries so that expectations, rather than the intervention mechanisms, are driving results (detection bias or placebo effects)⁶⁵; concerns about courtesy bias from outcomes collected through self-reporting; concerns about coherence of results; data on the baseline collected retrospectively; information is collected using an inappropriate instrument (or a different instrument/at different time/after different follow up period in the comparison and treatment groups).

Score “YES” if:

- the reported results do not suggest any other sources of bias.

Score “UNCLEAR” if:

- other important threats to validity may be present

Score “NO” if:

- it is clear that these threats to validity are present and not controlled for.

⁶⁵ All interventions may create expectations (placebo effects), which might confound causal mechanisms. In social interventions, which usually require behaviour change from participants, expectations may form an important component of the intervention, so that isolating expectation effects from other mechanisms may be less relevant.

Appendix 6: Study descriptive information

Table A6 1: Study, intervention, participants and evaluation strategy

Authors	Title	Location	Method of allocation of treatment, stated identification method	Data collection moment	Data sample	Characteristics of clients
Amin et al. (1995)	Poor women's participation in credit-based self-employment: the impact on their empowerment, fertility, contraceptive use, and fertility desire in rural Bangladesh	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises: 2277 female beneficiaries, 1166 non-beneficiaries.	Poor married women aged between 14 and 49 years old
Amin et al. (1998)	NGO- Promoted Microcredit Programmes and Women's Empowerment in Rural Bangladesh: Quantitative and Qualitative Evidence	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises: 2360 loanees from NGO areas, 1200 non-loanees from non-programme areas.	Poor married women under age 50

Asim (2008)	Evaluating the Impact of Microcredit on Women's Empowerment in Pakistan	Pakistan	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises: 196 mature clients, 75 prospective clients. Sample varies for several indicators as observations from windowed women who are household heads were dropped from the original sample. Likewise, for specific indicators observations from new mothers were also excluded.	Poor women
Banerjee et al. (2009)	The Miracle of Microfinance? Evidence from a Randomized Evaluation	India	Cluster-randomised assignment, adjusted regression analysis	Two data point measurement	Total sample includes 104 areas (referred to as "slums") divided as follows: 52 intervention areas (slums), 52 comparison areas (slums). A total of 6850 households (on average 65 households in each slum) were surveyed for this study.	women aged between 18 and 55

Crepon et al. (2011)	Impact of microcredit in rural areas of Morocco: Evidence from a randomized evaluation	Morocco	Cluster-randomised assignment, adjusted regression analysis	Two data point measurement	81 pairs of villages matched, approximately 29 households per village surveyed 4495 households in baseline, 5551 households in end line (1400 new households).	Men and women between 18 and 70 with an economic activity (at least 35 % women)
Garikipati (2008)	The Impact of Lending to Women on Household Vulnerability and Women's Empowerment: Evidence from India	India	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises: 117 participants, 174 non-participants.	Poor married women
Hashemi et al. (1996)	Rural credit programmes and women's empowerment in Bangladesh	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises: 1225 women divided into four sub- samples as follows: 284 GB members, 232 BRAC members, 315 GB Non-members,	Married women under age 50

					394 Control group.	
Holvoet (2005)	The Impact of Microfinance on Decision-Making Agency: Evidence From South India	India	Self-selection, adjusted regression analysis	Single data point measurement	Total sample covers 300 households divided as follows: 250 programme households divided into five sub-samples as follows: 50 households with IRDP male participants, 50 households with IRDP female participants, 50 households with TNWDP Myrada young women, 50 households with TNWDP Myrada old women, 50 households with TNWDP Rido old women clients, and 50 non-programme households.	Female and male from rural areas

Holvoet (2006)	The differential impact on gender relations of 'transformatory' and 'instrumentalist' women's group intermediation in microfinance schemes: a case study for rural South India	India	Self-selection, adjusted regression analysis	Two data point measurement	Total sample comprises: 50 Myrada group members, 50 Rido group members.	Women
Hoque and Itohara (2009)	Women Empowerment through Participation in Micro-Credit Programme: A Case Study from Bangladesh	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample covers 180 women divided as follows: 90 female clients (30 from each of the NGOs: BRAC, GB, TMSS), 90 female non-clients.	Poor women
Husain et al. (2010)	SHG and empowerment of women: Self-selection or actual benefits?	India	Self-selection, adjusted regression analysis	Single data point measurement	45 new members, 1995 old members.	Poor women
Jamal (2008)	Exploring the impact of microfinance in Pakistan	Pakistan	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises:	Poor women from rural and urban areas

					2187 borrowers classified as follows: 1599 mature borrowers, 588 pipeline borrowers. 1206 non-borrowers divided as follows: 601 living in project areas, 605 living in non-project areas.	
Karlan and Zinman (2007)	Expanding credit access: using randomized supply decisions to estimate impacts	South Africa	Randomised assignment, adjusted regression analysis	Two data point measurement	Total sample covers 787 applicants classified as follows: 325 poor applicants (treated group), 462 egregious applicants (comparison group).	Poor first-time loan applicants (men and women) of African descent
Kim et al. (2007)	Understanding the impact of a microfinance-based intervention on women's empowerment and the reduction of	South Africa	Cluster-randomised assignment over 8 clusters (2x 4 pairs matched on size and accessibility),	Two data point measurement	Total sample comprises 860 women divided as follows: 430 loan recipients (4 villages),	Poor women aged between 16 and 96 years

	intimate partner violence in South Africa		adjusted regression analysis		430 non-participants (4 villages).	
Lakwo (2007)	Microfinance, rural livelihoods, and women's empowerment in Uganda	Uganda	Self-selection, adjusted regression analysis	Single data point measurement	Total sample covers 180 female groups divided as follows: 90 female loan group, 90 female non-loan group.	Women groups
Lastarria-Cornhiel and Shimamura (2008)	Social Welfare Outcomes of Micro-credit in Malawi	Malawi	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises 498 households as follows: 249 from programme village, 249 from non-programme village. For empowerment: Sample restricted to two-spouse households from which the authors could obtain responses from both spouses (282 households).	Women and men
Mizan (1993)	Women's Decision-making Power in Rural Bangladesh :	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample covers 200 women divided as follows :	Poor women

	A case Study of Grameen				100 GB women participants, 100 women non-participants.	
Mohindra et al. (2008)	Can microcredit help improve the health of poor women? Some findings from a cross-sectional study in Kerala, India	India	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises 928 women divided as follows: 592 SHG members (150 early joiners and 442 late joiners), 336 non SHG-members.	Women from households below the poverty line, aged between 18 and 59
Ngo (2008)	Microfinance and Gender Empowerment in Kyrgyzstan	Kyrgyzstan	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises 500 households divided as follows: 419 households from programme and non-programme villages (186 from North areas and 122 from South areas), 81 households from SHG.	Poor households in remote rural areas
Pitt et al. (2003)	Does Micro-Credit Empower Women? Evidence from Bangladesh	Bangladesh	Self-selection, natural experiment (instrumental	Single data point measurement	The initial sample comprises 1798 households as follows:	Women and men

			variables) adjusted regression analysis		<p>1538 target households, of which 905 were in microcredit program.</p> <p>260 non-target households from 05 non-programme areas.</p> <p>Due to the fact that some microcredit programmes expanded their operations to some of the former non-programme areas, new households were added to this sample. New additions are as follows:</p> <p>120 added to previous target households group.</p> <p>220 added to previous non target households group.</p> <p>Thus, final sample comprises 2074 households.</p>	
Pitt et al. (2006)	Empowering women with micro finance: Evidence from Bangladesh	Bangladesh	Self-selection, natural experiment (instrumental	Single data point measurement	The initial sample comprises 1798 households as follows:	Women and men

			variables) adjusted regression analysis		<p>1538 target households, of which 905 were in microcredit program.</p> <p>260 non-target households from non-programme areas.</p> <p>Due to the fact that some microcredit programmes expanded their operations to some of the former non-programme areas, new households were added to this sample. New additions are as follows:</p> <p>120 added to previous target households group.</p> <p>220 added to previous non target households group.</p> <p>Thus, final sample comprises 2074 households.</p>	
Rahman et al. (2009)	Factors influencing women's empowerment on microcredit	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises: 387 borrowers from programme areas,	Women

	borrowers: a case study in Bangladesh				184 non-borrowers from non-programme areas.	
Schuler and Hashemi (1994)	Credit Programs, Women's Empowerment, and Contraceptive Use in Rural Bangladesh	Bangladesh	Self-selection, adjusted regression analysis	Two data point measurement	Total sample comprises: 990 married women (intervention group), 315 married women (comparison group).	Married women younger than 50
Setboonsarng and Parpiev (2008)	Microfinance and the Millennium Development Goals in Pakistan: Impact Assessment Using Propensity Score Matching	Pakistan	Self-selection, adjusted regression analysis	Single data point measurement	Total sample covers 2881 households divided as follows: 1416 households borrowers, 1465 households non-borrowers. Sample for empowerment based on matching approach is divided as follows: 1204 households (treated), 663 households (control).	Female and male borrowers from urban and rural areas

Sharif (2002)	Poor Female Youth and Human Capital Development in Bangladesh: What Role for Micro-Credit Programmes?	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample includes 368 female participants divided as follows: 79 youth participants (bracket age for youth: between 16-24 years), 289 adult participants (above 24 years).	Married women aged between 18 and 55
Sharif (2004)	Microcredit Programmes and Women's Decision-Making Status: Further Evidence From Bangladesh	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises 483 women divided as follows: 368 female participants, 115 female non-participants.	Married women aged between 18 and 55
Wakoko (2003)	Microfinance and women's empowerment in Uganda: A Socio economic approach	Uganda	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises 528 participants as follows: 247 women, 280 men.	Women and men aged between 16 to 99 years
Zaman (1998)	The links between BRAC input and 'empowerment correlates	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample comprises 2895 women divided as follows: 379 BRAC TG members,	Married women aged 15-65 years

					149 BRAC NTG members, 1193 TG non-members, 1174 NTG non-members.	
Zaman (1999)	Assessing the Poverty and Vulnerability Impact of Micro-Credit in Bangladesh: A case study of BRAC	Bangladesh	Self-selection, adjusted regression analysis	Single data point measurement	Total sample includes 1568 women divided as follows: 379 BRAC members, 1189 non-members.	Married women

Table A6 2: Credit variables and empowerment variables in included studies

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
Amin et al. (1995)	Credit, skill training, health education and family planning	Yes	Membership credit organization (yes/no)	Authority index	+	<ul style="list-style-type: none"> • Family planning adoption • <i>Child's education</i> • <i>Purchase of a household item</i> • <i>Health related issues</i> 	<p>Women's self-reported decision-making power over some important areas.</p> <p>0 = husband alone, 0,5 = jointly, 0,5 – 1 = woman alone depending on area.</p> <p>Responses were scored. The values for the questions are then summed up and standardised.</p>
			Times loan received (#)	Authority index	+		
			Utilization of loan by respondent herself (yes/no)	Authority index	+		
Amin et al. (1998)	Credit	Yes	Membership NGO (yes/no)	Interspouse consultation index	0	<ul style="list-style-type: none"> • <i>Buying household furniture and utensils</i> • <i>Purchase of land</i> 	Questions seek to represent extent to which husbands consult their wives

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> • <i>Education expenses of children</i> • <i>Medical treatment of family</i> • <i>Purchasing women's clothes</i> • <i>Purchasing children's clothes</i> • <i>Purchasing daily food</i> 	<p>in household affairs.</p> <p>Generally = 1, never = 0, occasionally = 0,5.</p> <p>Responses were scored. The values are then summed up and standardised; indices controlled for statistical and conceptual distinctiveness and reliability.</p>
			Membership NGO (yes/no)	Autonomy index +		<p>Frequency of husband's restrictions on:</p> <ul style="list-style-type: none"> • Visiting respondent's parental home • Visiting hospital • Visiting village market 	<p>Questions seek to represent women's self-reported autonomy in their physical movement outside the home and in</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> • <i>Helping a relative with money</i> • <i>Setting aside money for respondent's own use</i> 	<p>their spending of some money on their own.</p> <p>Generally = 0, never = 1, occasionally = 0,5.</p> <p>Responses were scored. The values are then summed up and standardised; indices controlled for statistical and conceptual distinctiveness and reliability.</p>
			Membership NGO (yes/no)	Authority index	+	<p><i>Decision-making on the following matters:</i></p> <ul style="list-style-type: none"> • Voting in election • <i>Child's education in school</i> 	<p>Questions seek to represent women's self-reported actual decision-making power over</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> • Family planning • <i>Family day-to-day expenditures</i> • Going outside of home • <i>Medical treatment</i> • Entertaining guests • <i>Buying respondents traditionally favorite things</i> 	<p>some important areas.</p> <p>Wife alone = 1, husband alone = 0, jointly = 0,5.</p> <p>Responses were scored. The values are then summed up and standardise; indices controlled for statistical and conceptual distinctiveness and reliability.</p>
Asim (2008)	Credit	Yes	Participation in programme (yes/no)	Boy's schooling <hr/> Girl's schooling <hr/> Child's medical care	0 0 0		<p>These ordered outcome variables measure the extent to which women preferences are</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables (if index)	Components of dependent	Short description
				Medical checkup	0		reflected in these domains (see components) of household decisions.
				Purchase of household assets	0		
				House repair	0		
				Sale/purchase of house	0		
				Grocery/fruits	0		Women do not require someone's permission to purchase items mentioned.
				Medicine for herself	0		
				Personal clothes/cosmetics	-		
				Buy ice-cream/sweets for children	-		
				Buy books/uniform for children	0		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
				Take a child to the doctor	0		
Banerjee et al. (2009)	Credit	Yes	Credit intervention area (yes/no)	Woman makes spending decisions	0		Decisions include household spending, investment, and savings.
				Woman makes non-food spending decisions	0		
Crepon et al. (2011)	Credit	Yes and no	Credit (yes/no)	Women index	0	Index of qualitative indicators of women's empowerment, such as capacity of women to take some decisions and their mobility inside and outside the villages (full index not defined)	Index not specified. Summary index of qualitative variables such as the capacity of women to take some decisions and their mobility inside and outside the villages.

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
				% household self-activities managed by women	0		Full list of activities not specified
				Number of activities managed by female household member	0		
Garikipati (2008)	Credit	Yes	Length of membership of credit group (years = 0 for non-members)	Say in household decisions	0	<ul style="list-style-type: none"> • <i>Woman deciding (individually or jointly with others) about children's education</i> • <i>Woman deciding on what crops to grow</i> • <i>Woman deciding to lease in/out agricultural land</i> • <i>Woman making a major financial decision (open a</i> 	<p>The indicators intend to capture the extent to which women have a say in household decisions (and control over finances).</p> <p>For each indicator, questions were scored with</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> <i>bank account, apply for a loan, and so on)</i> • <i>Woman initiating the financial decision</i> • <i>Woman deciding to sell crops</i> • <i>Woman deciding to buy/sell large livestock</i> • <i>Woman deciding to buy agricultural inputs</i> • <i>Woman participating in the sale negotiations for each item.</i> 	<p>(different numbers of) points which were used to rank women as empowered or not in that domain.</p> <p>For the 3 composite indices, women with a score of 2 or 3 or better were classified as “empowered.”</p>
				Control over minor finances	0	<ul style="list-style-type: none"> • <i>Woman kept money from sale of livestock produce, or from:</i> • <i>Sale of poultry</i> 	

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> • <i>Woman has regular personal spending money</i> • <i>Woman has money for emergency use</i> 	
				Control over major finances	0	<ul style="list-style-type: none"> • <i>Woman retains money from the sale of crops</i> • <i>Woman retains money from sale of goats</i> • <i>Woman retaining her own wage earnings, or children's wages</i> • <i>Woman retaining husband's wages</i> 	
Hashemi et al. (1996)	Credit, new members attend	Yes	GB member (yes/no)	Ability to make small purchases	+	<ul style="list-style-type: none"> • <i>Woman purchasing small items used daily in food preparation for the family</i> 	These indicators intend to capture women's ability to make household spending and

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
	<p>training sessions so that they understand the program's objectives and modes of operation, including the Bank's "Sixteen Decisions" having to do with self-improvement, social reform, and community development.</p>					<ul style="list-style-type: none"> • <i>Woman purchasing small items for oneself</i> • <i>Woman purchasing ice cream or sweets for the children</i> 	<p>whether they have a say in decisions related to household expenditures.</p> <p>For each item an additional point if the purchases normally were made without asking for the husband's permission, and another additional point if the purchases were made at least in part with money earned by the respondent herself.</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
							Respondent with a score of 7 or better considered “empowered” and coded as 1.
				Ability to make large purchases	+	<ul style="list-style-type: none"> • <i>Woman purchasing pots and pans</i> • <i>Woman purchasing children’s clothing</i> • <i>Woman purchasing saris for oneself</i> • <i>Woman buying the family’s daily food</i> 	<p>These indicators intend to capture women's ability to make household spending and whether they have a say in decisions related to household expenditures.</p> <p>For each category additional point if purchase was made, at least in part, with money earned by the</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
							<p>respondent herself.</p> <p>Respondent with a score of 5 or better considered “empowered” and coded as 1.</p>
				Involvement in major decisions	+	<ul style="list-style-type: none"> • <i>Woman making a decision (individually or jointly with the husband) within the past few years about house repair or renovation</i> • <i>Woman’s decision to take in a goat to raise for profit</i> • <i>Woman deciding to lease land</i> 	<p>These indicators intend to capture women's ability to make household spending and whether they have a say in decisions related to household expenditures.</p> <p>Additional point was given for each category if money earned by the</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> Woman deciding to buy land, a boat or a bicycle rickshaw 	<p>respondent was used.</p> <p>Respondent with a score of 2 or better considered "empowered" and coded as 1.</p>
		BRAC member (yes/no)		Ability to make small purchases	+	See above	See above
				Ability to make large purchases	+	See above	See above
				Involvement in major decisions	0	See above	See above
		Membership duration		ability to make small purchases	0	See above	See above
				ability to make large purchases	0	See above	See above

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
				Involvement in major decisions	+	See above	See above
Holvoet (2005)	Credit, enterprise development training, social welfare services versus only credit	Yes and no	Credit (Female/ male clients)	Female decision-making with respect to loan use	+		The indicators seek to capture the degree of women's participation in decision-making on the use of the loan, household expenditures and household money management and particularly the change from conventional, norm-following behavior or male decision-making to female decision-making.
				Female decision-making with respect to household expenditures	0		
				Female decision-making with respect to household money management	0		
			Credit (Group/ individual credit)	Female decision-making with respect to loan use	+		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables (if index)	Components of dependent	Short description
				Female decision-making with respect to expenditures	0		The analysis presented in the paper requires careful interpretation, e.g. the first relationship here connotes that if credit is allocated to a female client, there is a higher likelihood of the Woman deciding on loan use instead of societal norms being followed, than when credit is allocated to the male.
				Female decision-making with respect to money management	+		
		Credit (old/new)		Female decision-making with respect to loan use	+		
				Female decision-making with respect to expenditures	0		
				Female decision-making with respect to money management	0		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
			Organizational model (Rido/Myrada)	Female decision-making with respect to loan use	+		
				Female decision-making with respect to expenditures	0		
				Female decision-making with respect to money management	0		
Holvoet (2006)	Credit with only financial intermediation or also with social intermediation (awareness-raising on	Yes	Myrada membership	Female Control over Resources	+		The indicator intends to capture the degree of control of women over resources. Descending scores for
			Rido membership	Female Control over Resources	+		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
	gender and development issues)		Financial + social intermediation	Female Control over Resources	+		<p>increasing levels of empowerment.</p> <p>Index constructed on the basis of:</p> <p>% assets in own name (=0),</p> <p>% assets in both names (=1),</p> <p>% assets only in men's name (=2).</p> <p>The analysis requires careful interpretation, e.g., more elaborate 'social' intervention approach of Myrada results in significantly higher level of female control over resources than</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
							Rido's 'financial only' approach.
Hoque and Itohara (2009)	Credit	Yes	Amount of credit	Status of empowerment	0	Status of Empowerment based on 4 Indicators:	Status of empowerment has 2 values:
			Duration of credit use	Status of empowerment	0	<ul style="list-style-type: none"> • <i>Contribution to household income</i> 	1 'empowered' or 0 'not empowered'.
			Credit use by woman (yes/no)	Status of empowerment	+	<ul style="list-style-type: none"> • <i>Access to resources: measure based on scoring of 8 issues</i> • <i>Participation in family decision making process: measure based on scoring of 10 issues</i> • Perception on gender awareness 	
Husain et al. (2010)	Credit	Yes	New members SHG (< 6 months)	Control over respondents' income	0		1 if (female) respondent herself decides,

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables (if index)	Components of dependent	Short description
			versus older members				0,5 in case of joint control, 0 in all other cases.
				Who spends husbands' income/ control of family income	0		
				Who decides on treatment of respondent	0		
				Who decides on major household purchases	0		
				Who decides on daily purchases	0		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
Jamal (2008)	Credit	No	Credit (yes/pipeline/no credit)	Economic aspects of empowerment	0	<ul style="list-style-type: none"> • <i>Do you take decisions on the aspects of purchase, construction, modification or repair of house?</i> • <i>Does your husband discuss with you when a decision on construction/modification/repair of house is made?</i> • <i>Do you take decisions on the purchase or sale of livestock?</i> • <i>Did your husband discuss with you before sale or purchase of livestock?</i> • Do you purchase dresses for the family? • Do you purchase utensils for your family? 	Women's empowerment index in each category uses responses to questions about the perception of women regarding the role of women in household decision-making. After assigning a score to each response, the final score of a particular aspect is obtained by summing up across all types of decisions in that category.

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
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- Do you purchase gold and jewelry for your family?
- *Do you take decisions on borrowing money?*
- *Do your husband discuss with you issues of borrowing money?*
- Do you spend the money you have borrowed?
- Do you repay the money you have borrowed?
- *Do you take decisions on transactions involving household equipment?*
- Do you have any debt in your name?

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
							<ul style="list-style-type: none"> • <i>Does your husband discuss with you when he has incurred the debt?</i>
				Income and expenditure	0		<ul style="list-style-type: none"> • <i>Do you have your own income?</i> • <i>Do you spend it for the family yourself?</i> • <i>Do you need the permission of your husband to spend your income?</i> • <i>Do you get any part of your family income or husband's income in your hands regularly?</i> • <i>Do your husband discuss with you when he spends income for the family or his own requirements?</i>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
				Asset transactions	+	<ul style="list-style-type: none"> <li>• <i>Do you possess any household asset?</i> <li>• <i>Do you have cash savings in your own name?</i> <li>• <i>Do you operate a bank account in your name?</i> <li>• <i>Do you pledge, sell, or exchange any of the above said assets yourself?</i> <li>• <i>Do you need permission from your husband to sell, pledge, exchange any of the assets?</i> <li>• <i>Do you have or have you purchased land in your own name?</i> 	

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
							<ul style="list-style-type: none"> • <i>Is the house you stay in registered in your name?</i> • <i>Is the house you stay in registered in your and your husband's name?</i>
			Credit recent credit organization (yes/pipeline/no credit)	Economic aspects of empowerment	0	As above	
				Income and expenditure	0	As above	
				Asset transactions	0	As above	
			Credit more established organization (yes/pipeline/no credit)	Economic aspects of empowerment	0	As above	
				Income and expenditure	0	As above	

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
				Asset transactions	0	As above	
Karlan and Zinman (2007)	Credit	No	Credit (yes/no; female sample)	Decision-making scale	0	<p>Decision-making scale based on questions about how the household decides about:</p> <ul style="list-style-type: none"> • <i>Routine purchases</i> • <i>Expensive purchases</i> • <i>Giving assistance to family members</i> • <i>Family purchases</i> • <i>Recreational use of money</i> • <i>Personal use of money</i> • Number- of children • Use of family planning 	<p>Questions asked to married applicants whose loan applications were rejected (as being 'marginally uncreditworthy').</p> <p>Value for each item 0 if decision-making by the respondent's spouse or someone else in the household, 1 if decision-making by the couple, and 2 if decision-making by respondent.</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> • Method of family planning • <i>Assistance given to relatives</i> • <i>Decision to borrow</i> • <i>Amount to borrow</i> • <i>Where/who to borrow from</i> 	Index is sum of the 13 responses (range: 0-26).
Kim et al. (2007)	Credit , savings, learning programme (health, reproduction, gender, community action)	Yes	Credit (yes/no)	Autonomy in decision-making	+	10 questions about household decisions, e.g., making small, medium, or large purchases, taking children to the clinic, visiting family or friends. (No further details on components provided.)	Study defines 9 indicators of empowerment amongst which autonomy in decision-making. Others are: self-confidence, financial confidence, challenging gender norms, perceived

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description								
							<p>contribution to household income, household communication, partner relationship, social group membership, collective action.</p> <p>Autonomy in decision-making means: does not need partner's permission for 5 of 10.</p>								
Lakwo (2007)	Credit, savings, training	Yes	Membership (yes/no)	<table border="1"> <tr> <td>Cattle</td> <td>0</td> </tr> <tr> <td>Shoat</td> <td>0</td> </tr> <tr> <td>Poultry</td> <td>+</td> </tr> <tr> <td>Radio</td> <td>0</td> </tr> </table>	Cattle	0	Shoat	0	Poultry	+	Radio	0			<p>Variables refer to decision- making on livelihood assets and strategies.</p>
Cattle	0														
Shoat	0														
Poultry	+														
Radio	0														

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables (if index)	Components of dependent	Short description
				Bicycles	0		The indicators seeks to capture the extent to which women have achieved empowerment in household decision-making (e.g. decision over buying and selling of poultry). Values of variables not clearly defined in study. Interpretation of direction of relationship based on text, not on table.
				Bed/ mattresses	+		
				Business	0		
				Bank account	0		
Lastarria-Cornhiel and	Credit, training	Yes	Female client (yes/no)	Female spouse decision-making	0		This indicator captures the household

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
Shimamura (2008)				on food consumption			decision-making on food consumption with options: female spouse decision, joint decision or male spouse decision.
Mizan (1993)	Credit, social education	Yes	Grameen bank participation (yes/no)	Household decision-making scale	+	Decision-making on: <ul style="list-style-type: none"> • <i>Purchase of daily food</i> • <i>Expenses on education and marriage of children</i> • <i>Expense on medicine for self and husband</i> • <i>Investing respondent's earning in business</i> • <i>Purchase and selling of land</i> • <i>Hiring labor</i> • <i>Buying cows, goats and agricultural implements</i> 	This indicator is measured by a composite scale consisting of several decision-making items. Decisions by: 1=husband only, 2=jointly, 3=wife only.
		Years of loan from GB	Household decision-making scale	+			
		Monthly income from GB investment	Household decision-making scale	+			

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> • <i>Providing financial support to respondent's or husband's parents</i> • <i>Buying clothes for self and other family members</i> 	
Mohindra et al. (2008)	Credit, skills training, awareness campaigns	Yes	Credit (yes/ no) (early joiner, > 2 years versus non-member)	Male decision-making	0	Decision-making agency in: <ul style="list-style-type: none"> • <i>Seeking health care of family member</i> • <i>Daily household expenditures</i> • <i>Child's education in school</i> • Family planning • Voting in an election 	Dichotomous indicator capturing whether a woman's husband (or male relative) was sole decision-maker on a number of household issues. Female only and joint decision-making considered to reflect a high level of empowerment.
			Late joiner	Male decision-making	-		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent (if index) - dependent variables	Components of dependent	Short description
							<p>Male decision-making is when woman reported at least 1 situation in which husband or male relative was sole decision-maker.</p> <p>So negative relation means an increase in female influence in decision-making.</p>
Ngo (2008)	Credit, training business skills	Yes	Women with credit (North and South Kyrgyzstan separately)	Large purchases (appliances and furniture)	0		Selected categorical variables that intend to capture female respondent's participation in decision-making on household
			Female residents programme versus idem control villages in	Purchase/ sell/ rent land, property	0		
				Getting a credit	0		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
			North and South Kyrgyzstan separately	Purchase/ sell large animals	0		expenditures with categories: 'alone', 'jointly' and 'no say'.
				Purchase/ sell smaller animals	0		
Pitt et al. (2003)	Credit	Yes	Female credit (yes/ no) Households in programme villages with female credit groups versus non-programme villages	Purchasing ability (factor)	+	<ul style="list-style-type: none"> • <i>Food</i> • <i>Cosmetics</i> • <i>Candy</i> • <i>Utensils</i> • <i>Furniture</i> • <i>Children's clothing</i> • <i>Own clothing</i> • <i>Wife can buy asset</i> • <i>Wife can buy asset without husband's permission</i> 	The subsets of empowerment variables are treated as containing a latent factor. In this context, factor analysis is used to estimate index "weights" for numerical estimates of latent factor. 2 relevant factors result: 1. Purchasing capacity: women's
				Transaction management (factor)	+	<ul style="list-style-type: none"> • <i>House repair decision</i> • <i>House repair implementation</i> • <i>House repair spending</i> 	

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> • <i>Livestock purchase decision</i> • <i>Livestock purchase implementation</i> • <i>Livestock spending</i> • <i>Household loans decision</i> • <i>Household loans implementation</i> • <i>Household loans spending</i> • <i>Land/equipment purchase or sale decision</i> • <i>Land/equipment implementation</i> 	<p>capacity to make particular purchases independently.</p> <p>2. Transaction management: describes decision-making ranging from full power in wife's hands to full power in husband's) and likelihood that wife spends money.</p>
Pitt et al. (2006)	Credit	Yes	Female credit (yes/ no) Households in programme villages with	Purchasing ability + (factor)		<ul style="list-style-type: none"> • <i>Food</i> • <i>Cosmetics</i> • <i>Candy</i> • <i>Utensils</i> • <i>Furniture</i> • <i>Children's clothing</i> 	The subsets of empowerment variables are treated as containing a latent factor. In this

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
			female credit groups versus non-programme villages			<ul style="list-style-type: none"> • <i>Own clothing</i> • <i>Wife can buy asset</i> • <i>Wife can buy asset without husband's permission</i> 	context, factor analysis is used to estimate index "weights" for numerical estimates of latent factor. 2 relevant factors result:
				Transaction management (factor)	+	<ul style="list-style-type: none"> • <i>House repair decision</i> • <i>House repair implementation</i> • <i>House repair spending</i> • <i>Livestock purchase decision</i> • <i>Livestock purchase implementation</i> • <i>Livestock spending</i> • <i>Household loans decision</i> • <i>Household loans implementation</i> • <i>Household loans spending</i> • <i>Land/equipment purchase or sale decision</i> 	<p>1. Purchasing capacity: women's capacity to make particular purchases independently.</p> <p>2. Transaction management: describes decision-making ranging from full power in wife's hands to full power in husband's) and</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
						<ul style="list-style-type: none"> • <i>Land/equipment implementation</i> • <i>Land/equipment spending</i> 	likelihood that wife spends money.
Rahman et al. (2009)	Credit	Yes	Credit (yes/ no)	Empowerment index	0	<p>The following indices used as a proxy for empowerment:</p> <ul style="list-style-type: none"> • Economic security • <i>Purchase decision</i> • <i>Control over assets</i> • Mobility index • Awareness 	<p>The latent variable empowerment is measured through an index called empowerment index (EI). To calculate the EI, all the 5 indices shown left are added.</p> <p>Someone scoring 3 or more out of 5 indices is considered empowered and scores 1, otherwise 0.</p>

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
Schuler and Hashemi (1994)	Credit, training, awareness raising	Yes	Credit (yes/ no) ⁶⁶	Empowerment indicator	+	Empowerment indicator composite of following 8 variables/ indices:	To combine the 8 indicators into a single score, a woman was classified as empowered if she had a positive score on 5 or more of the eight separated indicators.
			Credit (yes/ no) ¹	Empowerment indicator	+	<ul style="list-style-type: none"> • Physical mobility • <i>Economic security</i> • <i>Ability to make small purchases on her own</i> • <i>Ability to make larger purchases</i> • <i>involvement in major (investment) decisions</i> • Freedom from domination and violence in family • Political and legal awareness • Participation in politics 	
			Credit (yes/ no) ¹	Empowerment indicator	+		
			Credit (yes/ no) ¹	Empowerment indicator	+		

⁶⁶ Adult female) Grameen or BRAC Bank member versus eligible adult females living in non-programme village.

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables (if index)	Components of dependent	Short description
Setboonsar ng and Parpiev (2008)	Credit, training and consulting	Yes	Credit (yes/ no)	Women have say in schooling matters Women have say in health care	0 0		Variables capturing women's participation on household decision-making over issues that imply expenditures.
Sharif (2002)	Credit	Yes	Young female borrowers (16 – 24) versus adult female borrowers	Daily food purchases Large Purchases Education of children Health expenditures	- - 0 -		In each domain, women were asked to rank on 5-point scale in each area, where 1 = no participation in decision-making, 2 = possibly influence, 3 = joint decision, 4 = partially own decision, 5 = own decision.

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
							Empowered (=1) if decision is joint, partially or completely her own (> 3).
Sharif (2004)	Credit	Yes	Credit (yes/ no)	Daily food purchases	+		For each of the 6 decision-making domains listed, participation in decision-making ranked along 5-point scale: 1 = no participation in decision-making, 2 = possibly influence, 3 = joint decision, 4 = partially own decision, 5 = own decision.
				Large Purchases (housing, furniture, assets, etc.)	+		
				Education children	+		
				Health expenditures	+		
			Post-1996 participants versus non-participants	Daily food purchases	+		
				Large Purchases (housing,	+		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
				furniture, assets, etc.)			
				Education children	+		
				Health expenditures	+		
			Pré 1996 participants (in 1997) versus post-1996 participants	Daily food purchases	0		
				Large Purchases (housing, furniture, assets, etc.)	0		
				Education children	0		
				Health expenditures	0		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
Wakoko (2003)	Credit, training and deposits by some institutions	Yes and no	Membership of 2 or more informal financial groups (women)	Income use decisions	+		Relying on a factor analysis approach, binary responses to a set of decision-making questions were used to construct the index on household income use. These questions capture who makes the decision on a specific household issue 3 questions on household income use decisions loaded on index: • When to sell farm produce?
			Credit (from informal sources) (yes/ no) (women)	Income use decisions	0		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
							<ul style="list-style-type: none"> • How to use income from farm activities? • Whether or not to save? <p>Higher score = more decisions by respondent herself = more empowerment</p>
Zaman (1998/1999)	individual loans (ca. 75% of BRAC's lending) for traditional activities	Yes	Non-borrowing BRAC member versus member with more than 10,000 taka in loans	Owns poultry	+		Sixteen binary correlates were constructed from responses to questions about whether woman respondents owned and controlled assets. All sixteen
	Loans with complementary inputs, such as facilities for savings, and		More than 10,000 taka borrowed versus non-borrowing member	Can sell poultry independently	+		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables	Components of dependent (if index)	Short description
	depending on sector support structure including training, consciousness-raising for relatively new activities		Less than 5,000 taka borrowed versus non-borrowing BRAC-member	Owens livestock	+		indicators were treated separately.
			More than 10,000 taka borrowed versus non-borrowing member	Can sell jewelry independently	+		
			Non-borrowing BRAC member versus eligible non-member	Has savings	+		
			BRAC members and – borrowers versus eligible non-members	Can use savings independently	-		
			Loan size	Has savings	+		

Study	Services provided	Solidarity group	Credit Independent variable	Dependent variable: decision-making household expenditures indicators	Relationship independent - dependent variables (if index)	Components of dependent	Short description
			Loan size	Can use savings independently	+		
			All credit variables	Owns land	0		
			All credit variables	Can sell livestock independently	0		
			All credit variables	Owns jewelry	0		

Note 1: + means significant positive relation between independent and dependent variable ($p < 0.05$); – means significant inverse relation ($p < 0.05$); 0 means no significant relation ($p > 0.05$). Note 2: components in italics refer to aspects of women’s control over household expenditures.

Appendix 7: Methods for effect size calculation

Table A7 1: Effect size formulae used

No.	Study	Effect size formula	Effect size calculation possible?
1	Amin et al., 1995	SMD8, OR	Yes
2	Amin et al., 1998	SMD 4, SMD8	Yes
3	Asim, 2008	SMD3, probit, SMD1	Yes
4	Banerjee et al., 2009	SMD7 using assumptions made regarding sample size in TR and CTL; pooled SMD calculated assuming same SD in TR and CTL.	Yes
5	Crepon et al., 2011	SMD1 not possible since no sd of either treated or controls given. Only overall N and SE given which is not sufficient. No other formula applicable. We therefore calculated the SMD by transforming the estimated OR from regression analysis.	Yes
6	Garikipati, 2008	SMD1, logit, multinomial logit	Yes
7	Hashemi et al., 1996	OR	Yes
8	Holvoet, 2005	Not possible, the data reported not sufficient to do any effect size calculation.	No
9	Holvoet, 2006	SMD2	Yes
10	Hoque and Itohara, 2009	SMD1, logit	Yes
11	Husain et al., 2010	SMD3. SMD1 not possible since no sds are given. SMD8 not possible since sd of dep var not given, also reg coeff given but only their sign but not their actual values.	Yes
12	Jamal, 2008	SMD8 not possible since TR n, CTL n and sd of dep var missing. No other formula applicable.	No
13	Karlan and Zinman, 2007	SMD1 not possible. Not sufficient information given, e.g. no TR n and CTL n as well as no TR SD and CTL SD. We therefore approximated SMD7	Yes

No.	Study	Effect size formula	Effect size calculation possible?
		assuming TR n and CTL n the same as overall N and SD given.	
14	Kim et al., 2007	OR	Yes
15	Lakwo, 2007	Logit	Yes
16	Lastarria-Cornhiel and Shimamura, 2008	Tobit, linear probability model. SMD8 not possible since sd of dep var not given. Considered SMD10 but not possible either since TR SE and CTL SE not given separately. Only overall SE given which is not sufficient. PSM ATT values given, but TR sd as well as CTL sd of outcome variables needed which are not given, hence SMD1 not possible either.	Yes
17	Mizan, 1993	SMD7 and SMD8 both not possible since sd of dep var missing. No other formula applicable.	No
18	Mohindra et al., 2008	OR	Yes
19	Ngo, 2008	SMD1 (see Table 5.2 → same as 8.5.1, 8.5.2) – SMD3 might be possible for these 2 tables as well but we are not using SMD3 here, SMD11 (see Tables 5.7, 5.8, 5.9A, 5.9B), SMD5 ok, SMD8 (see Table 5.11) not possible since sd of dep var isn't reported. Table 11 also reports logit coeff (OR/RR1) but outcome variable unclear, determinants of SHG membership investigated, not sufficient data for OR.	Yes
20	Pitt et al., 2003	SMD8 not possible since sd of dep var not reported. No other formula applicable. Factor analysis model used and factor loading, uniqueness and Eigenvalue report but not useful.	No
21	Pitt et al., 2006	Peer-reviewed version of previous paper but more results reported. SMD7 and SMD9 (Tables 4, 5) possible.	Yes
22	Rahman et al., 2009	Probit (tables 5, 6) BUT: probit coeff possibly not useful since they investigate factors affecting the empowerment index without investigating the impact of microfinance participation on this index.	Yes

No.	Study	Effect size formula	Effect size calculation possible?
23	Schuler and Hashemi, 1994	Logit	Yes
24	Setboonsarng and Parpiev, 2008	SMD3 possible. SMD1 potentially possible but mean and sd not given separately for TR and CTL groups. PSM ATT, SE and t-stats reported (Tables 12, 14; Kernel matching Table A2, stratification matching Table A3), descriptives for outcome variables reported (Table A1).	Yes
25	Sharif, 2002	SMD1, however, the comparison is not treated versus controls but youth participants versus adult participants. Probit possible too (Table 12.4).	Yes
26	Sharif, 2004	Ordered probit model (Table 5) looking at 6 dimensions of decision-making, new versus old participant comparison, t-ratios given	No
27	Wakoko, 2003	SMD6 possible (Table 6.1), SMD3 possible (Tables 6.6, 6.7, 6.8, 6.9, 6.10, 6.11), OR and logit (Tables 6.12, 6.13, 6.14 – Odds ratios and betas)	Yes
28	Zaman, 1998	SMD7, logit (Tables 1.4, 1.5), but overall standard error not calculable so study not included in meta-analysis	Yes
29	Zaman, 1999	SMD8 (Table 5), logit (Tables 4, 11 (which is equal to 1.4 in his 1998 paper)), but overall standard error not calculable so study not included in meta-analysis	Yes

Note: OR findings transformed to SMD for meta-analysis using Chinn's (2000) transformation.

TABLE A7. 1: FURTHER INFORMATION ON EFFECT SIZE CALCULATIONS

Method	Effect size formula	Requirements for effect size calculation
Comparison of means	SMD1	N, mean and sd of treatment and control groups
	SMD2	t-value and total N
	SMD3	t-value, n_treatment and control
	SMD4	f-statistic of t-test and total N

	SMD5	p-value of t-test and total N
Comparison of frequencies	SMD6	Chis-sq and total N
OLS regression	SMD7	Unstandardised beta, sd depvar, n_t and n_c
	SMD8	Standardised beta, sd depvar, n_t and n_c
Contingency table	SMD11	p-value of Chisq and total N
Odds ratio	12	Beta and cis from logistic regression
Logit	13	Beta and se_beta (from se, t- or z-values)
Multinomial logit	14	"
Probit	15	"
Ordered probit	16	"
Linear probability	17	"
Tobit	18	"

Table A7 2: Studies using unconventional estimation methods

Study	Estimation	Variance	Other statistics	Formula	Comments
Asim, 2008	Probit	Se	Total n; N_cov		$se = \frac{\beta_{logit}}{se}$
Garikpati, 2008	Logit	z-value	N,mean, sd _treat and control	$t = z * \frac{\sqrt{df}}{\sqrt{N}}$.1.1.1.1 OR and SMD1
	Multinomial logit	z-value	Total_n Treat_n	$se = \frac{\beta_{logit}}{se}$	t=z*df^.5/n^.5 se = beta/se
Hashemi et al., 2006	Logit	Confidence interval		SMD = ln(OR)/1.65	
Hoque and	Logit		N_cov;		T=wald_t

		t-value (Wald test)	Tot_n	$t = Wald_t * \frac{\sqrt{df}}{\sqrt{N}}$ $se = \frac{\beta_{logit}}{se}$	Se=beta / se
Itohara, 2009			Tot_n		
Lakwo, 2007	Logit	Se	Tot_n Covs not clear		
Lastarria et al., 2008	Linear probability	Se	N_covs Tot_n	$se = \frac{\beta_{logit}}{se}$	
Rahman et al., 2009	Probit	z-values	N_covs Tot_n	$se = \frac{\beta_{logit}}{se}$	
Schuler et al., 1994	Logit	Significance level 'stars'	N_covs Tot_n		Not possible
Sharif, 2002 and 2004	Probit Ordered probit	t-value; r2 t-value	N_cov; no tot_n N_cov; tot_n treat_n	$se = \frac{\beta_{logit}}{se}$	
Wakoko, 2003	Logit	Significance level 'stars'			Not possible
Zaman, 1998 and 1999	Logit	Significance level 'stars'			Not possible

Appendix 8: Further discussion and background to meta-analysis of quasi-experimental studies

This Annex presents a more comprehensive discussion and analysis of empowerment-related variables in the included studies.

A8.1. Introduction

Meta-analysis aims to combine results of studies to gain greater confidence in conclusions than would be warranted by the individual studies taken separately. The presumption is that this is legitimate when there is homogeneity with respect to treatment, context and outcome; that the studies are testing a common hypothesis in a comparable way (Petticrew and Roberts, 2006:205, box 6.13). This is not the case in many of the quasi-experimental and regression studies discussed here, hence results of these analyses should be treated with caution.

Thus, a further relevant characteristic of the mainstream literature and application of quantitative research synthesis is that both treatment and outcome in the studies are equivalent in the relevant way, and generally fairly standardised in the field; they also employ common methods of analysis and reporting (Hedges and Olkin, 1985; Sutton et al., 1998; Chalmers et al., 2002).

Before describing the range of treatment indicators we are faced with, we discuss the various outcomes we came across in the studies included in this review. The definitions and metrics of the outcomes we dealt with were very diverse. We extracted 1,031 estimates from just over 200 different outcome indicators across 29 reports summarising 25 independent included studies which we then categorised into broader constructs such as economic, social and general empowerment constructs. Overall we allocated these over 200 outcome indicators to 18 different constructs, these constructs were then further summarised into 3 different dimensions: control, decision and other empowerment. The dimension 'other empowerment' contained everything that could not be labelled either as control or decision and thus included a variety of different indicators ranging from economic to social and broader empowerment and poverty indicators/indices, discrete to continuous which made it very difficult to obtain any meaningful information from this rather diverse dimension. Hence, the meta-analysis excluded these other measures of empowerment.

We found a high degree of heterogeneity among treatment indicators, which suggested that further analysis by subgroups was required, i.e. we needed to pool the various studies using particular characteristics such as treatment indicators, outcome dimension and/or method (which is a combination of research design and analytical method) and others. However, this was a challenging task as discussed further below.

Studies using decision as main outcome dimension

MF membership

Amin et al. (1998), Husain et al. (2010), Wakoko (2003), Hashemi et al. (1996) and Lakwo (2007) used MF membership as their main treatment indicator. In addition, all these studies used decisions as their main outcome dimension. Hence, it appeared that the common treatment indicator as well as the similar outcome dimension across these studies allowed us to pool them. However, they are different in many other aspects. For example, these studies all used different methods in terms of research design and analytical method which

in turn led to different effect size calculations. Husain et al. (2010) followed a pipeline design and used mainly OLS, SMD3 is calculated for this study. The remaining four studies applied a with-and-without design but a range of analytical techniques were employed and three different effects size calculations were used: SMD4, OR and logit. Also, the country context and time matters; Amin et al. (1998) and Hashemi et al. (1996) examined Bangladesh while Husain et al. (2010) investigated India, Lakwo (2007) and Wakoko (2003) looked at Uganda; the studies were published between 1996 and 2010. Moreover, in terms of methodological quality, apart from Husain et al. (2010), all studies suffered from threats to validity; hence the importance of sensitivity analysis by risk of bias assessment.

MF participation

Asim (2008), Ngo (2008), Setboornsarg and Parpiev (2008), Sharif (2002 and 2004), Lastarria-Cornhiel and Shimamura (2008) and Mohindra et al. (2008) used MF participation as their main treatment indicator. All studies investigated decisions as the main outcome dimension. These seven studies cover Pakistan, Malawi, India, Kyrgyzstan, and Bangladesh. We decided to pool the studies that apply MF membership and MF participation, since many of them used these two concepts interchangeably. This, however, can be misleading since many MF members do not have loans but still receive some of the benefits of being part of an MF group such as group discussions, access to training, and so on (see Steele et al., 2001). The studies included here did not provide a clear descriptive account of what exactly MF membership or participation entailed, whether it was just receiving a loan or other services as well, which very much depends on the MFI, country-context and so on. Nevertheless, we pooled these studies knowing quite well that this is not ideal.

Other treatment indicators

Only one study (Garikipati, 2008) in the decision dimension used another treatment indicator which was length of membership.

Studies using control as main outcome dimension

MF membership

The following studies used MF membership as well as control as an outcome dimension: Amin et al. (1995), Holvoet (2006), Amin et al. (1998) and Husain et al. (2010); the latter two also look at decision dimension. These four studies cover India and Bangladesh. Pipeline (Husain et al., 2010), cross-section (Holvoet, 2006) and with and without designs are employed using a range of analytical methods as well as five differed effect size calculations: SMD2 (Holvoet, 2006), SMD3 (Husain et al., 2010), SMD4 (Amin et al., 1998), SMD8 and OR (Amin et al., 1995).

MF participation

Only one study used MF participation as a treatment indicator: Lastarria-Cornhiel and Shimamura (2008) which also looks at decision dimension.

Other treatment indicators

Garikipati (2008) used length of membership and also looked at decision dimension. The study by Amin et al. (1995) used times loan received as well as utilisation of loan by respondent in addition to MF membership.

Other empowerment as main outcome dimension

MF membership

Only four studies in this outcome dimension used MF membership: Lakwo (2007) which also looked at decision dimension and was discussed above, Hoque and Itohara (2009) and Zaman (1998 and 1999) which used multiple treatment indicators (see further below). SMD1, SMD7, SMD8 and logit are used across all four studies for effect size calculations.

MF participation

Mohindra et al. (2008) and Ngo (2008) which looked at decision dimensions also investigated other empowerment dimensions using MF participation as the only treatment indicator. Further studies using MF participation as the treatment indicator were Pitt et al. (2003 and 2006), Rahman et al. (2009) and Schuler and Hashemi (1994). These six studies covered three countries: Bangladesh (4), India (1), and Kyrgyzstan (1). They are all with and without studies, though Schuler and Hashemi (1994) is a panel. Pooling these 6 studies was challenging due to the nature of the outcome dimension which covered a range of empowerment indices as well as socio-economic indicators. In addition, numerous effect size formulas were applicable for these studies which made pooling even more difficult.

Other treatment indicators

The remaining studies in this outcome dimension used a range of treatment indicators; Garikipati (2008) used length of membership and also looked at decision and control dimensions. Hoque and Itohara (2009) used multiple treatment indicators such as MF membership, amount of credit, duration of credit use and credit use by woman. Zaman (1998 and 1999) used amount of credit as well as MF membership as treatment indicators.

Concluding remarks

We can see from the above discussion that there were studies that applied several treatment indicators within one study (Amin et al., 1995; Hoque and Itohara, 2009; Zaman 1998 and 1999). Some studies also investigated several outcome dimensions (e.g. Amin et al., 1998; Garikipati, 2008, Husain et al., 2010, Lakwo, 2007; Lastarria-Cornhiel and Shimamura, 2008; Mohindra et al., 2008; Ngo, 2008) and at times several effects size calculations could be applicable for the data from one particular study (e.g. Amin et al., 1995; Asim, 2008; Garikipati, 2008; Hoque and Itohara, 2009; Lastarria-Cornhiel and Shimamura, 2008; Ngo, 2008; Pitt et al. 2006; Sharif, 2002; Wakoko, 2003; Zaman 1998 and 1999). In addition, eight countries were covered by the studies in this meta-analysis between 1993 and 2011 and a wide range of research designs and analytical methods were employed. Given this diversity, it was difficult to make a sensible decision as to how to pool these studies.

It appears that focusing on the decision construct was most sensible and within that dimension pooling the studies using MF membership and MF participation as treatment indicators seemed appropriate.

A question that also arose was whether and how to extract a single effect size when there were multiple estimates in a given study of impact of a given indicator of treatment on a given outcome variable (study/treatment/dimension). The approach we took to deal with effect size dependence is outlined in section 2 following Lipsey and Wilson (2001).

A8.2. Requirements for effect size estimates

The 25 independent findings were selected on the basis of including particular proxies of women's control over household spending. As to other empowerment-related variables, the studies do not constitute a representative or complete set of studies that deal with these issues, since our search and inclusion strategies were not aligned to this focus.

Consequently, we did not attempt to pool effect sizes based on these outcome variables. As noted earlier, a very wide range of effect size calculations was necessary; the calculation acronym and the data required for each are given in Table A8.1.

Table A8 1: Effect size calculations and data requirements

Effect size calculation	Comments	t-test			Chi-square			Regression models										Studies ¹				
		TR mean	T R sd	CTL mean	CT L sd	T R n	CT L n	To I N	t-va l	p-va l	f-va l	2 X 2	p-va l	Sd dep var	Unstan d reg coeff	Sd reg coeff	Log it coe ff		Probit/ tobit coeff	t-val of beta		
SMD1	N, mean and sd of treatment and controls																				Asim, 2008, Garikipati 2008, Hoque and Itohara 2009, Ngo 2008, Sharif 2002	
SMD2	t-test equal sample size																					Holvoet 2006
SMD3	t-test unequal sample size																					Asim, 2008, Husain 2010, Setboornsarg and Parpiev 2008, Wakoko 2003
SMD4	F-statistic of t-test																					Amin et al., 1998
SMD5	p-value of t-test																					Ngo, 2008
SMD6	Chisq and total N																					Wakoko 2003
SMD7	Unstandardised beta, sd dep var, n_t and n_c																					Banerjee et al. 2009, Karlan and Zinman 2007, Pitt 2006, Zaman 1998

SMD8	Standardised beta, sd dep var, n_t and n_c					Amin 1995, Amin et al., 1998, Zaman 1999
SMD9	Unstand. beta and t-value					Pitt 2006
SMD11	p-value of Chisq and total N					Ngo 2008
OR	Odds ratio and confidence intervals					Amin 1995, Crepon et al., 2011, Hashemi 1996, Kim 2007, Mohindra 2008, Wakoko 2003
Logit, mnl logit; Probit; Oprobit; tobit, Linear prob ²	Beta and its se, t-value, p-value or z-value					Asim 2008, Garikipati 2008, Hoque and Itohara 2009, Lakwo 2007, Lastarria 2008, Rahman 2009, Schuler and Hashemi 1994, Sharif 2002 and 2004, Wakoko 2003, Zaman 1998 and 1999

Note: Effect size calculation not possible for: Holvoet 2005, Jamal 2008, Mizan 1993, and Pitt 2003.

Table A8.1 presents the methodologies and opportunities for ES calculation with respect to all empowerment-related variables in the included studies. The table summarizes our extraction of statistics from which impact effect sizes may be calculated. Meta-analysis requires estimates both of a comparable effect size, either a standardized mean difference (SMD), an “r” statistic, odds ratio (OR), or risk ratio (RR), and their standard errors. Of the 29 reports summarising 25 unique studies, 7 did not provide statistics which could be used for this purpose; 14 provided statistics which clearly could be used (SMD1-11), 5 provided OR statistics (however two of the studies that provided OR statistics also provided data for SMD calculations), and 12 provided tobit or probit coefficients and their standard errors (or t-values) but not sufficient covariate coefficients and descriptive statistics to compute marginal effects (of those 12 studies, seven also provided statistics for SMD calculations). OR estimates may be transformed into SMD using the transformations suggested by Chinn (2000). Our effect size calculations

followed those set for Lipsey and Wilson (2001)⁶⁷. Appendix 7 outlines the effect size formula applicable for each study and provides a justification should a calculation not have been possible. Table A8.2 presents a further summary of outcomes, treatments and methodological remarks on effect size calculations.

⁶⁷ <http://gunston.gmu.edu/cebcp/EffectSizeCalculator/index.html>

Table A8 2: Summary of outcomes, treatments, methods, and effect size calculations

No.	Study	Treatment variable	Outcome variables	Outcome construct	Outcome dimension	Analytical method	Effect size formula	Comments
1	Amin et al., 1995	Membership credit organization (yes/no), Times loan received (#), Utilization of loan by respondent herself (yes/no).	Mobility, Authority, Aspiration, Recent fertility, Contraceptive use, Desire for no more children.	Authority index	Control	— Multivariate /OLS/logit	SMD8, OR	SMD8: Only three quite extreme values positive versus rest which are near to zero - no clear pattern - differ by outcome and by treatment.
2	Amin et al., 1998	Membership NGO (yes/no)	Authority index, Autonomy index, Consultation index.	Authority index, Autonomy index, Consultation index.	Control, Decisions.	— Multivariate /tables	SMD4, SMD8	Authority index low d value – maybe not appropriate.
3	Asim, 2008	Participation in programme (y/n)	Boy's schooling, Girl's schooling, Child's medical care,	Decision-making	Decisions	— IV/PSM	SMD1, SMD3, ordered probit	Ordered probit: quite heterogeneous, outcomes are decisions about consumption goods.

Medical checkup. —
 Purchase of household assets, —
 House repair, —
 Sale/purchase of house, —
 Grocery/fruits, —
 Medicine for herself, —
 Personal clothes/cosmetics, —
 Buy ice-cream/sweets for children, —
 Buy books/uniform for children, —
 Take a child to the doctor. —

4	Banerjee et al., 2009	Credit intervention area (yes/no)	Woman makes spending decisions, Woman makes non-food spending decisions.	Decision-making	Decisions	—ITT	SMD7
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5	Crepon et al., 2011	Credit (yes/ no)	Number of activities managed by female member HH,	Activities managed by female,	Other empowerment	ITT	OR
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		Women index.	Women index.							
6	Garikipati, 2008	Length of membership of credit group (years = 0 for non-members)	Say in household decisions,	Control, decisions,	—	Multivariate/logit	SMD1, logit, multinomial logit	Multinomial logit: very narrow confidence intervals - check out logit coefficient and z-value - check formula for z-value to t-value;		
			Control over minor finances,	Decision-making, Vulnerability, Control.				Other empowerment.	three large negative ES - dependent variables are use of loan - exclude Table 6 as outcome. Variables are not indicators of empowerment.	
			Control over major finance.						No multinomial logit estimates.	
7	Hashemi et al., 1996	GB member (yes/no)	Ability to make small purchases,	Decision-making	Decisions	—	Multivariate /logit	OR	Mainly positive, but some extreme positive.	
			Ability to make large purchases,							—
			Involvement in major decisions,							—
			Ability to make small purchases,							—
			Ability to make large purchases,							—
Involvement in major decisions,	—									
			Ability to make small purchases,			—				

		Ability to make large purchases,						
		Involvement in major decisions.						
		Female decision-making with respect to loan use,						
		Female decision-making with respect to HH expenditures,						
		Female decision-making with respect to HH money management,						
		Female decision-making with respect to loan use,						
8	Holvoet, 2005	Credit (Female/male clients), Credit (Group/individual credit), Credit (Old/new), Organizational model (Rido/Myrada)	Decision-making	Decisions	Multivariate /logit			Not possible, the data reported not sufficient to do any effect size calculation.
		Female decision-making with respect to expenditures,						
		Female decision-making with respect to money management,						
		Female decision-making with respect to loan use,						
		Female decision-making with respect to expenditures,						
		Female decision-making with respect to money management,						

			Female decision-making with respect to loan use,							
			Female decision-making with respect to expenditures,							
			Female decision-making with respect to money management.							
	Myrada membership,		Female Control over resources,							
9	Holvoet, 2006	Rido membership, Financial + social intermediation.	Female Control over resources,	Control over resources	Control	Mean gain scores/t-tests	SMD2			Needs to be entered the raw scores and the means and standard deviations.
			Female Control over resources.							
		Membership (yes/no),								
10	Hoque and Itohara, 2009	Amount of credit, Duration of credit use, Credit use by woman (yes/no).	Status of empowerment.	Status of empowerment	Other empowerment	Multivariate /logit	SMD1, logit			Logit: two rather high estimates - Table 4, two large positive logit coefficients on a dummy (0/1) variable for utilization of credit explaining 0/1 variable.
			Control over respondents' income,							
11	Husain, Mukherjee and Dutta, 2010	New members SHG (< 6 months) versus older members	Who spends husbands' income/ income,	Control.	Control, Decisions.	basic OLS/tables	SMD3			
			Who decides on treatment of respondent,							

		Who decides on major HH purchases,						
		Who decides on daily purchases.						
		Credit (yes/pipeline/no credit),	Economic aspects of empowerment,					
		Credit recent credit organization, (yes/pipeline/no credit),	Income and expenditure,					
12	Jamal, 2008	Credit more established organization (yes/pipeline/no credit).	Asset transactions,	Decision-making	Decisions	DID		Not possible. E.g. SMD8 not possible since TR n, CTL n and sd of dependent variables missing. No other formula applicable.
			Economic aspects of empowerment,					
			Income and expenditure,					
			Asset transactions,					
			Economic aspects of empowerment,					
			Income and expenditure,					
			Asset transactions.					
13	Karlan and Zinman, 2007	Credit (yes/no; female sample)	Decision-making scale (how the household decides about: routine purchases, expensive purchases, giving assistance to family	Decision-making	Decisions	ITT	SMD7	

members, family purchases, recreational use of money, personal use of money, number- of children, use of family planning, method of family planning, assistance given to relatives, decision to borrow, amount to borrow, and where/who to borrow from).

14	Kim, Watts, Hargreaves, Ndhlovu, Ohetia, Morioson, Busra, Porter, Pronyk, 2007	Credit (yes/no)	Autonomy in decision-making.	Empowerment	Other empowerment	Multivariate	OR	
15	Lakwo, 2007	Membership (yes/no)	Cattle, Shoat, Poultry, Radio, Bicycles, Bed/ mattresses,	Decision-making, Well-being indicators, Asset ownership.	Decisions, Other empowerment.	Multivariate /logit	logit	Quite heterogeneous

			Business, Bank account.			—		
16	Lastarria-Cornhiel and Shimamura, 2008	Female client (yes/no)	Female spouse decision-making on food consumption	Economic, Social, Health, Empowerment indicators, Decision-making.	Decisions, Other empowerment	— PSM/tobit	Tobit, linear probability model	Linear probability model: one larger negative ES – not clear why. Tobit: very heterogeneous ES estimate.
17	Mizan, 1993	Grameen bank participation (yes/no), Years of loan from GB, Monthly income from GB investment.	Household decision-making.	Decision-making	Decisions	— Multivariate	Not possible. E.g. SMD7 and SMD8 both not possible since sd of dep var missing. No other formula applicable.	
18	Mohindra, Haddad and Narayana, 2008	Credit (yes/ no) (early joiner, > 2 years versus non-member), Late joiner.	Male decision-making.	Health, Well-being indicators, Decision-making, Satisfaction.	Decisions, Other empowerment	— Multivariate /logit	OR	Mainly negative and some outliers with low d values.

19	Ngo, 2008	Women with credit (North and South Kyrgyzstan separately), Female residents programme versus idem control villages in North and South Kyrgyzstan separately	Large purchases (appliances and furniture),	Decision-making,			SMD5: quite heterogeneous - is confidence interval too low	
			Purchase/ sell/ rent land,	Well-being indicators.		—		SMD11: wide confidence intervals - low heterogeneity.
			Property,		Decisions, Other empowerment.	—	ITT	SMD1, SMD5, SMD11, SMD3 possible too but not used
			Getting a credit,			—		
			Purchase/ sell large animals,			—		
			Purchase/ sell smaller animals.					
<hr/>								
20	Pitt, Khandker and Cartwright, 2003	Female credit (yes/ no) , Households in programme villages with female credit groups versus non-programme villages	Purchasing ability (factor),					
			Food,			—		
			Cosmetics,			—		
			Candy,			—		
			Utensils,			—		
			Furniture,	Empowerment indicators	Other empowerment	—	2SLS	
			Children's clothing,			—		Not possible. E.g. SMD8 not possible since sd of dep var not reported. No other formula applicable.
			Own clothing,			—		
			Wife can buy asset,			—		
			Wife can buy asset without husband's permission,			—		

Transaction management (factor),	—
House repair decision,	—
House repair implementation,	—
House repair spending,	—
Livestock purchase decision,	—
Livestock purchase implementation,	—
Livestock spending,	—
HH loans decision,	—
HH loans implementation,	—
HH loans spending,	—
Land/equipment purchase or sale decision,	—
Land/equipment implementation,	—
Land/equipment spending.	—

21	Pitt, Khandker and Cartwright, 2006	Female credit (yes/ no) , Households in programme villages with female credit groups versus	Purchasing ability (factor), Transaction management (factor).	Empowerment indicators	Other empowerment	2SLS	SMD7, SMD9	SMD7: Very narrow confidence intervals and some outliers - diverse outcomes - not clear what to exclude SMD9: some very large d values - not clear if calculated. correctly
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non-programme
villages

22	Rahman, Junankar and Mallik, 2009	Credit (yes/ no)	Empowerment index.	Empowerment index	Other empowerment	—	Probit	Probit	Low standard errors; not useful since they investigate factors affecting the empowerment index without investigating the impact of MF participation on this index.
23	Schuler and Hashemi, 1994	Credit (yes/ no)	Empowerment indicator.	Empowerment indicator, Composite.	Other empowerment	—	Multivariate /logit	logit	
24	Setboonsaeng and Parpiev, 2008	Credit (yes/ no)	Women have say in schooling matters, Women have say in health care.	Decision-making	Decisions	—	PSM	SMD3	Very narrow confidence intervals - t-value and unequal sample actually is standard error and t-value of ATT from matching.
25	Sharif, 2002	Young female borrowers (16 – 24) versus adult female borrowers	Daily food purchases, Large purchases, Education of children, Health expenditures.	Decision-making	Decisions	—	Probit/table —s	SMD1, probit	Probit: Very heterogeneous - some larger positive ES - large probit; the comparison is not treated versus controls but youth participants versus adult participants.

			Daily food purchases,					Outcomes are decisions about marriage, fertility. generally positive
			Large purchases (housing, furniture, assets, etc.),			—		but check out ES estimator;
			Education children,			—		new versus old participant comparison.
			Health expenditures,			—		
			Daily food purchases,			—		
26	Sharif , 2004	Credit (yes/ no)	Large Purchases (housing, furniture, assets, etc.),	Decision-making	Decisions	—Ordered probit/t-tests	Ordered probit model	
			Education children,			—		
			Health expenditures,			—		
			Daily food purchases,			—		
			Large purchases (housing, furniture, assets, etc.),			—		
			Education children,			—		
			Health expenditures.			—		
27	Wakoko, 2003	Membership of 2 or more informal financial groups (women),	Income use decisions.	Decision-making	Decisions	Multivariate /logit	SMD3, SMD6, OR, logit	SMD3: Some low means of d.

Credit (from informal sources) (yes/ no) (women).

SMD6: family members will eat - total outlier - very large chi-square - pretty obvious - this is only testing women versus men - not effect of mf (thus take out Table 6.1).

	Non-borrowing BRAC member versus member with more than 10,000 taka in loans,	Owns poultry,					
	More than 10,000 taka borrowed versus non-borrowing member,	Can sell poultry independently,				—	
28 Zaman, 1998	Less than 5,000 taka borrowed versus non-borrowing BRAC-member,	Owns livestock,	Empowerment	Other empowerment	OLS/logit	SMD7, logit	
	Non-borrowing BRAC member versus eligible non-member, BRAC members and – borrowers versus eligible non-members, loan size.	Can sell jewelry independently,				—	
		Has savings,				—	

		Can use savings independently,				
		Has savings,				—
		Can use savings independently,				—
		Owns land,				—
		Can sell livestock independently,				—
		Owns jewellery.				—
<hr/>						
		Non-borrowing BRAC member versus member with more than 10,000 taka in loans,	Owns poultry,			—
		More than 10,000 taka borrowed versus non-borrowing member,	Can sell poultry independently,			—
29	Zaman, 1999	Less than 5,000 taka borrowed versus non-borrowing BRAC-member,	Owns livestock,	Empowerment, Poverty.	Other empowerment	OLS/logit SMD8, logit
		Non-borrowing BRAC member versus eligible non-member, BRAC members and – borrowers	Can sell jewelry independently,			—

versus eligible
non-members,
loan size.

Has savings,

Can use savings
independently,

Has savings,

Can use savings
independently,

Owns land,

Can sell livestock
independently,

Owns jewellery.

—

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Notes: See Section 3.2 in the main text of the report for more details on treatment and outcome variables. See also An

International Initiative for Impact Evaluation
London International Development Centre
36 Gordon Square
London WC1H 0PD
United Kingdom

3ieuk@3ieimpact.org
Tel: +44 207 958 8351/8350



www.3ieimpact.org