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MICROFINANCE AGAINST POVERTY

A Meta-Analysis of Reported Impacts

In Developing Countries

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MICROFINANCE AGAINST POVERTY – A META-ANALYSIS OF REPORTED IMPACTS IN DEVELOPING COUNTRIES

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Goettingen, June 2006   Stephen Bainous Kargbo

Abstract

Poverty in the midst of plenty is one of the central challenges in today's global economy and society. It is widespread and chronic in many parts of the developing world, triggering a myriad of responses at individual, national and international levels. Microfinance is one such response and is a favourite tool used to fight against poverty, albeit with mixed results, especially in developing countries. Some studies indicate that the provision of microcredit to the poor improves their welfare; others show no effect or quite the opposite. A careful arbitration is therefore justified, and is achievable through a systematic analysis of the evidence contained in primary microfinance studies/assessments. This research, therefore, develops a theoretical/meta-analytical framework and then applies it to review available evidence on the impact of microfinance on poverty in developing countries. The theoretical framework is used to appraise, compare and synthesize empirical findings from over 100 primary impact assessments/evaluations released/published over the two decades between 1985 and 2005. The results show a relatively mild positive impact of microfinance on the selected poverty outcomes – food security, income security and general wellbeing. The type of implementing organisation, the level of independence of the evaluator, the menu of products/services, and the loan delivery mechanism seem to be important factors associated with the observed differential impacts of microfinance across 32 countries in Africa, Asia and Latin America. It is hoped that the entire research output amounts to a single scientific compendium - probably the first of its kind and, for that matter, new to the microfinance industry - with a potential for widespread appeal and use by policy makers, donors, researchers/scholars, practitioners and the general public.

Key Words: microfinance, micro credit, microfinance institutions, poverty, development policy, meta-analysis, impact evaluation, literature review.

Schlagworten: Mikrofinanz, Mikrokredit, Mikrofinanz-Institutionen, Armut, Entwicklungspolitik, Metaanalyse, Wirkungsevaluierung, Literatur

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List of Abbreviations

AIMS	Assessing the Impact of Microenterprises
ANOVA	Analysis of Variance
ATE	Average Treatment Effect
ATET	Average Treatment Effect on the Treated
BAAC	Bank for Agriculture and Agricultural Cooperatives
BRI	Bank Rakyat Indonesia
CARE	Cooperative for Assistance and Relief Everywhere
CART	Classification and Regression Trees
CGAP	The Consultative Group to Assist the Poor
DD	Double Difference
DFID	Department For International Development
DID	Difference in Difference
DSE	Deutsche Stiftung für internationale Entwicklung (German Foundation for International Development)
ERIC	Educational Resources Information Centre
EU	European Union
FEM	Fixed Effects Model
GDP	Gross Domestic Product
GNP	Gross National Product
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
INGO	International Non-governmental Organisation
MEM	Mixed Effects Model
NANGO	National Non-governmental Organisation
NGO	Non-governmental Organisation
PIA	Programme/Primary Impact Assessment
RCT	Randomised Control Trial
REM	Random Effects Model
SUTVA	Stable Unit Treatment Value Assumption
UN	United Nations
UNCDF	United Nations Capital Development Fund

| UNDESA | United Nations Department on Economic and Social Affairs |
| US | United States of America |

1 INTRODUCTION

Poverty[1] in the midst of plenty is one of the central challenges in today's global economy and society. It is widespread and chronic in many parts of the developing world, triggering a myriad of responses at individual, national and international levels, all of which could be subsumed into a World Bank slogan that says: *"Our dream is a world free of poverty"*.

In order to attain a poverty-free world, many poverty alleviation strategies often advocate increased production/economic growth as well as a more equitable distribution of wealth. In other words, policy makers are faced with the challenge of not only sustaining economic growth but also adopting policy tools that can reduce (income) inequality, protect the poor from shocks and other vulnerabilities and give them a voice in decision-making. One such policy tool has been the provision of loans to the agricultural sector to boost output, create employment and stimulate overall economic growth (Woller and Woodworth, 2001).

However, the provision of many such loans within the framework of subsidised agricultural credit programmes has been criticized for failing to produce the expected outcomes (see for example Adams and Von Pischke, 1992; Buckley, 1997; Woller and Woodworth, 2001). As it became clear that the solutions to poverty did not simply lie in supplying 'productive' farm loans, but in integrating other non-farm economic activities in the rural sector, policy attention gradually shifted to rural credit, which adopted a more integrated approach to the problems of the rural household (EU, 2000:5). With the rapid increase in urban poverty, and the stark realisation that the poor also demand savings services, the concept of microfinance gained roots. Today microfinance is the generic name for a range of financial

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[1] See Chapter 2 for various definitions of poverty.

services/products provided to economically handicapped individuals, households and/or their economic ventures.

Microfinance for the poor, whoever they are, is currently one of the leading issues in the development debate, and continues to generate high expectations from a wide range of interest groups and stakeholders including governments, non-governmental organisations (NGOs), investors, development practitioners, policy makers and researchers (Maxwell, 1999; UNCDF, 1999; Hulme and Mosley, 1996; Wright, 1999; Woller and Woodworth, 2001; Snow and Buss, 2001). As Rutherford (2000a) puts it, micro-finance is "a new reality in a new era", and there is a widespread acknowledgement of a microfinance revolution[2] especially since the early 1990s. Statistics from Daley-Harris' (2005) recent report on the state of a microcredit summit campaign clearly confirm this. Launched in 1997, this microcredit campaign aimed to reach 100 million of the world's poorest families with microfinancial services by 2005[3]. As of 2004, the report says, over 92 million clients, 67 million[4] of whom are said to be among the poorest, have been served by a worldwide register of over 3,000 microfinance institutions. This represents an explosive growth of 700 percent in the number of poorest clients in seven years (1997-2004).

Over the years, there has been not just a mere shift in nomenclature from farm/agricultural credit, to rural credit, microcredit, and now to microfinance, but also a fundamental change in paradigms[5]. In her

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[2] Seibel (2000) describes the "revolution" as a "new consensus" in the microfinance industry.

[3] There have been calls for that target to be extend to 200million poor families by 2015, with 100 million of them moving above the 1$ per day poverty line (Daley-Harris, 2004:28).

[4] In fact, when a family size of 5 is assumed, this works out to over 300 million poor family members affected, a number equal to the combined populations of the United Kingdom, France, Germany, Italy, Spain, The Netherlands, Switzerland and Norway (Daley-Harris, 2005:2).

[5] See chapter 3 for a brief description of the evolution of microfinance, drawing heavily from Kargbo (2000) and Robinson (2001).

book, *The Microfinance Revolution – Sustainable Finance for the Poor*, Robinson (2001) argues that this fundamental shift is inexorably pushing the microfinance industry from its 'charitable' origins to full commercialisation. The fact is that, according to Rutherford (2000b), a number of traditional assumptions about the poor and the best ways to alleviate their misery have been shown to be grossly simplistic or even inaccurate. One such assumption was that the poor are too poor to save and cannot repay loans at market interest rates. This provided justification for the sole emphasis on subsidised microcredit (agrocredit) targeted mainly at (male) crop farmers in rural areas. Emerging research has shown that the poor do in fact save and repay loans at competitive interest rates (Barry, 1995; Woller and Woodworth, 2001:271). Consequently, the hitherto standard approach of providing credit for (agricultural) production purposes only, is gradually giving way to a more integrated approach which recognises the demand for financial services related to non-farm income generating activities, education and even consumption.[6] Development interventions are increasingly being geared towards enabling poor households achieve a sustainable livelihood security, of which the goals of food security and/or income security can be seen as sub components.

This new paradigm is an expression of an increased understanding of the complex problems, potentials and dynamic processes affecting the behaviour and welfare of poor individuals, households and communities. But it is still unclear how far the provision of financial services to the poor has really advanced the fight against poverty, an issue that this work aims to further illuminate.

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[6] But there is a growing momentum, spearheaded by FAO and GTZ, in favour of refocusing financial services to farmers/farming activities, rather than the (all too) general microfinancial approach now in vogue.

1.1 RESEARCH PROBLEM AND PURPOSE

The dismal performance of agricultural credit programmes of the 1990s has been documented in various assessment reports[7], and the search for innovative ways to ensure positive effects of microfinance interventions on the poor has been quite intense. Policy interventions such as microfinance generally commit substantial resources that are then unavailable for alternative programmes (World Bank, 1996). "Microcredit is at a critical point. ... A programme with such a commitment of resources cries out for both solid goals and evaluations …", and "… the policy problem now is the extraordinary support for a programme that has not been proven to make people better off..." (Snow and Buss, 2001:304). The assessment of effects and costs of an intervention is therefore imperative not just to ensure administrative and public accountability but also to serve as a feedback mechanism, which establishes a scientific basis for promoting/discouraging the choice of certain policy instruments.

The relationship between research and policy innovation is dynamic and complex, shaped by multiple relations and reservoirs of knowledge (RAPID, 2004). Although evidence based decision-making is not always the dominant approach to many policy formulation and implementation processes, research findings can and do make a difference. The influence of research is said to often depend "on external influences; context – politics and institutions; evidence – approach and credibility; links – influence and legitimacy" (ibid). Indeed, the assessment of development activities or interventions is an essential component of successful policy formulation and implementation, and the call for impact assessments and reviews has perhaps been loudest in donor-funded microfinance programmes (Duflos et al., 2004).

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[7] See for example Meyer and Nagarajan (1997), Zeller and Sharma (1998), Modurch (1998), Sabharwa (2000).

With the preponderance of political rhetoric about the potency of microfinance to eradicate poverty, the need for credible evidence attributing improved welfare effects to specific financial services is increasingly being recognised even outside academic circles. While research has enhanced current understanding of the role of new technology in agriculture and rural infrastructure, price regimes in poverty alleviation, and has further contributed to the formulation of clearer policy guidelines, it is unclear what the role of (rural) financial markets is in alleviating poverty (Zeller et al., 1997:9). Existing evidence of the impact of microfinance interventions - with respect to household livelihood security, including food and income securities - is inconclusive and, in some cases, even contradictory. Some studies indicate that the provision of microcredit to the poor improves their wellbeing, others show no effect or quite the opposite[8]. A careful arbitration is therefore justified, and is achievable through a systematic analysis of the evidence contained in primary studies/assessments.

Such a systematic analysis or research synthesis clearly has a scientific and an economic value (Cooper and Hedges, 1994), given the reality that research results have been conflicting and can be rather overwhelming. It is considered good reasoning to try and resolve conflicts/inconsistencies using existing studies, before embarking on an additional study which is often very costly (Hunt, 1997). Moreover, it is becoming increasingly difficult for one to keep pace with the overwhelming amount of incoming data in one's field of interest. This has increased the importance of systematic literature reviews, which summarize the large number of findings and hence reduce the information overload. Today, systematic reviews are recognised as one of the most useful and reliable tools to assist evidence-based decision-making (Khan et al. (eds.), 2001). Since most research and policy

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[8] Diagne and Zeller (2001), and Zeller et al. (2001) are two examples which highlight negative and positive impacts of access to credit in rural Malawi and Bangladesh respectively.

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information needs cannot be fully met by the results of one empirical study, review articles are needed to provide an overview of all the relevant findings on a given topic or in a given field. Traditionally, such articles have been written by subject experts, but research since the 1980's shows that whilst those articles are educational, they are commonly incomplete and rather selective in the data that they reference (ibid).

In the field of Microfinance, Sebstad and Chen's 1996 *"Overview of Studies on the Impact of Micro Enterprise Credit"* is probably illustrative and representative of the review literature to date[9]. While such a study is clearly commendable, its usefulness may be rather limited due to a number of reasons:

1) The total sample is only 32 and contains only "very few studies that used rigorous, quasi-experimental methods."

2) The study identification, selection, review criteria and analytical procedures are not sufficiently explained in the report to allow for a fair judgement on their adequacy, or facilitate replication.

3) The style of the report is narrative and the authors could have done more to make it more analytical. Not a single statistical estimate is reported (even though some of the studies analysed were 'rigorous') to quantify/substantiate such conclusions as "The studies found positive changes in output, with average increase in sales". Their analysis practically reduces to a simple *vote count:* "Of the ten studies that looked at impacts of credit on micro enterprise assets, seven found a positive change ... (Jamaica, Honduras, Dominican

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[9] Two more recent reviews of microfinance impact studies are discussed later in the thesis (chapter 4), where they are used as examples of microfinance literature reviews that relied on a qualitative approach.

Republic, South Africa, Kenya, Bangladesh, and Indonesia). Two found no change (Guinea and Sri Lanka) and one found mixed effects (Malawi)" (ibid).

A review of the "Impact of Finance on Food Security and Poverty Alleviation" by Sharma and Schrieder [in Zeller and Sharma (eds.), 1998:185-210], though more creative and informative, also exhibits similar analytical weaknesses.

For these and similar shortcomings, traditional reviews generally do not provide a sound basis for decision making (Cooper and Hedges, 1994; Hunt, 1997). On the other hand, systematic reviews, such as meta-analysis, aim to overcome the problems of traditional review articles by following an explicit review process. Meta-analysis is one of the relatively new approaches that have been successfully used in various scientific disciplines – but perhaps more so in the fields of psychology and medicine - to synthesise empirical evidence across studies (see for example Cooper and Hedges, 1994 and Lipsey and Wilson, 2001 for more details on the development of meta-analytical approaches). Its application in the social sciences is now only gaining ground, and is yet to be introduced in the field of microfinance, for example.

Thus, the first key component of this work is the development of a framework for the meta-analysis of microfinance impact studies. This involved a comprehensive identification and criteria-based selection of all relevant primary impact studies, the design of a coding system to extract/record the important features and findings of each study, and the identification of appropriate techniques to facilitate the analysis of the resultant database. The importance of such a framework lies in its methodological aptness and scientific superiority (to traditional overviews/reviews) in synthesising empirical results scattered and buried in the numerous literature.

The second key component is an application of the analytical framework to appraise, compare and combine study results as appropriate. Considering the wide variety of methods employed in the primary assessment of microfinance interventions, a framework that allows for the integration of qualitative and quantitative techniques in a single meta-study could prove innovative. Results derived from a practical application of this meta-analytical framework to statistically describe and/or aggregate evidence from microfinance impact studies could help build a basis for policy and future research. It is hoped that the entire research output will amount to a single scientific compendium - probably the first of its kind and, for that matter, new to the microfinance industry - with a potential for widespread appeal and use by policy makers, donors, researchers/scholars, practitioners and the general public.

The application of the proposed review framework to a sample of studies was intended to answer three central (sets of) questions:

1) What is the impact of microfinance interventions as reported in the empirical literature so far? Does access to credit lead to reduced poverty (higher incomes, increased food security, and/improved general wellbeing)? Is the calculation of an 'average effect' or the portrayal of an 'overall picture' desirable and feasible?

2) Under what conditions can a microfinance intervention be particularly (in)effective?

3) Are there substantive differences in the reported impacts of microfinance across studies? If so, which factors might be responsible for such differences?

1.2 STRUCTURE OF THE THESIS

The thesis comprises eight chapters grouped into three main parts. **Part I** explores the nexus between poverty, finance and development in general, highlighting some definitions of poverty as a basis for understanding pro-poor policy interventions (chapter 2). It examines the centrality of poverty as a development goal and outlines various strategies that are employed to alleviate poverty in different settings. Chapter 3 focuses on the role of microfinance in development through its linkages with the farm and non-form sectors of an economy. After a brief review of the relationship between financial intermediation and economic growth, the chapter discusses the meaning of microfinance and its various components, the evolution of microfinance over the years and the suitability of the *sustainable livelihoods* framework for the design, delivery and analysis of financial services.

In Part II (chapters 4 and 5), an analytical framework is developed against the background of commonly used impact assessment methods and traditional and modern approaches to reviewing and synthesizing research literature. Chapter 4 particularly focuses on the generic *evaluation problem* and the various methods and techniques that are applicable to the primary assessment/evaluation of policy interventions such as microfinance. It also presents a short description of qualitative and quantitative methods for reviewing research literature; that is, the literature reporting the findings of primary impact assessments. Chapter 5 gives special coverage to the method of meta-analysis. It reviews general aspects of meta-analysis, including definitions, stages and procedures and an overview of its strengths and weaknesses.

Part III contains the analysis and results based on an application of the meta-analytical framework developed in part two (chapter 5). Chapter 6 explains how the primary studies were collected and

processed to facilitate their (statistical) analysis. It also defines the scope and limitations of this research. Chapter 7 begins with an overview and descriptive analysis of studies included in this research, including for example, the distribution of studies by geographical regions, by type of institution and by some characteristics of the impact evaluator. It then proceeds to analyse the combined effects of microfinance on *overall* poverty, and on each of the three selected outcome domains - food security, income security and general wellbeing. The econometric analysis in Chapter 7 investigates and tries to identify plausible factors – at regional, programme and study levels that explain differences in the impacts reported across primary studies. The last chapter (8) summarizes the entire thesis and offers policy implications, the main conclusions of the meta-analysis, and issues for future research and development.

PART I

POVERTY, FINANCE AND DEVELOPMENT –

EXPLORING THE NEXUS

2 AN OVERVIEW OF POVERTY AND PRO-POOR POLICIES

2.1 DEFINING AND MEASURING POVERTY

Poverty is multifaceted and so are its definitions. Defining poverty and understanding its causes have long been the concern of policy makers and analysts in national as well as international institutions[10]. Central to an understanding of poverty, among other things, is whether poverty is defined in absolute or in relative terms. "Absolute poverty is defined in reference to a poverty line that has a fixed purchasing power determined so as to cover needs that are physically and socially essential. ... This absolute definition of poverty, in use in many countries, must be contrasted with a relative definition of poverty, where the poverty line is established not in terms of some well defined basic needs, but as a fixed proportion of some income standard in the population, for example the mean or median income"[11] (Bourguignon, 2004:1). It follows that the range of policy options considered in the fight against poverty is influenced by how poverty is defined and measured[12], which in turn is not free from value/ethical judgements (Creedy, 1998).

At the World Summit for Social Development held in March 1995 in Copenhagen, poverty was defined as the "lack of income and productive resources sufficient to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other

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[10] The World Bank acknowledges this and says its "understanding of poverty has broadened from a narrow focus on income poverty in the 1980s to today's multidimensional concept, which encompasses human development, security, voice, and participation" (World Bank, 2005:1).

[11] In the European Union, all those whose economic resources are below 50 per cent of the mean income in member countries are considered as poor.

[12] Yapa (1996) argues that academic representations of the material condition of poverty are part of the problem why the eradication of 'real' poverty remains elusive. It is thus important to bear in mind that "definitions are contextual and contingent upon ideological, epistemological or methodological orientation of the purveyors" (Simon, 1997:184).

basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments; and social discrimination and exclusion" (UNDESA, 2000).

The Committee on Economic, Social and Cultural Rights of the United Nations defined poverty as "the lack of basic capabilities to live in dignity" (UNESC, 2001). According to the World Bank, "Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom" (World Bank, 2004).

In September 2000, the World Bank published the *World Development Report 2000/2001: Attacking Poverty*, stipulating several dimensions of poverty[13], including:

1) Lack of opportunity: Low levels of income and consumption;

2) Low capabilities: Little or no achievement/improvements in health, education and human development;

3) Vulnerability: Exposure to certain risks and uncertainties (income shock for example), in combination with a reduced ability to protect or defend oneself against those risks and uncertainties and cope with their negative consequences. This vulnerability or low level of security may arise at the national, local, household or individual level. Hence "poverty can be seen as the probability (actual or perceived) that a household will suddenly (but perhaps also gradually) reach a position with which it is unable to cope, leading to catastrophe (hunger, starvation, family breakdown, destitution or death)" (Hulme et al., 2001:9).

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[13] This same set of dimensions was adopted in the World Bank's (2001) Sourcebook for Poverty Reduction Strategies.

4) Social exclusion; and

5) Access to social capital.

The central element in the forgoing definitions or descriptions of poverty is the idea of a minimum standard for a given component of wellbeing (namely, health, education, assets, etc.) or for an aggregate of the components. One common approach is to calculate an absolute value below which one is said to be poor and therefore lacking the minimum wellbeing. The minimum standard of wellbeing is proxied by the amount of money needed/spent to ensure it, otherwise called the *poverty line*. This reference to an absolute income/consumption based monetary threshold, proposed and popularized by the World Bank (Yapa, 1996:712), is perhaps the most widely quoted definition of poverty. According to it, a person is considered poor if s/he lives (or tries to live) on less than US$ 2 per day, or worse still, on less than US$ 1 per day[14]. However, for country specific analysis and policies, the national (or some more specific area) poverty line is often preferred to the World Bank's international standard.

Beyond 'straightforward definitions', a consideration of some measurement aspects is useful to enhance any analytical understanding and/or assessment of poverty. A widely used measure of poverty in a given society is the proportion of its population with income or consumption expenditures[15] on or below the (absolute or relative) poverty line. This is referred to as the *head count* poverty measure which reflects the incidence of poverty (Creedy, 1998). This measure is simple, but ignores the actual incomes of the poor, other than the fact

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[14] "A dollar a day is a shorthand for the purchasing-power parity of US$ 1.08 in the Unites States in 1993" (Robeyns, 2005:33). The poverty line can also be set using the food energy method, which specifies a level of dietary energy intake per adult equivalent below which calories are expected to be inadequate (Lipton, 1997:1003).

[15] Consumption expenditures are usually preferred because of the advantage that they are more intuitive and can better account for unofficial or shadow income (Lipton, 1997:1004).

that they all fall on or below the selected poverty line. Reducing the number of people found below the poverty line is certainly an important policy objective, but other aspects of poverty - including its intensity, duration and inequalities even among the poor – can also be important policy loci.

Thus other measures are designed to capture the severity and dynamic nature of poverty. In their paper "Chronic poverty: meanings and analytical frameworks", David Hulme and others (2001) combine a *spells approach* with a *components approach* to describe transitions from one welfare status to another, noting the inter-relations between the duration and depth/severity of poverty[16]. Figure 1 contains eight (sub) graphs showing a range of (their) categories of the poor.[17]

Each of the categories can have different implications for poverty measurement and policy. Based on their aggregations, the poor can be categorised as:

- *Chronic poor* – Those whose expenditure or consumption levels fall below the poverty line for a sustained period, say, five years or even a generation. These may be further disaggregated into *always poor* (graph 1), *usually poor* (graph 2). When the mean expenditure of the always poor falls way below the poverty line (poverty gap measures this), then poverty is said to be severe. This group is then better defined as *always severely poor* (graph 6).

- *Transient poor* – Those with mean expenditures close to the poverty line, and actual expenditure falling below the poverty line for one or more periods. These can also be further disaggregated into *churning poor* (graph 3) and *occasionally poor* (graph 4).

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[16] See also McKay and Lawson (2002) for more explanations and empirical evidence.
[17] A refined version of this appears in Clark and Hulme (2005), where they propose a unified poverty framework, conceptualising poverty in three meta-dimensions – breadth, depth and duration.

Figure 1: Understanding Poverty – Duration and Depth Matter
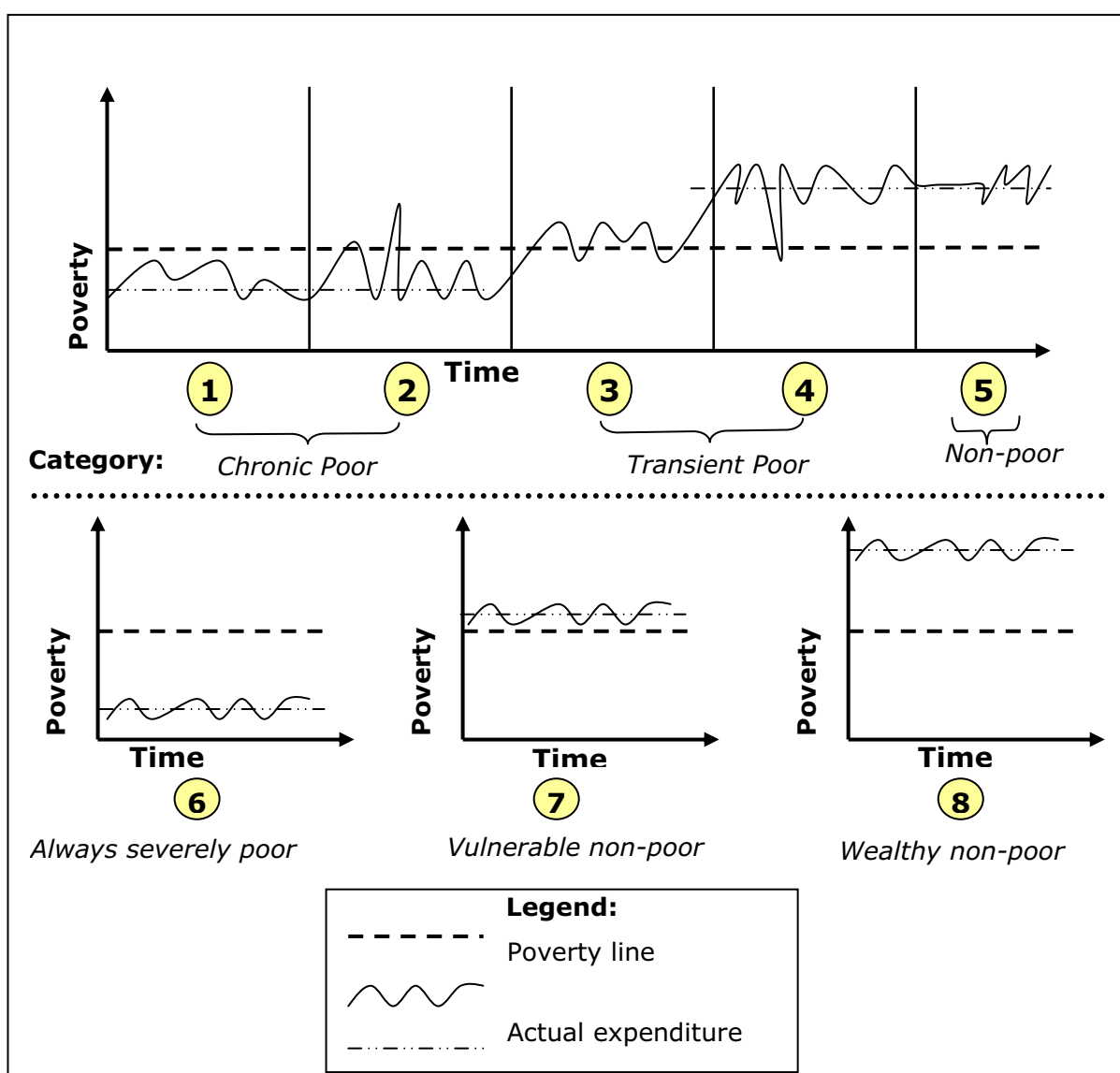
Source: Based on Hulme et al., 2001:13

- *Non-poor* – Those whose mean expenditures stay above the poverty line for all periods. They become *vulnerable non-poor* when their incomes stay just above the poverty line (graph 7), *non-poor* when above the line (graph 5), and *wealthy non-poor* when their mean expenditures are way above the poverty line (graph 8).

It is clear from the forgoing that measurements and analysis that reflect only the incidence of poverty can 'mislead' policy makers to concentrate

on helping the transient poor (that is, those just below the poverty line) instead of the neediest, as a given rise in consumption/income is less likely to bring the latter out of their (severe) poverty (Lipton, 1997:1004).

Conceptually, various sets of poverty measures and their logical/perceptual underpinnings may constitute different approaches to poverty. Table 1 summarises and compares some of the key approaches to poverty (assessments), including their definitional characteristics and policy elements, based on Laderchi et al. (2003).

Different 'understandings' of poverty require different approaches, adoptions of which clearly have different research and policy implications. The microfinance literature reflects varying preferences for each of these approaches, although aspects of monetary and participatory approaches seem predominant. In this research, two of the outcome variables of interest – income and subjective wellbeing – are each expected to appear more frequently in primary assessments employing the monetary approach and the participatory approach respectively. Hence particular care has been taken in the subsequent meta-analysis to categorise the 'degree' of poverty prevalent among clients served by each of the microfinance programmes evaluated.

Table 1: A Comparison of Poverty Approaches.

	MONETARY APPROACH	CAPABILITY APPROACH	SOCIAL EXCLUSION APPROACH	PARTICIPATORY APPROACH
Pioneered by	Booth (1887); Rowntree (1902)	Sen (1976,1985)	Lenoir (1974)	Chambers (1994)
Popular in	Economics World Bank	UNDP Political Science	European Union Sociology	World Bank Anthropology
Semantic Descriptors	Below a consumption/income threshold; Cost of *basic needs;* Wellbeing = maximisation of utility	Wellbeing=realisation of human potential Cost of *basic capabilities*	Relative deprivation or non-participation; Society's norms as benchmark	Voices of the poor; Participatory poverty assessment
Unit of Analysis	Individual and Household	The individual	Individuals or groups relative to others	Groups and individuals
Measurement Requires	Reference to 'external' information; A set of 'basic' needs	Reference to 'lists' of dimensions normally assumed to be objectively definable	Reference to current standards in society and state obligations	Local people's own perception of wellbeing and illbeing
Sensitivity to Social Institutions	None, but assessments can be broken down by groups	Emphasis on adequacy rather than sufficiency leaves space for (non modelled) variations	Central element	Reflected in the way poor people analyse their own reality
Importance of Processes	Not essential, but increasing emphasis	Not clear	A main thrust of the approach	Critical for most tools
Data Availability	Household surveys regularly conducted; Use of national income data	Data less regularly conducted, but could easily be improved	Current reliance on data collected for other purposes	Small purposive samples; Difficult at national level
Major Strengths	Analytically appealing	Can capture material as well as non-material wellbeing	Studies structural characteristics of a society; Identifies victims and perpetrators.	Flexible range of methods and tools; Judgment made by *insiders*
Major Weaknesses	Utility is not an adequate measure of wellbeing; Poverty is not an economic category; Measurement requires anchorage to external elements, and is often arbitrary; Externally imposed; Problematic cross-country comparability of surveys, price indices and poverty lines	Externally imposed; Arbitrariness in choice of basic capabilities; Inconsistencies according to method of aggregation; How to deal with multidimensionality; Less problems if capabilities are defined externally	Conflict between what's *normal* and what's *desired*; Highly context specific, so aggregation problems; Problems with multidimensionality; Challenge of capturing process; Cross-country comparisons problematic	Lack of 'scientificity'; Whose perceptions? Effect of cultural differences; Results may not be consistent, and neither representative nor comparable
Policy Implications	Emphasis on growth and distribution of income	Investment in extending basic capabilities via incomes and public services	Foster (structural) processes of inclusion, especially in the formal labour market	Empowerment of the poor

Source: Laderchi et al. (2003:28; modified).

2.2 POVERTY ALLEVIATION AS A POLICY GOAL

The eradication of poverty has been a dynamic process as well as an overarching developmental goal of many governments in developing countries, especially following their independence from colonial rule (Srinivasan, 2001:1). Consequently, at least two significant shifts in development thinking and practice have emerged during the last decade (World Bank, 2004). One is the sharper focus on poverty reduction as the goal of development, and the other is the portrayal of development as constituting more than just aggregate economic growth (Yitzhaki, 2001:3). These shifts are both nominal and pragmatic, and were epitomized by the 1990 *World Development Report* (Holtz, 1995:5), which included, for the first time, standardized global estimates of the prevalence of poverty, thus spearheading a new era for attacking poverty.[18]

Today, poverty, in all its forms, is said to be the greatest challenge to the world community (World Bank et al., 2000). Of special concern are the nearly 3 billion people living on less than US$ 2 a day, 1.2 billion of whom live on less than US$ 1 per day. Figure 2 depicts the worldwide incidence of income poverty, which is clearly concentrated in developing countries, especially sub-Saharan Africa (World Bank et al., 2000; Chen and Ravallion, 2004). While the worldwide aggregate and proportions of the poor indicate a reduction in poverty since 1980, the picture in Africa is discouraging

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[18] Actually, poverty first appeared as a World Development Report theme in 1978, and then in 1980, 1990 and 2000.

Figure 2: The Incidence of Extreme Poverty Around the World
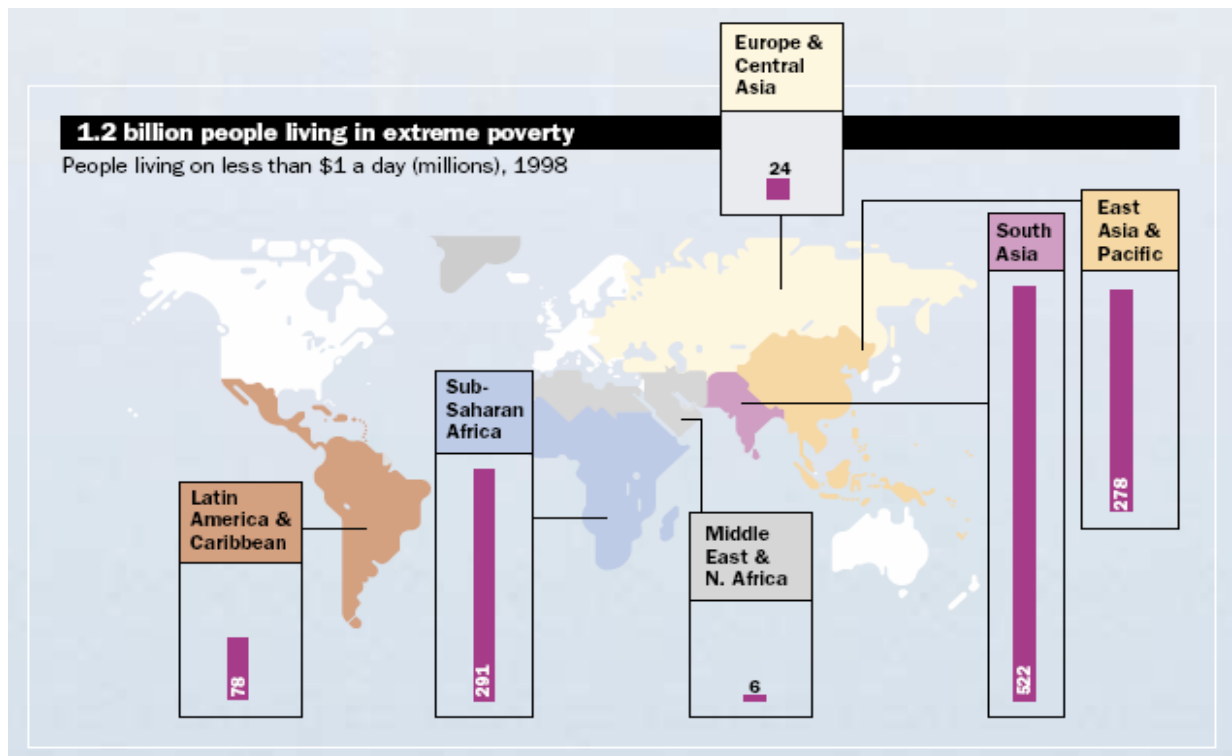
Source: World Bank et al., 2000.

Figure 3 shows the trends (dotted trend lines in logarithmic scale) in poverty in three main developing regions in the last twenty years (up to 2001), and a simple forecast of what the situation could look like in the next ten years. The increase in the proportion of poor, albeit slight, in Africa since 1990, against the steep reduction of poverty in Asia, puts the continent at the centre of any global discourse on poverty. It is doubtful whether any dramatic changes in these trends will occur before the 2015 deadline.

Figure 3: Poverty Trends in Africa, Asia and Latin America
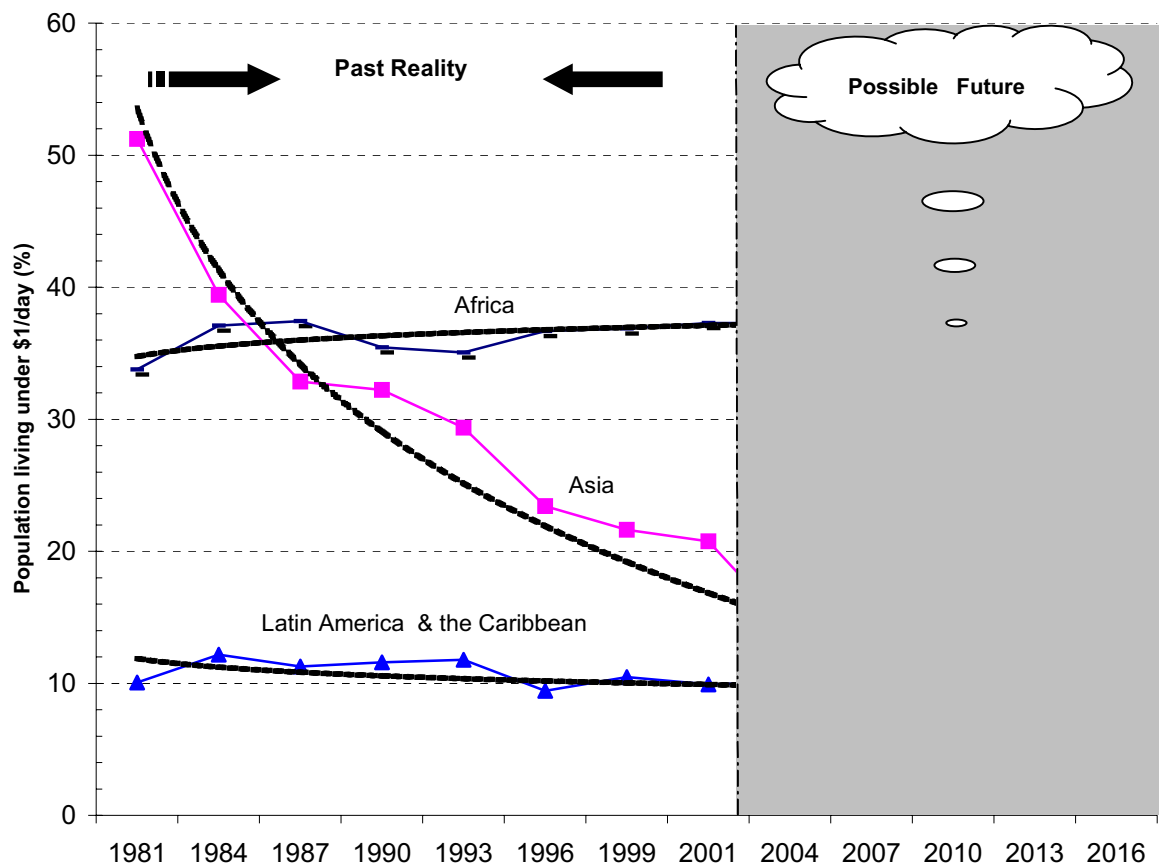
Source: Author, using data from the World Bank Poverty Monitor.

The re-emergence and growing prominence of poverty alleviation as the main goal of development also culminated into the 2000 Millennium Declaration (Dagdeviren et al., 2002:384). This recent and most encompassing set of (proposed) policy objectives to reduce poverty, later known as the Millennium Development Goals[19], MDGs for short, include, among others, halving the proportion of people living in extreme poverty by 2015; the base year being 1990. It is hoped that "the world will be better, and safer, for its 6 billion people and for the projected 7 billion people in 2015" (World Bank et al., 2000). This and

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[19] See Conway (2004:7, as cited in Bird et al., 2004.) for a summary of the millennium development goals.

similar declarations have resulted in the intensification of effort to identify and implement poverty-reducing policies in order to enhance the antipoverty arsenal both quantitatively and qualitatively; and the search for best practices and innovative ways of overcoming poverty continues to be pursued mainly through experimentation and a careful assessment of programme results.

But is the focus on poverty, translated into pro-poor policy instruments, justifiable? A slice of the recent literature on poverty seems to indicate a clear direction. The associations between economic growth, poverty and inequality are at the heart of an ever-growing economic literature. Theoretical as well as empirical evidence largely favour the adoption of growth and (re)distribution enhancing policies.[20] Along with the usual focus on macroeconomic stability, microeconomic efficiency and institutional quality, the wellbeing of the poor is indeed justifiable as a separate determinant of national and international policy choices (Woller and Woodworth, 1996).

Rodrik (2000), for example, underscores three main reasons why economic reform strategies should focus on poverty reduction. Firstly, societies generally place a higher weight on the welfare of the poor than that of the rich. It may therefore be entirely rational and proper for a government to choose growth strategies that promise a larger payoff for the poor even if impact on aggregate economic growth is less assured[21].

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[20] Bourguignon (2004), for example, proposes an arithmetic identity linking income, growth and the reduction of poverty and inequality, in what he calls the "Poverty-Growth-Inequality (PGI) Triangle". He explains that changes in poverty are a function of growth, distribution and the change in distribution of income. Adams Jr. and Page (2003) also discuss growth-inequality issues.

[21] This view is probably founded upon a Rawlsian theory of justice, which has been portrayed as a superior alternative to (economic) utilitarianism (see for example Fehr and Schmidt 2004 and the references therein).

Secondly, it is known that poverty's association with market imperfections only exacerbates the situation of the poor, because they cannot borrow against future earnings to invest in education, skills, agricultural technology and entrepreneurial activities. So even if the welfare of the poor does not receive extra weight, pro-poor interventions may well be the most effective in raising average incomes.

Thirdly, a capabilities approach to development[22] – rather than an exclusive emphasis on consumption and income - also warrants a focus on poverty. The poor are usually the most affected by hindrances to any capabilities-oriented development, and are therefore most deserving of urgent policy attention. In fact, Rodrik concludes that "the debate on growth versus poverty reduction is a meaningless debate that diverts attention from the questions that should be our real focus: what works, how, and under what circumstances?" (ibid).

Similarly, Bourguignon (2004) explains that the complementarities of states and markets, the importance of country/context specificity, the centrality of governance and institutions have emerged as core guiding principles of quality policy formulation and implementation (see also chapter one of Sadoulet and Janvry, 1995). Bourguignon then recommends that rather than being preoccupied with the "false dilemma" of whether the main focus of development strategies should be placed on economic growth, or poverty, and/or distribution, it is more meaningful to seek answers to the rapid elimination of absolute poverty under country-specific combinations of growth and distribution policies.

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[22] Armatya Sen is credited with pioneering this development approach, and has reportedly 'refined' his original capabilities framework to encompass five sets of *freedoms* – political freedoms, economic facilities, social opportunities, transparency guarantees and protective security (Sen 1999 as quoted in Hulme et al., 2001). See also table 1. Further, Gough (2003) compares and contrasts important elements underlying *Needs* versus *Capabilities* approaches to human wellbeing. See also Easterlin (2003) and Dean (2003) for a discussion on the theory of wellbeing.

2.2.1 Poverty Alleviation Strategies

Given the justification that poverty reduction is/should be pivotal in development policy-making, which strategies or policy instruments could be most potent in the fight against poverty? There is probably no clear-cut and definitive answer to this question, but theoretical insights and lessons from practice can provide a basis for choosing particular policy interventions from a given menu. For example, Rawls' writings on justice[23] could form a sound theoretical basis for 'society's representatives' to favour a set of policies (programmes and laws) against others. Under certain conditions, including that of a 'veil of ignorance' in an 'original position', these representatives – say the political community or a governing unit of any nation state – would choose principles of (distributive) justice that would govern the basic structure of a (just and fair) social order.

In economics, the growth and distributional effects of broad-range (macro)economic policies (including, for example, fiscal reforms, exchange rate (de)regulation and trade enhancement) are by now fairly well known. It has been shown that economic growth, and therefore the policies that promote it, is generally associated with reductions in income poverty (as well as improvements in social indicators), provided such growth is at least distribution neutral (Dagdeviren et al., 2002; Dollar and Kraay, 2000; Morduch, 1999). The main argument is that growth is the vehicle for reducing poverty, and this via the famous "trickle down" process advanced by the 'Washington Consensus'. That is, growth of per capita income implies a corresponding lowering of the levels of poverty, an assertion which in turn is largely based on neoclassical analytical models (see Dagdeviren et al., 2002 and the references therein for details on this).

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[23] No explicit review of theories of justice is being attempted here.

Following the recent literature, attention is given here to policy tools that are not only pro-growth but also pro-poor, as identified in recent policy documents and research (for example, Ravallion, 2002; Thomas and others 2000; UN, 2000; World Bank, 2000b, as quoted in Klasen, 2003:63). Pro-poor growth means growth that disproportionately benefits the poor relative to the non-poor, often indicated by a high poverty elasticity of growth (Klasen, 2004:65). Pernia (2003) explains that

> a change in poverty associated with economic growth can be broken down into a pure growth effect and an inequality effect. The extent to which poverty can be reduced (or increased with contraction) —referred to as poverty elasticity — hinges on both these effects. The pure growth effect is negative because positive growth reduces poverty, with inequality remaining constant.[24] The inequality effect can be either negative or positive depending on whether growth is accompanied by improving or worsening inequality. The degree of pro-poor growth can be measured by an index, which is simply the ratio of the total change in poverty (the poverty elasticity) to the pure growth effect. The pro-poor growth index (PGI) can be interpreted as the poverty-reducing efficiency of growth. PGI is greater than one if the inequality effect is negative, meaning that growth results in lesser inequality and the poor benefit proportionally more than the nonpoor. ... A PGI of one implies that inequality remains constant and all income groups gain equiproportionately from growth.

A negative PGI would then imply that growth is not pro-poor, having lead to an increase in poverty. But the extent to which growth is pro-poor seems to be determined in turn by such strategies as employment generation and agricultural growth, not so much by inflation and export promotion (Pasha and Palanivel, 2004:10); and the chain of determinants or linkages can easily get more complex.

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[24] It is generally recognised that the extent to which the growth elasticity of poverty is negative is a good measure of the degree to which the growth process has been pro-poor.

In theory, a policy agenda that reduces inequality, especially in high-inequality countries, offers great potential for poverty reduction through a triple effect growth payoff. That is, "it seems to reduce poverty immediately, increase growth, and enhance the poverty impact of such growth" (Ravallion, 2002; World Bank, 2000b, 2001b as quoted in Klasen, 2004). According to Bourguignon (2004:15):

> This literature has proposed several hypotheses which could explain why progressive redistribution may be growth-enhancing. First, credit market imperfections may explain that redistributing capital from capital-rich enterprises or individuals to capital-poor and credit constrained people increases efficiency, investment and growth. Second, political economy arguments have been proposed. Too much inequality in a redistributive democracy leads to more redistribution and less capital accumulation. Alternatively, too much inequality may lead to social tension expressed through collectively organized or individually-led violent redistribution. Other hypotheses (economies of scale in goods markets, etc.) have also been put forward in the literature. ... The key point is that poor people cannot borrow as they lack collateral, face imperfect credit markets, or their poverty prevents them from seizing investment opportunities that would benefit both themselves and society. For example, poor people cannot offer their children a good education, cannot obtain loans to start a business, or cannot afford insurance, however profitable their enterprises may be. Countries with a high poverty headcount, or an unequal distribution of wealth, thus underutilize their productive and growth potential to a greater degree than countries with fewer poor people or with a more equitable distribution.

An increased emphasis on redistributive policies might thus be a defensible way forward in the fight against poverty. This seems to be the position adopted by recent research (for example Dagdeviren and others, 2002; Thomas and others, 2000; World Bank, 2000a, b, 2002 as quoted in Klasen, 2004:80).

For Dagdeviren and others (ibid), the goal of "poverty reduction might be achieved through faster economic growth alone, through redistribution, or through a combination of the two", but that "… redistribution, either of current income or the growth increment of income, is more effective in reducing poverty for a majority of countries than growth alone" (ibid). They propose a set of feasible policy instruments by country categories, as presented in Table 2, but caution that most redistribution instruments, including progressive taxation, transfer payments and land reform, may be unsuitable for very low-income countries. This classification of redistributive/pro-poor policies adopted by Dagdeviren and others (ibid) is however not universal. There can be variations in how different policy instruments are labelled or described by different authors or policy documents.

Table 2: Feasibility of Redistributive Policy Instruments

REDISTRIBUTIVE INSTRUMENT	POLICY FOCUS (COUNTRY CATEGORY)		
	Redistribution of current income & assets (Middle income countries)	Growth with redistribution (Middle income and most low income countries)	Growth without redistribution (Very low income countries)
Progressive Taxation	*Yes*	*Yes for some countries*	*No*
Transfer payments	*Yes*	*Yes for some countries*	*No*
Consumer subsidies	*Yes*	*Yes*	*Yes for some countries*
Land reform	*Yes, but not always relevant*	*Yes*	*Not for most countries*
Education & health	*Yes*	*Yes*	*Yes*
Infrastructure & public works	*Yes*	*Yes*	*Yes*

Source: Dagdeviren et al. (2002:404, Table 2)

Building on Guhan's (1994, as cited in Kabeer, 2002) originally three analytical categories, Devereux and Sebates-Wheeler (2004) for example, describe four conceptually distinguishable policy instruments geared towards reducing poverty and vulnerability.[25] Their classification is based on one main grouping criterion, which is the *function* or purpose that a given policy instrument serves:

- *Promotional/promotive measures* aim to increase real incomes and capabilities of the poor. They include sectoral and institutional measures to enhance education, provide employment and improve the nutrition and health of the vulnerable and marginalized sections of the population. The expansion of assets/infrastructure to facilitate local development and the provision of microfinancial services (which will be discussed separately) are often put under this category (Devereux and Sebates-Wheeler, 2004:10).

- *Preventive measures* seek to avert deprivation in specific ways. These include formalised systems of insurance, pensions and other social welfare benefits to mitigate risk and reduce the impact of livelihood shocks and (transient) poverty. The establishment of minimum wages, employment guarantees and the traditional public safety net programmes designed to buffer the effects of economic restructuring in many developing countries may also be classified as preventive measures.

- *Protective measures* are intended to guarantee relief, to the extent that promotional and preventive measures have failed or are considered unfeasible to improve the standard of living of the

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[25] These conceptualisations were proposed within the context of social protection, perhaps in the usually narrow sense of 'social security/welfare'. But as Guhan himself concludes, social security should be understood "as part of, and fully integrated with, anti-poverty policies, with such policies themselves being broadly conceived in view of the complex, multidimensional nature of poverty and deprivation" (Guhan 1994:38, as cited in Kabeer, 2002).

(chronic) poor and vulnerable. Specifically, the poor could be given special concessions such as free primary education, medical fee waivers, food rations or subsidies and other forms of targeted cash or in-kind programmes.

▪ *Transformative measures* focus on the problems of social inequity, discrimination and exclusion*.* Transformative interventions often include advocacy, sensitisation campaigns and the building/enhancement of institutions and regulatory frameworks to uphold human rights - be they economic, environmental, social or cultural - and protect socially vulnerable groups. Programmes against exploitation and abuse (of for example women, children and people with disabilities), and others which help to transform public attitudes and behaviour, may be classified as transformative.

It is useful to note that these (four) descriptive categories of poverty reduction strategies may overlap, in that measures can simultaneously 'promote' as well as' 'prevent', 'protect' and/or 'transform'. They can however be viewed in gradation, proceeding from a wider 'promotional' domain to increasingly more specific ones (Kabeer, 2002; Devereux and Sebates-Wheeler, 2004). Interestingly, these categories broadly correspond with the World Bank's three separate groups of anti-poverty activities, namely, promoting opportunity, enhancing security and facilitating empowerment (World Bank, 2000).

Alternatively, poverty alleviation strategies may be classified as *financial* or *non-financial.* Here the main grouping criterion is the nature of the policy instrument rather than the function/purpose it serves. Microfinance, for example, would then be classified as a financial instrument, and social intermediation measures as non-financial.

In practice, policies or programmes whose primary aim is to reduce inequalities and poverty, especially in low income countries, often include one or more policy instruments specially designed and targeted at certain sections of the population that meet pre-defined socio-economic criteria. In Figure 4, these special policy instruments are portrayed as *'epigeal'*. They essentially supplement standard growth-enhancing macroeconomic policies – depicted as 'hypogeal' in the figure. What follows is a further description of the 'epigeal' pro-poor policy instruments, in whose domain microfinance, the focus of this research, is embedded.

1) **Safety nets**, among which are:

   a. Public works. Here participants receive food or minimal wages in return for (physical) labour and other local inputs to ensure the supply and/or maintenance of community assets (e.g. roads, irrigation infrastructure, community centres, etc.)

   b. Cash transfers. These are direct cash support given to those in dire need, including for example, relief to victims of conflict or a natural disaster. They typically take the form of termination payments, pension funds or small grants to households based on the number of dependent/vulnerable children or elderly. When significant cash-in-kind items are involved, they might be better described as income transfers.

Figure 4: Poverty Alleviation Tree (PAT): A Typology of Pro-poor Policies

Food for work

Direct cash/in-kind relief

'Smart' transfers

Universal price subsidies

Limited subsidies/rations

Community-driven projects

Public works

Cash transfers

Commodity/ Human capital subsidies

Social funds

Social Safety Nets

Low wage employment

Miniloans & leasing

Microfinance Programmes

Business development services

Social Intermediation

Training & mentoring

Microsavings

Microinsurance

Market information

Specially Targeted Strategies

Trade Enhancement

Institutional Reform

Agricultural Research and Development

Investments in Health and Education

Sound Fiscal/Monetary Management

Development of Physical Infrastructure

Legend:

'Epigeal'/Microeconomic Policies

'Hypogeal'/Macroeconomic Policies

Source: Author's representation

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It is perhaps in view of the potential benefits of such direct cash transfers that some have advocated what one might call a *'cash splash'* (universal-cash distribution) approach to development aid. For example, Meghnad Desai, director of the London School of Economics' Centre for the Study of Global Governance, is quoted to have made such a proposal: "We are giving fifty billion dollars of overseas aid. There are a billion poor people in the world. Why don't we just find the poor and give them one dollar a week and do nothing else. No questions asked. What they do with the money is not our concern. That would probably do more to relieve poverty than anything else" (Desai, 2003b cited in Hanlon, 2004:1).

Where the income transfer is made conditional on the fulfilment of certain behavioural requirements – such as attendance to a school, clinic, training event, etc. – they are sometimes labelled 'smart' transfers.

c. Commodity or human capital subsidies. Commodity subsidies are given as universal price subsidies (or ceilings) to ensure that the poor can afford selected basic food and/or non-food items. They can also be offered in the form of rations/limited subsidies, in which case the beneficiaries are only entitled to specific quantities of one or more goods distributed through designated outlets or exchange coupons/cards.

d. Social funds: These are funds channelled through local organisations/structures to (partly) finance community initiated and largely community-managed projects.

2) **Social intermediation**. This is defined as "… a process in which investments are made in the development of both human resources and institutional capital, with the aim of increasing the self-reliance of marginalized groups, preparing them to engage in formal financial intermediation. … Social intermediation involves the building of social capital in the form of groups that can generate an "information asset" for their members, allowing financial organizations to develop confidence in establishing a lending relationship" (Edgcomb and Barton, 1998:vii). It is distinct from the standard provision of social welfare in that it enables *beneficiaries* to become *clients* capable of entering into explicit contracts involving reciprocal obligations. This can be achieved through the provision of support services such as:

a. Business development

b. Training and mentoring, especially for small entrepreneurs

c. Market information and networking to enhance linkages along a commodity chain, for instance.

3) **Microfinance programmes**. These can be stand-alone or various combinations of microcredit, microsavings and microinsurance interventions. The topic of the entire thesis is, in fact, microfinance and its effectiveness as a policy alleviation strategy in developing countries. The components and the theoretical role of microfinance in alleviating poverty are the subject of a separate chapter (chapter 3). Subsequent chapters investigate how far the (theoretical) role of microfinance can be substantiated by existing empirical evidence.

There are obvious overlaps and trade-offs between various poverty alleviation strategies, but central to the choice of an appropriate policy instrument is differentiated targeting according to the needs and capability of the poor. "While these policies are likely to help the poor in high-inequality countries, the scale of income redistribution through

such measures is usually limited because of the small size of most of these programs" (Klasen, 2004:81).

Moreover, the exact combination and resulting effectiveness of policy instruments is said to depend, among others, on the level of development of a country, especially the initial income and level of inequality, structure of the economy, and the capacity of the public administration[26] (Dagdeviren et al., 2002). Of no less importance is the widening web of linkages in the global economy. Policy makers should thus bear in mind that "a country's performance in terms of growth and poverty alleviation is tied to the overall functioning of the international economy at any given time" (Sharma et al., in Diaz-Bonilla and Robinson (eds.), 2001).

Whatever policy choices are made at any one time, it is part of the dynamic policy process to require their review at some later date or stage. Impact assessment or evaluation represents a critical step in the cycle of an economic policy, and provides a basis for a better understanding of a policy problem – say persistent poverty – and for pursuing an optimal set of solutions. As already mentioned, microfinance is one of those favoured solutions, and we will now examine its role in greater detail.

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[26] Governance issues are indeed very important, and if the poor matter less to decision makers at home than they do to decision makers abroad, then policies will likely be poorly conceived and ineffective. The establishment of a binding consensus on the need to act might greatly enhance policy work and the effectiveness of public administration.

3 THE ROLE OF MICROFINANCE IN DEVELOPMENT

Previous chapters have dealt with various concepts of poverty and some of the policy instruments employed to fight against it. Microfinance is one of the 'favoured' pro-poor policy instruments, and this chapter discusses its meaning, evolution and main linkages with the farm and non-farm sectors of a developing country's economy.

3.1 FINANCIAL INTERMEDIATION AND ECONOMIC GROWTH

The financial system of a country comprises a variety of interlinked institutions, the commercial banks being the most visible and viable of them in developing countries (Gillis et al., 1987:331). Financial policy refers to the set of measures designed to affect the growth and functioning of the financial system. In developing countries, the term financial policy typically includes monetary policy (that is the use of monetary instruments to reduce instability) and measures intended to foster asset/capital accumulation, and the allocation of credit among different, and often competing, sectors. Financial intermediation - the mobilization and allocation of savings among economic agents - is one key function of any financial system,[27] arising from the fact that savings endowments do not necessarily match investment opportunities. Mechanisms are required to channel savings to productive investments, hence the need for effective financial intermediation[28]. It is now widely accepted that finance, and hence financial policies, do have important implications for the proper functioning of an economy. It has become so central to national (and international) economies that even by the late 1980s there was hardly any country where the monetization ratio – "the

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[27] Other functions include serving as a medium of exchange, a means of transforming and distributing risk, and providing policy instruments that help stabilize an economy.

[28] The degree of financial intermediation is best measured by the use of flow of fund accounts/tables, which display the sources and application of funds (savings) by different economic sectors. Where such data are not available, then the liquid to GDP ratio is often employed as an approximate measure. But perhaps a more useful measure is the ratio of private credits to GDP, in that it more accurately represents the actual volume of funds channelled into the private sector, as opposed to credits issued to the public sector and by the central bank (Calderón and Liu, 2003).

proportion of the total goods and services in an economy that are purchased with money" – stood below 85 percent (Gills et al., 1987:333). Gone is the era when, especially in the least developing countries, a substantial portion of economic activity was conducted through barter and related informal transactions outside the money economy.

From Bagehot (1873), Shumpeter (1912) to Robinson (1952) and Lukas (1988) (as cited in Levine, 1998:1), the relationship between a country's financial system and its economic growth have long been debated among economists. Current theory and empirical evidence suggest that the causality between financial development and economic growth is bidirectional. That is, financial development generally leads to economic growth, and that economic growth propels financial development, even in the long run. This effectively declares the old neoclassical growth theory – which emphasized that a change in the saving and investment rates, i.e. in capital accumulation, has an effect only on the long-run equilibrium of the *level* of real per capita income but not on its rate of growth and the most important variable which, over the long term, determines the growth rate of real per capita income, namely the rate of technical progress, is assumed to be exogenous – as gravely flawed (Winkler, 1998).

Calderón and Liu (2003) describe three major hypotheses that attempt to explain the finance-economic growth nexus[29], drawing in part from an emerging new theory of finance based on information economics. One is the *supply-leading hypothesis*, which posits a causal relationship from financial development to economic growth. This means that an increase in the supply of financial services, through an active creation of

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[29] There is a vast amount of economic literature explaining the nexus between the development of a country's financial system on one hand and its economic growth, inequality and poverty on the other (see for example Beck et al., 2004; Winkler, 1998; Bourguignon, 2004; Calderón and Liu, 2003).

financial institutions and markets, is expected to stimulate real economic growth.[30] This growth-promoting effect is however contingent on the ability of the financial system to overcome problems arising from information asymmetries and transaction costs (Winkler, 1998:19). Two, is the *demand-following hypothesis*. This competes with the previous hypothesis by postulating a causal relationship from economic growth to financial development. This means that an increasing demand for financial services might induce an expansion in the financial sector as the real economy grows[31]. Three is the *stage of development hypothesis*, proposed by Patrick (1966, in Calderón and Liu, 2003). According to this hypothesis, supply-leading financial development propels growth at the early stages of economic development by inducing real capital formation and inaugurating self-sustained economic growth. The supply leading characteristics of the financial sector diminish with further progress in financial and economic development, gradually giving way to demand-following effects[32]. In this of their study of 109 developing and industrial countries, Calderón and Liu (2003) conclude that bidirectional causalities between finance and economic growth coexist, and that financial deepening contributed relatively more to these simultaneous causalities in the 87 developing countries than in the 22 industrial countries. This, they say, suggests that developing countries have more room for financial and economic development.

It is useful to note that in many developing countries an informal financial sector – with such intermediaries as local moneylenders,

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[30] Among the authors supporting this view are Mckinnon (1973), King and Levine (1993a,b); Neusser and Kugler, and Levine et al. (2000), [as cited in Calderón and Liu (2003)].

[31] Such authors as Gurley and Shaw (1967), Goldsmith (1969) and Jung (1986) [as cited in Calderón and Liu (2003)] support this passive response of the financial sector to economic growth.

[32] This seems to agree with an assertion by Desai and Mellor (1993:2) that the distinction between a "demand-following and "supply-leading" approach to financial policy is at best artificial and rather incorrect, and who rather propose "simultaneity of demand for and supply of finance".

traders, landlords, and savings and credit associations - usually coexists with the formal financial system – consisting of bank and nonbank intermediaries. Since economic development involves the accumulation of various financial, physical, human and other forms of capital, it follows that once self-finance becomes a limiting constrain, credit transactions assume a pivotal role in that process.

Given that almost all the world's poor (those living below US$ 2 per day) are in low or middle income countries, raising minimum incomes – through a deeper and more efficient financial system[33] – could be seen as an antipoverty tool (Honohan, 2004:30). Honohan argues that "policies that ensure a well-functioning financial system not only contribute to economic growth, but also help reduce poverty more than some other growth enhancing policies. Emphasis on the financial sector - both mainstream and microfinance – is thus a crucial component of a balanced pro-poor development" (ibid). The importance of microfinance can thus be derived from the role of finance in (economic) development, recognising, as mentioned earlier, that financial intermediation – meaning the mobilisation and allocation of savings among sectors or economic agents – is one important function of any financial system. In this way funds are channelled to investors whose economic activities will help generate economic growth.[34]

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[33] Financial depth has been shown to be a significant explanatory variable for the poverty headcount and other poverty related indicators (see for example, Honohan, 2004; Beck and others, 2004).

[34] Gills et al., (1987) provide a rich discussion of financial policy and the role of finance in development, especially in chapter 13).

3.2 DEFINING MICROFINANCE

This study is concerned with a specific form of financial intermediation – microfinance, which can be defined as "the provision of financial services dealing with very small deposits and loans" (Bastelaer, 1999). It is the supply of one or more of its principal components, which include credit, savings and insurance, each of which are briefly discussed in this section.

Owing to the dominant and central position occupied by credit in the history of financial services, the savings component has been termed as the forgotten half of the 1980s, and the insurance component as the forgotten third of the 1990s (Zeller, 1995). The prefixes *'mini'* and *'micro'* are normally applied to indicate the small, numerous and often localised nature of the financial transactions involved.

3.2.1 Microinsurance

Insurance refers to the use of contracts (binding agreements) to reduce and redistribute risk. As put forward by Martin and Helms (2000b), the risks faced by micro-finance clients can arise from "... *structural factors* such as seasonality, inflation, or the vagaries of weather; unexpected *emergencies* such as sickness, unexpected loss of a family member, loss of employment, fires and theft; and the high costs associated with life cycle events such as marriage, funerals, and educating children... and *operating an enterprise* or *taking a loan* as well." In an insurance contract, the insurer typically accepts a fixed payment, or premium, from the insured, and in return undertakes to make payments if certain events occur. This type of formal insurance markets rarely exists in rural areas of most developing countries (Haddad and Zeller, 1997 as

quoted in Zeller and Sharma, 1998). Rural households do however utilize other measures to reduce or avoid risks.[35]

3.2.2 Microsaving

In financial terms, saving is the "excess of income over consumption", with the further distinction that *'saving'* refers to the flow of assets, and *'savings'* refers to stocks of assets and the ways of holding them (Black, 1997). They are the net changes of equity between periods. These "include changes in monetary and non-monetary assets, such as food stocks, livestock, trees, tin roofing sheets, jewellery, and other consumption and production durables, and adjustments for changes in debt" (Zeller and Sharma, 1998). Savings and investments in human capital, such as education and improved health status of household members, are also given an important consideration especially when dealing with the rural poor.

Rutherford (2000) identifies three saving strategies, viz saving up, saving down and saving through. He defines *saving up* as the act of keeping back cash or in-kind assets now so that it can be spent in the future, and s*aving down* as the act of procuring a cash or in-kind advance against part of one's future income. This in effect, is just an alternative view of a loan facility, wherein loan repayments as well as insurance premium payouts are considered a form of savings. *Saving through* refers to the flow of assets held back or acquired from both past and future incomes – a sort of dynamic combination of saving up and saving down. The rotating savings and credit association (ROSCA) is a good example of a mechanism for saving through, where a regular flow of small savings is made over an extended period of time, and at

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[35] For example, farmers' use of multiple seed varieties and mixed cropping, and co-insurance contracts - often implicit or unwritten, and based largely on the principle of reciprocity - with household neighbours, relatives, and market partners who (are expected to) help in difficult times.

some point in that period, a usefully large lump sum is taken in exchange.

3.2.3 Microcredit

Credit is "the system by which goods or services are provided in return for deferred rather than immediate payment" (Black, 1997). It is "a temporary transfer of purchasing power from an individual or organisation to another. It is a matter of confidence since one cedes purchasing power and expects repayment and compensation" (Meliczek, 1997). An identical term for credit is borrowing, which can be defined as incurring debts to finance spending.

Because of its centrality to this thesis, and owing to its importance, both in the literature and in the experience of practitioners, it is necessary to consider further distinctions of credit as applied in the micro-finance industry. The main types of credit are herein grouped under four major categories – duration, purpose, source and size of the loan or credit:

By time or duration:
- *Very short-term credit*: Loans of less than 3 month duration
- *Seasonal credit*: 3-7 months duration; usually following a agro-climatic calendar.
- *Medium-term credit*: for 1-3 years.
- *Long-term credit*: Loans for more than 3 years.

By purpose or utilization*:*
- *Productive credit* (also called dynamic credit): here credit utilisation leads to an appreciable improvement of operating results or output, since it enables and improves the productive input of real production factors, as in the case of credit for the purchase of farm inputs.

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- *Consumption credit* (also known as static credit) serves to maintain the status quo and therefore 'no improvement' of operating results[36]. Credit is used for purposes other than for direct production. Because money is fungible, these two distinctions are difficult (and in some cases unnecessary) to make in practice.

By source or supplier:
- *Formal credit*: this refers to loans from organised sources, and which are subject to government and central bank regulation. These include credit offered by commercial banks, parastatal development banks, agricultural banks, co-operatives and NGOs.
- *Informal credit*: this refers to loans from the so-called unorganised sources, which operate essentially outside government and central bank regulation. They include a moral community of friends, relatives, and self-help groups, and moneylenders, landlords, employers and traders who may not belong to the moral community (Zeller, 2000).

By Size:
- *Microcredit or mini loans*: this usually refers to small loans targeted at small farmers or small (micro) enterprises. When the credit is offered in combination with savings and/or insurance services, then it is better described as microfinance.
- *Macro credit*: this is not in common use, but may be used to describe medium sized or large loans that run into thousands or millions of dollars; far beyond the usual scope for small–scale poverty alleviation interventions.

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[36] This distinction might not hold in the long run. For instance, a credit that permits a household to eat without having to slaughter their draught animal will enable that household to produce more in the future.

Besides the type of credit that is being provided by microfinance institutions, it is useful to also consider the 'technology' that defines how these institutions channel loans to their clients. Three basic lending technologies or models have been distinguished: Individual, group and community (village) banking, the latter being a variation of group-based lending. Some of the common lending technologies in microfinance include:

1) **Individual Lending:** This is the traditional form of allocating and recovering loans purely on an individual basis. The amounts involved vary considerably depending on risk considerations and the availability of collateral. Only a few financial institutions that specialise in making individual loans in rural areas have been considered successful. The Bank Rakyat Indonesia (BRI) and the Bank for Agriculture and Agricultural Cooperatives (BAAC) are among the best known (Patten and Rosengard, 1991; Yaron, 1992).

2) **Joint Lending:** Joint liability of individual group members is the distinguishing criterion in this model. Members still maintain their individuality while sharing certain unifying linkages or boundaries. This technology is considered the single most important innovation introduced in recent years in the financial markets of developing countries, and the Grameen Bank of Bangladesh is often credited with this innovation (Hossain, 1998). Each borrower bears the consequences, should any of the group members fail to repay. The membership of such groups is limited, usually between four to eight persons, and each person can operate her/his on venture or income generating activity on an individual basis. The common usage of the term 'group lending' usually (inappropriately?) refers to joint lending.

3) **Group Lending:** This could be viewed as group lending proper in which the group is treated as a unit. The enterprise activity is usually taken as a group venture with each member being assigned specific tasks. Some times a group may decide to further divide its loan to be managed by individual group members, but the credit institution or micro-finance organisation is basically involved only down to the group level as a unit and not really with its individual members. This variation of group-based lending (the other being the joint lending) is hardly discussed in the literature, perhaps because there are no known cases of success. Where this technology has been employed, it is normally with well established groups which are in themselves sort of (quasi) legal entities.[37]

4) **Community Banking:** This is a sort of extension of the group ideology to include a whole village or community, but still maintaining one or more sub-group units of say 20-30 members. Funds are allocated to the community (group), which in turn extends financial services (credit and savings) to either groups and/or individuals. They are designed to enable poor communities establish their own community (village) level credit or savings association or bank (Nelson et al., 1996).

This short narrative of the meaning of microfinance helps underscore the fact that field approaches and strategies to providing credit and/or related services differ from programme to programme and from time to time as innovations evolve. The main differences lie in the kind of products offered, design particulars of the programme and context

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[37] One such little known field example of group lending is that employed by the Wesleyan Women's Loan Scheme in Sierra Leone, where organised women's groups (often as local church women's groups) are the end programme clients (see Kargbo, 2000; Kamara and Kargbo, 1997 and 1999 for more details about the Wesleyan Women's Loan Scheme and similar development initiatives in Sierra Leone).

specific factors. Seemingly identical microfinance programmes might show important differences when the fine details of their products are examined. Even where a number of programmes offer the same product component or type – say microcredit – significant differences could emerge based on the type of technology employed to channel credit to various programme clients. This research recognises the importance of these factors by specifying them as potential sources of variation or moderators of the results reported in microfinance impact assessments.

3.3 THE EVOLUTION OF MICROFINANCE – A REVOLUTION?

In order to ensure a deeper understanding of microfinance, this section describes key trends in the development of microfinance from its formal origins up to its current form. The evolution of microfinance can be better understood when seen through the lenses of development theory and practice. When viewed within the context of development theory, a number of historical trends come to focus.

First, a strong wave of development theories in the late 1940s to 1950s emerged with the wave of political independence of countries in Asia, Africa, the Caribbean and later Latin America and other low–income countries (Meier, 1995). In the words of Meier (1995), "Regions that had been considered in the eighteenth century as ... *barbarous*, in the nineteenth century as *backward*, and in the pre-war period as *underdeveloped* now became the *less developed* countries or the *poor* countries – and the *emergent* countries and *developing* economies" (italics for own emphasis). The dominant thought during this era, Meier claims, was the equation of development with economic growth, clearly influenced, at least in part, by the views of such classical economists as Adam Smith, Thomas Malthus, David Ricardo and John Stuart Mill (ibid). Development Economics jargons such as "big push", "take off", "balanced growth", "unbalanced growth" were reportedly in vogue up to

the early 1960s.[38] Capital accumulation and investment were seen as prerequisites for increasing incomes and economic growth (Rondinelli, 1990; Bryant and White, 1982). For development practitioners, subsidised credit, targeted to particular regions and sectors of society became the most celebrated development intervention, especially for poor farmers. Many microfinance programmes then, and even today, were implemented on the premise that the poor are too poor to pay market interest rates and generate appreciable savings.

A second wave in development thinking and theory gained momentum in the late 1960s and early 1970s, driven by the realities of the increasing numbers of people living in absolute poverty, and sharp income inequalities in many countries (Meier, 1995). The very meaning of development – then essentially equated to economic growth, meaning increase in real Gross Domestic Product - was questioned, and new dimensions of redistribution with growth, and the basic needs approach were added to the development discourse (Ellis and Biggs 2001:438). According to them, industrialisation was de-emphasized in favour of rural development and a broader meaning of capital to include human capital was adopted. Development interventions took the face of central state control and a top-down approach to planning and implementing poverty alleviation programmes (Rondinelli, 1990; Bryant and White, 1982). In keeping with dual-economy theories of development (Lewis, 1954; Fri and Ranis, 1964; as cited in Ellis and Biggs 2001:440), the role of the subsistence sector was to supply resources to the modern sector "envisaged as containing large-scale 'modern' agriculture (plantations, estates, commercial farms and ranches)..." (ibid). Pre-occupied with the objective of increasing

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[38] Meier (1995) gives a concise and comprehensive commentary on the evolution of these and other development theories and thinking. Ellis and Biggs (2001) also provide a neat, though superficial, timeline of rural development ideas which shows that the 1960s were characterised by modernisation, the 1970s by state intervention, the 1980s by market liberalisation, the 1990s by participation and empowerment, and the 2000s by sustainable livelihoods and good governance.

agricultural production (with an export orientation), many governments established agricultural development banks and implemented credit-only programmes during this era (Lapenu and Benoit-Cattin, 1998). The concept of Women in Development (WID) also exerted great influence on development policy at the time[39]. Women were considered to be among the poorest of the poor and the most marginalized in society, and it was assumed that their integration into economic progress and processes would lead to more equality, at least in gender relations. This thinking resulted in the design and promotion of micro-finance programmes particularly targeting women.

Since the 1980s, a third wave has brought with it a resurgence of neo-classical views. Policy–induced distortions and non-market failures associated with the implementation of public policies led to a serious "critique of comprehensive and detailed administrative (state) controls" (Meier, 1995). Benefiting from the consequent decline in enthusiasm for big government, non-governmental organisations and other non-state actors gained prominence and increasingly adopted a holistic approach to development, where financial and social intermediation were more integrated (Ellis and Biggs, 2001:443). This kind of development has been pursued on the basis of the socio-political principles of freedom, justice and solidarity. It is, according to Holtz (1995), seen as "a multi-dimensional process aimed at peace, satisfaction of basic needs and hence securing a life for all in dignity and freedom from need and fear, and the capacity of societies to have a future in One World". It is in this context that microfinance is seen by many not only as a means of economic advancement, but also as a means of attaining social development goals.

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[39] The UN for example, declared 1975 as an International Women's Year, to highlight the need for involving women in economic development (Boserup 1970 as cited in Kochzberski, 1996:138).

Dorward et al. (2005) for example, describe a 'microfinance revolution' that lends credence to one of their hypothesis, namely, ".... that development of specific critical institutional arrangements is particularly important in lifting poor economies out of the low equilibrium trap".[40] They argue that the revolution of microfinance is one of two major (the second being the green revolution) "... processes of change in developing countries in the last fifty years". According to them, the successes of many microfinance institutions, such as the Grameen Bank of Bangladesh, were propelled by changes in institutional arrangements and technology, which were often then followed by changes in the institutional environment at national as well as international levels. They claim that some of the new institutional arrangements such as group lending based on joint liability, and new products tailored to match the specific needs and abilities of clients have helped reduce risks and transaction costs[41]. Changes in the institutional environment, Dorward et al. further explain, "... included, for example, new financial regulations bringing microfinance activities into mainstream financial markets, with greater access to commercial finance, greater protection for microfinance clients, and opportunities for microfinance organisations to offer a greater range of financial services".

The practical history of microfinance may date centuries back to the many traditional and informal systems of credit based on mutual trust prevalent in developing economies. In Nigeria for example, such "… informal arrangements date back to the 15th and 16th centuries from

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[40] Dorward et al. (2000) explain this low level equilibrium trap as a sort of economic stagnation – a state of low economic activity – characterized by thin markets, inadequate co-ordination, weak information flows, high risks and transaction costs, high unit costs for infrastructural development, and weak institutional environment; factors which can themselves lead to (further) economic stagnation.

[41] Within a micro-credit programme, transaction costs usually include costs of gathering information about potential borrowers, screening of loan applications, disbursements and monitoring, recovery of loans and interests, etc. The reduction of such costs and the desire to attain sustainability remain the major driving factors behind the ongoing search, experimentation and promotion/adoption of innovative technologies in the field of microfinance.

where they were carried by slaves as part of their social capital to the Carribbean, where both the institution and the original Yoruba term, *susu*, are still found today" (Seibel, 2003:12). Relatives, friends, neighbours, moneylenders and rotating savings and credit associations have long been the only form of financial services available to low income households (Hassan, 2002:207).

However, the birth of *modern* microfinance – including legally recognised 'informal' finance – is widely believed to have occurred in Europe, first in Ireland beginning with Dean Jonathan Swift's loan fund for "poor artisans of Dublin" as early as the 1720s, and then in Germany in 1778 (Hollis and Sweetman, 1996:5; Seibel, 2003:10).[42] By the mid-nineteenth century, the Irish loan funds were said to have been lending to an estimated 20% of Irish households (Hollis and Sweetman, 1996).

In Germany, Friedrich Wilhelm Raiffeisen and Hermann Schulze-Delitzsch are credited with the 'reinvention' of the wheel of microfinance around the late 1840s following the distress caused by economic liberalisation, including (the *Stein-Hardenberg*) agricultural reforms (Seibel, 2003; Garson, 1996; Aschhoff and Henningsen, 1996:19).

Here the first groups were formed on the principle of solidarity of the members among themselves, following "the rules of the co-operative movement that had been born in England in the industrial sector and was just starting to develop in Denmark in the agriculture sector. Each member had to contribute an entry fee to belong to the group. Eventually, groups were registered and given legal status" (Garson, 1996). This led to the formation of banks like *Volksbanken* (People's banks) based either on principles of cooperation or mutualism (Aschhoff

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[42] This recorded origin is contrary to a view held by many that microfinance was invented in Bangladesh with the creation of the Grameen Bank by Professor Muhammed Yunis in the mid 1970s.

and Henningsen, 1996)[43]. Similar initiatives are said to have later emerged in Canada, France and other parts of Europe (ibid).

A different initiative to create financial-services groups is believed to have come from Asia after the Second World War. These groups had the basic function of collecting savings and distributing credit to their members (self-help groups) or providing guarantees to the borrowing members (solidarity groups). The Asian groups were constituted top-down without any contribution from the members, and they remained informal having no registered/legal status (Bechtel, 1994; as cited in Garson 1996). Today, financial groups are now well established aspects of the financial infrastructure in many developing countries, both nationally and locally (ibid).

Contrasting with such a clear history of revolutionary upgrading or formalisation of credit transactions in the now 'developed' countries of Europe, formalisation and subsequent access to formal credit in many developing countries remains severely limited (Seibel, 2005:12). It has even been estimated that formal credit does not reach more than 20 per cent of farm households in most of the developing world (Von Pischke, 1991; Graham, 1987; Seibel, 1986); and this, despite the view held by some scholars that informal lenders are exploitative or anti-developmental, especially with regard to their often high interest rates and apparent focus on consumption rather than investment (Bathrick, 1981; Bottrall and Howell, 1980; Donald, 1976). Von Braun et al. (1990) have noted, for example, that over 80 per cent of all credits obtained by rural households in the Gambia was provided by informal sources. This contrasts sharply with evidence in Desai and Mellor

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[43] This is an important distinction between this origin of 'modern' co-operatives and their historical predecessors which were dominated by compulsory kinship/family based associations, precinct co-operatives in rural areas and guilds of merchants or craftsmen in medieval townships in the early 8th and 9th centuries (Aschhoff and Henningsen, 1996:16-17).

(1993:14-18) which showed a greater share and continued "… increase in the relative role of institutional credit..." and a "… consequent decline in non-institutional loans … "; and this because "… resources of informal lenders are inadequate and ill-suited for modernization …". Desai and Mellor's prognosis was a speedy 'catching up' and eventual relative dominance of formal financial services in developing countries (ibid).

But why does informal credit continue to predominate? Different explanations have been offered for this reported predominance. Some analysts have shown that informal financial markets are operationally more efficient than formal financial institutions, and that they are usually preferred by small borrowers/farmers because the services/lenders are flexible, timely, close and non-restrictive (Adams, 1982; Karimu and Richards, 1980; Penny, 1986; Johnny, 1985; Jabati, 1990; Heidhues et al., 1990). Others have argued that the continued adoption and/or resilience of traditional financial practices, and their non-integration in modern banking and financial systems is a direct response to the failure of past attempts by governments and donor-funded rural credit programs to reach poor farmers or poor households in the rural areas over the last three decades or so (see for example, Robinson, 2001; Zeller and Sharma, 1998; Schmidt and Zeittinger, 1997).

In his examination of the evolutionary history of microfinance, Seibel (2000) identifies a number of progressive steps that have been made so far and obstacles that need to be overcome in many developing countries (see Table 1). It can bee seen from this table that in some countries, an improvement in the policy environment – deregulation of interest rates, reduction in entry barriers to the financial sector – and the enactment of new legal frameworks increasingly provide opportunities for setting up and/or upgrading informal/non-formal financial institutions to formal levels and for market integration.

However, inadequate property rights and judicial procedures, political interference, lack of viability and self-financing are among the key shortcomings/obstacles faced in most developing countries.

Table 1: Developments and Shortcomings in Microfinance

Topic	Developments in some countries	Shortcomings in most countries
1. Policy environment	Macroeconomic stability; Deregulation of interest rates; Greater ease in setting up banks, branches, and local MFIs with lower capital requirements	Inadequate policy & legal environment; Slow implementation of deregulation; Inadequate property rights and judicial procedures
2. Agricultural development banks (AgDBs)	Incipient reforms towards autonomy, operational viability and financial self-sufficiency, with or without privatisation	Lack of viability and self-reliance; Dependence on budgetary allocations; Political interference; Inability to meet demand for credit, deposit facilities and insurance
3. Microfinance institutions (MFIs)	New legal forms for commercially operating MFIs; Increasing numbers of viable and self-sustaining MFIs	Lack of appropriate legal forms; Excessive capital requirements
4. Agricultural finance	Self-financing from profits and savings plus commercial micro-credit replace preferential sources	Self-financing and commercial credit from MFIs insufficient in meeting the demand for financial services
5. Upgrading of non-formal financial institutions	New legal framework provides opportunities for upgrading to formal levels and financial market integration	The potential of upgrading millions of informal financial institutions has remained almost untapped
6. Non-governmental organisations (NGOs)	Innovative approaches to poverty lending; Some successful conversions to formal intermediaries	NGOs are reluctant to mobilize their own resources and strive for self-sufficiency; Donors support unviable NGOs
7. MFI regulation and supervision	Controversial discussion of the need for effective regulation and supervision of MFIs	First-tier authorities unable to supervise MFIs; AgDBs escape supervision; Lack of MFI self-regulation

Source: Seibel, 2000

Of course, microfinance continues to evolve, especially now that their is a wider interface between researchers and practitioners. New research and innovative experiments in the design and delivery of financial and

non-financial services hold the key to further revolutions in microfinance in poor and rich countries alike.

3.4 MICROFINANCE AND SUSTAINABLE LIVELIHOODS

Having reviewed the influence of development thinking on the evolution of microfinance, it can be said that top-down or 'blueprint' approaches to development have largely been put aside in favour of bottom-up or 'process' approaches (Rondinelli, 1983; Mosse et al., 1998; as cited in Ellis and Biggs, 2001:443). The World Bank's energetic adoption and pursuit of participatory poverty assessments and planning, culminating in a growing number of Poverty Reduction Strategy Papers (PRSP), is evidence of this paradigm shift, at least in principle (Ellis and Biggs, 2001). One implication of this shift is that the long-standing orthodoxy of the primacy of small-scale agriculture, and the promotion of farming systems research that went with it, may now need to be re-appraised "... in the light of emerging evidence that the rural poor tend to depend on non-farm (and often non-rural) sources of income in order to sustain their livelihoods" (Ellis, 1998, as cited in Ellis and Biggs, 2001).

The sustainable livelihoods[44] (SL) framework has thus emerged as a 'new' approach that integrates the multiple realities of poverty. It embodies, for example, no prior requirement for the poor to be a 'small farmer' or even a rural dweller. The livelihoods concept recognises the cross-sectoral and multi-occupational diversities of the poor, and "... takes an open-ended view of the combination of assets and activities that turn out to constitute a viable livelihood strategy ..." for the poor family/household or individual (Ellis and Biggs, 2001:445). It integrates such components as remittances and transfers, wages and salaries in activities that might have little or nothing to do with farming. It is

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[44] " A livelihood comprises incomes in cash and in kind; the social relations and institutions that facilitate or constrain individual or family standards of living; and access to social and public services that contribute to the well-being of the individual or family" (Ellis, 1998:6, as cited in Gordon 1999).

against this background of the growing importance of the SL framework, that the role of microfinance in the farm and non-farm sectors will receive further consideration in this section.

3.4.1   Microfinance and the Farm and Non-farm Economy

We start this section with a basic economic rationale for providing microfinance, which goes beyond the traditional products targeted at poor farmers. Given the serious problems of unemployment and underemployment that plague developing countries, microfinance is, for many, the only alternative that could help create jobs either by generating wage-employment or by promoting self-employment. It has been argued that under certain circumstances, credit can help poor people accumulate their own capital, and the Baker-Hopkin credit model or accounting identity provides a theoretical basis for such a proposition.

This identity has the following structural form, as applied in Wahid (1994):

$CE/E = [(D/E)(r-i) + r](1-c)$, where

E = the amount of equity

D = the amount of loan

r = the rate of return on assets

i = the rate of interest paid on loans;

c = the rate of consumption out of the income earned from assets; and

C = the discrete change.

The implication here is that as long as the return on assets (r) is larger than the interest rate on the loan (i), credit will have the desired effect of increasing the income of the borrower. It can however be extremely difficult (but not impossible though) for poor households to accumulate savings from their micro-enterprise income due mainly to low income and a high propensity to consume (that is 1-c close to 0). This

underscores the need to adapt microfinance products according to levels of poverty and the potential of clients' investments to generate income above credit costs.

An important conclusion from growing empirical evidence is that "virtually all cases of successful development indicate that rapid growth and poverty reduction always involve an emphasis on improving productivity and incomes in agricultural and non-farm rural occupations (Lipton and Ravallion, 1995; Timmer, 1988; World Bank, 2000a)" (in Klassen, 2003:68-71, in Tungodden et al., 2003 (eds.)). Agriculture is almost always seen as key to the development of a robust non-farm sector. Supporting the 'agriculture-as-the-engine-of-growth' model, a number of World Bank (1996, as cited in Gordon, 1999:14) studies show that a vibrant agricultural sector creates demand for consumption goods (and employment) in the non-farm sector. The development of agriculture (by way of increased irrigation and mechanization) may create, for example, an expanded market for simple, low-cost tools which can be produced and maintained locally. "The clear message here", Gordon states, "is that policies which promote agricultural development also promote the non-farm sector". With respect to poverty reduction in general, Klasen (ibid) suggests that "…pro-poor growth must, in the first instance, focus on growth in agriculture and non-farm rural growth, must be labor intensive and land intensive where the poor have access to land, and must be concentrated in geographic pockets of deep poverty".

Gordon (ibid) however notes that agriculture is often a part-time occupation, with non-farm employment and remittances serving as important sources of income. Non-farm employment opportunities that specifically benefit the poor are most likely to be in wage employment (for unskilled labour) and microenterprise. In many developing countries, the non-farm sector contributes between 20-50% of rural

employment (Islam, 1997, as cited in Gordon, 1999:21), thus offering the "… potential to absorb a growing rural labour force … and promote a more equitable distribution of income…" (Lanjouw and Lanjouw, 1997, as cited in Gordon, 1999), and which may then be ploughed back into farming.

Since the 'livelihoods approach' takes poor people's resources as a starting point for analysis and action, it provides a useful basis to "…inform the selection and *modus operandi* of targeted interventions". The typical sustainable livelihoods framework[45] can be modified (as in Figure 1), to show that microfinance contributes directly to the 'financial capital' resource base of the individual or household, which is then employed, in combination with other livelihood assets (physical, social, human and natural capital), to undertake various agricultural and non-agricultural activities aimed at attaining one or more desired livelihood outcomes.

Here physical capital includes, among others, roads, shelter and communication; social capital includes local support mechanisms or networks and the ability to influence concerted action; human capital includes education, skills and health; natural capital includes the endowments of land, water and biodiversity; and financial capital includes remittances, cash and other liquid assets.

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[45] It is important to bear in mind that the sustainable livelihoods framework is just one way of conceptualizing the complex situation of the poor. Its widespread adoption by international research and development agencies such as IFPRI, DFID, IFAD and CARE has obviously helped to popularise it.

Figure 1: The Sustainable Livelihoods Framework with Microfinance
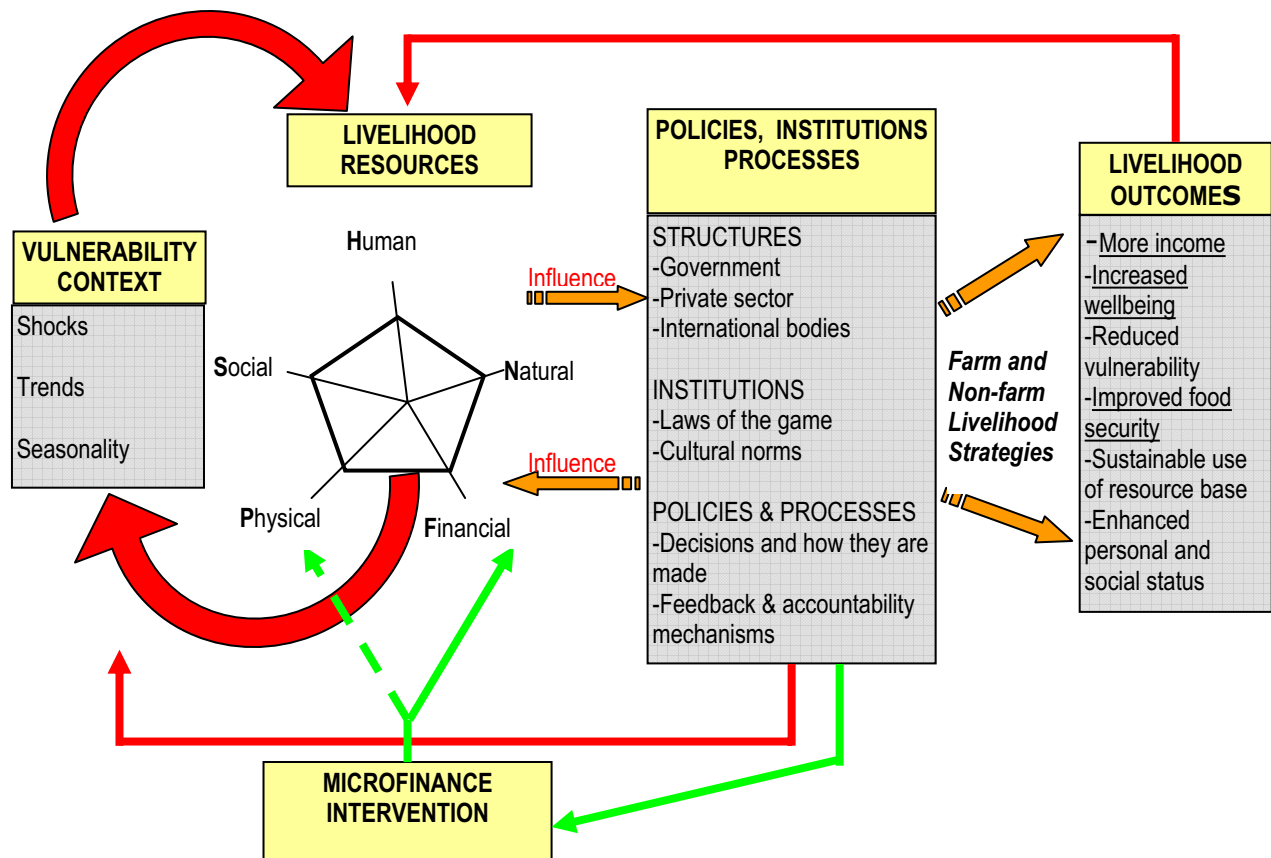
Source: Adoto and Meinzen-Dick (2002, modified)

Where (financial) capital is a binding constraint, as is often the case in poor countries, access to credit (whether cash or in the form of say, seeds, fertilizers or other in-kind items) augments the farmer's equity and can facilitate the expansion or intensification of hitherto limited production, or simply enable the adoption of 'new' livelihood strategies by an individual or household.

Even the provision of consumption credit might prove effective as it not only helps to maintain (household) labour and/or entrepreneurship, but can also help protect against the untimely or uneconomical depletion of existing stock of (physical) capital to finance or smooth current consumption. Similarly, the use of credit to, for instance, send a child to

school can represent an important investment to the growth and maintenance of human capital. "Investment in education contributes to the accumulation of human capital, which is essential for higher incomes and sustained economic growth. Education – especially basic (primary and lower-secondary) education – helps reduce poverty by increasing the productivity of the poor, by reducing fertility and improving health, and by equipping people with the skills they need to participate fully in the economy and in society" (World Bank, 1995a, as cited in Cammack, 2003:5-6).

In fact, it has been said that the 'sustainable livelihoods with microfinance' approach recognises that the poor have a "remarkable resourcefulness in coping with . . . risks in the context of limited resources and opportunities. Financial services contribute to this process by helping clients build all kinds of assets . . .. They also enable clients to diversify their sources of income by providing chunks of money to take advantage of opportunities when they present themselves" (Stabsted and Cohen, 2000:103, as quoted by GHK Research & Training, 2001:44).

Policies, institutions and processes of national governments and international bodies may either support or hinder the process of diversifying and/or transforming livelihood assets into desirable outcomes under any given context of vulnerability. Judging by the public statements and programmes of many national and international institutions (as already elaborated in earlier sections), the provision of microfinance to the poor offers great promise. The rest of the thesis seeks to ascertain the extent to which this 'favoured status' of microfinance can be corroborated by the available empirical evidence.

PART II

ANALYTICAL FRAMEWORK

4   MEASURING THE IMPACT OF MICROFINANCE

Having explored the nexus between poverty, finance and development in general, and in particular the potential of microfinance in promoting and securing sustainable livelihoods, this chapter discusses concepts, approaches and tools employed to gather empirical evidence on the impact of microfinance programmes or interventions. First, 'field' methods for assessing the primary impact of microfinance are examined, and second, methods for conducting literature reviews are presented and used as a theoretical background/reference point to appraise two recent reviews (meta-studies) of microfinance impacts. One of the literature review methods examined is called *meta-analysis* and is the main method employed in this research. Details of the meta-analytical approach are discussed in the next chapter, chapter 5.

4.1 PRIMARY IMPACT ASSESSMENTS

Many individuals and institutions need little or no list of reasons in these modern times to convince them about the importance of an evaluation exercise. It is known that even the most careful implementation of policy interventions backed by proper planning, professional staff and meticulous administration can be in error. Policy errors may be due to the fact that there are usually differences in knowledge and competency levels, and other idiosyncrasies among different actors (e.g. participants and administrators). Besides, it is not uncommon that the inception and design of a given policy measure might be based on a false premise about the causes of a problem or set of problems (Schmidt, 1999), thus rendering a programme based on such a policy irrelevant or ineffective at best. The likelihood of such errors, among other reasons, warrants a further scrutiny of even the 'best' programmes following some well-accepted standards. Since policy interventions, such as microfinance, generally commit substantial resources that are then unavailable for alternative programmes, policy makers are expected to decide on a

well-informed and defensible/efficient allocation of a country's scarce resources (Froelich, 2002:1).

The assessment or evaluation of effects and costs of an intervention is therefore imperative not just to ensure administrative and public accountability but also to serve as a feedback mechanism, which establishes a scientific basis for promoting/discouraging the choice of certain policy instruments.

In practice the decision on which programme merits funding can be quite complex. The decision maker might simply consider the plausibility of one programme's success over another, "… more or less supported by explicit behavioural, not necessarily economic, theory" (Schmidt, 1999:4). Another approach would be for the decision maker to rely on the advice of experienced practitioners. We may label these as the *plausibility* and *practitioner* approaches respectively. One serious problem with both approaches however, is that their objectivity can be highly questionable, meaning that less confidence should be placed on their resulting estimate of impact or effects. The need for objectivity and the desire to reduce the likelihood of erroneous conclusions are important factors that favour the engagement of *independent* evaluators/researchers (or methods)[46], who are expected to demonstrate high scientific standard and rigour in their analysis/estimation of the efficacy or, even further, the *efficiency* of any policy intervention[47].

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[46] The level of objectivity of an evaluator is presumed to be positively correlated with his/her level of independence or organisational distance from the programme in question. But the use of rigorous evaluation methods might be a more critical factor in ensuring objectivity and *'trueness'* than nominal independence.

[47] Programme efficiency refers to the effectiveness or impact or efficacy of a policy intervention per unit resource (usually in monetary terms) spent. This requires the estimation of benefits that were created by the intervention and at what costs, direct as well as indirect (Shreiner, 2001).

Should the decision maker prefer to secure the services of such an independent evaluator, instead of undertaking his/her *own assessment*, the task of the (hired) evaluator is usually not straightforward or easy. The truth is that there are many different ways to assess or evaluate the performance of development interventions. The nature or sector of the project or intervention, the purpose of the assessment or study and the intended use of the results, and cost considerations are among the many factors that determine the approach used. While some researchers try to consider the various levels and aspects of a programme and adopt a comprehensive approach, others may select only certain aspects. In the case of microfinance, several elements of a programme or intervention can be assessed or evaluated; and their success judged on the basis of one or more indicators or criteria, including for example, repayment rates, quantity and quality of outreach, sustainability of the service(s) and organisation/institution, and impact at individual borrower, household, enterprise and community levels (Buckley, 1997).

Primary impact assessments or evaluations[48] of microfinance interventions – especially those commissioned within the framework of non-governmental organisations (NGOs) and their partners – tend to focus more on programme efficacy or impact (Schreiner, 2001; Schmidt, 1999:4). That is, on programme results or outcomes and how these have affected the life of participants. It is this kind of studies that this research is primarily concerned with. Each assessment study or report will be 'interviewed' to find out how far the provision of microcredit and/or related financial services can be relied upon to help eradicate poverty. The rest of the section will thus overview some of the multiple methods employed to estimate programme impacts,

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[48] Baker (2000) explains that impact evaluation is just one component of a comprehensive evaluation, the others being monitoring, process and cost-benefit evaluations.

highlighting their key elements and practical challenges to their implementation.

4.1.1 The Evaluation Problem

One of the first questions to clarify in any impact assessment is: what should be considered as success? It is not always obvious which outcome measure will adequately reflect the relevant changes that might constitute programme success or failure. The choice of the outcome indicator therefore also depends on the aims of the intervention. The impact of a microfinance programme for example, can be reflected by improvements in the living standards of the clients, or even more specifically by changes in their income levels or by their adoption of life-saving or life-enhancing behaviours, say with respect to health and nutrition. Even when one outcome is clearly identifiable and measurable in a specific way, the evaluator will have to deal with a host of other challenges, including the problem of spillover and/or unintended effects.

To formalise our discussion of the case of a microfinance programme (MFP), let i refer to a unit (individual, household or other unit) that may or may not participate in the MFP. Let the state of (potential) participation – say receipt of a small loan or any other form of financial service from the MFP – be indicated by "T" (for treated) and non-participation by "C" (for control). If Y represents the outcome of interest, say income, then the potential outcomes for individual i (before the programme) are given by Y_i^T and Y_i^C. Depending on whether or not s/he participates, Y_i^T is the outcome that would be *realised* (after the programme) if the individual participates and Y_i^C if the individual does not. Ideally, an evaluator would like to compare the actual/realised outcome Y_i^T of person i when s/he participated in the programme as well as Y_i^C when that individual did not, such that Y_i^T - Y_i^C appropriately reflects the individual gain (or loss), G_i, due to

participation in the microfinance programme.[49] Restating this formally would yield

$$G_i \equiv Y_i^T - Y_i^C \qquad (\textbf{Equation 1})$$

The mean of all such individual gains, that is the mean of all the *G's*, *E(G$_i$)*, gives the "*average treatment effect*" (ATE).

To draw any casual inference from the gains of a single individual requires assuming that the programme impact on each individual *i* be independent of the treatment status of any other individual (from the rest of the population). That is, "the observed outcome Y_i depends only on the treatment [group] to which individual *i* is assigned and not on the allocation of other individuals" (Froelich, 2002:4). This is referred to as SUTVA (stable-unit-treatment-value assumption) in the literature (Rubin, 1986, as cited in Schmidt, 1999:14)[50]. What is even more challenging is that it is physically impossible to simultaneously observe one individual in two states of nature. That is, it is impossible to observe Y_i^T and Y_i^C simultaneously for the same unit; one cannot observe the income of participants had they not participated. This is the referred to as the counterfactual or evaluation problem.

Even though it is impossible to avoid this problem of observability at individual level, an assessment of average gains from treatment is still achievable. This is called the "*average treatment effect on the treated*" (ATET) (Ravallion, 2005:4). Using standard terminology, we can refer to the provision of financial services (receipt of loans) as *treatment*, calling programme participants the '*treated group*', and non-participants non-

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[49] "This approach to conceptualising the evaluation problem is known as the *Rubin Causal Model* in the statistics literature (Rubin 1974) and the *Switching Regression Model* (Quandt 1972 in the econometrics literature…" (Schmidt et al., 2000:3).

[50] Many microfinance programmes, like most anti-poverty interventions, are likely to have spillover effects making it difficult to observe a group of non-participants who have not been 'contaminated'/affected by the programme. Thus violations of SUTVA – which can lead to impacts being either understated or overstated - may be quite common in practice (See Ravallion, 2005:11-14 for a discussion of spillover effects including examples).

clients or the *'control group'*. Let us entertain the possibility that the allocation or tagging of individuals in to either 'treatment' or 'control' does not perfectly correspond to participation status. We might then regard the various group members only as *'potential candidates'*. To formalise this possibility, let us assign a dummy variable L_i, which takes the value "1" when unit *i actually* participates (say by receiving a loan) and "0" when *i actually* does not.

ATET is then given by

$$G \equiv E(Y_i^T | L_i = 1) - E(Y_i^C | L_i = 1) \text{ or } E(G_i | L_i = 1) .$$ **Equation 2**

Remember that the average outcome of treated individuals $E(Y_i^T | L_i = 1)$ is identified from the observed (post-treatment) data, while their average outcome had they not been treated $E(Y_i^C | L_i = 1)$ – the counterfactual – is not. It is the identification or construction of the counterfactual to replace this unidentified portion in equation 2 that constitutes the *evaluation problem* (Schmidt et al., 2000:3-4).

While equation 2, expressing the "average treatment effect on the treated" (ATET), will yield an unbiased estimate of the true mean gain as "expected" when appropriately calculated (using correct sample weights), it technically however, only captures the difference, *D*, in mean outcome; say income, between clients and non-clients of the microcredit programme, which essentially is the sample estimate of

$$D = E(Y_i^T | L_i = 1) - E(Y_i^C | L_i = 0).$$ **Equation 3**

This is because the average income of those in the control group $E(Y_i^C | L_i = 0)$ now approximates the (treatment) counterfactual by substituting for $E(Y_i^C | L_i = 1)$ in equation 2. Such an approximation can be biased. We can represent the bias by linking equations 2 & 3 by the simple identity, *D = G + B*, *"B"* being the *selection bias* (Heckman and

Robb, 1985; Mianski, 1993 as cited by Froelich 2002:7) in the estimate, and is given by

$$B = E(Y_i^C | L_i = 1) - E(Y_i^C | L_i = 0).$$ **Equation 4**

The bias represents the difference in the counterfactual means. It arises because the participants and non-participants are *purposively* (nonrandomly) assigned/selected groups that could have different outcomes even if they were all in one group. If all the individuals decided not to take loans from the MFP (or say there were in fact no MFP) *D* would be a biased estimator arising from the likelihood that there would still be income differences between clients and non-clients anyway. In other words, there is (observable) heterogeneity among potential participants. Quite often "there may be other factors or events that are correlated with the outcome of interest but are not caused by the project" (Baker, 2000:1). Once more, the problem of the missing counterfactual mean, $E(Y_i^C | L_i = 1)$, makes it 'impossible' to correct the bias, *B*.

The central problem remains to answer, as before, the question: what would have happened to the treatment group in the absence of the policy intervention (Y_i^T when L_i=0) or to the control group had they been treated (Y_i^C when L_i=1)? Again, the core task of impact evaluation, stated in other words, is thus the establishment of such a *counterfactual* to fill in the 'missing' data (Ravallion, 2005:3). Various methods have been used to estimate the counterfactual with varying degrees of accuracy and reliability. Some of these are reviewed in the next section, drawing mainly from Schmidt et al. (1999), Baker (2000), Froelich (2002) and Ravallion (2005).

4.1.2 Assessment Methods

The key line of difference in the multiple methods for assessing the impact of policy interventions is in the way the control or comparison group[51] (non-participants or non-recipients) is chosen or constructed to ensure that it is identical or sufficiently similar to the treated group (participants or recipients).

4.1.2.1 Experimental or Randomised Control Designs

Here the treatment or intervention is randomly allocated among individuals or units in the whole population. The set of units that do not receive treatment would then be statistically equivalent to the treated group, thus qualifying it to become a valid control group. Theoretically, this random assignment process guarantees a "… perfect counterfactual, $E(Y_i^C | L_i = 1)$, free from the troublesome selection bias issues that exist in all evaluations" (Baker, 2000:2)[52]. In this way, the evaluator ensures that any differences (other than in the outcome of interest) between treated and control groups are by pure chance, and not systematic. Thus the programme impact on the outcome of interest can simply be measured by the *ex-post* difference between the sample means of the treatment and control groups (as in Equation 1 above), provided the sample sizes are large enough. This is sometimes referred to as cross-sectional or *single difference* comparison *with* random assignment (Ravallion, 2005:15). In the natural sciences, this experimental approach is otherwise referred to as *randomised control trial* (RCT).

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[51] "Control" group is technically more appropriate when referring to those randomly excluded from the programme, but coming from the same population as the participants. "Comparison" group is more simply the group that does not receive the treatment or programme in question (Baker, 2000:2), and is more appropriate in the non-experimental conditions of social science research and programme implementation.

[52] Strictly speaking, "the random assignment does not remove selection bias, but instead balances the bias between the participant and non-participant sample" (Baker 2000:5).

Randomisation of (beneficial) policy interventions can be difficult to adopt in practice due to a number of problems associated with it. For instance, it is considered unethical to deny eligible candidates a much-needed service/benefit simply because the *'scientist'* wants to create a control group. This can become a politically sensitive issue, especially when the groupings correspond to geographical areas or administrative constituencies.[53] Other problems with (social) experimental designs include a high consumption of time and other resources, and selective compliance to the theoretical (random) assignments. Quoting Heckman and Smith (1995), Froelich (2002:9-10) mentions *randomisation bias*, *substitution bias* and *drop-out bias* as different sources of bias that may invalidate experimental evaluation results.

4.1.2.2 *Non-Random or Observational Designs*

These are also refereed to as quasi-experimental designs, and can be used to generate a comparison group when it is not possible to implement experimental designs, for example, after a programme has already been implemented. Econometric techniques are applied to ensure that the comparison group resembles the treatment group as much as possible, at least in observable characteristics.[54] This means that given a set of characteristics, *X*, that influenced treatment selection and the potential outcomes, the probability of being selected/assigned to a particular programme (participation versus non-participation) should not be affected by the potential outcome (of interest). The (vector) variable *X* must not include any variable that is itself affected by the policy intervention, otherwise conditioning on such a

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[53] This was reportedly the case in Mexico where an antipoverty programme, PROGRESA (Programme for Education, Health and Nutrition), adopted a randomised design, and is said to have been heavily criticised by the government opposition for using poor people as "guinea pigs" (control group) (Ravallion, 2005:17). Similar political difficulties have been experienced with the 'World Bank's social experimentation' projects in Peru, Venezuela and El Salvador (Baker, 2000:81-82).

[54] "This assumption is known as *selection on observables* (Barnow, Cain and Goldgerger, 1981), *ignorable treatment assignment* (Rosenbaum and Rubin, 1983) or as *conditional independence assumption* (Lechner, 1999) …" (as cited in Froelich, 2002:10).

(endogenous) variable will confound the causality. We now review some observational designs which can be applied to primary impact assessments of microfinance (and similar) interventions.

1) **Cross-Section or Single Difference Estimator**

This is the estimate of impact as expressed in equation 3. It is a comparison of the treated and comparison groups *after* a period of treatment, usually one or more years for microfinance interventions. This approach, also known as the *with-without* estimator, is straightforward but difficult to justify, unless one makes the strong assumption that treated and untreated units are equal with respect to characteristics/determinants, *X*, of both the selection process and the outcome of interest. In Conditioning on *X*, the population average of the observed outcome of non-participants would approximate the (unobservable) counterfactual outcome for participants. That is

$$E(Y_i^T | X_i, L_i = 1) = E(Y_i^T | X_i, L_i = 0).$$

This is called the *conditional independence assumption* (Schmidt et al., 2000:10). Using our example of the impact of microcredit on the income of clients/participants, the single difference impact estimator can be expressed as a regression of units of income on the set of covariates *X* and the dummy variable, *L* for loan receipt or participation. So that for the *i*th unit in the pooled sample, we have

$$Y_i = a + bL_i + cX_i + \varepsilon_i \text{,}$$ **Equation 5**

with *a*, *b* and *c* as parameters and ε a residual that includes other determinants of income and measurement errors. Equation 5 is a "common effect" specification in which all parameters (except the intercepts) are assumed to be treatment invariant (Ravallion, 2005:5). This assumption allows one to immediately read off the mean impact from the single standard regression output.

Recall that participation in the programme is indicated by *L*=1, so that if the *i*th individual participates, his/her income will be $a + b + cX_i + \varepsilon_i$. But if he/she does not participate (*L*=0), income will be $a + cX_i + \varepsilon_i$. The difference between the two 'states' is just *b*, which gives the income gain due to the provision of microcredit.

An important consideration is which control variables are selected and whether they are exogenous and hence uncorrelated with the error term ε in the regression. Here one concern might be that the regression of *Y* on *L* and *X* does not allow impact to vary with *X*, which may not reflect reality. Additionally, there can be several determinants of participation *L* such that $L_i = d + eZ_i + v_i$, Z_i being all the observed determinants of participation, *d* and *e* parameters and v_i an error term[55].

2) **Reflexive Comparison or Before-After Estimator**

This is also a straightforward approach that can be applied if data is available for a period *t'* before the treatment. Such data is usually collected as baseline or through (the less reliable) *recall* method. What is normally defined as the comparable group of non-clients or non-participants is in this case the participants themselves before the policy intervention. Each unit serves as its own comparison, such that the post-treatment outcome (at time *t*), is given by $E(Y_{it}^T - Y_{it'}^C | X_i, L_i = 1)$, which is identical with equation 3 plus a conditional/control variable *X*, and the time/period indicators *t* and *t'*.

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[55] See Baker (2000:46-48) for a discussion of some of the issues with control variables, exogeneity and correlation in single difference regressions.

3) **Single Difference with Matching**

In the absence of a random placement/assignment of (eligible) participants, various matching techniques can be used to mimic the randomisation process in order to reduce selection bias and obtain valid counterfactuals. Units within the participant group are matched (or paired) with units in the (source of) comparison group based on a *degree of sameness* on observable pre-intervention characteristics. The challenge is which set of comparators (from potentially many) to choose, and how should they be weighted in order to identify the best matches? Some theoretical insight coupled with knowledge about the setting, criteria and overall context of the policy intervention usually facilitate the determination of a finite set of comparators (Ravallion, 2005:22). *Propensity-score matching* (PSM) is one technique employed to select suitable comparators (Ravallion, 2005:21-28). In general, PSM involves the calculation of predicted probabilities P of programme participation – called propensity scores – conditional or based on an observed set Z of pre-treatment control variables (which could include outcome values for the state before or without the treatment, say level of income, formal education, family size, occupation, etc.) for a representative sample of both the participants and non-participants, such that $P(Z_i) = E(L_i|Z_i)$ $(0 < P(Z_i) < 1)$[56]. If

i) all the indicators of loan receipt (participation), L_i, are independent over all *i's* and

ii) programme outcomes are independent of participation given its determinants, Z_i

then programme outcomes are also independent of participation given $P(Z_i)$. "Under these conditions, exact matching on $P(Z_i)$ eliminates

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[56] The estimation of the propensity score can be implemented in various ways including binary probit models, multinomial logit models. Alternative matching estimators (and weighting schemes) can be based on *'pipeline matching'*, *pair matching*, *k-NN* matching, *local polynomial matching* and *least squares matching*. See Schmidt (1999), Froelich (2002), Ravallion (2005) and the references there in for a fuller discussing of matching techniques and their practical applications.

selection bias" (Ravallion, 2005:21), thus allowing for ATE to be given by G_i (equation 1).

4) **Double Difference Estimator**

This is a combination of the cross-sectional and the before-after comparisons. Participants are contrasted with non-participants on the selected outcome and its determinants before the intervention (first difference) and again after (a period of) programme implementation (second difference). An equivalent formulation is to first find the difference between the two time periods for each of the two groups, and then find the difference between the (group) differences. Data for the first difference is usually collected in a baseline survey at time t' before the start of the programme and data for the second difference in a follow-up survey at time t after the programme.

The double difference (DD) estimate, also known as *difference in differences* (DID), helps to eliminate bias due to unobserved characteristics or variables provided they are time invariant (Baker, 2000:54). It is pointless to focus on the elimination of bias due to unobservables when, in fact, that from observable sources has not been eliminated or reduced considerably. It is thus recommended that matching techniques be employed to delimit a comparison group (making it nearly identical with the participants) before applying double differencing to net out programme impact (Baker, 2000:55). This can be expressed (in a regression format) as the difference between the income after the programme $Y_{it} = a + bL_i + cX_{it} + \varepsilon_{it}$ and that before it $Y_{it'} = a + cX_{it'} + \varepsilon_{it'}$. That is,

$$Y_{it} - Y_{it'} = bL_i + c(X_{it} - X_{it'}) + \varepsilon_{it} - \varepsilon_{it'} . \qquad \textbf{Equation 6}$$

DD designs are particularly vulnerable to measurement errors in poor quality data. Selection bias can be pronounced if subsequent outcome changes are a function of initial conditions that also influenced the

assignment of the sample between the two groups. This is why it might be necessary to enhance DD estimates by controlling for this initial heterogeneity through matched or pipeline comparison groups (Ravallion, 2005:35-37).

4.1.3 A Caveat on The Assessment Methods

The discussion of evaluation methods so far has been restricted to the *classic formulation* of the evaluation problem[57], which estimates mean impacts on programme participants, relative to counterfactual outcomes in the absence of the programme. This approach addresses the policy concern of allocating resources to a particular programme – say microfinance - versus doing nothing. But policy makers are often more interested in doing something – the programme in question or an alternative (version of it) – rather than do nothing. Quite often, policy interests can extend beyond questions of efficacy to an assessment of efficiency. That requires going beyond direct programme benefits to determining direct and indirect costs and benefits to participants as well as non-participants. Under such circumstances, the evaluator should not only determine whether there are benefits to participants, but also whether there are positive net benefits, and further still, whether the net benefits are more positive than in alternative interventions designed to achieve the same goal (Schreiner, 2001). This is a '*measurement pitfall*' or level that is largely not addressed in most of the assessment reports considered in this research.

Apart from quantitative impact assessment methods, assessors often use non-quantitative or qualitative methods either as a stand-alone approach or in combination with one or more quantitative techniques. The latter is known as a mixed method or integrated approach, and

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[57] Other impact assessment methods, including triple differencing, use of instrumental variables and methods for economy-wide interventions, have been omitted in the discussion because they are not (yet) commonly applied in microfinance impact assessments. See Schmidt (1999) and Ravallion (2005) for a fuller and illustrative discussion of programme evaluation methods, including those omitted here.

explanations and conclusions derived from it tend to be holistic and plausible.

Whatever methods are applied, it is important to bear in mind that a specific microfinance programme may "perform well against the option of doing nothing, but poorly against some feasible alternative" (Ravallion, 2005:59). The *multiplicity of methods* poses a special challenge for the kind of aggregative review of reported impacts this research undertakes. Therefore, care has been taken in this research to identify (as far as possible) the specific method (s) employed in each primary assessment of the impact of microfinance. Moreover, each method/approach is given a quality rating to reflect the level of confidence that may be placed on the subsequent estimate of impact. Because of the variety of methods used in practice, it is reasonable to assume *a priori* that some variation in the reported impact of microfinance might be due, at least in part, to some methodological idiosyncrasies of each report.

4.2 REVIEWING THE REPORTED IMPACT OF MICROFINANCE

Recall that at the outset, the decision maker had a number of options on which to base policy choices. So far, the case has been made of the importance of an independent and methodologically rigorous approach, possibly with the hire of external/independent evaluators. Let us call this the *primary impact assessment* (PIA) approach, to differentiate it from the plausible and practitioner approaches mentioned earlier in this section.

We have seen that one important challenge in the PIA is to find a suitable strategy or method to ascertain the true efficacy of a particular programme *ex-ante* and/*ex-post*. This helps the evaluator avoid the fallacy of '*post hoc ergo propter hoc*' (i.e. because *A* occurs before *B*, therefore *A* is the cause of *B*).

Where a body of evaluations/primary impact assessments of sufficiently similar policy interventions already exists, the decision maker might first want to review the evidence and base his/her decision on the overall findings. This *review* approach is essentially a meta-evaluation, and we now consider some general and specific aspects related to the science of reviewing research literature, particularly in the filed of microfinance.

4.2.1 Definitions and Methods of Literature Review

The intellectual heritage of drawing from previous/existing knowledge in order to build 'new' knowledge can be traced at least as far back as Aristotle (Cooper and Hedges (eds.), 1994:4). For reasons ranging from sheer ignorance (about what has already been done), the desire to contribute to previous findings, and because of the availability of new methods (which are then applied to old problems), various "scientific sub literatures are cluttered with repeated studies of the same phenomena" (ibid). But even where repetitions pass as strict replications, it is rare, if not altogether impossible, for results to be identical across studies. Identifying or uncovering similarities, complementarities or contradictions in any given body of research is an important step/goal in the accumulation of scientific knowledge. There is little value (if any) in simply regurgitating previous research findings.

The process of revisiting or 'looking back' at previous research/studies is generally termed literature review. It has been defined as an "information analysis and synthesis, focusing on findings and not simply bibliographical citations, summarising the substance of a literature and drawing conclusions from it" (Educational Resources Information Centre (ERIC), 1982:85, as quoted in Cooper and Hedges (eds.), 1994:4). A 'typical' literature/research review surveys articles, books and other sources (e.g. dissertations, conference proceedings) relevant to a particular issue, area of research, or theory, providing a description,

summary, and critical evaluation of each work. The purpose of such a review is usually to offer an overview of significant literature published on a topic. Literature reviews often constitute an essential chapter of a thesis or dissertation, or may be a self-contained review of writings on a subject. It is in the sense of a self-contained review that we now consider the various methods employed to carry out a literature review.

A (literature/research) review usually entails at least one or more of the following:

1. A commentary narrating key facts or findings and features (as they are) of a body of literature.

2. A critical appraisal of the body of literature based on some criteria. The set of assessment criteria may or may not claim to be objective.

3. A consolidation of different studies into a clear structure, which has either been predefined or generated from the substance of the studies.

4. A construction or reconstruction of the body of literature to enable generalisation of empirical evidence or the generation of new findings.

Such a review may or may not be systematic. It is systematic when it follows clearly defined steps to ensure a reasonable level of objectivity and methodological rigour. *Systematic reviews*/overviews employ "explicit methods to identify, select and critically appraise relevant primary research…" (Khan et al., 2001:4). Statistical methods may or may not be applied. When statistical methods are applied in defining and analysing data from the primary studies, then such a systematic review is better referred to as *meta-analysis*.

Different characteristics of the review process and final product can lead to varying (but at time overlapping) classifications or types of literature

reviews. Figure 1 draws from a taxonomy of literature reviews presented by Cooper (1988, as cited in Cooper and Hedges, 1994:4&5). Standard research reviews have traditionally consisted of expert opinion on the whole or selected aspects of a limited number of studies. They are by default narrative summaries which comment on portions of the primary studies, usually without any detailed explanation of the review method and criteria. The subject experts often (implicitly) espouse their positions/opinion on focal theories and their practical applications.

Figure 1: A Taxonomy of Literature Reviews

Characteristic	Type of Review			
	Narrative	Interpretive	Integrative	Meta-analytical
Focus	Theories, practices or applications	Relationships between facts and figures	Research outcomes	Research outcomes, methods and theories
Goal	Identification of central issues	Finding commonalities and striking deviations	Generalisation, clarification or resolution	Integration, criticism, knowledge generation
Perspective	Espousal of position	Partly neutral	Neutral representation	Neutral representation
Coverage	Selective	Limited	Representative	Exhaustive at best
Organisation	Historical and thematic	Thematic and audience determined	Input-output orientation	Conceptual and methodological
Audience	Specialised scholars, policy makers	Scholars, public and policy makers	Scholars, practitioners and policy makers	Scholars, practitioners and policy makers
Author	Subject expert	Subject expert	Skilled analyst	Skilled and disciplined analyst

Source: Cooper, 1988, as cited in Cooper and Hedges, 1994:4&5, modified

Systematic reviews (integrative and/or meta-analytical) are by contrast more explicit in their approach. They are designed in such a way as to reduce biases and/or admit them where they occur. Greater clarity in

the identification of studies, choice of criteria and analytical techniques facilitates independent assessment of the quality of the review exercise and its potential for replication. This is one major source of appeal for the use of meta-analytical methods in systematic reviews. The main factors that increase the attractiveness of meta-analysis are discussed along with its important limitations in chapter 5, which describes the complete meta-analytical framework applied in this research to systematically review the reported impact of microfinance in developing countries in Africa, Asia and Latin America.

4.2.2 Recent Reviews of Microfinance Impact Assessments

In chapter 1, we highlighted some weakness of two different microfinance reviews conducted in the late 1990s. Here we examine two recent reviews of the impact of microfinance to underscore the fact that qualitative reviews remain the dominant, if not the only, methods that have been applied so far to summarise the available empirical evidence.

Morduch and Haley (2002) authored the "**Analysis of the Effects of Microfinance on Poverty Reduction**". This literature review, hereafter referred to as the *M&H-review*, had as its objective to research the following:

1. The effects of microfinance on poverty reduction as informed by the IDGs (Millennium Goals)
   a. What is the evidence? Is the effect different depending on the degree of poverty?
   b. Are there higher impacts if the first step is credit rather than savings and insurance?
   c. To the extent possible, particular attention should be paid to the definition of the target groups and the implications of the definitions used: e.g., destitute, extreme poor, moderate poor, and economically active vs. non-economically active poor.

2. The effects of microfinance on poverty reduction compared with other tools aimed at poverty reduction
   a. Is there evidence about the comparative strengths and weaknesses of microfinance vis-à-vis other tools, and how does microfinance rate against other development tools and interventions in terms of reducing poverty? Should there be a

b. What are the characteristics of microfinance programs which produce positive impacts (higher average income, other social indicators, etc.) and reduce risks (increased vulnerability, debt accumulation, negative social effects in households and communities, etc.)? (ibid, page 156)

The final report of the M&H-review was well structured to correspond to these core questions mentioned above. The authors succinctly present evidence from each study that provides some answer to the review (sub) question. In nearly all cases, the evidence – qualitative as well as quantitative - is included as quotations in the review report. Where some important study information did not readily fit the predefined headings, the authors created general additional subheadings such as "concerns" or "other factors". This meant that one primary study was quoted in several sections depending on the 'quotable' evidence it contains. Perhaps a comprehensive list or table of all the primary studies and some indication (frequencies or categories) of the nature of their evidence would have been useful as well.

Nathaniel Goldberg (2005) authored the most recent review, "**Measuring the Impact of Microfinance: Taking Stock of What We Know**", hereafter referred to as the G-review, under the auspices of the Grameen Bank USA. The author demonstrates methodological transparency by not only explaining how he identified the 'relevant' literature, but by also acknowledging bias. He describes his work as interpretive and encourages his readers to consider the review as only a guide to the original primary studies (page 10). He provides a running commentary of key results, highlights crucial methodological pitfalls, interpretation 'fallacies' or traps and a possible agenda for future research. The review however fails to state which criteria were used to determine which of the primary studies were "key" or "significant" to warrant their inclusion in the review.

These two recent reviews are excellent in many ways, but clearly more needs to be done – perhaps by future reviewers – to counterbalance the dominance of traditional methods and reap the known and potential benefits of quantitative reviews.

There can be several reasons why the said two reviews have been qualitative. First, if the population of studies is small, there might be no obvious advantages for computing any quantitative aggregates. So a short commentary or synopsis of the evidence will be enough. This was obviously not the case for the *M&H-review*. The authors themselves said, "Microfinance has been extensively examined over the past 10 to 15 years, and the resulting literature is now very large" (Morduch and Haley, 2002:1). The G-review corroborates this, and says "The prevalence of microfinance impact evaluations has increased in recent years, with programs using studies not just to prove the effectiveness of microfinance, but to improve it as well" (Goldberg, 2005:6). Based on the search strategy employed for this research, we were able to note up to 700 impact (related) documents. This clearly corroborates the claim of large numbers of microfinance impact assessments. Particular details about our search process and the subsequent 'filtering' and analysis of the studies are presented in part III of the thesis.

Second, if majority of the primary impact assessments employed qualitative approaches, one might find it hard to justify and indeed find appropriate non-qualitative review methods to apply. It seems however that there are a growing number of primary studies that apply sufficiently rigorous (quantitative) methods to permit one to go beyond traditional narrative reviews. Indeed "The number of rigorous studies of client outreach and impact has grown considerably, especially in the past few years…"(Morduch and Haley, 2002:1). Even with wide variations in quality and rigour of microfinance impact evaluations, the

G-review included "… the most significant microfinance impact evaluations that have been published as of mid-2005…" (ibid).

Three, cost considerations can exert a decisive influence on the choice of research methods. Like in primary evaluations, researches might adopt less (scientifically) desirable methods to suit a given budget, and perhaps a given sponsor or audience. This, though expedient, does not necessarily suggest a compromising of any professional standards. The M&H-review was prepared for CIDA (the Canadian International Development Agency), who funded it according to well defined terms of reference. Similarly the G-review was conceived, commissioned and funded through the laudable efforts of Alex Counts, President of the Grameen Foundation USA. The actual review probably lasted about six months (Goldberg, 2005:4), an incredible amount of work for such a short period.[58] Of course a high level of expertise and availability of support facilities/resources can help reduce the total duration of a review exercise. I submit, however, that going beyond narrative reviews often requires additional time and resources which may not be available.

A reviewer might also simply prefer certain methods to others. But whatever the reasons might be for 'limiting' a review process to the use of qualitative methods, the microfinance industry will clearly welcome an introduction of quantitative methods into a review of its impacts. The following chapters are devoted to making a contribution in that direction.

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[58] I have been quietly active in this meta-analytical review of the reported impacts of microfinance for at least three full years (as part of my doctoral research).

5 GENERAL ASPECTS OF META-ANALYSIS

Before discussing the specific case of the application of strategies and techniques of meta-analysis to review the reported impact of microfinance in developing countries, we first present a general overview of its main concepts and statistical procedures. Since contemporary meta-analysis is relatively new, it is hoped that such an overview provides the requisite introductory background and a theoretical framework or context on which the practical review process and, indeed, the essence of this research is built.

5.1 DEFINITION AND HISTORICAL DEVELOPMENT

Gene V. Glass (1976, as cited in Schwarzer, 1989) first introduced the term *meta-analysis* to describe the approach he employed to assess conflicting claims about the effectiveness of psychotherapy. He "statistically standardised and averaged treatment-control differences for 375 psychotherapy studies … concluding [in a paper he later published with Mary Lee Smith] that psychotherapy was indeed effective" (Smith and Glass, 1977 as cited by Lipsey and Wilson, 2001:1). Glass defined the method of meta-analysis as "the analysis of analyses … the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings. It connotes a rigorous alternative to the casual, narrative discussions of research studies which typify our attempts to make sense of the rapidly expanding research literature" (Glass, 1976:3 as cited in Schwarzer, 1989). According to Lipsey and Wilson (2001:1) "Meta-analysis can be understood as a form of survey research in which research reports, rather than people, are surveyed".

The use of statistical techniques to synthesise findings from a collection of studies has been traced as far back as 1904 when Karl Pearson averaged the results from five different studies that estimated the correlation between inoculation for typhoid fever and mortality (Cooper

and Hedges, 1994:5). Schmidt and Hunter (1977), Rosenthal and Rubin (1978) Hedges and Olkin, 1985, and Cooper and Hedges (1994) are among those who have written significant material on "the concepts, methods and statistical theory of various versions of meta-analysis" (Lipsey and Wilson, 2001:10). An increasing number of publications demonstrate the applicability of meta-analytical techniques to various disciplines ranging from their experimental context origins in medicine [clinical psychology] and agronomy (Florax, 2002:2), to education, (agricultural) economics and other social sciences. For example, Corrao and others (2004) compare the strength of evidence provided by the epidemiological literature on the association between alcohol consumption and the risk of 15 diseases; Marra and Schurle (1994) review how measures of crop yield risk are effected by farm size; Sutton et al. (2001) provide an illustrated guide to meta-analysis and highlight possible methodological developments using Bayesian statistics; Greenberg et al. (2005) summarize the results of three meta-analyses of training programmes and suggest some methodological improvements; Alston and others (2000) synthesized various estimates of the rate of return to agricultural research and development from 289 studies; Nijkamp and Poot (2001) used several meta-analytical techniques – including frequency tabulation, logit and rough set analyses – to assess the impact of five fiscal policy areas on long-run economic growth; Stanley and Jarrell (1989) present meta-regression analysis as a way to harmonise dissonance in the empirical economic literature; Gates (2002) advocates the adoption, in ecological reviews, of review techniques in medical science – including point estimation with confidence interval, investigation of bias, and sensitivity analysis.

Despite such remarkable developments, 'modern' meta-analysis, or statistical research synthesis, is still considered "a relatively young methodology" (Alston et al., 2000:188). In some fields of study, even those with abundant quantitative evidence on a certain research topic,

the potential of meta-analysis is yet to be exploited. This is the case regarding the question of the impact of microfinance (on poverty), as already argued in previous sections. This research attempts to fill this 'gap' by meta-analysing the reported impacts of microfinance on poverty in developing countries, adopting what have now become 'standard' meta-analytical procedures.

5.2 ESSENTIAL STAGES IN META-ANALYSIS

Meta-analysis, and indeed systematic reviews, now constitutes a type of research in its own right. Hoffert (1997), in an article on *The Scientist* about meta-analysis gaining status in science and policy making, quotes Murlow (1994:597-9) to have "… defended meta-analysis as not merely a valid method of systematic review but also an 'efficient scientific technique'". The stages in a typical meta-analytical research are analogous to those in a primary research project, from idea generation and problem formulation to data collection, data entry, analysis and presentation.

5.2.1 The Preliminary Stage

Before undertaking any systematic review using the meta-analytical approach, it is crucial to first consider its applicability to the set of scholarly work of interest. In this preliminary stage, Lipsey and Wilson (2001) propose a number of important issues to consider, including:

a. That meta-analysis applies only to empirical research work, not theoretical papers or narrative reviews and policy proposals. One can only conduct a review or synthesis on a topic for which primary research exists (Cooper and Hedges, 1994:9). But the number of primary studies can be as few as two or be way in the range of three or more digits (Cooper and Hedges, 1994:18).

b. The findings of the empirical studies have to be quantitative or quantifiable.

c. "If the full data sets for the studies of interest are available, it will generally be more appropriate and informative to analyse them directly using conventional procedures rather than meta-analyse summary statistics" (Lipsey and Wilson, 2001:2). This reanalysis of the original data is better known as *secondary* analysis, to distinguish it from the primary analysis in original research (Schwarzer, 1989:3).

d. The empirical findings must also be conceptually and statistically comparable. This means the studies must address a similar topic or set of research questions, employ comparable designs and report results in compatible (statistical) formats.[59] The 'sampling frame' should thus be narrow enough so that the included studies examine the same underlying phenomenon, but broad enough so that there is something to be gained by the synthesis that could not (easily) be obtained by looking at a single primary study.

5.2.2 Problem Formulation Stage

In harmony with the preliminary considerations, the researcher now carefully formulates the topic of interest and main questions to be answered or issues to be investigated. Ideally, the statement of the problem should give some indication of the body of literature and the category of variables – dependent as well as independent - whose relationship will be investigated. The problem formulation suggests the specific knowledge that will be gained through a meta-analysis. Common questions are of the type:

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[59] The degree of similarity that is considered a prerequisite can be highly subjective and even controversial. Some have even defended the meta-analysis of (relatively) dissimilar studies. For example, Smith and Glass (1977:753 as cited in Hunt, 1997:40) argue that "Mixing different outcomes together is defensible. First, it is clear that all outcome measures are more or less related to "well-being" and so at a general level are comparable. … [Moreover,] each primary researcher made value judgements… It is reasonable to adopt these value judgements and aggregate them …".

a. Is there evidence to support the reported existence or non-existence of a relationship?

b. What is the size and significance of this relationship (as measured by a given index)?

c. Are estimates of the relationship(s) in question identical across primary studies? If yes, what is the average estimate?

d. If no, what factors might be responsible for the differences in outcomes across studies?

The importance of this stage cannot be overemphasised, but a well formulated problem statement "will guide the selection of research studies, the coding of information from those studies, and the analysis of the resulting data" (Lipsey and Wilson, 2001:12). In fact, in order to facilitate the subsequent meta-analytical stages, the problem formulation stage might go as far as defining the precise form(s) of statistical findings – ranging from group mean differences to correlations, proportions or some other form – that would be most appropriate in providing the needed answers.

5.2.3 Data Collection Stage

The data collection exercise needs to be carefully planned and executed. Planning here involves delimiting the population of primary studies whose results are to be reviewed/synthesised, and the likely sources of the literature. Detailed criteria should be developed to help select desirable studies from the potentially large number of 'candidates'. The criteria are a sort of an 'inclusion test' which every study must pass in order to qualify for planned meta-analysis. They are usually spelt out with respect to:

a. The language(s) in which the primary reports are written.

b. Time frame. It might be the case that only studies within a specified range of years would be relevant to the particular research domain.

c. Subjects. What should be the characteristics of units in the sample that provided data for the primary studies?

d. Variables. What key (dependent and independent) variables should have been examined in the study in order for it to be included in the proposed meta-analysis? What type of 'treatment' or intervention will be considered relevant? What is the minimum statistical information that must be reported in a study?

e. Research Design. Should the primary studies be of any particular methodological quality? Is there a preference, for instance, for experimental rather than quasi-experimental or other study designs?

f. Geographical location. Is the analyst interested only in studies conducted in particular countries or regions?

g. Publication status. Does the meta-analyst only want to include published studies? Are any forms of publications considered more appropriate than others?

Armed with a clearly defined set of eligibility criteria, the actual search for the needed literature can now proceed. But "in contrast to the (relatively) well defined sampling frames available to primary researchers, literature searchers confront the fact that any single source of primary reports will lead them to only a fraction of the relevant studies, and a biased fraction at that" (Cooper and Hedges, 1994:10).
First, the searcher seeks to identify and prepare a bibliography of studies/citations that have been 'sifted' using (some of) the eligibility criteria. The meta-analyst often aims to capture as many studies as possible, and this helps protect against bias. *Footnote chasing* – the

pursuit of many writings cited by one author – is one popular mode of searching references in other (review) papers, books and topical bibliographies (Cooper and Hedges, 1994:46). This reference search method is also known as *ancestor search*, in contrast with *forward or descendant searching* which starts with one author/document and locates later articles that cite them. Consultation with colleagues and experts, manual and computer/electronic browsing of libraries, catalogues and databases are other useful ways to search for potential studies. For example, Hess and Kohler (2006, forthcoming) have recently posted some innovative guidelines on how to successfully conduct internet-based literature searches (http://www.uni-goettingen.de/de/sh/18500.html).

The second and final stage in the search process is the actual retrieval of the relevant studies. This might involve direct downloading and printing of electronic material and/or photocopying from books, journals or other document types. Once a definitive list of retrieved and relevant studies has been drawn, attention should shift to the next stage of encoding specific information from each study. The entire search exercise can be daunting and highly time consuming, especially when one aims to be comprehensive and exhaustive. Regardless of the intended thoroughness of the literature search, it is essential that a meticulous accounting system – showing whether or not a study has been identified, retrieved and other additional fields that help track progress and/or even encode some bibliographical details of each study – is created early enough.

5.2.4 Data Entry Stage

This is technically part of data collection, but it is treated here as a separate stage to underscore its importance. Here the reviewer needs to decide what bits of information to extract from each study and enter or code that information into a suitable (pre-designed) form or

questionnaire that is part of the database management system. The coding should include information sufficient to answer the questions in the problem statement, as well as some useful description of the body of knowledge being examined. The information to be extracted for each study may be grouped into a number of possible categories, including:

a. Characteristics of the study as defined by the methods used, the profile of the author(s), the type of publication and other features. A concise definition of what constitutes a study needs to be specified and applied uniformly throughout the coding process and subsequent analysis.

b. Information about the sample and the setting of the study. This may include gender of the subjects, their socio-economic or other relevant characteristics.

c. Information about the dependent variable. What it is and how it is measured or operationalised to indicate the relationship under study. This might include a direct recording of the study findings as *effect sizes* or bits of information that should be converted/transformed to enable the computation of the required *effect size*. The effect size is an index or "a statistic that encodes the critical quantitative information from each relevant study finding" (Lipsey and Wilson, 2001:3). Depending on the type of analysis to be undertaken, each effect size might require the entry of associated statistics – for example, standard error - or information to enable their calculations. General procedures for calculating some common effect sizes are discussed later in this section.

The aim of the coding or data-entry stage is to create a database for use in a descriptive analysis and/or a more in depth statistical analysis. Items that are omitted in the coding will also be omitted in the analysis, at least not without having to return to the coding stage.

5.2.5 Data Analysis and Interpretation Stage

Once the effects of the intervention have been appropriately recorded or transformed into appropriately standardised effect sizes, and their corresponding standard errors and other associated statistics computed, the reviewer might proceed with the (further) analysis in two main stages – descriptive analysis and in-depth or econometric analysis.

a. Descriptive Analysis. Here the reviewer describes the general profile of the dependent variable or effect sizes and other coded data to reveal tendencies, trends or some other interesting *character* of the meta-data. For example, graphical methods such as histograms, funnel plots or error bars can be used to visualize variability in the various data points. The data may also be described using a comprehensive listing of the individual studies or a contingency table categorising them, say by gender of the author, research design, publication type, outcome measure and so on. Summary statistics such as the (grand) mean, minimum, maximum, mode, variance and confidence intervals can also be reported as part of the descriptive analysis. In fact, a most common value of each of the moderators or coded categories can be used to display the 'typical' characteristics of the sample. "Much can be learned from a careful description of study results and characteristics in research synthesis. Indeed, it can be argued that providing a broad description and appraisal of the nature and quality of the body of research under examination is fundamental to all other analyses that the synthesist might wish to conduct" (Cooper and Hedges, 1994:117).

b. In-depth Analysis. This can include many kinds of sub-analyses ranging from measuring the relationship among (the coded) independent variables (for example, type of study, background of author, period of publication, research method, etc.), among study or outcome level effect sizes, and between the independent variables

and the dependent variable (effect size). Specific tests also need to be conducted to provide guidance on further steps in the analysis as well as the statistical context for interpreting the results of the meta-analysis. For instance the homogeneity statistic will help answer the question of whether there is a common population effect size for the observed sample of studies.

Heterogeneity or the lack of homogeneity across study effect sizes is commonplace. The reviewer would thus do well to investigate the various factors that might account for such variation beyond stochastic causes. This can be achieved through statistical models reflecting the kinds of assumptions the analyst is prepared to make and the corresponding weighting scheme applied. Procedures for computing different effect sizes and some (in-depth) analytical techniques are reviewed in the section on *main procedures*.

5.2.6 The Presentation Stage

While the adage that "the data speak for themselves" might be valid in some ways, it is often expected that the researcher (primary or reviewer) "speaks for the data" in a manner compatible with the database, consistent with its analysis, coherent in structure and comprehensible to the intended audience. While a data point can tell one, for example, "that an eight ounce [227g] glass contains four ounces of liquid, it cannot say whether that glass should be viewed as half empty or half full. Such a judgement depends on, among other things, the thirst of the observer, the amount of liquid in glasses nearby, and the nature of the liquid (say, water or bourbon)" (Cooper and Hedges, 1994:12).

The meta-analyst should therefore attach considerable importance to the final write-up/report of his/her work, as "… a reader's judgement of the quality of research depends entirely on the clarity of writing and the

thoroughness of reporting in the published research report" (Cooper and Hedges, 1994:426). The structure of the final report is relatively flexible, but it may be advisable to "… use the standard presentation format for scientific studies: Introduction, methods, results, and discussion" (ibid).

Like in the (descriptive) analysis, the use of certain tools/techniques can greatly enhance interpretation and discussion of results. Alongside narrative text, results can be presented as lists and tables ordered or sorted by one or more factors, say *magnitude* or *direction* of effect, or another informative grouping variable chosen from the coded characteristics of the primary studies and their respective contexts. Pictorial or graphical representation of the raw and/or processed data can be done in the form of funnel, forest, schematic, scatter or stem and leaf plots, line graphs, charts or some other creative "styles" available in basic or specialist software packages.

5.3 MAIN STATISTICAL PROCEDURES IN META-ANALYSIS[60]

The successful conclusion of the data collection, analysis and interpretation stages usually involves the employment of several analytical tools and procedures drawn from general statistical theory and/or specifically developed for use in quantitative review. These estimation procedures are grouped here into two categories: those particularly needed to compute, correct and/adjust the individual effect sizes, and those needed in the subsequent analysis to statistically combine and/compare them.

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[60] Most of the computational formulae discussed here are sourced from Lipsey and Wilson (2001), except where otherwise stated. Moreover, for lack of a standard notation in meta-analysis, we adopt a more descriptive notational style to (hopefully) facilitate understanding and emphasize the pre-eminence of the definitions offered.

5.3.1 For Individual Effect Sizes

Even when the outcome of interest has been clearly specified (at the problem formulation stage), it is often the case that the primary reports measure the particular outcome in a number of different ways – different (result) formats, different scales and different units. Recall that the effect size is a sample statistic that represents the magnitude (and direction) of a relationship between two variables. There are various 'metrics' in which an effect size can be written depending, for the most part, on the kind of relationship and information depicted in the (primary) research. All of these have important implications for data collection (searching and coding/entry), analysis and inference, and spell the need for adopting the applicable procedures.

One, a set of studies might report a *central tendency* or *distributional* statistic (mean, mode, median, sum, frequencies, proportion, etc.) of the values of a certain variable measured on a single sample of respondents. If all the findings refer to the same variable operationalised in the same or sufficiently similar way, and they report the same statistic, then fairly straightforward comparisons and combinations can be made using the original statistic as 'effect size'. ***Proportions*** and ***arithmetic means*** can be computed as effect sizes (together with their standard errors and inverse variance weights) using the following formulae. For proportions:

$$ES_p = p = \frac{k}{n}, \tag{5.1}$$

$$SE_p = \sqrt{\frac{p(1-p)}{n}}, \tag{5.2}$$

$$w_p = \frac{1}{SE_p^2} = \frac{n}{p(1-p)}, \tag{5.3}$$

where *ES* stands for effect size, *p* for proportion, *k* is the number of subjects in the category of interest, *n* is the total number of subjects in the sample, *SE* for standard error and *w* for (inverse variance) weight. For arithmetic means:

$$ES_m = \overline{Y} = \frac{\sum x_i}{n},$$ (5.4)

$$SE_m = \frac{SD}{\sqrt{n}},$$ (5.5)

$$w_m = \frac{1}{SE_m^2} = \frac{n}{SD^2},$$ (5.6)

where *m* stands for arithmetic mean, $\overline{Y}$ is the raw mean, x_i is an individual score for subject *i* (*i*=1,2,3,…n), *n* is the complete sample size, and *SD* is the standard deviation of *x*, and other terms as already defined. "Differently operationalised variables representing the same construct, e.g., scores on different mathematics achievement tests, could only be meta-analysed if they were standardised in some way that made their values comparable …" (Lipsey and Wilson, 2001:38).

Two, a set of studies may report results in the form of *pre-post contrasts*. Here a variable is measured at time 1 and later repeated (re-measured) at time 2 on the same subjects. The findings may be reported as direct differences between the central tendency statistics (e.g. proportions or means) for the two different times. This yields the *mean gain*, which need not be standardised if the same operationalisations of the variable were involved. This might be the case say, for a reflexive comparison of the mean incomes of microfinance clients (just) before they receive loans and their mean incomes after a year or so. The mean gain effect size will, however, need to be standardised if different operationalisations were involved.

The *unstandardised **mean gain*** effect size and its associated standard errors and weights are given by:

$$ES_{ug} = \overline{Y}_{t2} - \overline{Y}_{t1} = \overline{G}, \tag{5.7}$$

$$SE_{ug} = \sqrt{\frac{2SD_p^2(1-r)}{n}} = \sqrt{\frac{SD_g^2}{n}}, \tag{5.8}$$

$$w_{ug} = \frac{1}{SE_{ug}^2} = \frac{n}{2SD_p^2(1-r)}, \tag{5.9}$$

where the subscript *ug* stands for unstandardised mean gain, $\overline{Y}_{t2}$ is the mean at time 2, $\overline{Y}_{t1}$ is the mean at time 1, $\overline{G}$ is the mean in time 2 minus that in time 1, SD_p^2 is the pooled variance of the time 1 and time 2 values/scores (i.e. $(SD_{t1}^2 + SD_{t2}^2)/2$), SD_g^2 is the variance of the gain scores, *n* is the sample common to times 1 and 2, *r* is the correlation between the time 1 and time 2 scores, and all other terms as previously defined. If standardisation is required, then the following formulae are appropriate:

$$ES_{sg} = \frac{\overline{Y}_{t2} - \overline{Y}_{t1}}{SD_p} = \frac{\overline{G}}{SD_g / \sqrt{2(1-r)}}, \tag{5.10}$$

$$SE_{sg} = \sqrt{\frac{2(1-r)}{n} + \frac{ES_{sg}^2}{2n}}, \tag{5.11}$$

$$w_{sg} = \frac{1}{SE_{sg}^2} = \frac{2n}{4(1-r) + ES_{sg}^2}, \tag{5.12}$$

where SD_p is the pooled standard deviation of time 1 and time 2 scores (i.e. $\sqrt{(SD_{t1}^2 + SD_{t2}^2)/2}$), SD_g is the standard deviation of the gain scores, and all other terms as previously defined.

It is important to note that the estimation procedures discussed so far are those appropriate for correlated or dependent sample statistics (i.e. one-sample and repeated measures data). Deriving a satisfactory value for the correlation coefficient (*r*) between the two time periods can turn

out to be quite troublesome, especially when sufficient information is not reported in the primary studies.[61]

Three, a set of studies might report values of one or more variables measured on more than one group of subjects. The case of two groups, say one treated group and one control group, whose performances are contrasted before and/or after a certain treatment or intervention is perhaps most common in meta-analysis (Rosenthal, 1994, as cited in Lipsey and Wilson 2001:14). Group membership or any such *treatment factor'* can be viewed as a dichotomous variable since only two (discrete) values/levels are possible – treated or not treated (control). Various effect size statistics, including mean and proportion differences, ratios and correlations, can be computed from data provided on group contrasts. For the sake of brevity and simplicity, the ensuing procedures for the estimation of these effect sizes will be limited to the relatively common context of two groups measured on the same outcome, but which involves different operationlisations across studies. So only the standardised formulae will be adopted here. Also, where an adjustment or a correction for small sample bias is appropriate and available, the corrected version is presented.

When the contrast is based on the respective mean outcome per group, and that outcome is measured on a *continuous scale*, then the **standardised mean difference** (corrected for sample bias) will be an appropriate effect size, and is given by

$$ES_{sm} = \left[1 - \frac{3}{4N - 9}\right]ES_{bm},$$ (5.13)

$$SE_{sm} = \sqrt{\frac{N}{n^T n^C} + \frac{ES_{sm}^2}{2N}},$$ (5.14)

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[61] See Lipsey and Wilson (2001) for specific suggestions on how to get around or resolve some of the common challenges, including that of calculating and interpreting the necessary inferential statistics.

$$w_{sm} = \frac{1}{SE_{sm}^2} = \frac{2n^T n^C (N)}{2N^2 + n^T n^C (ES_{sm}^2)}, \tag{5.15}$$

where subscript *sm* stands for standardised mean difference, *N* is the total sample size (i.e. $n^T + n^C$), *ES$_{bm}$* is the standardised mean difference for small samples (i.e. $ES_{bm} = \frac{\overline{Y}^T - \overline{Y}^C}{SD_p}$, but which is biased when applied to large samples without the correction)[62], the superscripts *T* and *C* stand for treated group and control group respectively, all other terms as previously defined. In most meta-analytical literature, the biased (though standardised) estimator of the mean difference, *ES$_{bm}$*, is referred to as "Cohen's *g*", and the unbiased or corrected estimator, *ES$_{sm}$* as "Hedge's *d*".

"By standardising the differences between intervention and control group means on the corresponding pooled standard deviation, treatment [or programme] effects are represented in terms of standard deviation units irrespective of the nature of the original operationalization and can be meaningfully combined and compared across studies" (Lipsey and Wilson, 2001:51). The computation and/or standardisation of effect sizes using the procedures presented so far (particularly 5.13 – 5.15) require that at least certain descriptive data – means, standard deviation and sample size of one of the two groups or the total of both (or information to enable their calculation) - be reported in the original studies. This is unfortunately not always the case. While some studies might report only one or more *significance test* statistic (*t*-values, *F*-values and *df*) along with their sample sizes, others might report only the exact, or at times only the approximate,

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[62] The use of the pooled standard deviation (*SD$_p$*) as an estimate of the population standard deviation (σ, or *SD* in our notation) is usually preferred when the two groups (*T* and *C*) involve large sample sizes and the difference between their respective *SD*'s is relatively small. When, however, *SD^T* and *SD^C* differ greatly – reflecting a strong influence of the intervention on *SD^T* – it is recommended that only *SD^C* be plugged into the formula (if the relevant data exists). This is because *SD^C* is presumed to remain unaffected by the intervention. When *SD^C* is used (instead of *SD$_p$*) in the computation of *ES$_{sm}$*, then the effect size index is called "Glass' Δ" (Cooper and Hedges, 1994:232).

significance levels ($p=\alpha$, or $p</>\alpha$) for the *t*-test or one-way ANOVA (analysis of variance). Cooper and Hedges (1994), and Lipsey and Wilson (2001) contain useful procedures for calculating mean differences and other effect sizes under such circumstances.

When, on the other hand, the outcome on which the 'treatment factor' (treatment and control groups) is contrasted is measured on a dichotomous scale, the effect size can be given by the **proportion difference** or the *odds ratio*. The difference between two proportions is given by

$$ES_{pd} = p^T - p^C, \tag{5.16}$$

$$SE_{pd} = \sqrt{p(1-p)\left(\frac{1}{n^T}+\frac{1}{n^C}\right)}, \tag{5.17}$$

$$w_{pd} = \frac{1}{SE_{pd}^2} = \frac{n^T n^C}{p(1-p)(N)}, \tag{5.18}$$

where the subscript *pd* stands for proportion difference, p^T is the proportion of the treated group (with the outcome of interest), p^C is the proportion for the control group, p is the weighted mean of p^T and p^C (i.e. $(n^T p^T + n^C p^C)/N$), and other terms as already defined.

Although quite simple and intuitive, the proportion difference has some dependencies that can lead to an exaggeration of heterogeneity across studies and an underestimation of the confidence interval around the average proportion difference. The **odds ratio**, sometimes referred to as the *cross-product ratio*, is therefore preferable in such situations where the outcome of interest is dichotomous (Lipsey and Wilson, 2001:52). If the observed multinomial frequencies are as shown in Table 1, then the maximum likelihood estimator (also see Fleiss, 1994, in Cooper and Hedges (eds.) 1994:251) of the odds ratio (*or*) is given by

$$ES_{or} = \frac{ad}{bc} = \frac{p_a p_d}{p_b p_c} = \frac{p_a/p_b}{p_c/p_d} = \frac{p_a(1-p_c)}{p_c(1-p_a)}, \qquad (5.19)$$

where *a, b, c,* and *d* are the cell frequencies or counts of a 2x2 table of individual study results, and p_a, p_b, p_c, and p_d are the cell proportions for each group in each status as shown in the fourfold table (Table 1).

Table 1: Generic Cross-tabulation Terms

	Frequencies			**Proportions**	
	Status A (y=1)	*Status A'* (y=0)	*Total*	*Status A* (y=1)	*Status A'* (y=0)
Treatment (x=1)	a	b	$a+b=n^T$	$p_a=a/n^T$	$p_b=b/n^T$
Control (x=0)	c	d	$c+d=n^C$	$p_c=c/n^C$	$p_d=d/n^C$
Total			$n^T+n^C=N$		

Note: if *a, b, c,* or *d* = 0, add 0.5 to all cells.

Source: Lipsey and Wilson, 2001:53; modified.

To relate this table to our discussion on evaluating the impact of microfinance interventions (chapter 4), the 'treatment factor' can either take a value of 1 (x=1) for loan recipients or a value of 0 (x=0) for the control (those who don't receive loans). This is analogous to an explanatory variable in a regression. Similarly, the dependent or response variable *y*, say status of income, food security or wellbeing after an intervention period, can take the value 1 (*y*=1) for those who experienced the desired status (success) and the value 0 (*y*=0) for those who experienced otherwise. The treatment and control groups could then be contrasted on the basis of, say, those who experienced or reported an increase in food security (status A) versus those who did not (i.e. not status A or simply status A').

In order to facilitate the interpretation of the odds ratio (which is centred around 1) and the calculation of its associated standard error and inverse variance weight, it is often advisable to transform this effect size statistic by taking its natural logarithm. The logged odds ratio, ES_{lor} can itself be treated as an effect size or converted back to its original form, ES_{or}, by taking the antilogarithms. The relevant formulae are

$$ES_{lor} = \log_e(ES_{or}), \tag{5.20}$$

$$SE_{lor} = \sqrt{\frac{1}{a} + \frac{1}{b} + \frac{1}{c} + \frac{1}{d}}, \tag{5.21}$$

$$w_{lor} = \frac{1}{SE_{lor}^2} = \frac{abcd}{ab(n^C) + cd(n^T)}, \tag{5.22}$$

where subscript *lor* stands for logged odds ratio, e is the base of the natural logarithm (or approximately 2.71828)[63], and all other terms as previously defined. Re-conversion of ES_{lor} to ES_{or} is achieved by

$$ES_{or} = e^{ES_{lor}}, \tag{5.23}$$

where the terms are as already defined.

One final set of outcome measures, some members of which are not so common in the microfinance literature, is needed when correlations are reported or computable from the study data. The standard format in which correlations are reported is the *Pearson* **product moment correlation**, *r*, when the two variables of interest are both measured on a continuous scale. For a microfinance programme, this would mean that the 'treatment factor' *loan access* or receipt is measured, for instance, as the actual amount of loan (in monetary units) a client receives or the credit limit s/he is eligible to take.

In most cases however, the 'treatment factor' remains dichotomous, and when the response variable, say income, is measured on a

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[63] Note that log_e = ln, which is standard notation for natural logarithm.

continuous scale, then a variant of the standard correlation can be computed as the *point-biserial correlation* (r_{pb}). If the two variables are both dichotomous, then the product moment correlation is given by the *phi-coefficient*. Each of these variants require slightly different computational formulae, but in general, the (population) correlation between two continuous variables, *x* and *y* is given by

$$r = r_{xy} = \frac{\sigma_{xy}^2}{\sigma_x \sigma_y},$$ (5.24)

where σ_{xy}^2 is the covariance between *x* and *y*, and σ_x *and* σ_y are the standard deviations of *x* and *y* respectively. An alternative formula would be

$$r = r_{xy} = \frac{\sum Z_x Z_y}{N},$$ (5.25)

where Z_x and Z_y are the standardised scores of the *x* and *y* variables, and *N* the total sample. The correlation *r* can be used directly in its raw form as an effect size, regardless of whether both variables were operationlised in the same way. But to facilitate (more accurate) calculation of the standard error and other statistics, it is recommended that *r* be transformed to a *z*-score using Fisher's *r*-to-*z* transformation, as given by

$$Z_r = 0.5 \log_e \left[\frac{1+r}{1-r} \right],$$ (5.26)

where Z_r is the *z*-transformed correlation (*r*), and other terms as already defined. We can therefore compute our now familiar statistics using the following formulae:

$$ES_r = r,$$ (5.27)

$$ES_{zr} = 0.5 \log_e \left[\frac{1 + ES_r}{1 - ES_r} \right],$$ (5.28)

$$SE_{zr} = \frac{1}{\sqrt{N-3}},$$ (5.29)

$$w_{zr} = \frac{1}{SE_{zr}^2} = N - 3,$$ (5.30)

Using the correlation to measure the linear relationship between two variables becomes even more differentiated when one considers the fact that some variables are natural dichotomies (e.g. male vs. female), while others can be artificially dichotomised, that is, a naturally continuous variable is split into two categories. Another critical distinction is that correlations from a simple bivariate regression are derived differently from correlations in a multiple regression. Further details on such differentiated cases for calculating the product moment correlation are presented where they specifically apply to the studies considered in this research.

It is important to note however that several of the different forms of bivariate correlations can also be used to present findings to which the mean difference effect sizes and odds ratio (as already discussed) typically apply. Some of the other main procedures for transforming and/or combining the various types of effects sizes, common among the studies considered in this research, are discussed in the next section.

5.3.2 For Combining and Comparing Effect Sizes

It is clear by now that there are a number of possibilities/considerations involved in computing an appropriate effect size. Critical considerations include the kind of data reported in the primary studies, the number and nature of the variables involved, the depth of the intended analysis, computational ease and the requirements from statistical theory. So what should be done when primary studies report their findings in one or multiple outcomes often operationalised in several different ways or end-points?

A serious meta-analysis would at least aim and try to ensure that the final meta-data consists of k (statistically) independent studies, each of which contributes only one effect size per outcome construct whenever they are included in an overall or subgroup analysis. The presence

within some studies of more than one effect size per outcome construct complicates proper inference based on statistical techniques which normally assume non-dependencies among effect sizes. This is because the preferred unit of analysis is the study and not the (sub-sample) effect sizes.

Thus in order to obtain a single effect size per study, the meta-analyst might simply choose one of the multiple effect sizes in the study either at random or based on justifiable criteria established prior to the coding, during the coding or afterwards, and use it to represent that study effect in all the analysis. Alternatively s/he can compute a summary of the multiple effect sizes by taking an average, and then use that average as the study effect in all analysis. Better still, s/he can compute a summary of the multiple effects by creating a statistical *composite*, using either a univariate approach (assuming independence and homogeneity) or a multivariate approach, which models any within study dependencies and heterogeneity. [64]

Computational ease/convenience, statistical validity, statistical efficiency (optimal use of available statistical information), and comparability through inferential statistics are among the key considerations for selecting a method (random or criteria based choice, computation of an average, or derivation of composite) to arrive at one effect size per study. Uneven and/incomplete reporting (in primary studies) of the required information, including cases of missing observations or even missing variables, are additional problems or challenges that often confront the meta-analyst.

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[64] Obtaining a composite effect from studies with multiple treatments and/or multiple end-points can require complex modelling approaches (see for example Cooper and Hedges, 1994:352-355, and the references therein for details).

Combining individual effects sizes across studies also poses similar challenges as deriving a composite within a study. One way to do this is to aggregate only according to a broad grouping of the effect sizes – that is to aggregate by correlations (*r*-family) and by mean/proportion differences (*d*-family) - for each outcome construct. This is only a 'partial' combination of likes. A more ambitious option can be to convert all the different individual study level (or any meaningful outcome level construct) effect sizes to the same effect size index, say all to *correlations*, or all to standardised *mean differences.* Table 2 shows some of formulae that can be used to implement such conversions.

An overall or grand mean effect of all the studies (or those in a category) can then be computed. The grand mean should be calculated over the individual effect sizes that have been weighted according to their precision, not just the sample size of the primary study.[65] This is then the **combined effect** of the studies included in the analysis.

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[65] "An effect size based on a large sample contains less sampling error and, hence, is a more precise and reliable estimate than an effect size based on a small sample" (Lipsey and Wilson, 2001:106; also Cooper and Hedges, 1994:265). Weighting by precision/reliability – with more precise values contributing more to the combined value than less precise ones – can be implemented using such methods as the inverse variance method, Mantel-Haenzel method or Peto method depending on the effect size indices involved (Borenstein and Rothstein, 1999:273).

Table 2: Approximate Conversions For Some Effect Sizes

No.	From	To	Formula	Note
1.	ES_{or}	ES_{lor}	$ES_{lor} = \log_e\left[\dfrac{p^T}{1-p^T}\right] - \log_e\left[\dfrac{p^C}{1-p^C}\right]$	p^T = proportion of subjects with 'success' among the treated. p^C = proportion of subjects with 'success' among the control. This logit difference* is equivalent to (5.20).
2.	ES_{lor}	ES_{or}	$ES_{or} = e^{ES_{lor}}$	This is the same as (5.23) e = natural logarithm = 2.718
3.	ES_{lor}	ES_{sm}	$ES_{sm} = 0.551(ES_{lor})$	Only for proportion of subjects in two groups/categories. There are different formulae for *arcine* and *probit* transformations.
4.	ES_{sm}	ES_{or}	$ES_{or} = e^{\left(\frac{\pi ES_{sm}}{\sqrt{3}}\right)}$	π = 3.142
5.	ES_r	ES_{Zr}	$ES_{Zr} = 0.5\log_e\left[\dfrac{1+ES_r}{1-ES_r}\right]$	This is the same as (5.28), where the terms are as previously defined for (5.26) and (5.27).
6.	ES_{Zr}	ES_r	$ES_r = \dfrac{e^{2ES_{Zr}}-1}{e^{2ES_{Zr}}+1}$	This conversion facilitates interpretation.
7.	ES_{phr}	ES_{sm}	$ES_{sm} = \dfrac{2ES_{phr}}{\sqrt{(1-ES_{phr}^2)}}$	*phr* = phi-correlation coefficient. May also approximate from standard and point-biserial correlations.
8.	ES_{pbr}	ES_{sm}	$ES_{sm} = \dfrac{2ES_{pbr}}{\sqrt{(1-ES_{pbr}^2)(p(1-p))}}$	*pbr* = point-biserial correlation If the two groups' sample sizes are equal, then apply formula 7.
9.	ES_{sm}	ES_r	$ES_r = \dfrac{ES_{sm}}{\sqrt{(ES_{sm}^2+4)}}$	r = standard product moment correlation coefficient. May also approximate phi and point-biserial correlations.
10.	ES_{sm}	ES_{pbr}	$ES_{pbr} = \dfrac{ES_{sm}}{\sqrt{ES_{sm}^2+(1/p(1-p))}}$	If the two groups' sample sizes are equal, then apply formula 9.

* The *arcsine* and *probit* transformations are considered alternatives to the logit transformation of proportions and/or odds ratio effect sizes. Arcsine and probit methods are however known to respectively produce underestimates or exaggerated results.

Source: Adapted from Lipsey and Wilson, 2001.

Besides the combined (grand mean) effect, the meta-analyst can calculate the confidence interval, test for statistical significance, and for homogeneity between effect sizes that make up the grand mean[66]. The grand mean effect size (weighted), and its standard error are given by

$$CES = \frac{\sum (w_i ES_i)}{\sum w_i},$$ (5.31)

$$SE_{CES} = \sqrt{\frac{1}{\sum w_i}},$$ (5.32)

where *CES* is the combined effect size or weighted grand mean effect size, ES_i is the value of the single (or composite) effect size included, w_i is the inverse variance weight for ES_i, and *i* equals 1, 2, to *k* number of effect sizes included (which will correspond to the number of studies under the rule of one effect size per included study), and SE_{CES} is the standard error of the combined effect size.

The **confidence interval** around the combined effect size is based on its standard error and a critical value from the *z*-distribution corresponding to the desired confidence level (e.g. 95% or α = 1-0.95 = 0.05). It is given by

$$CES_L = CES - C_\alpha (SE_{CES}) \text{ to}$$ (5.33)

$$CES_U = CES + C_\alpha (SE_{CES}),$$ (5.34)

where subscripts *L* and *U* indicate lower and upper confidence interval limits respectively, C_α is the critical value for the *z*-distribution[67], and other terms as defined previously.

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[66] The different diagnostic tests and procedures related to combined effect size are based on the kind of assumptions made about (and/or through) the data, the underlying population relationships represented, and the intended inferences to be made. *Fixed*, *random* and *mixed* effects models are among the main approaches that can be implemented to proceed with an in-depth statistical/econometric analysis under varying assumptions and requirements. Unless otherwise stated, only the fixed effects framework techniques are presented here as an introductory basis for the subsequent (and expanded) analysis implemented in part III of this thesis.
[67] Most commonly, for α=0.01 or 0.05, the critical value, C_α =2.58 or 1.96 respectively, which are the corresponding *z*-statistics for a two-tailed test at α.

Examining its confidence interval can approximate the level of significance of the combined effect size. If the confidence interval does not include zero, then the combined effect size is statistically significant at $p \leq \alpha$. The null hypothesis that the population effect size (say θ) is zero is thus rejected. Equivalently, this null hypothesis may be tested (for significance difference) by the z-test, such that

$$z = \frac{|CES|}{SE_{CES}},$$ (5.35)

where $|CES|$ is the absolute value of the combined effect size (as in equation (5.31)). If z exceeds 2.58 (see footnote [67]), then the combined effect is different from zero, with a two-tailed $p \leq 0.01$, and if it exceeds 1.96, then the combined effect is statistically significant at $p \leq 0.05$, two tailed.

The homogeneity test yields a statistic that indicates whether the assumptions of the *fixed effects* model – that all studies (effects) come from a common population, so that any variation between the individual effect sizes/studies is as a result of sampling error only – are correct or justified. It is given by

$$Q = \sum w_i (ES_i - CES)^2,$$ (5.36)

where Q is the homogeneity test statistic, which is distributed as a chi-square with k-1 degrees of freedom, k being the number of effect sizes or studies. In general, if Q exceeds the critical value for a chi-square value with k-1 degrees of freedom, then the observed variance is significantly greater than that assumed by a fixed effects model. Therefore the null hypothesis of homogeneity can be rejected.

When homogeneity is rejected by the test (or not believed in the first place even without the test), then it is useful to proceed with variance or heterogeneity analysis. One relatively simple way to do this is to re-aggregate the non-homogenous effect sizes/studies by grouping them

into appropriate categories (from the coded study characteristics or potential *moderators*) and repeat the homogeneity test until it is not rejected within those categories. This can be called the ANOVA analogue method or model, which assumes that heterogeneity can be explained as a function of known study-level covariates (e.g. treatment type, client profile, etc.). The ANOVA analogue method effectively partitions the excess variability into a portion explained by the grouping/categorical variable and a residual portion that is (still) present within the groups. If the independent variable is non-categorical and continuous, then weighted least squares regression techniques should be used (Lipsey and Wislon 2001:134; Hedges, 1994, in Cooper and Hedges (eds.), 1994:286). Alternatively, the heterogeneity can be incorporated using random effects (when excess variability between studies are assumed to be 'unmodellable'), or mixed effects (which assumes that the excess variability has a systematic and 'modellable' portion, as well as a random and 'unmodellable' part.[68]

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[68] Cooper and Hedges (1994:part VI) present illustrated accounts of these alternative approaches and other modelling techniques. Details of specific procedures, along with other statistical issues such as sensitivity analysis, publication bias and other artefacts, are presented as applicable in later sections of the thesis. It is important to note that even where it has not been possible (desirable) to create a set of independent effect sizes – whether for all the studies or for a sub-category of them – meta-analysis can still be carried out using statistical methods capable of modelling the different dependencies.

5.4 STRENGTHS AND WEAKNESSES OF META-ANALYSIS

Now that some concepts and issues related to the processes and statistical procedures in meta-analysis have been discussed, we would like to conclude this general section with a summary of its known strengths and weaknesses. Of course, meta-analysis is just one way to synthesize research, and it is obviously not a panacea for research and policy inadequacies.

5.4.1 Strengths of Meta-analysis

One, the introduction or application of meta-analytical steps and procedures (as already discussed in the previous section) imposes a useful discipline in the entire review process. Thorough documentation of the search strategies, specification of eligibility criteria, the pains-taking coding of relevant (and other seemingly irrelevant) study characteristics and results, and the elaborate data analysis based on statistical theory help to make the review process explicit and systematic, thus enabling others "assess the author's assumptions, procedures, evidence, and conclusions rather than take on faith that the conclusions are valid" (Lipsey and Wilson, 2001:6)

Two, meta-analysis allows for the representation of the evidence regarding a domain of knowledge in a more differentiated and sophisticated manner than traditional conventional reviews. It is able to incorporate other important information - the magnitude and direction of an effect, the context under which the original research was undertaken, etc. – beyond the usual 'judgement' passed on studies based solely on the merit of their statistical significance. This, in a way, also protects against over-interpreting differences across studies.

Three, because of its ability to incorporate, scrutinize and account for differentiated information from the original studies, meta-analysis is

capable of 'discovering' new findings or relationships which would otherwise remain obscure in other approaches. This is besides its ability to estimate a pooled or overall effect with greater statistical power than individual primary studies. In this way, meta-analysis is able to facilitate generalisation and provide a foundation for future research on the same or similar topic

Four, although meta-analysis can be implemented with as little as two studies, it provides a structured and more comprehensive framework for reviewing a large number of studies without necessarily being overwhelmed.

5.4.2 Weaknesses of Meta-analysis

Meta-analysis is not without its own disadvantages and criticisms. First, undertaking a credible meta-analysis usually requires a considerable amount of *time and expertise*, especially when a relatively large number of studies is involved (Lipsey and Wilson, 2001:7). The underlying statistical theory and techniques may not necessarily be a comfortable knowledge domain of the reviewer, who may already be an expert in the topic of research. In some cases, even the standard statistical techniques employed in primary research may require modification in meta-analysis.

Second is its inflexible or *limited applicability*. Meta-analysis is by definition only applicable to quantitative research literature, and needless to say that 'numbers' are not the only acceptable means to describe and understand our world of (scientific) reality. "It may well be that some research issues also require a more qualitative assessment and summary than meta-analysis can provide" (Lipsey and Wilson, 2001:7).[69]

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[69] It may be possible to combine meta-analytic and qualitative approaches to review the same set of studies. This kind of integrated or mixed-methods approach in 'meta-

Third, is what is referred to as the *apples-and-oranges problem*. This is perhaps the most often repeated criticism of meta-analysis, and argues that meta-analysis is meaningless because it "mixes apples and oranges." That is, meta-analysis often combines studies that are dissimilar in significant ways, such as sample frame, outcome construct and context. In defence, Glass says: "Of course it mixes apples and oranges; in the study of fruit nothing else is sensible; comparing apples and oranges is the only endeavour worthy of true scientists; comparing apples to apples is trivial." (Glass, 2000).

The key issue is how to deal with scope if the research question appears to be too broad for meaningful conclusions. One solution to this issue lies in establishing a hierarchy of constructs differing in scope. As Hedges (1986:359 as cited in Schwarzer, 1989) suggests, the meta-analyst may start out with a more general research question using broad constructs but then should turn to subordinate constructs which are more narrow in scope in order to avoid premature or over generalized conclusions. Awareness of the apples-and-oranges problem may help to identify a pattern of appropriate constructs. One set of studies would be nested under one specific category, while another set would be nested under another category. Otherwise any combined effect size or grand mean from a combination of studies that are 'unacceptably' dissimilar will make little sense (Greenberg et al., 2005:360).

Fourth, and closely related to a broad definition of the outcome or treatment effect of interest, is the mixing of studies with *different methodological quality* in the same analysis. Some meta-analysts have heeded the call (from critics) that only studies of high(est) methodological quality should be included in a research synthesis. The

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analysis' has been referred to as *best evidence synthesis* (Slavin, 1985, 1995 as cited in Lipsey and Wilson, 2001:7).

equivocality of such calls, and indeed the lack of agreement on what constitutes methodological quality, makes this criticism highly controversial. Perhaps to avoid the "garbage in garbage out" reproach, some meta-analyses have concentrated only on published studies – publication in refereed journals or other platforms – being a proxy for methodological quality. A promising approach might be to "treat methodological variation among studies as an empirical matter to be investigated as part of the meta-analysis" (Lipsey and Wilson, 2001:9). Stanley (2001:135), argues that methodological and other differences may, in fact, provide the rationale for undertaking meta-analysis in the first place. In any case, it will be important to recognise the (potential) trade offs and accept the resulting consequences on the research.

Fifth is the *file drawer problem*. The publishing processes (at least peer review) are known to be highly selective and, therefore, may not represent the "state of the art" accurately. "Since De Long and Lang (1992), publication bias has been generally recognised as yet another threat to empirical economics" (Stanley, 2005). Researchers are inclined to report findings that are statistically significant and to neglect those that are not. In addition to this reporting bias, journal editors tend to reject submitted manuscripts, which do not include statistically significant findings, due to the high competition for journal space. This implies a publication bias. Manuscripts which were either rejected or not submitted in the first place may remain or even disappear in the "file drawers" or may be distributed as conference papers or "grey report literature" only. This file drawer problem often leads to an overestimation of population effect sizes.

It is not proven, however, in how far this inference is valid. If, for example, an outcome statistic fails to become significant, this might be due to small sample size but the corresponding effect size may be large. If, on the other hand, statistics become significant, this might be

attributed mainly to large sample size, and the corresponding effect size may be negligible. It is possible, therefore, that some findings in the "file drawers" include higher effect sizes than those in published studies.

That said, the file drawer problem should not be understood as a criticism pertinent to meta-analysis only. Instead, it is a more general issue that applies to all kinds of literature reviews, qualitative as well as quantitative ones. Only those data that are available can be integrated. The meta-analyst might therefore be well advised to also pursue the 'grey' literature by adopting and implementing a fairly exhaustive search strategy.

Sixth is the *lumping problem*. Meta-analysis has been criticized for lumping together non-independent results. When multiple outcomes are derived from the same studies, those studies are given more weight than others, and sample size would increase artificially. Multiple end-points would mean that the number of effect sizes is much higher than the number of studies because authors report more than one summary statistic in their articles. Several indicators, each of which produces one effect size, may operationalize the construct under investigation, or it may be that a variable is measured at more than one point in time, or the author has conducted more than one experiment with the same subjects.

This issue underscores the importance of a clear and consistent definition of the unit of analysis. Should one treat a single study or a single effect size as the unit of analysis? When faced with this problem in a specific situation, the meta-analyst has to make a good judgment about the expected amount of bias which would affect the data, and then decide how to proceed. Most meta-analysts today do not agree with the position of Glass who liberally relied on the effect size as the unit of analysis, no matter how many studies they were derived from.

Instead, it is suggested to use either the study or the sample within a study as the unit of analysis.

These and perhaps other disadvantages and criticisms of meta-analysis have stimulated a great deal of creative thinking as well as the invention of novel strategies to cope with them. Any statistical procedure can be misused, and meta-analysis is no exception. Today there is no longer a serious criticism that rejects meta-analysis methodology per se, but there are warnings not to misuse the quantitative approaches to research synthesis.

PART III

META-ANALYSIS APPLIED TO MICROFINANCE

6 DATA COLLECTION AND PROCESSING

6.1 BACKGROUND CONTEXT

Having discussed some of the main meta-analytical approaches and tools, we now show how these techniques were specifically adapted/employed in this research. Chapter one includes a formulation of the research problem and purpose, which spells out the research questions that the meta-analysis seeks to answer. The main meta-analysis seeks to establish whether there is a relationship between microfinance and poverty as widely reported, to estimate the magnitude and direction of such a relationship, to assess the plausible factors that influence the observed links or associations, and by so doing, summarize the body of literature on the impact of microfinance in a way that will aid policy and future research in the field.

In theory, microfinance influences the welfare of the poor via a number of pathways. Income earnings and food consumption are two aspects of (proxies for) human welfare or poverty that probably have the longest history of being associated with access to credit, and indeed other small-scale financial services. Access to credit (microfinance) is believed to reduce poverty not only because it represents an increase in income, but more importantly because it enables the poor undertake income generating activities which would otherwise be impossible, given their already low and unstable incomes (Zeller et al. 1997:25-27). Access to credit is also believed to reduce food insecurity by boosting food production (and consumption) at the small farm level. Under favourable conditions, the surplus of crop and livestock products can provide an additional source of income to help defray other welfare-enhancing expenses.

A number of narrative reviews of the impact of microfinance (four of which we already commented upon in chapters 1 and 4) on poverty

have paid great attention to aspects of income security, food security and the general welfare of the poor. So we considered it justifiable to focus our meta-analysis on investigating these traditional links between access to credit and poverty. We held the grounded belief that it should be possible to find suitable and sufficient numbers of studies that have reported *impact-type* information on at least one of these traditional welfare outcomes – income security, food security or general wellbeing. This was the basis for launching the hunt for microfinance impact studies/reports.

6.2 SEARCH STRATEGY AND DATA CODING

A large part of the search was conducted through electronic means. Our starting point was the web-based documents of AIMS (Assessing the Impact of Microenterprises) website. The author initially just glanced through several pages of such documents and those that were available on the CGAP website to get a sense of what might be 'out there'. No specific records of this initial *sensing* phase in the search were kept, but ad hoc entries of a number of such documents and those gathered from the local university libraries and other sources were made into *EndNote* – a software package for maintaining bibliographies. The decision on which documents made it to EndNote was largely based on the author's informed/subjective opinion of their potential usefulness.

This was too haphazard for a reasonable meta-analysis. But based on the readings of the initial array of documents and the entries in some databases, a set of keywords was developed. These keywords reflected important elements of the research topic and were expected to be able to capture a sufficiently large number of microfinance impact studies. The first set of terms related to *impact* – "the role of", "the effect of" and the "impact of". Each of these was combined with each of nine terms in the second set related to *microfinance* – "microfinance",

"microcredit", "agricultural finance", "rural credit", "rural finance", "farm credit", "credit", "small loans" and "financial services".

The results of our search using these sets of keywords or search terms in various databases are summarised in Figure 1. Chart (a) in the figure shows the sum of the number of hits (y-axis) for each of the three 'impact' terms when combined with any of terms 1-9 (see notes to the graph). There we see that *Google* database produced the highest number of hits – nearly 80,000 *pdf* documents, which is the sum of the hits for each of the three 'impact' terms in combination with "credit" (column 7). This obviously included many overlaps, and any attempts to examine each of those documents would have been overwhelming and clearly inefficient. Actually, such combinations with "credit" consistently yielded the highest number of hits in all sources except in the *Microfinance Gateway*.

Chart (b) of Figure 1, shows the relative contribution of each of the impact search terms to the absolute hits shown in Chart (a). Of the seven different sources, only the *Microfinance Gateway (MG)*, *Economic Papers* and *Agricultural Economics Search* indicate a fairly 'insensitive' or balanced distribution across the 27 (3x9) term combinations. The MG is, by design, the most specialised of the data sources for our topic, and it is thus not surprising that it indicates the best relative balance across combinations.

Figure 1: Summary of Electronic Searches

(a)

(b)

The Microfinance Gateway · Google · Economic Literature · Economic Papers · Agricultural Economics Search · Online Contents · Scirus

Legend: Role, Effect, Impact
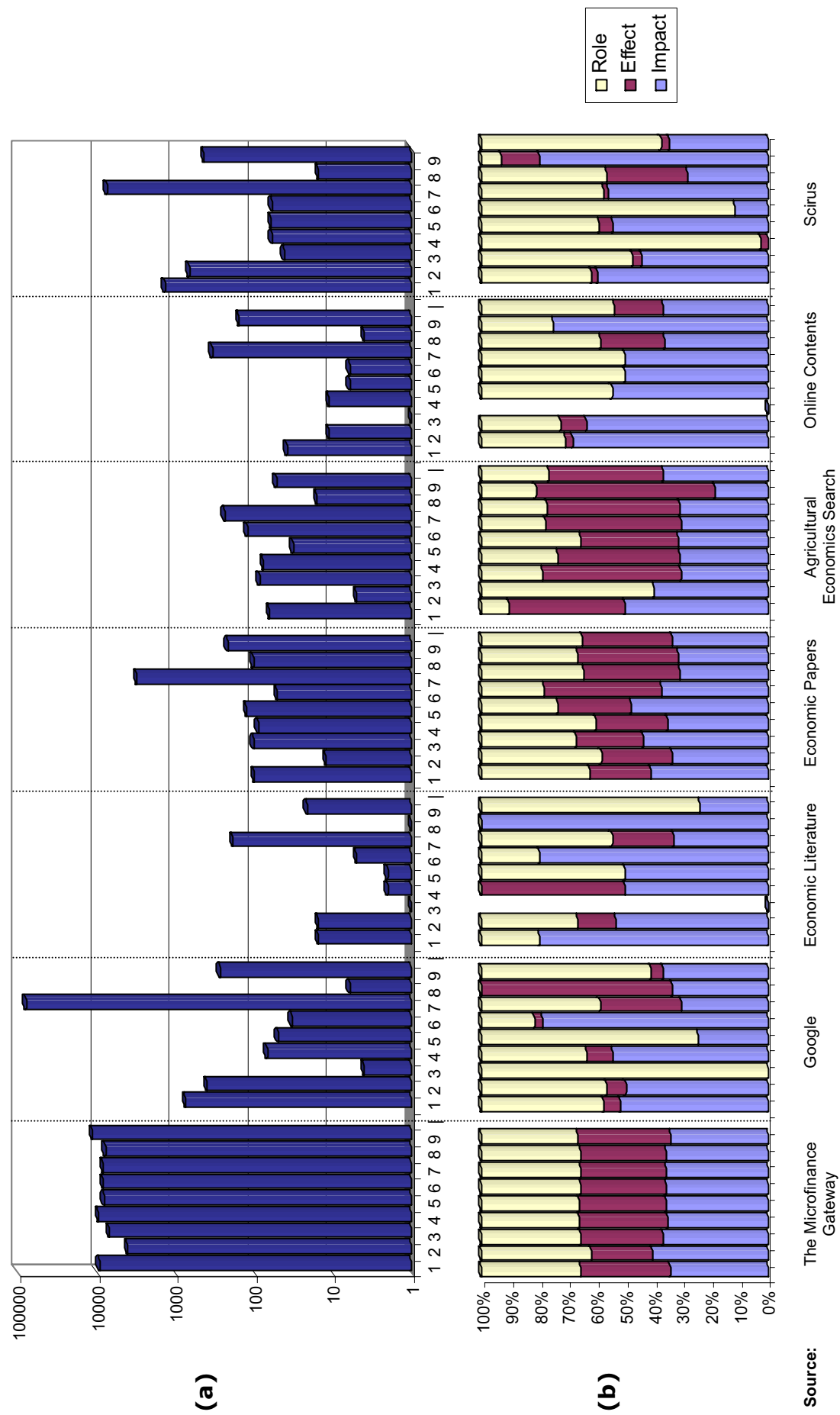
Source:

Notes: 1 = Microfinance (MF); 2 = Microcredit (MC); 3 = Agricultural finance (AF); 4 = Rural credit (RC); 5 = Rural finance (RF); 6 = Farm credit (FC) 7 = Credit (c); 8 = Small loans (SL); 9 = Financial Services (FS)

Not only are the nine absolute sums almost equal (see Chart (a)) in the MG, its results are far less sensitive to which of the *impact synonyms* entered the search. By examining the titles, we discovered an average overlap of over 85% among impact synonyms with microfinance within the MG documents/hits. None of the other sources came near that.

Based on this assessment of the key databases, we refocused our search for documents on the Microfinance Gateway, and later complemented our bibliography through *ancesto*r and *descendant* searches. A number of criteria ('gates') were then established against which documents were selected:

1. The study should be written in English, based on the assumption that it is the language for most documents or publications.

2. The topic or the abstract had to contain at least some of the key words in our list. Each document's topic must state or imply that the report contained an assessment of the *impact* of a *microfinance* (related) activity or programme. Studies that could not be clearly rejected on this basis were included in the group for further screening. Initial 'wild' searches produced over 700 citations, but a topical search of the *Microfinance Gateway* yielded over 250 impact citations/documents. Sections of the main body of the report then had to be read until the study could be rejected or selected. This was the first round of selection.

3. Each document in the pool was further examined to ensure its assessment of credit took place in a *developing country*. Studies that assessed credit in a non-developing country were excluded from the core group.

4. Is the developing country covered in the report located in *our* regions of interest? The decision was taken to focus on three regions – Africa, Asia and Latin America. These not only corresponded to the geographical classifications used by many international agencies, but also to broad *centres* of poverty and, hence, microfinance institutions and their activities.

5. Each assessment study also had to contain findings on the impact of microfinance on at least one of three welfare/poverty outcomes – income, food and general wellbeing.

6. Studies that made it to this point, *gate 6*, were examined to make sure the design of the assessment included a *control* or *comparison group*. Only these studies were then tagged for inclusion in the final sample meta-analysed in this thesis. The findings reported in each of the final set of studies were grouped into four types – means, proportions, correlations and test statistics – in conformity with the types of procedures for the statistical analysis of study effects.

In Figure 2, we present an inverted tree that was used to classify the potentially relevant documents or citations according to the selection/inclusion criteria just enumerated. The (inverted) tree is an adaptation of a non-parametric technique contained in CART (Classification And Regression Trees) software as presented in Yohannes and Webb (1999).

Figure 2:Document Selection and Classification Tree

Potentially
Relevant
Citations
N=

1. Is the document written/obtainable in English?

Yes
n=

No
n=

D_1

2. Does title/abstract indicate impact of microfinance was assessed?

Yes*
n=

No
n=

D_2

3. Is the assessed microfinance programme located in a developing country?

Yes
n=

No
n=

4. Is the developing country located in a relevant region?

5.Relevant poverty outcome reported?

Yes
n=

No
n=

Yes
n=

No
n=

5. Relevant poverty outcome reported?

6. Design with control/comparison group?

Yes
n=

No
n=

Yes
n=

No
n=

Yes
n=

No
n=

Yes
n=

No
n=

M_5

Q_5

M_6

Q_6

6. Did assessment utilize a control/comparison group?

M_1

Yes
n=

No
n=

Q_1

Yes
n=

M_3

No
n=

Q_3

Yes
n=

M_2

No
n=

Q_2

Yes
n=

M_4

No
n=

Q_4

7. Are results reported in means (compatible) format?

Yes
n=

No
n=

8. Results reported in proportions (compatible) format?

Yes
n=

No
n=

9. Results as correlations (compatible) format?

Yes
n=

No
n=

10. Results as test statistics?

Yes
n=

No
n=

Notes:
N or n = Total or sub-sample size

*All documents retrieved and in hard copy

D_1 & D_2 = Citations discarded
M_1 - M_6 = Documents for Meta-analysis
Q_1 - Q_6 = Documents for a qualitative
             review

Source: Authors' presentation.

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It (the tree) was 'grown' by applying a predefined splitting rule/criterion at every step in the node splitting. By answering the simple yes/no questions each set of documents was separated into left and right binary subsets. When a split occurred, the (sub) sets or nodes, ended up in either terminal nodes (rectangular box) or in non-terminal nodes (circles). Only the non-terminal nodes required further splitting by applying the next splitting criterion/rule/question.

The classification process is also summarised in Table 1, where the binary options 1 = yes and 0 = no. Again, documents in set M_1 are all those that passed all six gates/criteria, and included in our meta-analysis. It is also clear from the table that up to eleven different sets of documents were excluded from the analysis. Documents in sets M_2 to M_6 were deemed meta-analysable, but did not completely satisfy the criteria to be included in M_1. Those in sets Q_1 to Q_6 were deemed unsuitable for any 'neat' meta-analysis, but may be reviewed using qualitative methods.

Table 1: Document Classification

Impact Reported?	Developing Country?	Relevant Region?	Relevant Outcome?	Control Group?	Selected For	Tree Code
1	1	1	1	1	*Meta-analysis 1*	M_1
1	1	0	1	1	Meta-analysis 2	M_2
1	1	1	0	1	Meta-analysis 3	M_3
1	1	0	0	1	Meta-analysis 4	M_4
1	0	0	1	1	Meta-analysis 5	M_5
1	0	0	0	1	Meta-analysis 6	M_6
1	1	1	1	0	Qualitative Analysis 1	Q_1
1	1	0	1	0	Qualitative Analysis 2	Q_2
1	1	1	0	0	Qualitative Analysis 3	Q_3
1	1	0	0	0	Qualitative Analysis 4	Q_4
1	0	0	1	0	Qualitative Analysis 5	Q_5
1	0	0	0	0	Qualitative Analysis 6	Q_6

Source: Author

Alongside the tedious search for documents on the impact of microfinance on poverty, a codebook was developed, tested and finalised before actual data entry started. The original codebook consisted of 24 pages filled with roughly 170 items, some of which required the coder to choose from five or more options. The various data items were grouped under three main categories of variables – study descriptors, programme characteristics and effect size data. We describe these here briefly and append an abridged version of the code book:

A) **Study Descriptors:** The study descriptors were further split into document, study, and method descriptors. The document items were mostly bibliographical information, but also included information that kept track of the search and retrieval process. Information about the (first) author's gender, institutional affiliation, the methodological approach, and a study quality score were entered as study descriptors as well.

Throughout the research, a study is defined as a set of data collected under a single research plan from a specified sample of respondents/subjects from a named microfinance institution or programme in one country. This implies that one written report/document might present the results from one or several studies. Similarly one study might report results on multiple outcomes or impact domains. Even further, the data for one outcome may be in multiple formats from which one or more effect sizes can be readily computed. On the other hand, the results of one study may be described in multiple reports. In the latter case, the coder was required to select the most recent and/or most comprehensive of the reports. No further distinction was made between country programmes or institutions with one project and those with multiple projects (sites).

B) **Programme Characteristics:** This category included information about the microfinance project, programme or organisation, and information on the relevant outcomes. Detailed information about what constituted a *treatment* in the particular case or context was extracted here. It was important to know which loan type(s) and technology were used (see chapter 3); the *breadth* and *depth* of outreach; interest and repayment rates; and some socio-economic characteristics of the clients.

C) **Effect Size Data:** The information on poverty outcomes included a description of how impact on each of them was measured and in which format. At this level, all the data that would be needed to calculate a single effect size per study outcome was entered, including information to enable possible conversion to other appropriate effect indices.

The coding of each document was done manually on hard copies of the codebook and later transferred into Excel spreadsheets, using an Excel programme that was specifically written to enable transfer/entry of the coding protocol into a computer. The excel programme was written in Microsoft VBA (visual basic for applications), and performed automatic entry of data that needed to be repeated or computed from other values. This included the calculation of the standardised mean difference, odds ratio and correlation effect sizes whenever the required information was inputted. The section of the database that calculated the effect sizes was developed with the help of the Effect Size Calculator, an Excel-based programme written by Wilson (1999).

A composite sheet in the database (in Excel) contained the final (meta-analysable) set of 136 outcome effects from 94 studies and 56 documents, with data entered on over 50 fields or variables required to

conduct a full-blown meta-analysis, including study and outcome identification numbers, the calculated study-outcome level effect sizes and the potential moderators selected from the coded categories. The composite/consolidated sheet was then exported to SPSS for the required statistical analysis – descriptive and in-depth/econometric. We present and discuss the results in chapter 7.

6.3 SCOPE AND LIMITATIONS OF THE APPLIED FRAMEWORK

The research sets out to establish the impact of microfinance on poverty based on the findings reported in impact assessments or evaluations of microfinance programmes implemented in developing countries. This broad scope was delimited in three main ways – by specifying what constituted a treatment or intervention, the policy relevant outcomes related to such a treatment, and the key regions considered representative of the developing world, at least with respect to microfinance. Although these three delimiting aspects of the research – treatment, outcome and geo-economic context – have already been discussed in the preceding sections, they are recapitulated here in order to re-establish their centrality to the subsequent empirical analysis.

In our research framework, only the provision of microcredit is considered as the basic treatment or intervention. Those microcredit programmes that provide other financial and/or non-financial services represent a version of the treatment/intervention which can lead to substantive differences in the measured treatment effects or impacts. This potential source of variation was recognised *a priori* and captured in the coding protocol. However, all programmes that do not provide loans/microcredit were deemed to constitute a fundamentally different treatment, and are therefore considered to be outside the scope of this research.

Furthermore, the treatment was narrowed down to an individual or household's participation in a microcredit programme. Only those who actually borrow from a given source constituted the treated group. This is in line with common practice in microfinance evaluations.[70] On the other hand, the comparison or control group comprised non-borrowers (including those who were eligible but chose not to borrow), or new clients or 'pipeline' clients. But since a substantial variation in the definition/source of control groups was neither expected nor observed among the selected studies, no specific coding was applied to further differentiate the control or non-treatment groups[71].

With respect to impact domains/outcomes, we note that there are potentially countless outcomes that may be related, at least theoretically, to the provision of microfinance. The studies included in this meta-analysis have attempted to assess the impact of microfinance on one or more of such outcomes ranging from the quantity and quality of food intake, business size and income, farm productivity, level and mix of assets, maternal and child health, women's fertility levels and empowerment, environmental awareness, to overall well-being and happiness. The particular outcome or set of outcomes investigated in an impact study generally depend on the objectives of the particular programme and other factors, including the funding partners and what might be considered a 'hot' topic among policy makers and development practitioners. From the onset, this research chose to focus on the most 'traditional' proxies of poverty or human welfare – food

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[70] A few recent studies have shown that a more accurate way of assessing credit impact is to include eligible non-borrowers in the treated group. Where credit access (treatment) is measured on a continuous scale, then the amount of credit that a household or individual may be allowed to borrow (credit limit) has been shown to be more accurate than simply taking only the actual amounts borrowed (see for example, Pitt and Khandker 1998; Morduch, 1998; Diagne and Zeller, 2001).
[71] In some studies, however, the pre-treatment outcome data – collected either through a baseline survey or by recall methods during a post-treatment survey – are recorded for the control group. Such cases are identifiable through their *design* and *data type* codings – that is, as 'reflexive' and 'single panel' respectively.

security, income and general wellbeing - which were more likely to be reported by any microfinance impact study.

Only assessments/evaluations that reported the impacts on at least one of these outcomes were included in the final meta-analysis. Among the reports/studies meta-analysed, the impacts of microfinance on each of the three relevant outcomes were measured in a number of ways. Food security, for instance, was measured as the quantity of food intake (number of calories or number of meals), or amount of money spent on food or the opinion of the respondents on their level of food sufficiency over a given period. The quality or nutritional dimension of food security, which is equally important, was not reported by most (pilot) studies and was therefore left out from the coding process.

Similarly, the impact of microfinance on income was measured variously including, the mean total income/expenditure (farm and non-farm) per unit, or mean business profit, or the respondent's opinion on the net change in income over a given period. General welfare/wellbeing was measured in most studies as the opinion of the respondents regarding overall net change in their livelihood situation or status over a given period. Only in a few cases is the respondents' general welfare measured in terms of the number or proportion who cross a particular threshold equivalent to an established poverty line.

These and similar differences in the detailed measures and/or their operationalisation to capture the effects of microfinance on poverty outcomes obviously pose analytical challenges, which might have implications for the level of inference that is warranted from this research. To facilitate proper comparison and synthesis across studies, the results of each study were transformed to a *scale-free* unit called *effect size*, as already elaborated in chapter 5. But even after standardising the various study findings - by computing (logged) odds

ratios for dichotomous variables, and standardised mean differences for continuous variables - to make them 'meta-analysable', we considered it theoretically appropriate to conduct a separate analysis for each relevant poverty outcome. While this has the disadvantage of reducing the number of observations per (sub) analysis, it helps fulfil the requirement that a study contributes only one 'effect' per each meta-analysis, thus rendering the computed effect sizes statistically independent from each other.

For each outcome analysis, the effect size is the dependent variable, which may or may not be a true estimate of the population parameter. The assumptions made about the 'trueness' of estimated outcome effects provide a basis for the choice of a modelling approach to any variability between studies. In each case we first adopt assumptions consistent with a *fixed effects* model (FEM), as is common in many meta-analysis. In a FEM, each outcome effect is believed to be a true estimate of a single common effect in the population of microfinance evaluations. Therefore the weighted study effects should theoretically be identical or homogenous across studies; any variation between study effects is deemed to arise from (within-study) sampling error *only*. This is why the weighting scheme in FEM is implemented using a term that only represents subject-level sampling error, which should then sufficiently account for the variability in the observed statistical estimates of the population values.

Whenever the null hypothesis of homogeneity was rejected through the appropriate test, further analyses were implemented under the *new* assumption that the *excess* variability (beyond that attributable to within-study sampling error) is systematic/non-random and identifiable. Thus the additional analysis *partitions* the effect size variance in such a way that it can be explained by factors at the primary study level, including for example, differences in treatments/interventions, research

design, and study quality. These and other (potential) explanatory/independent variables, also referred to as moderators, were included in the coding protocol of each study. The specified FEM is thus expected to be able to sufficiently explain or account for any such between-study variability. The partitioning of the between-study effect size variance under FEM is achieved through a *modified weighted multiple regression* as presented in the next chapter.

Besides FEM, we adopt a *random effects* modelling (REM) approach which is often seen as a more realistic alternative to fitting data with an obviously heterogeneous distribution. The REM postulates that heterogeneity/variability beyond subject-level sampling error is stochastic and its sources cannot be identified. It is assumed that the sampling error is not only due to the fact that subjects/respondents within each study are only (different) samples from a population of potential subjects, but also because the set of studies is sampled from a population of potential studies. Since it incorporates both the subject-level and study-level sampling errors, the REM requires a different weighting scheme to compute the *combined mean effect* and its associated statistics. The sum of these two variance components gives the total variance associated with the (heterogeneous) distribution of the observed effect sizes. In the next chapter, further details are specified on how the unobserved random variance component is estimated via the *method of moments* and *maximum likelihood* approaches.

Apart from the two extremes – one being the FEM where any variability can (or should be) 'fully' accounted for by the moderators, and the other being the REM where the variability is assumed to be random and due to unknown sources – we also implement a *mixed effects* model (MEM). Here the key assumption is that the *excess* variance is partly due to identified systematic factors (moderators in the model) and

partly due to unknown/random sources. The remaining/unobserved (and possibly immeasurable) random variance component of the variability beyond subject-level sampling error thus reflects a statistical uncertainty that is incorporated into an appropriate weighting scheme.

The adoption of the said alternative analytical models is justifiable not only for statistical exploration under varying assumptions, but also for the additional analytical insights that might otherwise be lost or unachievable under a single model. This also serves as a sensitivity analysis, and any comparisons are not intended to suggest superiority of one approach over the other. In fact, FEM for instance, is statistically a special case of REM, in which the random variance component is assumed to be zero (see for example Choi et al., 2003:i85).

Finally, we recognise that we may have achieved our aim of an exhaustive search of the microfinance impact literature only to a certain degree, given our inclusion criteria and resource constraints. The final set of studies included in the meta-analysis may not be entirely free from an artefactual character in a number of ways[72], which might have either a systematic or an unsystematic influence on the estimated effect sizes. The coded moderators also included a number of potential artefacts, such as methodological approaches.

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[72] In fact, according to Cooper and Hedges (1994:324), every study has imperfections. Assessing the artefactual character of studies can itself be a separate research in its own right. Meyer and von Cramon-Taubadel (2004), for example, demonstrate that an extensive literature on asymmetric price transmission is laden with methodological artefacts.

In spite of these and possibly other study imperfections, we hope, however, that the empirical analyses provide a sufficient basis for policy makers, researchers and practitioners to form an objective opinion about the cumulative evidence of the impact of microfinance for the specific cases, and possibly for similar contexts across the developing world.

7 EMPIRICAL ANALYSIS AND RESULTS

The meta-analytical framework applied in this research has been described in chapters 5 and 6. Here we present the specific procedures applied to the overall poverty impact analysis and sub-analysis of the relevant poverty outcomes – food security, income and general welfare. We begin with a descriptive analysis of the overall distribution of effect sizes and their association with other variables. This not only offers a first dip into the data, but also highlights likely general trends and/features of the broader literature on microfinance impacts.

7.1 DESCRIPTIVE ANALYSIS OF MICROFINANCE IMPACT STUDIES

Appendix B lists the primary studies/outcomes included in the meta-analysis in descending order of their effect magnitude. A total of 136 study-level outcomes were coded from 94 studies contained in 56 different documents. These 94 studies or assessments represent a total sample size of over 54,000 subjects (individuals or households), over 33,000 of whom received small loans for one or several years. The list of outcome level effects already goes beyond a mere 'vote counting', which normally compares the number of (significant) positives versus negatives; but we note however that 77% (105) of the outcome effects are positive as compared with 22% (30) negative and 0,7 % (1) showing no difference.

Figure 1 shows the thirty countries covered by the various microfinance impact assessments in our database. The countries are ordered according to the number of studies they contributed. Not surprisingly, Bangladesh programmes were the most assessed of all, followed by India; and both countries are in Asia. The third and fourth largest study contributors are Malawi in Africa and Bolivia in Latin America. These are all countries with a long history of microfinance activity, and therefore

seem to be in the list of most 'favoured' areas by donors and researchers alike.

Figure 1: Microfinance Impact Studies in Various Countries
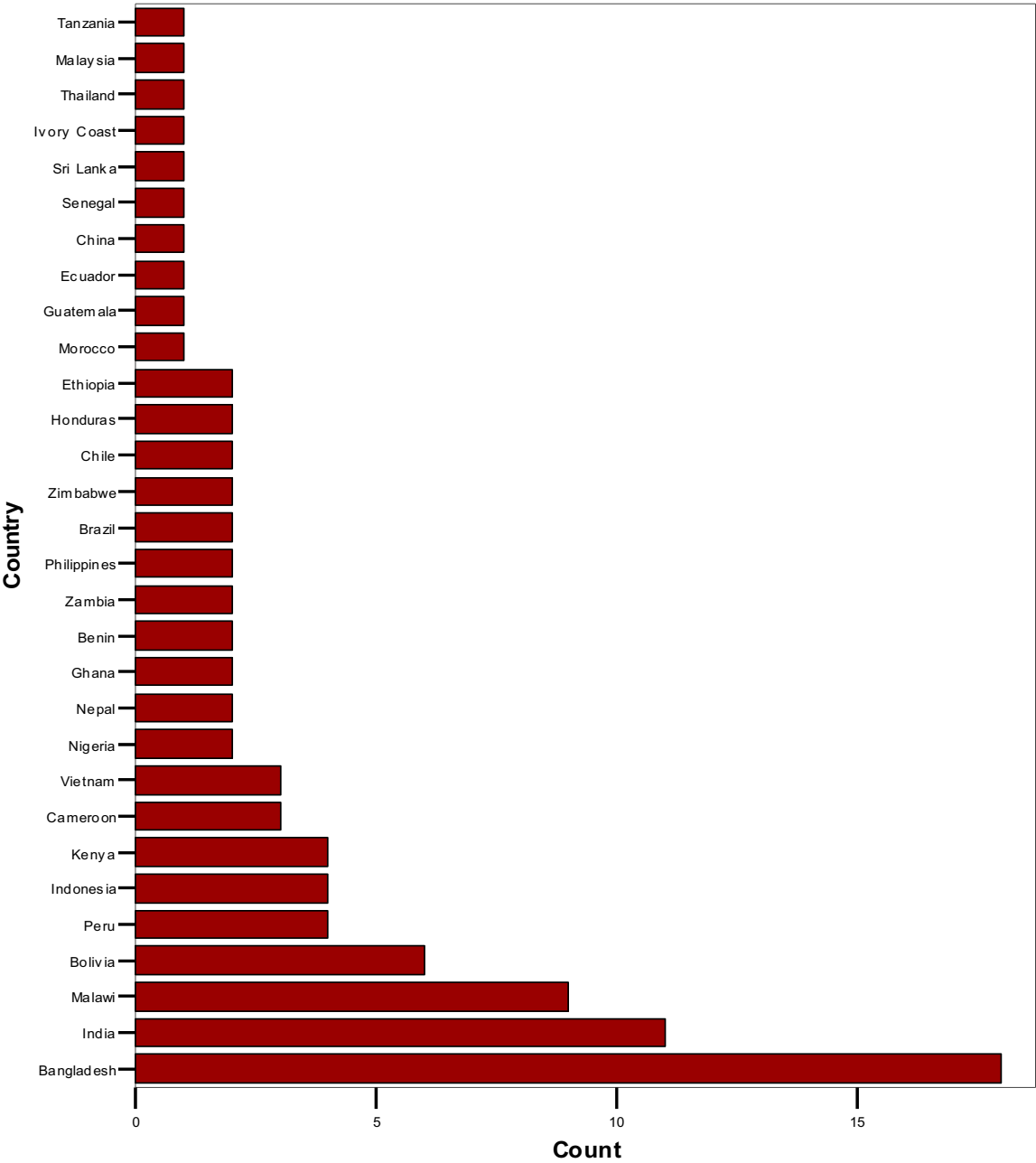
Source: Author's meta-data

The different microfinance organisations whose assessment(s) are included in the meta-analysis have millions of clients between them, and spread across the 30 developing countries. Most (70%) of the primary assessments were either of bank or NGO-run microfinance programmes. This probably reflects the extent of involvement of the non-state actors in the provision of microfinancial services in the developing world. Alternatively, this might suggest that non-state actors tend to undertake or subject themselves more often to impact evaluations than other institutions.

At least 46 authors (counting only the first authors) wrote or contributed to the original primary assessment studies, released or published over the two decades from 1985 to 2005. Only 14% of the outcome effects came from studies released before 1996, with the rest equally distributed between the 1996-2000 and the 2001-2005 periods. Figure 2 shows the proportion of studies in our dataset that were published over the two decades. The large portion of impact assessment activity occurred between 1996 and 2002, and could be a reflection of the increased interest in microfinance programmes just before and following the launching of the Micro Credit Campaign in a summit held in Washington D.C., from February 2-4, 1997.

Figure 2: Microfinance Impact Assessments over the Last 20 Years
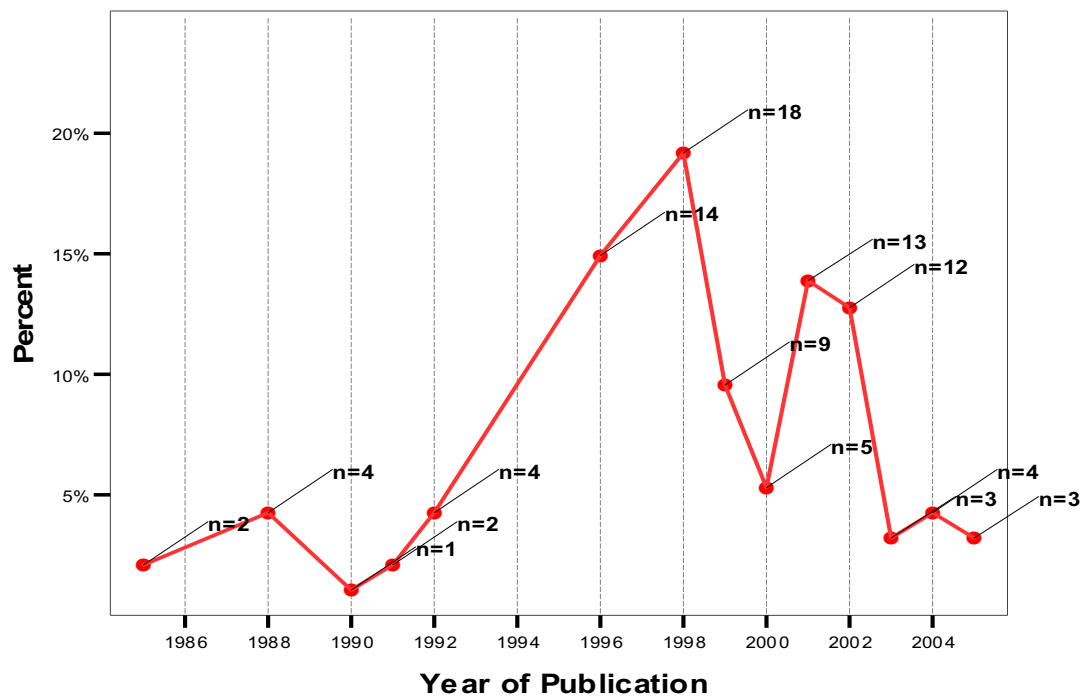
Source: Author's meta-data

Figure 3-5 also depict patterns regarding the nature of evaluations, the repayment performance of the clients and the direction of net benefits form microfinance services. In Figure 3, we see that the proportion of documents prepared by internal evaluators remained fairly stable, but at a low level. The proportion of assessment reports from external evaluators and independent researchers kept fluctuating but at a higher level than internal assessments. This should not be surprising, given the increasing demand for objective and rigorous impact evaluations by donors and (even) the general public, as a means to improving and/proving the extent of microfinance impact.

Figure 3: Nature of Microfinance Evaluations Conducted in the Last 20 Years
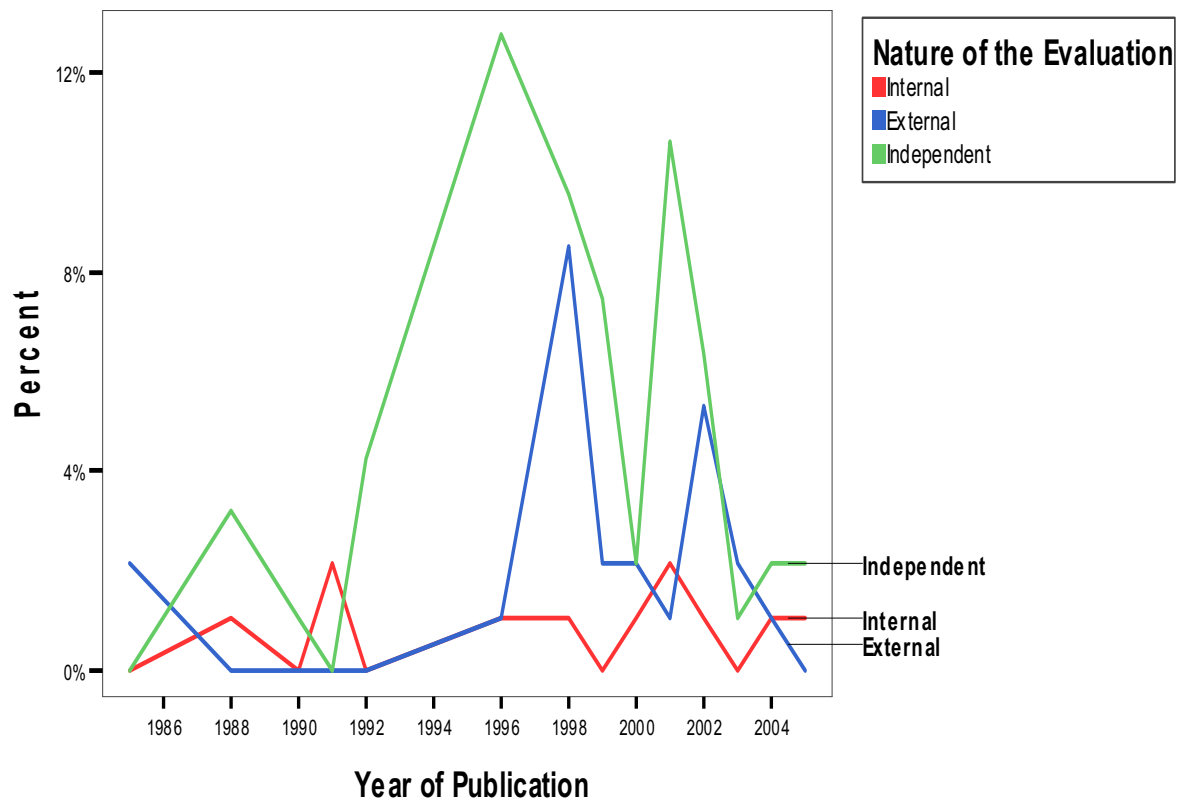
Source: Author's meta-data

In Figure 4, we observe that both high (above 50%) and low (50% and less) repayment rates were reported quite often between 1990 and 1998, with higher repayments in the lead. Since 2000, however, cases of poor repayment performance have increased and overtaken the proportion of 'good' repayers. It is uncertain to what extent this phenomenon from our data represents the current trend, but hardly any policy maker would fail to raise fundamental questions. Could it be that the rapid (and often supply-led) implementation of microfinance programmes worldwide is doing more harm than good to clients? Have repayment rates diminished because unprofitable

investments/enterprises are being financed? Providing answers to these and similar questions requires, in our opinion, additional research.

Figure 4: Repayment Patterns in Microfinance since 1985
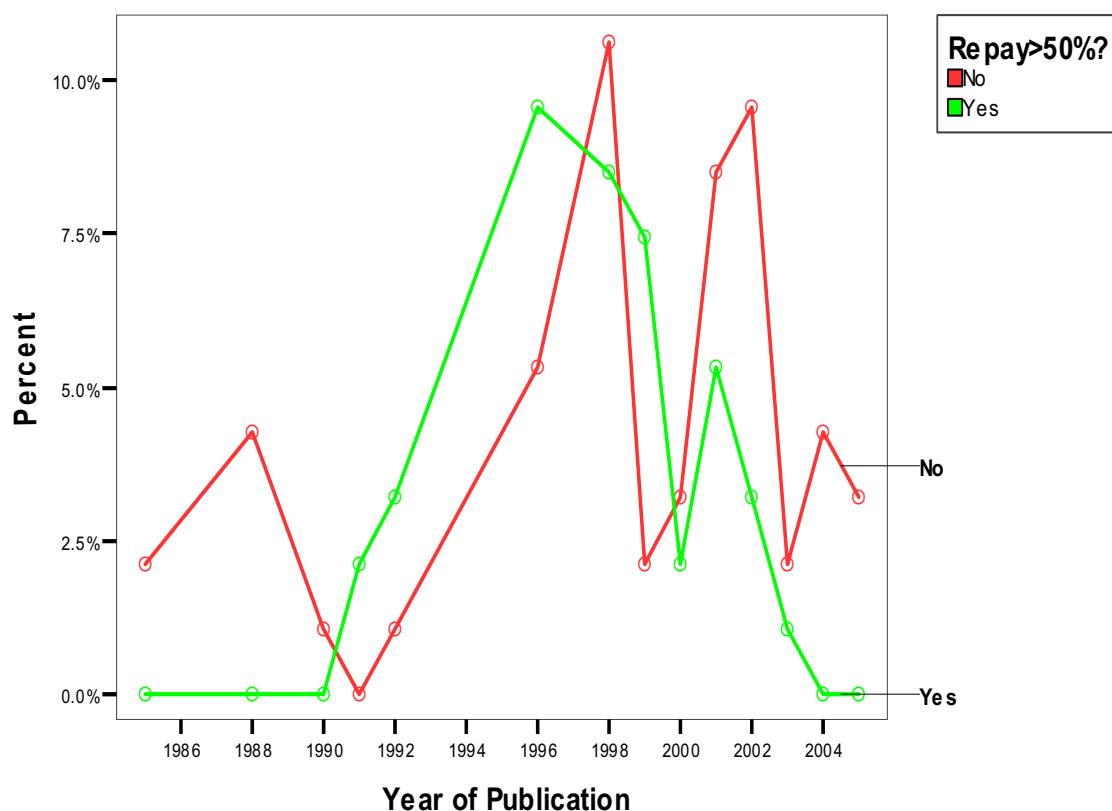
Source: Author's meta-data

Nonetheless, the possibility of some underlying 'problem' with microfinance also appears to be supported by the pattern revealed in Figure 5. It shows the incidence of positive impacts (favours treated) and that of negative impacts (favours control), and is quite similar to the repayment pattern. The number of studies that report positive impact is clearly more than those reporting negative impacts, but the gap has reduced considerably, again, since 2000. It makes logical sense to observe that repayment performance drops together with (or because of?) reduced net benefits from microfinance interventions.

Of course, a reverse causation is also imaginable: that the quest to achieve high repayment rates (and financial sustainability) might force clients into further debts (usually from another microfinance provider), and induce other economic and social problems. We suggest that the observed drop in repayment performance may have been the result of reduced *real* benefits of microfinance to its clients, or perhaps due to poor management or the problem of moral hazard. The next section will provide a deeper (econometric) analysis of the said observations, and other critical issues.

Figure 5: The Direction of Microfinance Effects since 1985
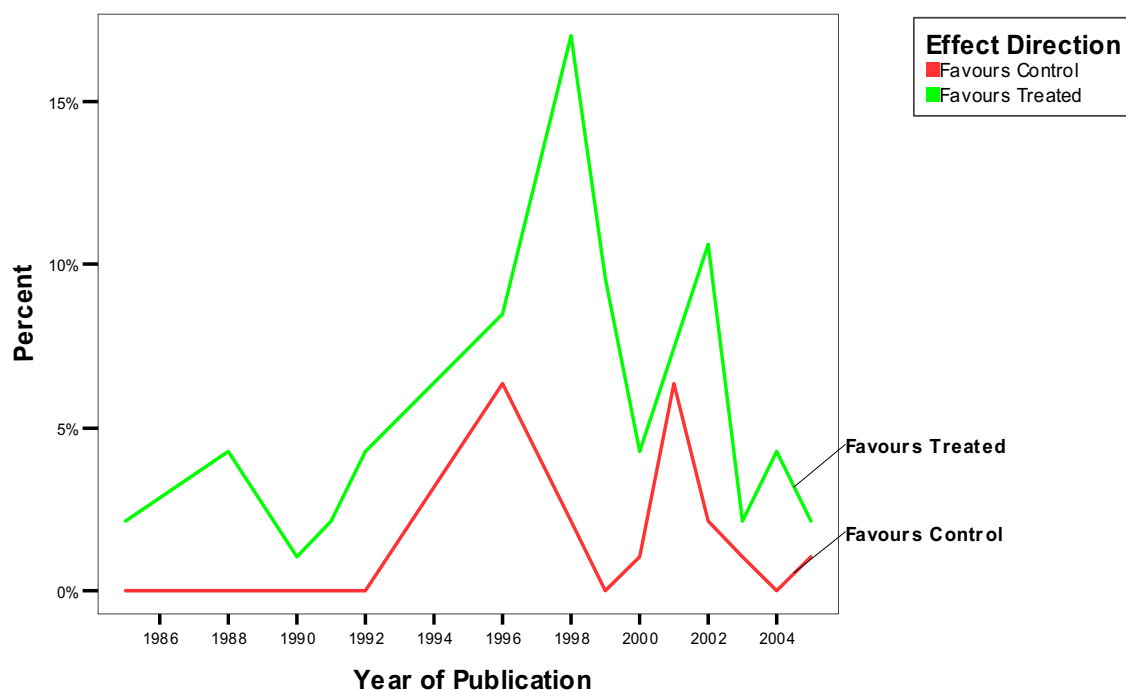
Source: Author's meta-data

For now, we explain some distributional aspects of our dataset, and the suitability of our applied methods. The overall distribution of the effect sizes suggests some normality (see Figure 6) which might render them suitable for 'standard' statistical analysis as one whole.

Figure 6: Overall Distribution of Outcome Based Microfinance Effects

Mean = 0,35242
Std. Dev. = 0,6674115
N = 136
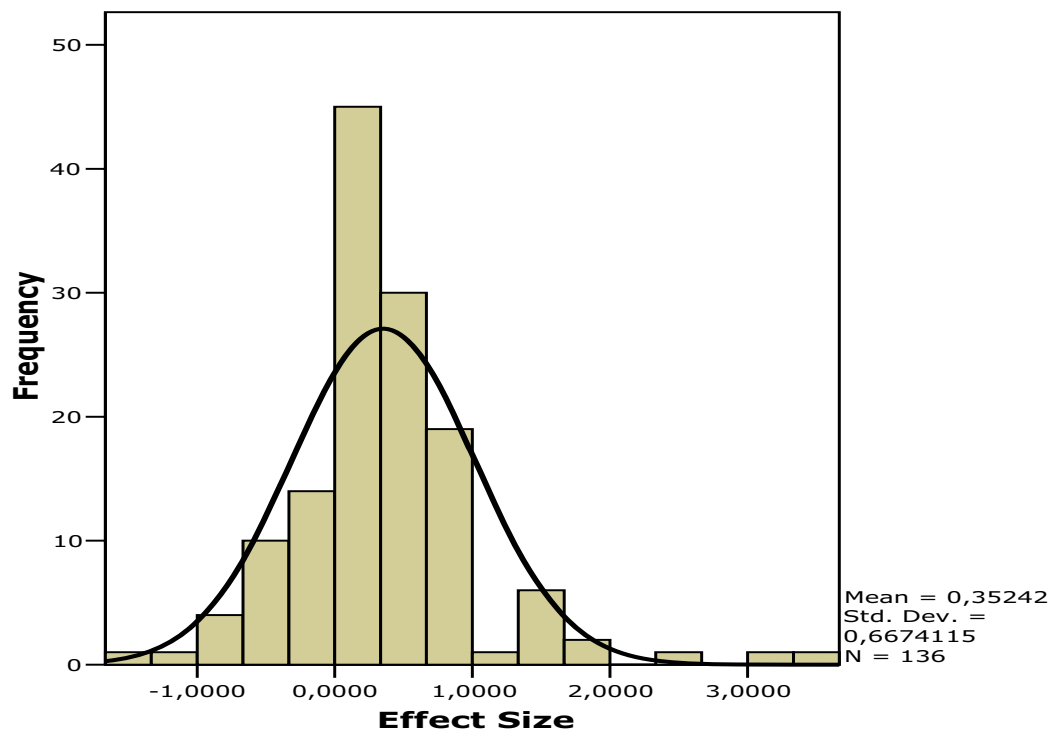
Source: Author's meta-data

Along with the histogram, a (grand) mean effect size of 0.35 and a standard deviation of 0.67 are reported. This means that if poverty were measured on a given scale, microfinance clients outperform non-clients by over one third of a standard deviation unit on that scale.

But one problem with a straightforward combination of effect sizes (to produce a grand mean) is, however, that some studies provided results for more than one outcome, and this will make the application of standard statistical techniques to the total sample erroneous. In such cases, the validity of the reported statistics is therefore suspect, except if the statistical dependencies are modelled explicitly. Such modelling

usually requires more sophisticated techniques than those employed in this research.

The multiplicity of outcomes per study in our dataset renders them non-independent, thus violating the *statistical independence* requirement for standard analysis. In meta-analysis, statistical independence is usually assumed when a study or sample contributes no more than 1 effect size per analysis (Lipsey and Wilson, 2001:112). To achieve this, we first identified all those studies reporting multiple effects/outcomes, and then selected *only one* outcome effect for each of those 41 studies. The criteria applied in the selection assumed that:

i. Information about the general wellbeing of respondents in each study is more 'honest' and perhaps a better proxy for poverty or welfare than income or food alone.

ii. Respondents are more likely to provide accurate information about their food security status than their income flows, partly due to problems with numeracy on one hand, and some misgivings about disclosure of personal fortunes (income).

Therefore the selection preference was: reported effects on wellbeing before food security, and food security before income. This process reduced our number of observations for the overall analysis from 136 to 94. This is why our descriptive analyses have been restricted to this reduced set of observations/studies which we consider to be statistically independent (except Figure 6 which includes all 136 cases).

Summary statistics for these 94 studies are presented in Table 1. The grand mean effect size is now 0.36. The repayment performance of the microfinance institutions represented in the database is 67% on average, but with a wide range of between 43% and the maximum 100%. We also present a box plot to get an 'eyeball' view of the data.

Table 1: Descriptive Statistics of Selected Variables

	N	Minimum	Maximum	Sum	Median	Mean	Std. Deviation
Effect Size	94	-1.67	3.34	33.42	.32	.36	.689
Total sample	94	25.00	9338.00	54588.00	237.00	580.72	1346.089
Control sample	94	10.00	9186.00	33420.00	128.50	355.53	1318.541
Treated sample	94	15.00	1188.00	21168.00	129.00	225.19	246.958
Repayment rate	94	43.50	100.00	6289.62	50.00	66.911	21.552
Percent women	94	2.20	100.00	5982.95	50.00	63.65	25.064
Squareroot of N	94	5.00	96.63	1831.24	15.39	19.48	14.261
Valid N (listwise)	94						

Source: Author's meta-data

The box plot (Figure 7) clearly shows the presence of extreme values, identified by their study numbers (IDs), and this suggests a lack of homogeneity across studies.

Figure 7: A Box Plot of Microfinance Effect Sizes
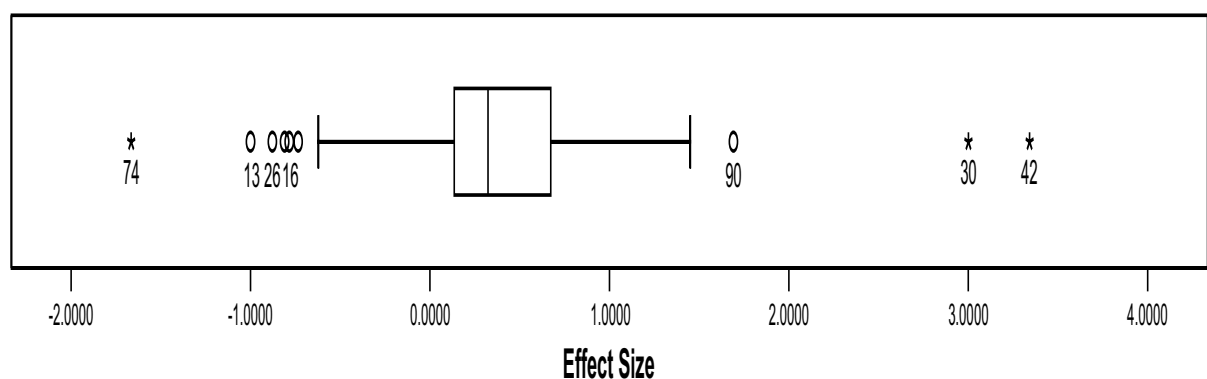
Source: Author's meta-data

By all visual judgment, the studies contained in our dataset seem far from being homogeneous. Table 2 demonstrates this possibility also, as none of the categorical variables groups the studies into fairly equal/similar proportions. For example, none of the studies reported information on the general-wellbeing of microfinance clients in Latin America. Similarly, studies released between 1991 and 1995 did not contain any information on the food security of their samples. Grouping the studies by the living environment of the microfinance clients is one of the few categorical variables that allocates them almost equally – 42 (45%) study assessments whose clients predominantly lived in rural areas and 52 (55%) studies with clients from (peri)urban areas. It is difficult to say whether the proportions represented in each of the categories are meaningfully different from each other by a simple examination of Table 2. We therefore need to proceed with a deeper analysis in order to discover and interpret the underlying patterns and relationships, especially across studies.

Table 2: Summary of Microfinance Impact Studies by Various Categories

		Poverty Outcome								
		Food			Income			General wellbeing		
		N	Row %	Col %	N	Row %	Col %	N	Row %	Col %
Region	Africa	15	46.9%	60.0%	10	31.3%	21.7%	7	21.9%	30.4%
	Asia	5	11.4%	20.0%	23	52.3%	50.0%	16	36.4%	69.6%
	Latin America	5	27.8%	20.0%	13	72.2%	28.3%			
Year Category	Before 1991	1	14.3%	4.0%	4	57.1%	8.7%	2	28.6%	8.7%
	1991-1995				2	33.3%	4.3%	4	66.7%	17.4%
	1996-2000	9	19.6%	36.0%	30	65.2%	65.2%	7	15.2%	30.4%
	2001-2005	15	42.9%	60.0%	10	28.6%	21.7%	10	28.6%	43.5%
Nature of the Evaluation	Internal	4	36.4%	16.0%	2	18.2%	4.3%	5	45.5%	21.7%
	External	10	41.7%	40.0%	7	29.2%	15.2%	7	29.2%	30.4%
	Independent	11	18.6%	44.0%	37	62.7%	80.4%	11	18.6%	47.8%
Type of Organisa-tion	Government	4	23.5%	16.0%	8	47.1%	17.4%	5	29.4%	21.7%
	NANGO	9	29.0%	36.0%	13	41.9%	28.3%	9	29.0%	39.1%
	INGO	3	33.3%	12.0%	5	55.6%	10.9%	1	11.1%	4.3%
	Bank	6	21.4%	24.0%	16	57.1%	34.8%	6	21.4%	26.1%
	Other	3	33.3%	12.0%	4	44.4%	8.7%	2	22.2%	8.7%
Type of Loan	Individual Loans	8	22.9%	32.0%	20	57.1%	44.4%	7	20.0%	30.4%
	Group Loans	8	27.6%	32.0%	15	51.7%	33.3%	6	20.7%	26.1%
	Individual as well as Group Loans	9	31.0%	36.0%	10	34.5%	22.2%	10	34.5%	43.5%
Non-financial Services?	FS Only	15	23.8%	60.0%	31	49.2%	67.4%	17	27.0%	73.9%
	FS and Non-FS	10	32.3%	40.0%	15	48.4%	32.6%	6	19.4%	26.1%
Clients' Living Environ	Urban	13	31.0%	52.0%	22	52.4%	47.8%	7	16.7%	30.4%
	Rural	12	23.1%	48.0%	24	46.2%	52.2%	16	30.8%	69.6%
Savings?	No	17	30.9%	68.0%	25	45.5%	54.3%	13	23.6%	56.5%
	Yes	8	20.5%	32.0%	21	53.8%	45.7%	10	25.6%	43.5%
High Quality?	No	6	22.2%	24.0%	12	44.4%	26.1%	9	33.3%	39.1%
	Yes	19	28.4%	76.0%	34	50.7%	73.9%	14	20.9%	60.9%
Effect Direction	Favours Control	9	47.4%	36.0%	7	36.8%	15.2%	3	15.8%	13.0%
	Favours Treated	16	21.3%	64.0%	39	52.0%	84.8%	20	26.7%	87.0%

Note: **Row%** means the number of cases (N) in the category expressed as percent of total N (sum of all 3 Ns) along the row

Col% means the number of cases (N) in the category expressed as percent of total N within the column

Source: Author's meta-data

7.2 AN IN-DEPTH ANALYSIS OF THE IMPACT OF MICROFINANCE ON POVERTY

One objective of this research was to provide a simple description of the microfinance literature as guided by the information that was coded into our database. But beyond this, the study sought to compute what can be referred to as the average effect of microfinance programmes on their clients. To achieve this, we first had to calculate individual effects per study using a standardized summary index called the effect size statistic (see chapter 5 for details).

Using the individual affect sizes, an average effect size was calculated to be 0.36 (see Table 1), without assigning any weights. It is however more appropriate to weight by a certain factor that discounts effect sizes from small or less precise studies. We calculated the standard error associated with each individual effect size, and squared it to get the variance (as recommended in Lipsey and Wilson, 2001 and Sutton, et al., 2001:140). In chapter 5, the formulae for computing effect sizes and their associated statistics were presented. We restate the relevant equation for the **_standardized mean difference_** effect size ES_{sm} (also known as Hedges d), which is the summary statistic chosen for this meta-analysis.

$$ES_{sm} = \left[1 - \frac{3}{4N - 9} \right] ES_{bm},$$
(as in 5.13)

$$SE_{sm} = \sqrt{\frac{N}{n^T n^C} + \frac{ES_{sm}^2}{2N}},$$
(as in 5.14)

$$w_{sm} = \frac{1}{SE_{sm}^2} = \frac{2n^T n^C (N)}{2N^2 + n^T n^C (ES_{sm}^2)},$$
(as in 5.15)

where subscript _sm_ stands for standardised mean difference, _N_ is the total sample size (i.e. $n^T + n^C$), ES_{bm} is the standardised mean difference for small samples (i.e. $ES_{bm} = \frac{\overline{Y}^T - \overline{Y}^C}{SD_p}$, but which is biased when applied

to large samples without the correction), the superscripts *T* and *C* stand for treated group and control group respectively, *SE* is the standard error and *w* the computed weight.

Recall also the equation for computing the combined (grand mean) effect and its standard error, as given by

$$CES = \frac{\sum(w_i ES_i)}{\sum w_i},$$ (as in 5.31)

$$SE_{CES} = \sqrt{\frac{1}{\sum w_i}},$$ (as in 5.32)

where *CES* is the combined effect size or weighted grand mean effect size, ES_i is the value of the single (or composite) effect size included, w_i is the inverse variance weight for each ES_i, and *i* equals 1, 2, to *k* number of effect sizes included (which will correspond to the number of studies – 94 in this case - under the rule of one effect size per included study), and SE_{CES} is the standard error of the combined effect size. Other computational details for the confidence intervals and the magnitude and significance of the homogeneity statistic, *Q*, also remain as has been presented in Chapter 5.

Table 3 shows the results of running a matrix procedure to compute the weighted grand mean using SPSS (version 12.1) command syntax written by Wilson (1999). We also use the command syntax for the subsequent regression analysis. In the table, one observes a noticeable drop in the size of the grand mean from 0.36 to 0.31 (weighted) as calculated under a fixed effects model, which produces, in this case, just about the same value (of 0.33) as with a random effects model. Although the weighted mean effect produced by both approaches are very significantly different from zero, the random effects model has a much broader confidence band. The positive sign of the weighted grand

mean indicates a beneficial, though very modest impact, of microfinance programmes on their clients.

Table 3: The Weighted Grand Mean of Microfinance Effect Sizes

```
Run MATRIX procedure:

*****  Meta-Analytic Results  *****

------- Distribution Description ------------------------------
          N        Min ES       Max ES      Wghtd SD
      94.000       -1.665        3.342         .535

------- Fixed & Random Effects Model --------------------------
        Mean ES     -95%CI      +95%CI         SE         Z          P
Fixed    .3087       .2867       .3306      .0112   27.5589      .0000
Random   .3263       .2141       .4385      .0572    5.7006      .0000

------- Random Effects Variance Component ---------------------
v    =    .280109

------- Homogeneity Analysis ----------------------------------
         Q           df           p
  2277.4007      93.0000        .0000

Random effects v estimated via noniterative method of moments.

------ END MATRIX -----
```

Source: Author's analysis

Based on the homogeneity analysis, shown by *Q* and its associated significance, we may definitively reject the null hypothesis that the individual effect sizes are equal or homoskedastic (have equal variance). This (heteroskedasticity) necessitates a relaxing of the assumption of fixed effects that variability between studies is no more than can be expected on the basis of chance alone.

To account for the excess variability, the studies are first divided into sub-groups, which are expected to account for or explain the observed excess variability. We implement an analogue to the analysis of variance (ANOVA) using alternative model specifications.

The specifics of the various analytical models are based on a random effects conceptualization, which we now describe only briefly. Here we adopt a more standard notation to facilitate the drawing of parallels to weighted least squares regressions, often employed in primary empirical research.

Following Raudenbush (1994, in Cooper and Hedges (eds.), 1994:309-310), we suppose that each effect size in our data is an estimate T_i of the true effect size θ_i, with the number of independent studies/effects represented by k, and $i=1, \ldots, k$. We further represent the error with which T_i estimates θ_i as e_i, (that is the sampling error), so that they are linked by

$$T_i = \theta_i + e_i \tag{7.1}$$

Assuming independence between our set of study sizes, our prediction model is given by the set of moderators or independent variables plus two error terms, such that

$$\theta_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \ldots + \beta_p X_{ip} + e_i + v_i, \tag{7.2}$$

where

β_0 is the model intercept;

$X_{i1}, \ldots, X_{ip}$ are (selected) moderators or predictors coded in the data set (see **Table 6**);

$\beta_1, \ldots, \beta_p$ are regression coefficients for the predictors

e_i is the variability in effect sizes attributed to sampling error

v_i is the random effect of study i, representing the deviation of modelled effects from the true effect. If all variability is expected to be completely explained by the model, then v_i becomes or is set to zero, and it will then be described as a fixed effects model. Under a mixed

effects model, part of the variability in the true (population) is unexplainable by the specified model.

The results of the ANOVA-type analysis (with categorical regressors only) are presented for two categorical variables as shown in Table 4 and Table 5). The use of alternative model specifications serves as a sensitivity check to see how far the results may be confounded by model choice.

Table 4a: ANOVA Results of Grouping by Client's Living Environment

```
Model 1: Fixed Effects

*****  Inverse Variance Weighted Oneway ANOVA  *****
 *****  Fixed Effects Model via OLS  *****
------- Analog ANOVA table (Homogeneity Q)  -------
                Q            df           p
Between      33.3998      1.0000        .0000
Within     2244.0008     92.0000        .0000
Total      2277.4007     93.0000        .0000
------- Q by Group -------
    Group       Q        df        p
    .0000  673.0476  41.0000    .0000
   1.0000  1570.953  51.0000    .0000
------- Effect Size Results Total    -------
        Mean ES       SE    -95%CI   +95%CI        Z        P        N
   Total    .3087    .0112    .2867    .3306  27.5589    .0000  94.0000
------- Effect Size Results by Group -------
    Group  Mean ES      SE    -95%CI   +95%CI         Z        P        N
    .0000    .3804    .0167    .3476    .4132  22.7552    .0000  42.0000
   1.0000    .2503    .0151    .2207    .2798  16.5860    .0000  52.0000

 Model 2: Mixed Effects Via Method of Moments:

 *****  Inverse Variance Weighted Oneway ANOVA  *****
 *****  Mixed Effects Model  *****
------- Analog ANOVA table (Homogeneity Q)  -------
                Q            df           p
Between        .4682      1.0000        .4938
Within      126.4542     92.0000        .0100
Total       126.9225     93.0000        .0112
------- Q by Group -------
    Group       Q        df        p
    .0000   35.5439  41.0000    .7112
   1.0000   90.9104  51.0000    .0005
------- Effect Size Results Total    -------
        Mean ES       SE    -95%CI   +95%CI        Z        P        N
   Total    .3264    .0574    .2138    .4390   5.6822    .0000  94.0000
------- Effect Size Results by Group -------
    Group  Mean ES      SE    -95%CI   +95%CI         Z        P        N
    .0000    .3703    .0861    .2015    .5391   4.3004    .0000  42.0000
   1.0000    .2912    .0771    .1401    .4423   3.7766    .0002  52.0000
------- Method of Moments Random Effects Variance Component -------
v      =   .28232
```

Source: Author's analysis

Table 4b: ANOVA Results of Grouping by Client's Living Environment

```
Model 3: Mixed Effects Via Maximum Likelihood Approach

 *****  Inverse Variance Weighted Oneway ANOVA  *****
 *****  Mixed Effects Model  *****
------- Analog ANOVA table (Homogeneity Q)  -------
                Q            df           p
Between        .3346       1.0000       .5629
Within       99.2048      92.0000       .2854
Total        99.5394      93.0000       .3025

------- Q by Group -------
    Group       Q        df        p
   .0000   27.5966  41.0000    .9458
  1.0000   71.6081  51.0000    .0300

------- Effect Size Results Total    -------
        Mean ES      SE   -95%CI   +95%CI        Z        P        N
   Total   .3306    .0654    .2025    .4587   5.0588    .0000  94.0000

------- Effect Size Results by Group -------
    Group  Mean ES      SE   -95%CI   +95%CI        Z        P        N
   .0000    .3728    .0979    .1809    .5647   3.8078    .0001  42.0000
  1.0000    .2967    .0878    .1247    .4688   3.3803    .0007  52.0000

------- Maximum Likelihood Random Effects Variance Component -------
v     =    .37293
se(v) =    .05837
```

Model 4: Mixed Effects Via Restricted Maximum Likelihood Approach

```
 *****  Inverse Variance Weighted Oneway ANOVA  *****
 *****  Mixed Effects Model  *****
------- Analog ANOVA table (Homogeneity Q)  -------
                 Q           df           p
Between         .3259      1.0000       .5681
Within        97.3436     92.0000       .3316
Total         97.6694     93.0000       .3499

------- Q by Group -------
    Group       Q        df        p
   .0000   27.0561  41.0000    .9539
  1.0000   70.2875  51.0000    .0379

------- Effect Size Results Total    -------
        Mean ES      SE   -95%CI   +95%CI        Z        P        N
   Total   .3309    .0660    .2015    .4603   5.0129    .0000  94.0000

------- Effect Size Results by Group -------
    Group  Mean ES      SE   -95%CI   +95%CI        Z        P        N
   .0000    .3730    .0989    .1792    .5668   3.7717    .0002  42.0000
  1.0000    .2972    .0887    .1234    .4710   3.3511    .0008  52.0000
------- Restricted Maximum Likelihood Random Effects Variance Component -
v     =    .38103
se(v) =    .05956
```

Note: Group 0 = (Peri)Urban; Group 1 = Rural

Source: Author's analysis

Table 5a: ANOVA Results of Grouping by Regional Location of Clients

```
Model 1: Fixed Effects
 *****  Inverse Variance Weighted Oneway ANOVA  *****
 *****  Fixed Effects Model via OLS  *****
------- Analog ANOVA table (Homogeneity Q)  -------
                Q            df           p
Between     134.5369      2.0000       .0000
Within     2142.8638     91.0000       .0000
Total      2277.4007     93.0000       .0000

------- Q by Group -------
    Group       Q        df        p
   1.0000 381.5207  31.0000     .0000
   2.0000 1664.717  43.0000     .0000
   3.0000  96.6265  17.0000     .0000

------- Effect Size Results Total    -------
         Mean ES      SE    -95%CI   +95%CI       Z        P        N
    Total   .3087    .0112    .2867    .3306  27.5589    .0000  94.0000

------- Effect Size Results by Group -------
    Group  Mean ES      SE    -95%CI   +95%CI       Z        P        N
   1.0000   .0719    .0240    .0248    .1190   2.9940    .0028  32.0000
   2.0000   .3933    .0139    .3660    .4206  28.2224    .0000  44.0000
   3.0000   .2851    .0303    .2258    .3445   9.4110    .0000  18.0000
Model 2: Mixed Effects via Method of Moments

 *****  Inverse Variance Weighted Oneway ANOVA  *****
 *****  Mixed Effects Model  *****
------- Analog ANOVA table (Homogeneity Q)  -------
                Q            df           p
Between       8.1100      2.0000       .0173
Within      123.0658     91.0000       .0142
Total       131.1758     93.0000       .0056

------- Q by Group -------
    Group       Q        df        p
   1.0000  34.7680  31.0000     .2931
   2.0000  65.7315  43.0000     .0144
   3.0000  22.5663  17.0000     .1639

------- Effect Size Results Total    -------
         Mean ES      SE    -95%CI   +95%CI       Z        P        N
    Total   .3258    .0564    .2152    .4364   5.7722    .0000  94.0000

------- Effect Size Results by Group -------
    Group  Mean ES      SE    -95%CI   +95%CI       Z        P        N
   1.0000   .1007    .0973   -.0899    .2913   1.0356    .3004  32.0000
   2.0000   .4327    .0810    .2739    .5915   5.3414    .0000  44.0000
   3.0000   .4605    .1339    .1980    .7230   3.4387    .0006  18.0000
------- Method of Moments Random Effects Variance Component -------
v     =   .27174
```

Note: Group 1 = Africa; Group 2 = Asia; Group 3 = Latin America

Source: Author's analysis

Table 5b: ANOVA Results of Grouping by Regional Location of Clients

```
Model 3: Mixed Effects via Maximum Likelihood Approach

 *****   Inverse Variance Weighted Oneway ANOVA   *****
 *****   Mixed Effects Model   *****
------- Analog ANOVA table (Homogeneity Q)  -------
               Q            df           p
Between      6.5693        2.0000       .0375
Within      98.7831       91.0000       .2708
Total      105.3524       93.0000       .1796

------- Q by Group -------
    Group       Q        df         p
   1.0000   27.7941   31.0000     .6318
   2.0000   51.6393   43.0000     .1720
   3.0000   19.3497   17.0000     .3088

------- Effect Size Results Total   -------
         Mean ES      SE    -95%CI   +95%CI        Z         P         N
   Total    .3297    .0634    .2054    .4540    5.1984    .0000  94.0000

------- Effect Size Results by Group -------
    Group  Mean ES      SE    -95%CI   +95%CI        Z         P         N
   1.0000    .1032    .1091   -.1107    .3170    .9456    .3443  32.0000
   2.0000    .4335    .0913    .2545    .6124   4.7476    .0000  44.0000
   3.0000    .4768    .1496    .1836    .7701   3.1872    .0014  18.0000
------- Maximum Likelihood Random Effects Variance Component -------
v     =    .34962
se(v) =    .05494

Model 4: Mixed Effects Via Restricted Maximum Likelihood Approach

*****   Inverse Variance Weighted Oneway ANOVA   *****
 *****   Mixed Effects Model   *****
------- Analog ANOVA table (Homogeneity Q)  -------
               Q            df           p
Between      6.3927        2.0000       .0409
Within      96.0003       91.0000       .3397
Total      102.3930       93.0000       .2372

------- Q by Group -------
    Group       Q        df         p
   1.0000   26.9936   31.0000     .6725
   2.0000   50.0513   43.0000     .2138
   3.0000   18.9554   17.0000     .3311

------- Effect Size Results Total   -------
         Mean ES      SE    -95%CI   +95%CI        Z         P         N
   Total    .3302    .0644    .2040    .4563    5.1279    .0000  94.0000

------- Effect Size Results by Group -------
    Group  Mean ES      SE    -95%CI   +95%CI        Z         P         N
   1.0000    .1035    .1108   -.1136    .3205    .9342    .3502  32.0000
   2.0000    .4335    .0927    .2518    .6153   4.6755    .0000  44.0000
   3.0000    .4789    .1518    .1814    .7764   3.1550    .0016  18.0000
------- Restricted Maximum Likelihood Random Effects Variance Component -
------
v     =    .36114
se(v) =    .05663
```

Source: Author's analysis

From Table 4 (a and b) the grand mean effect sizes do not appear to be sensitive to the choice of model, except for the fixed effects. Under fixed effects assumptions, the grand mean is 0.31; under each of the other model variants for random or mixed effects (models 2-4), it is 0.33. It may therefore not matter very much which model specification is chosen to combine the total number of studies, although splitting the studies into the categorical subgroups is likely to produce more meaningful or easily interpretable grand means. The average effect sizes for each group category seem to be more sensitive to model specification, even as the value of the random component (v) increases steadily from one model to the next. Table 5 shows consistency for the total estimates as expected, but depicts clear regional differences, at least with respect to the level of homogeneity within each sub-group. Nonetheless, we observe that average impacts in Asia and Laitn America are over four times the size of average impacts in Africa.

The use of the ANOVA-analogue approach will now be discounted in favour of a weighted least squares regression which allows for the specification of a 'full' model that incorporates our hypothesized moderators or predictors. Figure 8 shows the distribution of the raw effect sizes within categories of poverty outcome. The following sections will attempt to identify some of the sources of variability between effects for the set of studies that contributed effect sizes to each poverty outcome group.

We now proceed with an estimation of a regression model to endeavour to explain the wide variability of effects sizes between studies. Again results are presented for estimates based on alternative model specifications. We adopt the same set of predictors for each of the three outcome constructs – food security, income and general wellbeing (see **Table 6**), and for most of the graphs we have utilized the full sample of 136 effect sizes since they are statistically independent within each poverty outcome.

Figure 8 : Distibution of Effect Sizes by Poverty Outcome
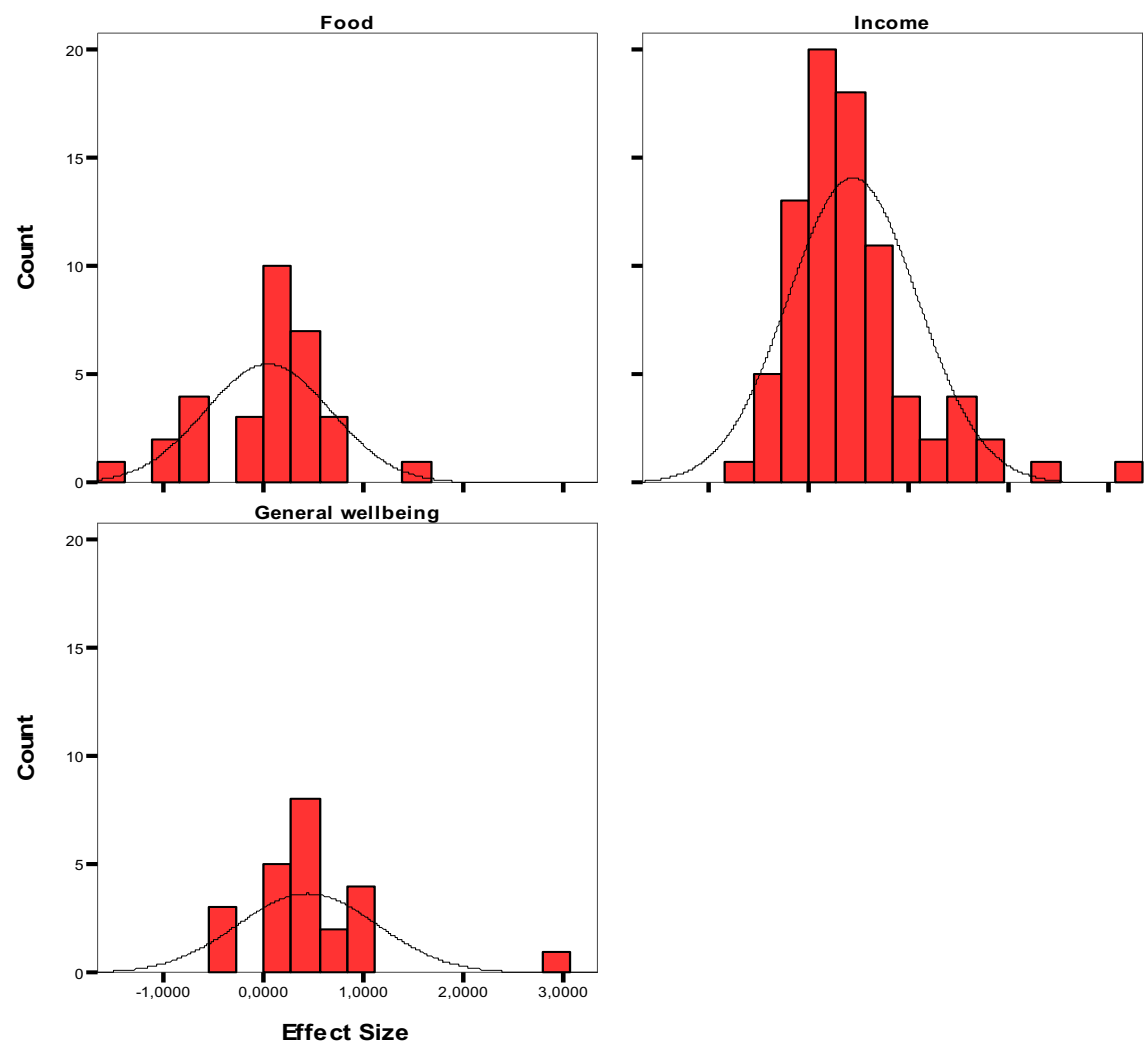
Source: Author's meta-data

Table 6 : Moderators Included in the Prediction Model

Variable	Purpose	Expected Sign
RuralAsia	A dummy to test the influence of assessment results from rural Asia in comparison to other regions	+, considering the 'success' stories reported
Savings	A dummy that takes the value 1 if a savings facility is offered in addition to credit	+, because it is believed to provide more flexibility and incentive to clients
NonFin	A dummy that takes the value 1 if non-financial services are provided together with microcredit	+, because it may offer flexibility, improved skills, cohesion and hence performance
RepayCat	Repayment category that takes the value 1 if the programme reports loan recovery rates over 50%	+, taking repayment as a proxy for impact
Probit	A dummy that takes the value 1 if a probit transformation was applied to convert an odds ratio to a standardized mean difference effect size	0, this was expected to be neutral, as it's only a 'transformation'
Gov	A dummy that takes the value 1 if the microfinance programme was government-owned and/or government-run	-, since state involvement in microfinance has been widely reported to induce negative results.
PeerRev	A dummy that takes the value 1 if the study was peer reviewed at the minimum. This included Journal articles and books.	+, assuming a bias in favour of reporting positive impact of microfinance.
YearPub	A continuous variable to capture time variant effects.	?
Loan1	A dummy variable that takes the value 1 if the microfinance programme provided individual loans only.	-, since group lending is believed to improve performance among the poor

Source: Author

7.2.1 The Impact of Microfinance on Food Security

We now turn to the particular case of the effect of microfinance on the food security of participants. Recall that one impact pathway of microfinance on poverty is via increased quantity (and quality) of food intake. This is usually reflected as a direct increase in food consumption expenditure or indirectly via increased farm-level food production.

As mentioned earlier, the level of food security was measured in the primary studies by the average number of calories or average expenditure on food per person per year, or by the proportion of subjects whose food situation did not worsen over the period. In the former case, the food outcome was measured on a continuous scale and therefore formulae 1 and 3 of Table 2 in chapter 5 were applied to compute the standardised mean difference between the two groups. In the latter case, the proportion of the microfinance clients with a successful food security outcome (that is food intake either stayed the same or improved) is contrasted with the success proportion among those in the comparison group. This is treated as a dichotomous outcome measure, and first a logged odds ratio was computed before being converted to a standardized mean difference effect size. In this way all the studies reporting findings on the impact of microfinance on food security are meta-analysed using one effect size type – the standardized mean difference.

Only the regression outputs based on the assumption of mixed effects estimated by the Restricted Maximum Likelihood Method (REML) are presented in this section[73]. Outputs based on alternative models are included as an appendix (C) to facilitate direct comparison whenever the reader wants to do so. It is, however, important to recognise two

---

[73] The restricted approach is known to produce reliable results "because it adjusts variance estimates for the uncertainty associated with estimation of the fixed effects" (Hedges, 1994, in Cooper and Hedges (eds.), 1994:319).

noticeable differences between fixed effect and random effect results. One, confidence intervals get bigger with random models and, two, effects that were significant under a fixed effect model may no longer be significant.

Table 7 presents the regression outputs based on our model for the sub-dataset on food security.

Table 7: Impact of Microfinance on Food Security

```
*****  Inverse Variance Weighted Regression  *****

 *****  Random Intercept, Fixed Slopes Model  *****

------- Descriptives -------
     Mean ES      R-Square             N
     -.0031         .5948       25.0000

------- Homogeneity Analysis -------
                  Q            df              p
Model        22.9470       9.0000         .0063
Residual     15.6301      15.0000         .4071
Total        38.5770      24.0000         .0302

------- Regression Coefficients -------
              B        SE   -95% CI   +95% CI        Z         P      Beta
Constant 199.7360  84.8565  33.4173 366.0547   2.3538     .0186     .0000
RuralAsi   -.3988    .3842  -1.1518    .3541  -1.0382     .2992    -.1939
Savings     .0984    .2794   -.4493    .6460    .3521     .7248     .0678
NonFin      .1682    .2593   -.3399    .6764    .6489     .5164     .1217
RepayCat    .3827    .2510   -.1093    .8746   1.5244     .1274     .2831
Probit      .1282    .3024   -.4646    .7210    .4239     .6716     .0913
Gov        -.9225    .4044  -1.7150   -.1299  -2.2812     .0225    -.4972
PeerRev     .0184    .3012   -.5719    .6087    .0611     .9513     .0122
YearPub    -.0999    .0424   -.1830   -.0168  -2.3566     .0184    -.4839
Loan1      -.3475    .2905   -.9169    .2220  -1.1959     .2317    -.2386

------- Restricted Maximum Likelihood Random Effects Variance Component -
------
v      =   .27000
se(v)  =   .08353
```
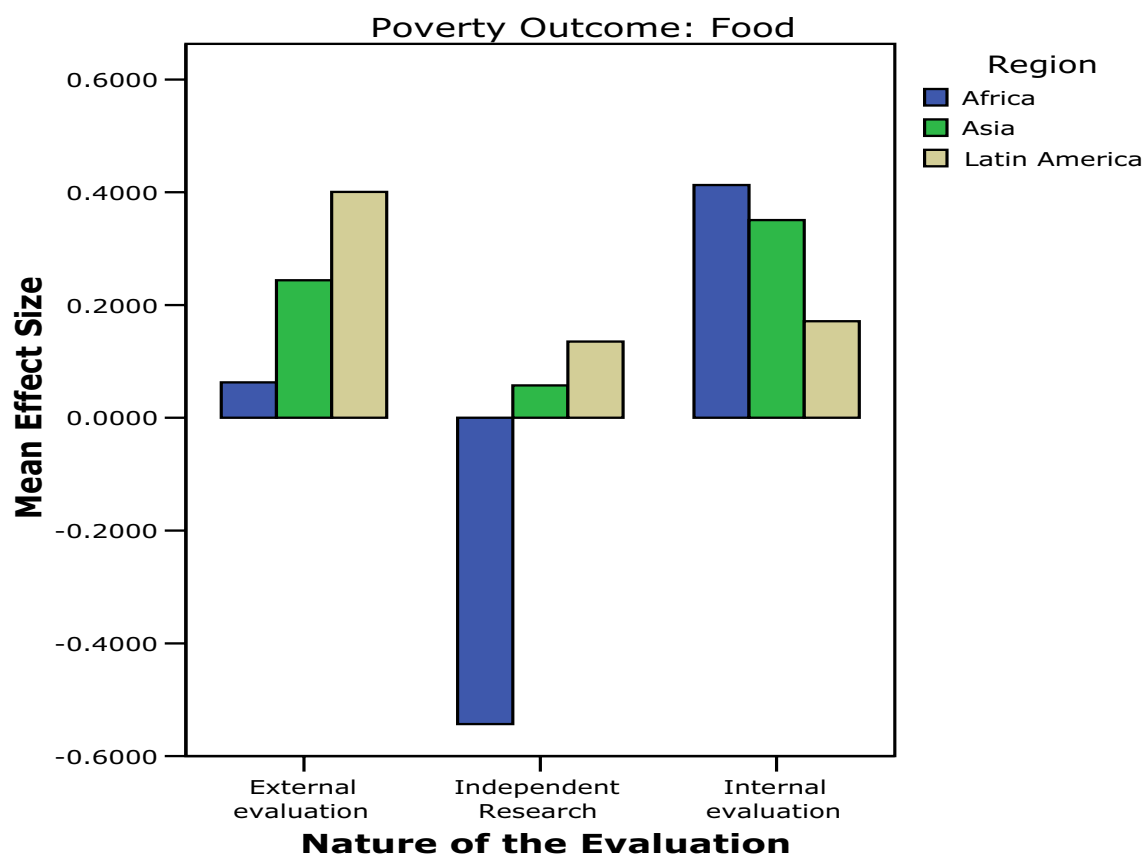
Source: Author's analysis

First we observe that the weighted grand mean effect of microfinance on food security is very small and negative, suggesting that microfinance clients seem to suffer more from food insecurity than their non-client counterparts, although this can also be attributed to differential targeting.

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Both the unadjusted and adjusted coefficients for the repayment category (for programmes experiencing repayment rates above 50%) confirm a positive relation between repayment rates (above 50%) with the size of impact. The year of publication of the assessment report is significant at 5% and carries a negative sign. This clearly validates the patterns observed in our descriptive analysis of repayment performance and direction of effect over time (see Figure 4 and 5), which were based on the full dataset. But the variable may well imply that researchers increasingly 'discover' negative impacts of microfinance programmes on poverty. This might be credited to more careful and rigorous assessments, especially when seen in light of the growing percentage of independent evaluations/researchers over the same period (see Figure 3).

But is there any basis to suppose that solid impact evaluations are biased in favour of negative impacts? To check this, we recast our food security data, plotting mean effect size for each region under various evaluation regimes as shown in Figure 9. While independent evaluators, might not necessarily be 'biased' against finding positive impacts (which in itself contradicts their 'independence'), it is reasonable to expect that they might be more capable or willing to identify (and report) negative impact than internal evaluators who usually have a stake in the 'success' of the microfinance project.

Figure 9: Mean Effects of Microfinance by Nature of Evaluation and Region

Source: Author's meta-data

A further analysis of the 'food security' data is shown in Figure 10. There, it can be seen that negative impacts of microfinance on food security were reported after 2000 in Africa and Asia. Incidentally, when the data was split into the period before the promotional events of the Microcredit Campaign summit in 1997 - including similar global initiatives around that period to eradicate poverty - and afterwards (Figure 10 b), the negative effects disappeared for Asia but persisted in Africa. And indeed majority of the studies assessing impact on food security during the period 2001-2005, were conducted in Africa. It may be inappropriate to suggest any causal links yet, but we note the apparent association between impact and the time and event variables. We shall re-examine these relationship again for each of remaining two poverty outcomes – income and general wellbeing.

Figure 10: The Microfinance Movement and Food Security
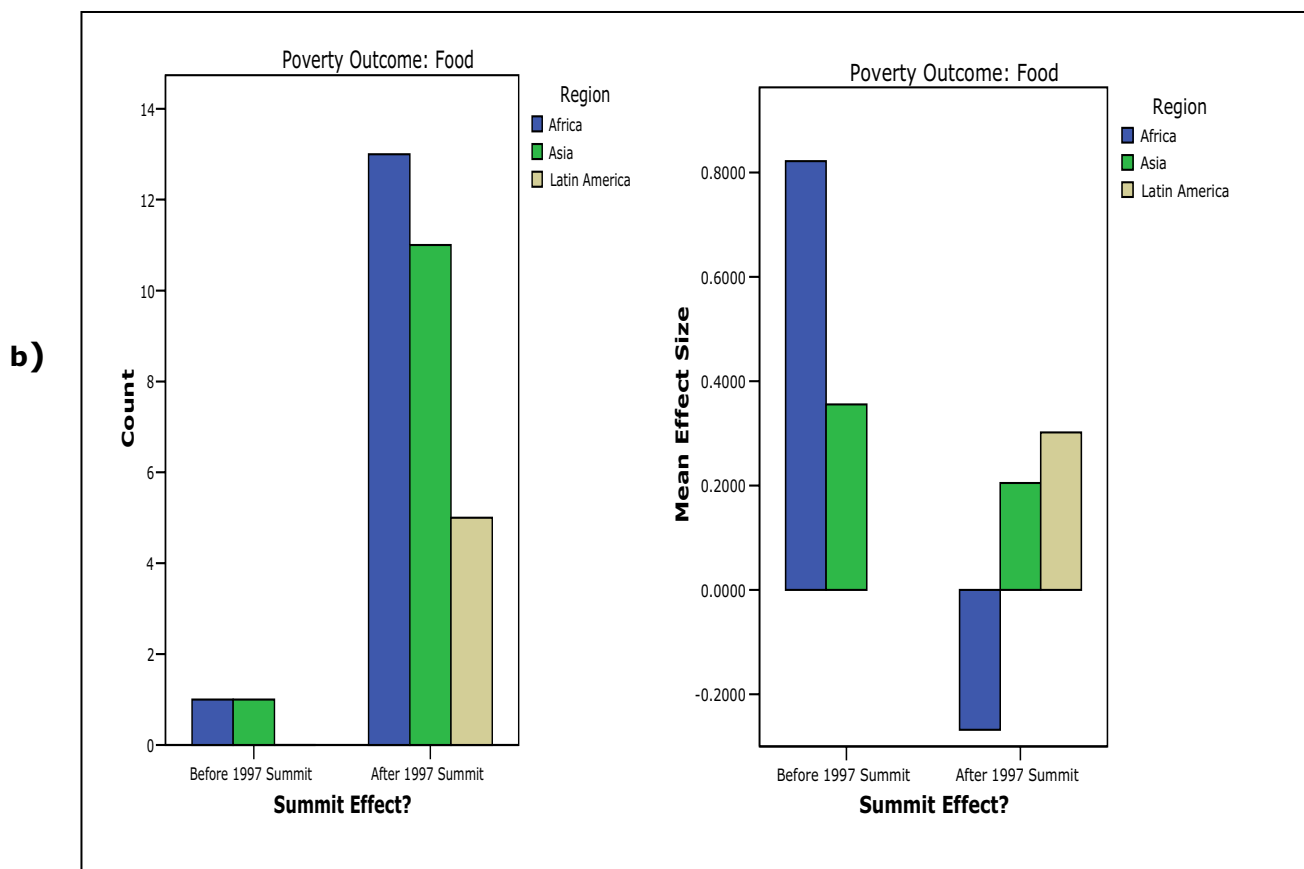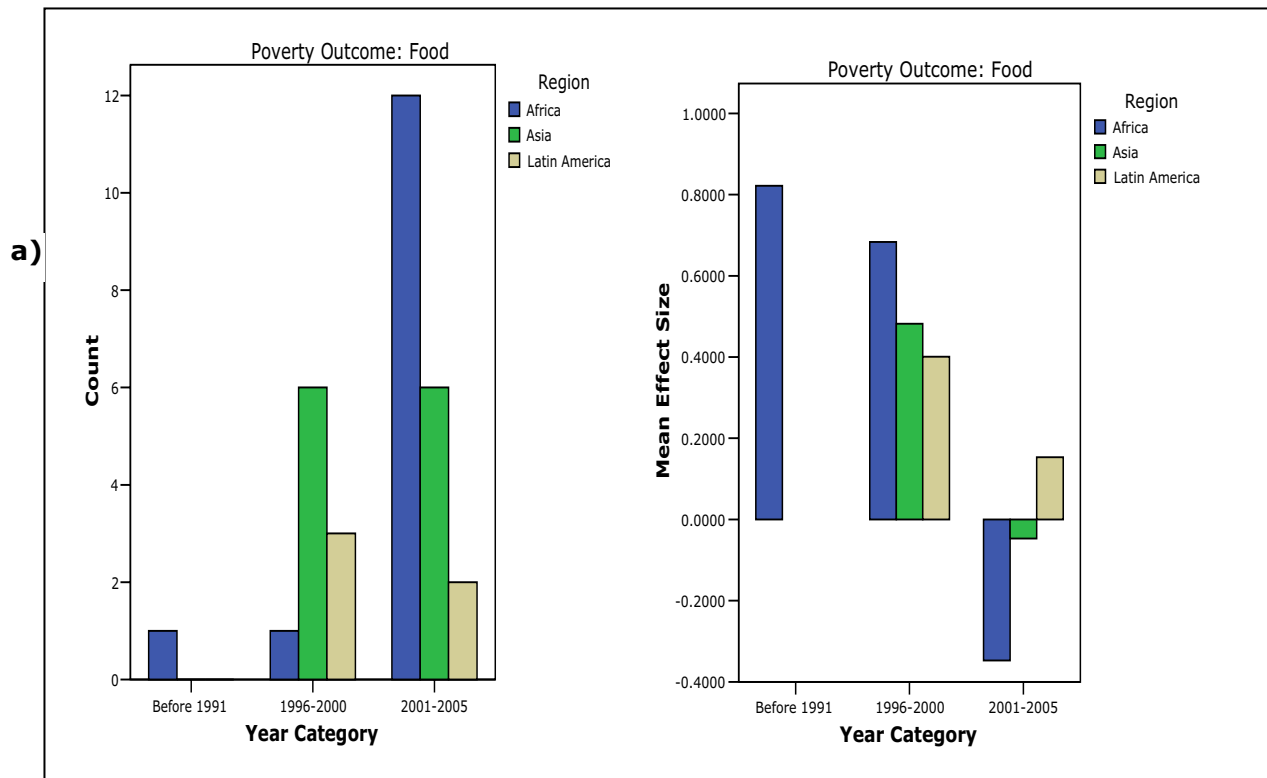
Source: Author's meta-data

When we consider the possible influence of organizational design/type of a microfinance institution on its impact, government programmes tend to experience negative impact on their clients more than non-state providers. The coefficient is not only negative, but also large and significant at the 5% level. Figure 11 is a bar chart of regional mean effects of microfinance on food security clustered by type of organization.

Figure 11: Mean Effects of Microfinance on Food Security by Type of Organisation and Region
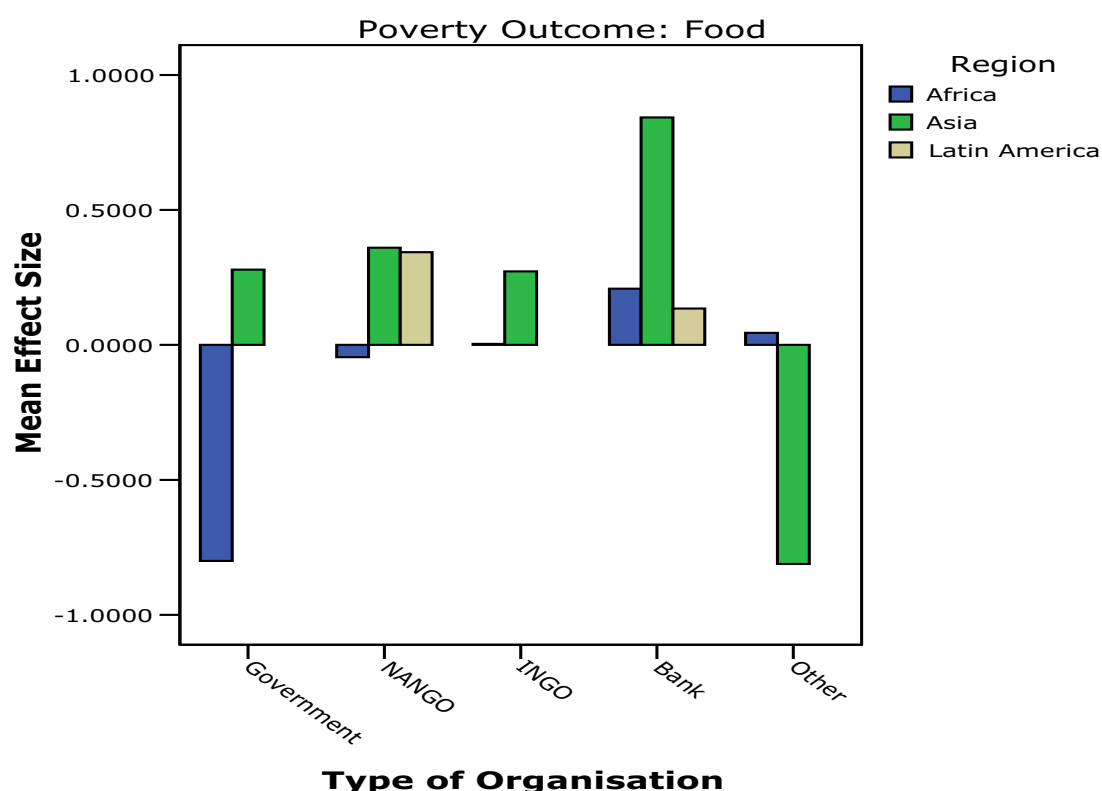
Source: Author's meta-data

From this chart, it appears that only Bank institutions and international non-governmental organizations (INGOs) have not been reported to produce any negative effects on the food security of their clients. Clients of government institutions in Africa, on the contrary, report serious worsening of their food situation. Clients of national nongovernmental organizations (NANGOs) also do report a slight

relative worsening of their food situation. Perhaps more empirical evidence should be sought in these areas to identify the 'real' underlying linkages.

With regards to the type of *technology* for loan delivery to the poor, we examine the coefficient for individual loans (Loan1) which was hypothesized to carry a negative sign since group dynamics among loan recipients is believed to help improve impact, or repayment performance at least. And indeed our model reports a negative coefficient for individual loans (after accounting for rural Asia), albeit non-significant. In Asia and Latin America, Group or 'mixed' loans seem to perform better there than in Africa. In fact, while no loan technology seems to be associated with positive impact in Africa, group loanees are relatively worse off than their non-client counterparts. This calls for some caution in the adoption/replication of "best practice" recommendations across regions.

Figure 12: Impact of Microfinance on Food Security by Loan Type and Region
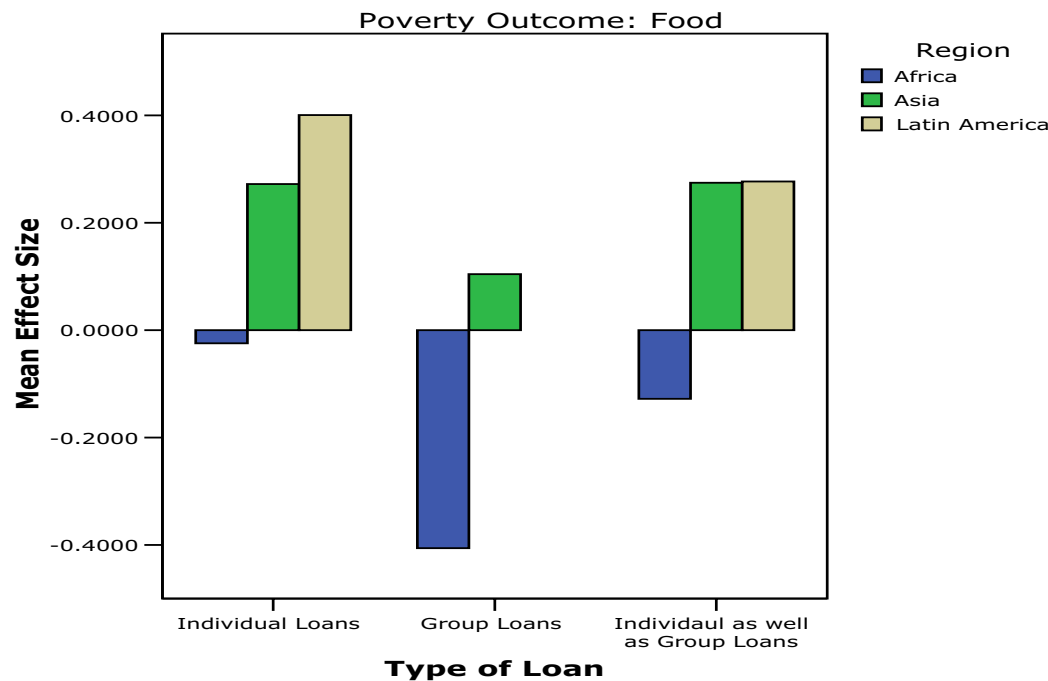
Source: Author's meta-data

7.2.2 Microfinance Impact on Client Incomes

Another pathway through which microfinance is expected to reduce poverty is by raising the (disposable) income of clients. This in turn helps to protect current consumption and/or generate more income to meet food and other welfare needs. The results in Table 8 show that our model performs relatively poorly, explaining only 24% of the variability between the income effect sizes.

Table 8:The Impact of Microfinance on Client Income

```
 *****   Inverse Variance Weighted Regression  *****

 *****   Random Intercept, Fixed Slopes Model  *****

------- Descriptives -------
     Mean ES     R-Square          N
      .4398        .2368      46.0000

------- Homogeneity Analysis -------
                  Q           df            p
Model        13.5261       9.0000       .1402
Residual     43.5997      36.0000       .1796
Total        57.1258      45.0000       .1061

------- Regression Coefficients -------
              B       SE   -95% CI   +95% CI         Z         P      Beta
Constant  3.4097  37.3717 -69.8388  76.6581     .0912     .9273     .0000
RuralAsi  -.2940    .1514   -.5907     .0027   -1.9420     .0521    -.2816
Savings   -.0722    .1551   -.3763     .2318    -.4656     .6415    -.0698
NonFin     .2644    .1536   -.0367     .5654    1.7211     .0852     .2381
RepayCat   .2376    .1517   -.0598     .5349    1.5659     .1174     .2275
Probit     .0314    .1611   -.2843     .3471     .1948     .8455     .0268
Gov       -.2716    .1887   -.6414     .0981   -1.4398     .1499    -.2022
PeerRev    .1825    .1707   -.1519     .5170    1.0697     .2848     .1559
YearPub   -.0015    .0187   -.0381     .0352    -.0790     .9371    -.0123
Loan1     -.1238    .1572   -.4319     .1842    -.7880     .4307    -.1193

------- Restricted Maximum Likelihood Random Effects Variance Component -
v     =   .18183
se(v) =   .04390
```

Source: Author's analysis

However, there is a surprising negative correlation between the size of income impact and the location of microfinance clients in rural Asia compared to either urban Asia or elsewhere in Africa or Latin America. The provision of non-financial services alongside microcredit continues,

as expected, to be positively associated with the impact of credit on poverty (outcomes). This is so regardless of whether a fixed or a random effects model is used.

We compared mean effects of microfinance on income over the twenty-year span of our data, and found no clear association between impact on income and the year of publication or our dummy for the microcredit campaign summit. We also do not find any clear patterns between microfinance impact on income and the nature of the evaluation. We note however that the mean effect on income under each evaluation type is positive for all regions, but especially for the independent assessments undertaken in Lain America (see Figure 13).

Figure 13: Microfinance Effects on Income by Nature of Evaluation and Region
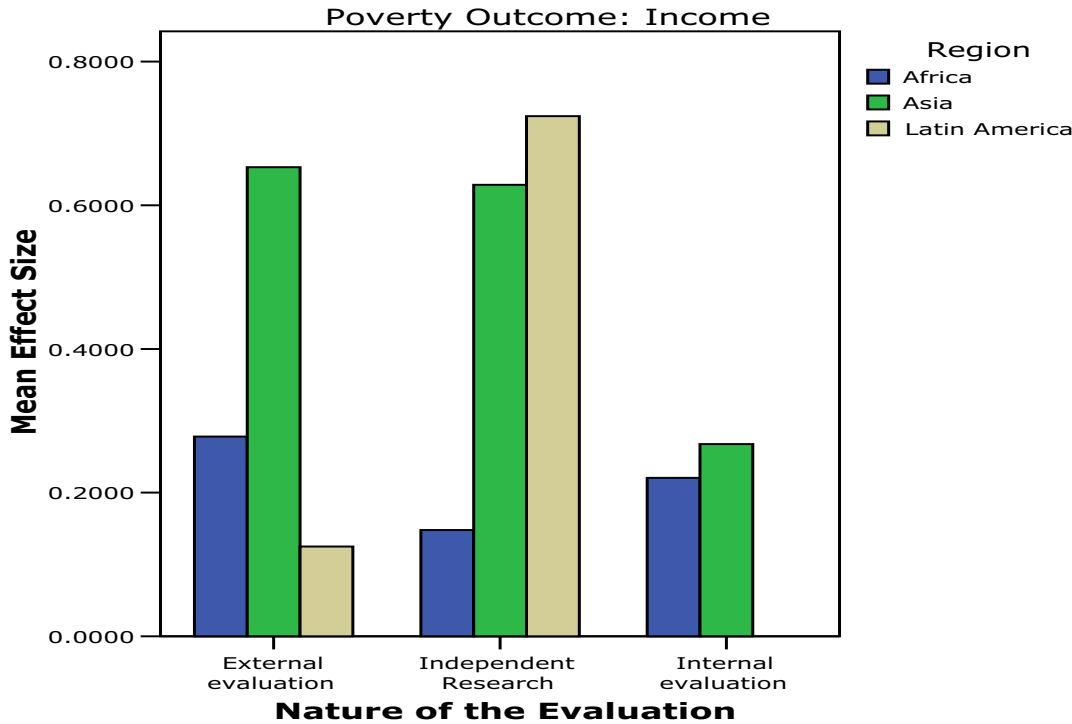
Source: Author's meta-data

But once again we do observe a negative impact of microfinance on client income in government-run programmes in Africa, albeit only slight. This is shown in Figure 14.

Figure 14: Microfinance Effects on Income by Type of Organisation and Region
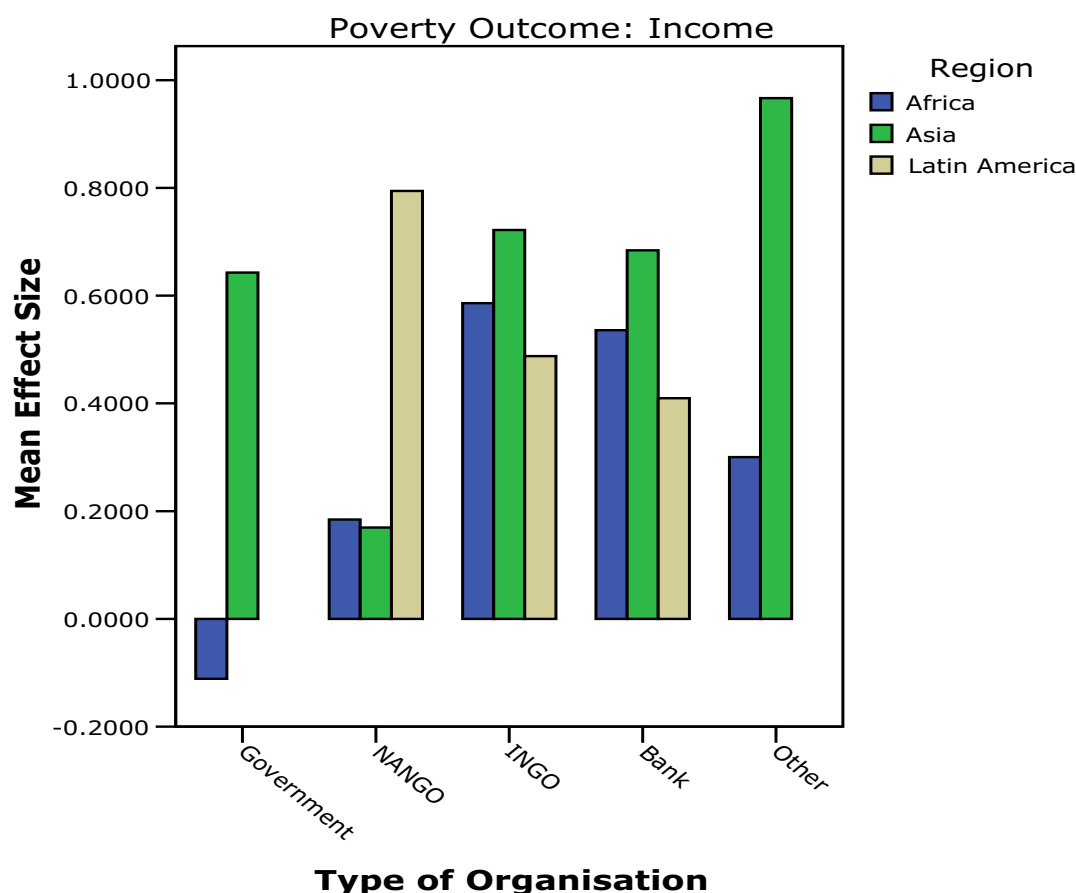
Source: Author's meta-data

7.2.3 The Impact of Microfinance on General Wellbeing

General wellbeing is conceptually perhaps the best proxy for poverty. From a measurement perspective, however, the estimation of changes in wellbeing poses serious challenges. In the case of the assessment studies in our dataset, wellbeing was measured in terms of the personal subjective opinion of the respondents. The proportion of clients who rated themselves as being better off or not worse off over a stated period was contrasted with that of non-clients in the same period. In this way the odds of success among microfinance clients was theoretically expected to be better than that of non-clients. To make the point clearer we reconvert the grand mean difference in wellbeing of

0.44 (see Table 9) back to the odds ratio using formula number 4 included in Table 2 of chapter 5. That is:

$$ES_{or} = e^{(\frac{\pi ES_{sm}}{\sqrt{3}})}$$, where, ES_{or} is the odds ratio and ES_{sm} the standardised mean difference effect size; e and π are constants equal to 2.718 and 3.142 respectively. This yields an odds ratio of 2.2, meaning that the odds of a successful (wellbeing) outcome are 2.2 times greater for the treatment group than for the control group.

Table 9: The Impact of Microfinance on General Wellbeing

```
 *****   Inverse Variance Weighted Regression   *****

 *****   Random Intercept, Fixed Slopes Model   *****

------- Descriptives -------
    Mean ES     R-Square               N
      .4345        .6816        23.0000

------- Homogeneity Analysis -------
                Q            df               p
Model        28.1319        9.0000         .0009
Residual     13.1435       13.0000         .4368
Total        41.2754       22.0000         .0076

------- Regression Coefficients -------
             B       SE   -95% CI  +95% CI         Z         P      Beta
Constant -178.445  69.4903 -314.646 -42.2439  -2.5679    .0102     .0000
RuralAsi    .8055    .2614    .2931   1.3180   3.0811    .0021     .5774
Savings     .1622    .3646   -.5525    .8769    .4448    .6565     .1168
NonFin     -.4776    .3865  -1.2351    .2798  -1.2359    .2165    -.3066
RepayCat    .3572    .3999   -.4266   1.1410    .8932    .3717     .2469
Probit     1.2695    .4145    .4570   2.0820   3.0625    .0022     .6321
Gov         .7931    .3630    .0817   1.5045   2.1851    .0289     .4736
PeerRev     .1601    .5061   -.8318   1.1521    .3164    .7517     .0887
YearPub     .0884    .0346    .0207    .1562   2.5578    .0105     .6143
Loan1      1.1591    .3595    .4544   1.8637   3.2241    .0013     .7599

------- Restricted Maximum Likelihood Random Effects Variance Component -
------
v      =    .24736
se(v)  =    .07814
```

Source: Author's analysis

The mixed effects model fits our 'wellbeing data' quite well, with an R-square of 0.68. The impact of microfinance is now positively correlated with the location of clients in rural Asia, and the provision of non-financial services now takes a negative sign, though the coefficient is not significant. The variables for government, year of publication and individual loan technology carry significant positive coefficients.

Like the income data, the wellbeing data did not exhibit any clear patterns on the association between microfinance impact on client's wellbeing and the reporting periods. However, when the mean effects are computed for each evaluation regime, the external evaluation cluster shows a relatively high and positive impact on wellbeing, especially in Asia.

With respect to wellbeing, all organisations are associated with a positive impact, except for international nongovernmental organisations (INGOs), as shown in Figure 15. Could it be that INGOs tend to put more emphasis on food and income which are perhaps easier to quantify? Or do they tend to ignore the 'soft' aspects of welfare so that clients' own self assessment comprise a 'protest' element? This too might require further investigation to get down to the roots of what might be a real or perhaps induced problem of incompatibility.

Many group loan recipients also reported a relatively high negative mean impact of microfinance on their general wellbeing, particularly in Africa. This might be pointing to real challenges with the (sometimes externally-initiated) group formations and activities of group-based microfinance interventions. We show this relationship in figure Figure 16.

Figure 15:   Microfinance Impact on Wellbeing by
Type of Organisation and Region
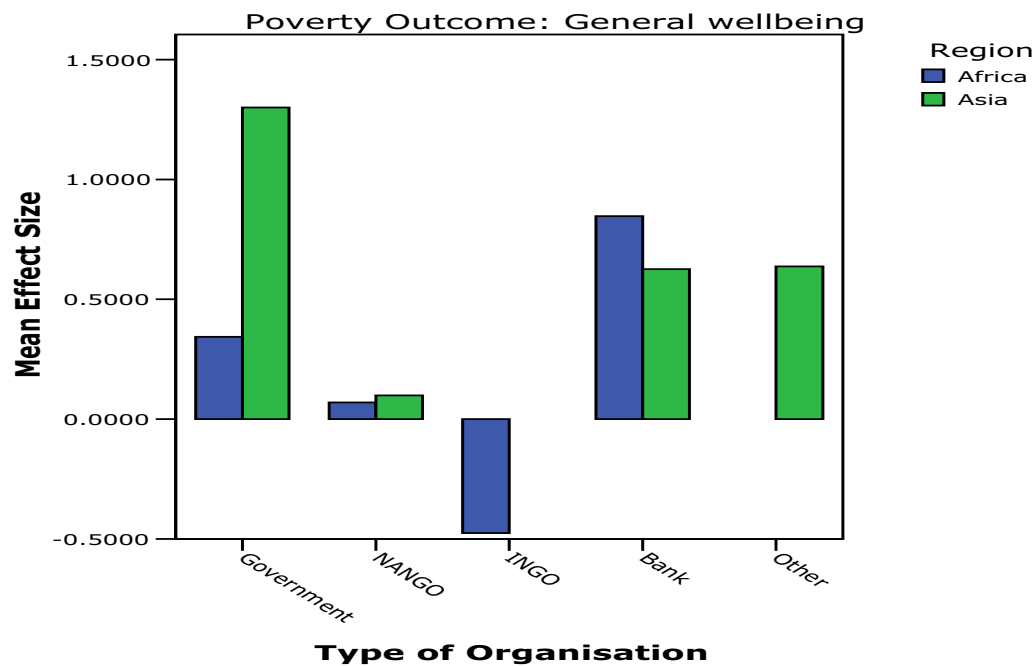
Source: Author's meta-data

Figure 16: Microfinance Effects on Wellbeing by Loan Type and Region
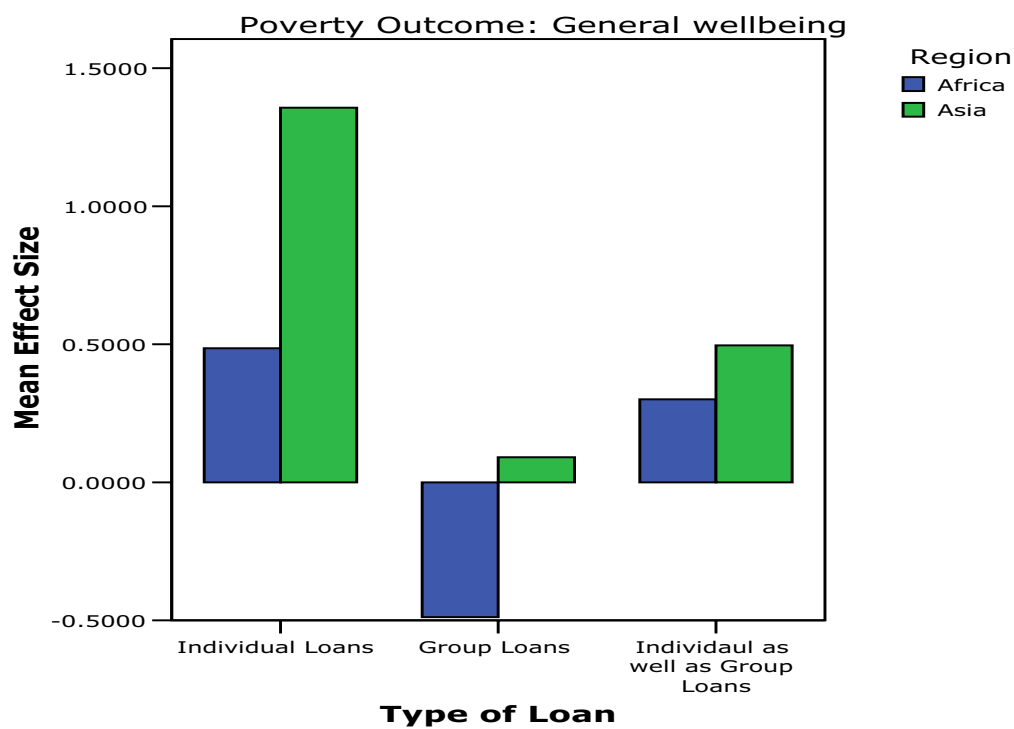
Source: Author's meta-data

On the whole, our weighted multiple regressions point to a positive impact of microfinance on poverty, particularly on wellbeing and, to a lesser extent, on income security. We also identify a mean negative impact of microfinance on food security; especially in Africa. It is however unclear to what extent this reflects substantive programme or client related factors.

This research intended to use information on absolute loan sizes, average loan sizes as a share of GNP, size of loan portfolio, socio-economic characteristics of clients, and several other moderators hypothesized to be substantively related to programme impact. Unfortunately, much of such information was either unreported, incomplete or not in a manner judged suitable for coding.

This *information deficit* might well be representative of the microfinance literature and, if so, is an image that calls for urgent improvement, perhaps through the establishment of minimum reporting standards for all impact evaluations or assessments of microfinance programmes worldwide. This, we believe, will pave the way for a new wave of (meta-analytical) research to help throw light on the many policy questions looming over the effectiveness of microfinance in alleviating poverty, and perhaps other domains of development.

This brings us to the point where we will now like to summarize this research, highlight what we consider as main findings, conclusions and their likely policy implications. This is we do in the next chapter.

8 SUMMARY AND CONCLUSIONS

8.1 SUMMARY OF THE THESIS

The purpose of this research was to examine available evidence on the impact of microfinance on poverty in developing countries. Against the backdrop of claims and counter claims about the effectiveness of microfinance programmes and the challenge this spells for researchers, policy makers and practitioners, the research focused on finding answers to the following key questions:

1) What is the impact of microfinance interventions as reported in the empirical literature so far? Does access to credit lead to reduced poverty (higher incomes, increased food security, and/improved general wellbeing)? Is the calculation of an 'average effect' or the portrayal of an 'overall picture' desirable and feasible?

2) Under what conditions can a microfinance intervention be particularly (in)effective?

3) Are there substantive differences in the reported impacts of microfinance across studies? If so, which factors might be responsible for such differences?

The thesis argues that current reviews of the literature on microfinance impacts have critical deficits that may limit their usefulness for objective decision making. Apart form the 'expert aura' that surrounds a number of the available reviews, it is difficult to say how much they have contributed to informed policy choices on microfinance in relation to other pro-poor poverty reduction strategies. This is largely because only a limited use is made, in our view, of the available quantitative results to augment the qualitative narratives presented.

Throughout the thesis, we recognise the fact that microfinance has undergone a major shift in paradigm, judging from its most recent history. The provision of agricultural credit has now become peripheral in the new dispensation of credit, and indeed, it is quite common to find microfinance programmes that even shy away, perhaps justifiably so, from providing targeted farm credit. Today's microfinance, as the name implies, is broadly defined and is being actively promoted as a poverty eradication/alleviation tool that can be used to fight almost every poverty (related) menace ranging from women's empowerment to HIV-AIDS, education, income generation, food security and to almost any set of development goals, including the current millennium development targets. What results has such an unprecedented 'microfinance' movement produced?

In chapters two and three of the thesis, we reviewed the policy context of microfinance with respect to other poverty reduction strategies – especially safety nets and social intermediation - and the broader role of finance in development, via the farm as well as the non-farm sectors of developing country economies. We examined what is meant by *promotive*, *preventive*, *protective* and *transformative* policy instruments, and highlighted the potential of microfinance to fulfil any of these four policy functions. We drew attention to the fact that a functioning policy framework is dynamic, and that any policy strategies therefore need regular assessments in order to determine their efficacy and/or efficiency.

Such assessments have been done, and are being done, with microfinance interventions worldwide. Some theoretical foundations or approaches to the assessment of microfinance impacts were reviewed in chapter four. There, it was argued that although notable attempts have been made to review the ever-growing number of primary (field level) assessment reports on the effects of microfinance on the poor, there remains the need to look beyond anecdotal evidence.

We proposed that the method of *meta-analysis*, which is already widely used in synthesising (often conflicting) evidence in such scientific disciplines as clinical medicine and educational psychology, and to a limited extent in economics, could be applied to the field of microfinance. Following the general principles and procedures in contemporary meta-analysis – the main ones of which are discussed in chapter five of the thesis – this work develops a meta-analytical framework and applies it to review nearly 100 microfinance impact assessments from 30 developing countries reported over the twenty-year period from 1985 to 2005.

In particular, a unique coding scheme was developed and used to extract various kinds of information (qualitative as well as qualitative) from each assessment study that reported results on the impact of microcredit on the poor, and with respect to at least one of three poverty outcome constructs – food security, income changes and general wellbeing. The systematic process and criteria implemented to collect the relevant data (studies) are documented in Chapter six. In order to facilitate quantitative analysis of the empirical evidence, a summary index of impact, called the standardized mean difference, was calculated for each study and then synthesized or *meta-analysed*. We used modified weighted multiple regression models in SPSS, with the help of suitable macros (command syntax) originally written by Wilson (1999).

The empirical analyses and results of this research are provided in chapter seven. But the main finding of our meta-analysis is that microfinance has a mild positive impact on the welfare of its clients. The impact is more pronounced in Asia and Latin America whose overall poverty impacts were over four times that of Africa. In particular, a positive impact was observed on income as well as on general wellbeing. But not so with food security; instead many microfinance clients in Africa, for instance, suffered from food insecurity more than their nonclient 'neighbours'. The size of impact seems to be influenced by (or is at least correlated with) the type

of microfinance organization, the effects of certain global initiatives, and the type of loan delivery technology, and whether or not savings and/or non-financial services are provided together with the credit. While there were fewer state run microfinance programmes, their clients seemed particularly more likely to report negative impacts than clients of non-governmental organisations or banks.

8.2 Conclusions and Policy Implications

After an extensive search of the literature on the impact of microfinance on the livelihoods of the poor in developing countries, we created a dataset spanning two decades – 1985 to 2005. We believe that our data set is quite representative of the wide variety of impact assessments or evaluations, which often make conflicting claims about the efficacy of microfinance. From this thesis, the following conclusions and policy implications can be drawn:

First, the large occurrence of missing or incomplete information in the microfinance impact literature, points to a need for minimum standards. We gathered hundreds of various *impact* studies that had to be discarded either partly or completely due to incomplete or unavailable information. For example, it is unacceptable that an assessment report would be written (not necessarily for publication) without an author's name, date or even such important programme related information as the number of and type of borrowers, the average loan size, etc. The establishment of minimum reporting standards (as obtains in some disciplines) will not only facilitate the communication of primary impact evidence, but will facilitate the systematic review of such evidence to help form the basis for solid future policy formulation.

There are differential impacts of microfinance on its clients associated with the type of implementing agency or institution. It has long been known that governments may not be particularly suited for implementing microfinance projects. This research provides yet additional evidence of

this[74]. Government run programmes in Africa especially have clients who do not experience any positive change in their food security even after receiving microcredit from their governments. This is not saying there are no good government run programmes; just that others (for example national non-governmental organisations (NANGOs) and Banks) might be better suited to do the job. On the other hand, clients of international non-governmental organisations (INGOs) reported negative impacts on general wellbeing. Even if this was just a subjective perception of the clients, INGOs, and indeed other organisations, might find it useful to recognise that the poverty of clients extends beyond food and/or income alone.

The increase in the number assessments conducted by independent researches over the years is a welcome development. The positive correlation between independent evaluations and negative impact demonstrates, in our opinion, that independent evaluators/researchers are probably more able to identify, and obviously more willing to report, negative results when found than perhaps other kinds of evaluators. Of course, if external support for a microfinance project will depend on the results of an internal assessor, could it be that he or she might consider it justifiable to report 'strategically'?

Finally, we note that the four highest numbers of assessments were conducted in Bangladesh, India, Malawi and Bolivia. If the large and long embracement that microfinance is receiving from important global institutions such as the World Bank, UN and the European Union (and indeed many others) has been based on evidence from these 'flagship' countries, now is perhaps the time for such global institutions to support a broader search for more evidence in other parts of the developing world. Our research identified a mild positive impact of microfinance relative to

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[74] See Altenburg and Drachenfels (2006) for a recent discussion of this and what they describe as the „New Minimalist Approach" to public interventions.

nonclients. That microfinance clients are on average better off than nonclients by only 0.3 standard deviation units on whichever measure or scale is chosen, smacks of an indictment on the worldwide microfinance movement. Why does political rhetoric seem to be far ahead of actual impact? If the poor repayment performance between the mid 1990s to now is a reflection of reduced net benefits to clients, it seems worrying that these coincided with important global initiatives, including the First UN Decade for the Eradication of Poverty (1997-2006), the Microcredit Campaign summit held in early 1997, the declaration of 2005 as the International Year of Microcredit, and several other initiatives. Could it be that the first and advocated effect of such initiatives was increased flow of microcredit funds to the developing countries? If so, did the resulting (supply-led) cash flow really translate into positive impacts on the poor clients? If so, then why do we continue to observe poor repayment performance[75] and concomitant negative impacts in the nearly ten-year period since 1997?

8.3 ISSUES FOR FURTHER RESEARCH

This thesis has already raised a number of questions. Despite the effort made to conduct an extensive (and exhaustive search of the microfinance impact literature), there might be many other reports which the researcher was not able to access and retrieve due to resource and some other constraints. One logical continuation of this research will be to investigate the characteristics and conditions of 'good' and 'poor' microfinance performers based on our results form each of the three continents covered.

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[75] Abbink et al. (2006), did some game experiments and one of their collusions was that low repayment rates may be as a result of "shirking" among groups who receive high interest-bearing loans.

Another possible future development will be to establish a globally accessible database of impact studies. Many such documents are already available on different institutional websites (such as the Microfinance Gateway, CGAP, AIMS, Imp-Act, etc.). A special system would need to be designed on which information extracted from these and future studies can be coded directly, either by an interested reviewer or by the author of the report him/herself. In this way, impact related information could be analysed quite easily to help keep the count and 'scores' on microfinance impact worldwide.

At a primary research level, issues relating to the size of microfinance impact and the organizations or clients that report them should be better documented, especially with a view to facilitating future (meta-) analyses. The differential impacts of microfinance institutions with respect to different poverty outcomes might be an issue for further research. Are particular organisations suited to creating more impact on a particular poverty outcome than others?

Well, whatever research agenda emerges, we hope that this research represents just the beginning of, and perhaps a pointer to, some important policy issues and questions that could not have been raised without a *Meta-analysis* of this kind.

9 APPENDICES

A. A Codebook for the Meta-analysis of Microfinance Against Poverty

B. List of Studies Sorted By Magnitude of Effects Size

C. Alternative Model Results for the Impact of Microfinance On Three Poverty Outcomes

A Data Extraction Form
for the Meta-analysis of
Microfinance Against Poverty (MAP)

The MAP database is part of a research aimed at reviewing the empirical evidence on the poverty impact of microfinance interventions in developing countries. Please use this data extraction form/mask to record the findings and other information reported in each primary impact assessment/evaluation. Key study selection criteria and extendend analytical details are specified in a separate codebook.

Throughout the MAP rersearch/database a study is defined as a set of data collected under a single research plan from a **specified sample** of subjects from a **microfinance institution or programme in a given country**. This implies that a single report/document might present the results from one or more studies. Similarly a single study might report results on multiple outcomes or impact domains. Even further, the data for one outcome may be in multiple formats from which one or more effect sizes can be computed.

Page margins and/or other spaces may be used to note any additional information, including hints, modifications, assumptions, and page references from where the relevant data were extracted.

STUDY ID	
STUDY NAME	
Coding Time (Mins.)	
Coder's Full Name	

Date	Signature

MAP --- Study Descriptors - Document

Document Number [ ] Automatic Value

Folder Number [ ] The reference number of the folder in which a hard copy of the document is filed.

MAP Number [ ] Microfinance Against Poverty (MAP) Number: Number assigned to the document during search/retrieval process.

Document Title [ ]
[ ]

Document Type
- [ ] Journal article   **Other:** [ ]
- [ ] Book/book chapter
- [ ] Thesis/dissertation
- [ ] Technical/conference report
- [ ] Discussion/working paper

Document Search
- [ ] Online database   Search method used to locate the document. (Select one.)
- [ ] Manual search
- [ ] Invisible college (other experts/practitioners)

Document Source Name of search engine, database or other document through/from which the document was identified and/or retrieved:
[ ]

Last Name Author 1 [ ]   **Total Number of Authors** [ ]

Last Name Author 2 [ ]   only if number of authors = 2.

Editor [ ] Author 1 served as editor of this document.

Year of Publication [ ] Year in which the document was published or released

Number of Progr. [ ] The total number of different microfinance programmes the document reports on.

Number of Countries [ ] Total number of countries whose microfinance programmes are assessed in the report.

Name of Country 1 [ ] Name of the (first) country on the document.

Develop [ ] At least one of the evaluated programmes located in developing country.

Impact [ ] Document includes results about the impact/effects/role of an intervention or programme or proj

Credit [ ] The results specifically relate to the impact of microcredit (on the poor).

Control [ ] The study uses a control/comparison group.

Include [ ] The document is suitable for the desired meta-analysis.

Reason If the document is not suitable for the desired meta-analysis, please state main reason(s):
[ ]

Status
- [ ] Yet to be retrieved   Which best describes the status of the document (Select one).
- [ ] Being coded
- [ ] Coding completed
- [ ] Coding terminated; document 'excluded' from the meta analysis

Notes

MAP --- Study Descriptors - Study

Document Number [_____] *Automatic Value*

Study Number [_____] **Study ID** [_____] *Automatic Values*

Number of Outcomes [_____] Total number of outcomes (whether relevant to this meta-analysis or not) included/reported in the study results. Count all food related (sub) outcomes as one category; all income related (sub) outcomes as another; general-well-being responses as another, and count any others in their own appropriate grouping(s).

Relevant Outcomes [_____] Relevant outcome(s). Of all the outcomes reported (OutcomeN), how many are relevant to this meta-analysis? That is, impacts on food, income and general well-being.

Study Title Full title of the study which may or may not be the same as the document title.

[_____]
[_____]

Year of Release [_____] Year of release or publication of the study/document

Country [_____] The name of the country in which the particular microfinance programme for this study is located

Region To which region does the study level country belong? Select one.

☐ Africa **Other:** [_____]

☐ Asia

☐ Latin America & Carribean

Release Platform The name of the medium or platform on which the particular document was released /published. It can be the name of a journal, publisher, university department, research institution or a development organization:

[_____]

Reference Particulars [_____] Reference Particulars of the release platform and document. For a journal,it should be the volume number,issue number and page numb.

Study Size [_____] The total number of pages of the study.

Year Data [_____] Year in which the study data was collected.

Duration [_____] How long did the study data collection last (in days).

Last Name Author 1 [_____] **Total Number of Authors** [_____]

Last Name Author 2 [_____] only if Number of authors = 2.

First Author´s Gender ○ Male ○ Female

Educational Level ☐ Doctoral or higher What is the highest degree level attained by the (first) author? Select one.

☐ Master´s

☐ Bachelor´s

☐ Not availabel/don´t know

Educational Area Subject area in which the (first) author is trained or specializes. Select one.

☐ (Agricultural/Development) Economics **Other:** [_____]

☐ Development studies/Antropology or similar

☐ History, languages or similar

Institutional Affiliation With which type of institution is the (first) author affiliated/employed? Select one

☐ Academic (university, research) **Other:** [_____]

☐ Non-Govermental Organisation

☐ Private (e.g. consultancy)

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MAP --- Study Descriptors - Method

General Approach
- ☐ Qualitativ
- ☐ Quantitativ
- ☐ Mixed

General approach that best describes the methodology employed in the study. Select one.

Design
- ☐ Reflexive (Before-After/Pre-Post)
- ☐ First Difference (With-Without)
- ☐ Matching (e.g. Propensity scores)
- ☐ Double Difference
- ☐ Randomisation/Experimental

Which design best describes the research (based on kind or construction of comparison group) employed in the study)? Select one.

Nature
- ☐ Internal evaluation
- ☐ External evaluation
- ☐ Independent Research

The nature of the study can best be described as. Select one.

Data Type
- ☐ Single panel (1 group; 2 times)
- ☐ Cross-sectional (2 groups; 1 time)
- ☐ Double panel (2 groups; 2 times)

Which best describes the type/kind of data collected/ used in the assessment of the microfinance programme? Select one.

Treated Group [ ]

Number of subjects in the treated group sample (borrowers/clients).

Control Group [ ]

Number of subjects in the control/comparison group sample (non-borrowers/nonclients).

MAP --- Programme Characteristics (1)

Programme Name

Name of the programme evaluated/assessed in the study:

[ ]

MFO Name

Name of the microfinance organization/institution/ministry/department that operates/implements the particular programme which was evaluated/assessed:

[ ]

MFO Type

Which of the following best describes the type of microfinance organization? Select one.

- ☐ Government   **Other:** [ ]
- ☐ National NGO
- ☐ International NGO
- ☐ Bank

MFO Year [ ]

Year in which the microfinance organization or institution was established in the country.

Programme Year [ ]

Year in which the microfinance programme/project was started.

Main Funding Source
- ☐ Domestic
- ☐ Foreign/International

Select one.

Currency [ ]

Currency unit of the country in which the programme is located.

Ex Rate [ ]

How many local currency units are equivalent to 1US$ using **Year Data** as reference period?

Capita GNI in $ [ ]

Per capita gross national income in US dollars at reference year.

Total Population [ ]

Total population of the country at reference year.

Poor Number [ ]

Total number of the population considered poor at reference year by international standards.

MAP --- Programme Characteristics (2)

Volume [   ] Total amount of loan outstanding (in US$) at reference date. This should be the size of the loan portfolio at that point in time.

Loan Type
- ☐ Individual loans
- ☐ Group loans
- ☐ Individual as well as group loans

Type of loan product administered in the programme. Select one.

Savings ☐ The programme offers a savings and/or deposit facility.

Insure ☐ The progr. offers an insurance facility or service (apart from a loan insurance fund/savings).

Non-financial ☐ The programme includes/offers non-financial services.

Loan Size [   ] What is the average amount (in local currency units) lent to clients/borrowers?

Loan Reach [   ] Total/cumulative number of clients served by the programme since its inception.

Breadth [   ] Total number of active (loan) clients at the time of the survey/study.

Depth [   ] Proportion of active clients who are female.

Cycle [   ] Loan period in weeks from receipt to stipulated final repayment date (loan term).

Interval [   ] Number of weeks between one repayment and the next installment.

Interest [   ] Percent (annual) interest charged per loan.

Interest Type How is interest amount calculated?
[   ]

Repay [   ] Repayment rate on average.

Client Age [   ] Mean age of clients in the programme/treatment group.

Living Environment
- ☐ Rural
- ☐ Urban
- ☐ Peri-Urban

Which of these best describes the environment where the programme clients live? Select one.

Poverty Level How are the programme clients/target described in the study? Select one.
- ☐ Very/ultra poor
- ☐ Poor
- ☐ Non-poor

Other: [   ]

Activity What is the main economic (or loan-assisted) activity of the programme clients (borrowers)?
[   ]

Page2 [   ] Specify the page numbers where most of the information about the microfinance programme was found.

MAP --- Outcome

Study Number [   ]   Automatic Value

Outcome Number [   ]   **Out ID** [   ]   Automatic Values

Outcome Name

Name of the relevant outcome for which the required data are reported:

☐ Food

☐ Income

☐ General well-being

Other: [   ]

Use and attach additional pages (6-9) for each new study outcome!

Measure

How was the outcome variable measured in the study?

[   ]

Scale [   ]   Which scale/unit was used to measure the outcome variable?

Treated Group [   ]   Number of subjects in the treated group sample (borrowers/clients).   ☐ **Use values from Study for treated and control groups.**

Control Group [   ]   Number of subjects in the control/comparison group sample (non-borrowers/nonclients).

Page [   ]   Page reference/numbers of the study where outcome related information was found. Please list specific page numbers, separated by a comma.

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MAP --- Outcome - Means

Format ☐ Use the "Means" format!

Mean Type ☐ Means and standard deviations

Treatment Mean	[ ]	The mean of the treated group on the particular outcome variable.
Treatm. Stand. Dev.	[ ]	Standard deviation of the treated group.
Control Mean	[ ]	Mean of the control/comparison group on the outcome of interest.
Control Stand. Dev.	[ ]	Standard deviation of the control group.

Mean Type ☐ Means and t-values

Treatment Mean	[ ]	The mean of the treated group on the particular outcome variable.
Control Mean	[ ]	Mean of the control/comparison group on the outcome of interest.
T-Value	[ ]	The actual t-value of the significance test. Useful when standard deviations are not reported for each of the means.

Mean Type ☐ Mean gain scores

Treatment Mean	[ ]	The mean of the treated group on the particular outcome variable.
Treatm. Stand. Dev.	[ ]	Standard deviation of the treated group.
Control Mean	[ ]	Mean of the control/comparison group on the outcome of interest.
Control Stand. Dev.	[ ]	Standard deviation of the control group.
Pre-Post Test Corr.	[ ]	Pre-post test correlation if means type is Mean Gain Scores.

Mean Type ☐ Regression Coefficient (unstandardized)

Coefficient	[ ]	Value of regression coefficient for group membership.
Full Stand. Dev.	[ ]	The Standard deviation for the total sample (treated + control)
or T-Value	[ ]	t-value for the regressor/variable (coefficient).

MAP --- Outcome - Proportions

Format   ☐ Use the "Proportions" format!

Treated	**Pass1**		Number of people with success1 (same + increase) in the treated group (borrowers).
	or Fail1		Number of people without success1 (with decrease or worse off; i.e. failure1) in the treated group.
	or Proportion1		The proportion people with success1 (same + increase) in the treatment group (borrowers). Express as a decimal, not percent.
Control	**Pass1**		Number of people with success1 (same + increase) within the control group (non-borrowers).
	or Fail1		Number of people without success1 within the control group.
	or Proportion1		The proportion of people with success1 in the control group (non-borrowers). Express as a decimal, not percent.

Treated	**Pass2**		Number of people with success2 (increase) in the treated group (borrowers).
	or Fail2		Number of people without success2 (same +decrease/worse off) in the treated group.
	or Proportion2		The proportion of people with success2 (increase) in the treatment group. Express as a decimal, not percent.
Control	**Pass2**		Number of people with success2 (increase) within the control group (non-borrowers).
	or Fail2		Number of people without success2 within the control group.
	or Proportion2		The proportion of people with success2 in the control group (non-borrowers). Express as a decimal, not percent.

MAP --- Outcome - Tests or Correlations

Format   ☐ Use the "Tests" format or the "Correlations" format!

⊩► **Use**   ○ Tests   **Choose one test effect size data (TESD 1 - 6)**

TESD 1   ☐ t without means (independent groups)

T-**Value** [   ]   The value corresponding to the test effect size data (t, p, F, or X²).

TESD 2   ☐ t-dep without means (dependent goup)

T-**Value** [   ]   The value corresponding to the test effect size data (t, p, F, or X²).

Number of Pairs [   ]   Number of pairs for the dependent t-test.

R-**Value** [   ]   Correlation for the paired values.

TESD 3   ☐ p only and df

P-**Value** [   ]   The value corresponding to the test effect size data (t, p, F, or X²).

Tail [   ]   For p-values, please indicate whether it is one or two tailed.

Df [   ]   Degree(s) of freedom for the relevant test statistic (p or X²).

TESD 4   ☐ Oneway F for K=2

F-Value [   ]   The value corresponding to the test effect size data (t, p, F, or X²).

TESD 5   ☐ Chisquare (X²) for df=1

X²-Value [   ]   The value corresponding to the test effect size data (t, p, F, or X²).

Df [   ]   Degree(s) of freedom for the relevant test statistic (p or X²).

TESD 6   ☐ p only for Chisquare df=1

P-**Value** [   ]   The value corresponding to the test effect size data (t, p, F, or X²).

Tail [   ]   For p-values, please indicate whether it is one or two tailed.

Direction   ☐ Expected direction (of change)   Direction indication of the test values. (Select one.)
☐ Unexpected or reverse direction
☐ Unknown

Sign [   ]   Please indicate whether the relationship/change value carries a positive or a negative sign.

⊩► **Use**   ○ Correlations

Correlation Effect Size [   ]   Point-biserial or phi coefficients being variants of product-moment correlation.

Sign [   ]   Please indicate whether the relationship/change value carries a positive or a negative sign.

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Appendix B: List of Studies Sorted by Their Effect Sizes

	Study Name	Effect	Country	EffectID	StudyID
1	Mosley, 1999d	3.3422	Bolivia	63	42
2	Hashemi, 2001	3.0008	Bangladesh	46	30
3	Khandker, 2001A	2.4259	Bangladesh	118	79
4	Hashemi, 2001	1.8343	Bangladesh	45	30
5	Mosley, 1996d	1.6912	Indonesia	132	90
6	Raju, 1992a	1.5734	India	97	65
7	Raju, 1992c	1.5334	India	101	67
8	Panjaitan-Drioadisuyo & Cloud, 1999	1.4507	Indonesia	57	37
9	Raju, 1992d	1.4388	India	103	68
10	Freeman et al., 1998b	1.4053	Kenya	8	7
11	Mosley, 1999c	1.3574	Bolivia	62	41
12	Mosley, 1999a	1.2715	Bolivia	60	39
13	Bandyopadhyay et al., 1985a	0.9749	India	109	72
14	Raju, 1992b	0.9497	India	100	66
15	Khandker, 2003C	0.9413	Bangladesh	93	62
16	Raju, 1992b	0.9171	India	99	66
17	Raju, 1992d	0.8918	India	104	68
18	Freeman et al., 1998a	0.8705	Ethiopia	7	6
19	Mosley, 1999b	0.8670	Bolivia	61	40
20	Matul, 2000a	0.8471	Benin	27	18
21	Salami, 1988	0.8216	Ghana	13	11
22	Matul, 2000a	0.8013	Benin	26	18
23	Warning & Key, 2002	0.7582	Senegal	10	9
24	Bunn, 2001	0.7526	Peru	107	70
25	Murthy et al., 2002B	0.7492	India	77	50
26	Hossain & Diaz, 1998	0.7219	Philippines	78	51
27	Montgomery et al., 1996b	0.7213	Bangladesh	135	93
28	Nichols, 2004	0.6894	China	44	29
29	MkNelly & Dunford, 1998B	0.6833	Ghana	83	54
30	Khandker et al., 1998b	0.6742	Bangladesh	2	2
31	Fernandez, 2002	0.6731	India	84	55
32	Khandker et al., 1998d	0.6651	Bangladesh	4	4
33	Edgcomb & Garber, 1998b	0.6538	Honduras	69	46
34	Raju, 1992a	0.6238	India	98	65
35	Mourji, 2000	0.6058	Morocco	47	31
36	Khandker et al., 1998a	0.6026	Bangladesh	1	1
37	Khandker et al., 1998c	0.5527	Bangladesh	3	3
38	Mosley, 1996a	0.5497	Bolivia	129	87
39	Mourji, 2000	0.5323	Morocco	48	31
40	Halder, 2001B	0.5067	Bangladesh	81	53
41	Puhazhendi & Badatya, 2002	0.4968	India	79	52
42	Hospes et al., 2002B	0.4631	Kenya	12	10
43	Bandyopadhyay et al., 1985b	0.4458	India	110	73
44	Buckley, 1996d	0.4427	Malawi	128	86
45	LAPO & Imp-Act, 2004	0.4412	Nigeria	43	28
46	DeLancey, 1988a	0.4399	Cameroon	53	34
47	Matul, 2000b	0.4355	Benin	29	19
48	Brown, 2002	0.4342	Tanzania	39	26
49	Edgcomb & Garber, 1998a	0.4297	Honduras	68	45
50	Montgomery et al., 1996a	0.4270	Bangladesh	134	92

	Study Name	Effect	Country	EffectID	StudyID
51	Aroca, 2002b	0.4171	Brazil	31	21
52	Matul, 2000b	0.4086	Benin	28	19
53	Edgcomb & Garber, 1998a	0.4008	Honduras	67	45
54	Murthy et al., 2002A	0.3900	India	76	50
55	Barnes & Keogh, 1999	0.3813	Zimbabwe	9	8
56	MkNelly & Dunford, 1998A	0.3718	Ghana	82	54
57	McNamara & Nga, 1998a	0.3595	Vietnam	89	60
58	Mustafa et al., 1996B	0.3556	Bangladesh	73	48
59	Barnes & Keogh, 1999	0.3448	Zimbabwe	108	71
60	Aroca, 2002a	0.3414	Brazil	30	20
61	Bayracharya et al., 1991A	0.3378	Nepal	123	81
62	Khandker, 2001B	0.3327	Bangladesh	119	79
63	Wydick, 2002	0.3271	Guatemala	66	44
64	Halder, 2001A	0.3202	Bangladesh	80	53
65	Zeller et al., 2001A	0.3045	Bangladesh	120	80
66	Muazzam Husain et al., 1998B	0.3044	Bangladesh	71	47
67	LAPO & Imp-Act, 2004	0.3005	Nigeria	42	28
68	Zeller et al., 2001B	0.2931	Bangladesh	121	80
69	Muazzam Husain et al., 1998A	0.2863	Bangladesh	70	47
70	Todd et al., 2000	0.2810	Philippines	50	33
71	Zeller et al., 2001C	0.2758	Bangladesh	122	80
72	Bajracharzya et al., 1991B	0.2693	Nepal	124	82
73	Buckley, 1996a	0.2660	Kenya	125	83
74	DeLancey, 1988b	0.2475	Cameroon	55	35
75	Dunn & Arbuckle Jr., 2001B	0.2453	Peru	65	43
76	Todd et al., 2000	0.2361	Philippines	51	33
77	Mosley, 1996e	0.2344	India	133	91
78	Rahman et al., 1996	0.2310	Bangladesh	94	63
79	Copestake et al., 2005b	0.2228	Peru	115	77
80	DeLancey, 1988c	0.2128	Cameroon	56	36
81	Morduch, 1998c	0.2095	Bangladesh	88	59
82	Es Global Consulting, 2003B	0.1959	Malawi	96	64
83	Morduch, 1998a	0.1956	Bangladesh	86	57
84	Coleman, 2002	0.1941	Thailand	37	25
85	Aroca, 2002c	0.1941	Chile	32	22
86	Quach et al., 2004	0.1919	Vietnam	34	24
87	McNamara & Nga, 1998b	0.1849	Vietnam	90	61
88	Mustafa et al., 1996A	0.1825	Bangladesh	72	48
89	Copestake et al., 2005a	0.1713	Peru	114	76
90	Copestake et al., 2000A	0.1695	Zambia	116	78
91	Quach et al., 2004	0.1681	Vietnam	35	24
92	Raju, 1992c	0.1677	India	102	67
93	Rahman & Yadav, 1990	0.1623	Malaysia	85	56
94	Doocy et al., 2004	0.1529	Ethiopia	41	27
95	Quach et al., 2004	0.1521	Vietnam	36	24
96	Khandker, 2003A	0.1493	Bangladesh	91	62
97	MkNelly & Dunford, 1999B	0.1477	Bolivia	59	38
98	Dunn & Arbuckle Jr., 2001A	0.1351	Peru	64	43
99	Zaman, 1999	0.1199	Bangladesh	75	49
100	Morduch, 1998b	0.0994	Bangladesh	87	58

	Study Name	Effect	Country	EffectID	StudyID
101	MkNelly & Dunford, 1999A	0.0884	Bolivia	58	38
102	Copestake et al., 1998A	0.0689	Zambia	5	5
103	Coleman, 2002	0.0646	Thailand	38	25
104	Khandker, 2003B	0.0419	Bangladesh	92	62
105	Lafontaine, 2001B	0.0039	Ivory Coast	113	75
106	Lafontaine, 2001A	0.0000	Ivory Coast	112	75
107	Diagne & Zeller, 2001d	-0.0021	Malawi	21	15
108	Buckley, 1996c	-0.0170	Malawi	127	85
109	ES Global Consulting, 2003A	-0.0188	Nigeria	105	69
110	Diagne & Zeller, 2001a	-0.0636	Malawi	14	12
111	Mosley, 1996c	-0.0900	Indonesia	131	89
112	DeLancey, 1988a	-0.0953	Cameroon	52	34
113	ES Global Consulting, 2003B	-0.1071	Nigeria	106	69
114	DeLancey, 1988b	-0.1091	Cameroon	54	35
115	Buckley, 1996b	-0.1133	Kenya	126	84
116	Mosley, 1996b	-0.1319	Indonesia	130	88
117	Galenson, 1998	-0.1432	Ecuador	49	32
118	Diagne & Zeller, 2001a	-0.2018	Malawi	15	12
119	Diagne & Zeller, 2001f	-0.2346	Malawi	25	17
120	Hospes et al., 2002A	-0.2501	Kenya	11	10
121	Diagne & Zeller, 2001b	-0.3516	Malawi	17	13
122	Diagne & Zeller, 2001e	-0.3700	Malawi	23	16
123	Aroca, 2002d	-0.4741	Chile	33	23
124	Diagne & Zeller, 2001c	-0.4752	Malawi	19	14
125	Copestake et al., 1998B	-0.4758	Zambia	6	5
126	Copestake et al., 2000B	-0.5009	Zambia	117	78
127	Mustafa et al., 1996C	-0.5020	Bangladesh	74	48
128	ES Global Consulting, 2003A	-0.5316	Malawi	95	64
129	Diagne & Zeller, 2001f	-0.6051	Malawi	24	17
130	Hulme et al., 1996	-0.6217	Sri Lanka	136	94
131	Diagne & Zeller, 2001d	-0.7347	Malawi	20	15
132	Diagne & Zeller, 2001e	-0.7846	Malawi	22	16
133	Diagne & Zeller, 2001c	-0.8104	Malawi	18	14
134	Brown, 2002	-0.8788	Tanzania	40	26
135	Diagne & Zeller, 2001b	-1.0006	Malawi	16	13
136	Kabeer & Noponen, 2005	-1.6652	India	111	74

Note:
In each case, the effect (size) is the standardised mean difference between microfinance clients and non-clients. Please refer to the main body of the dissertation for definitional issues and the particular poverty outcome measured.

Further details of the studies can be obtained form the Author on request.

Source: Author's Database

Appendix C: Alternative Model Results for the Impact of Microfinance on Three Poverty Outcomes

C1: For Impact of Microfinance on Food Security

Model 1: Fixed Effects
```
 *****  Inverse Variance Weighted Regression  *****
 *****  Fixed Effects Model via OLS  *****
------- Descriptives -------
     Mean ES      R-Square              N
       .0247         .5434       25.0000
------- Homogeneity Analysis -------
                  Q            df           p
Model        279.8856        9.0000       .0000
Residual     235.1399       15.0000       .0000
Total        515.0255       24.0000       .0000


------- Regression Coefficients -------
              B       SE    -95% CI   +95% CI         Z        P      Beta
Constant 158.1387  21.8713 115.2710  201.0065    7.2304    .0000     .0000
RuralAsi   -.6741    .0963   -.8628    -.4854    -7.0017    .0000    -.3611
Savings     .2322    .0723    .0904     .3740     3.2095    .0013     .1734
NonFin      .1753    .0782    .0221     .3285     2.2432    .0249     .1350
RepayCat    .2983    .0644    .1721     .4245     4.6333    .0000     .2512
Probit     -.0702    .0666   -.2008     .0604    -1.0532    .2923    -.0592
Gov       -1.0801    .1067  -1.2893    -.8710   -10.1223    .0000    -.5331
PeerRev    -.1671    .0895   -.3425     .0082    -1.8679    .0618    -.1200
YearPub    -.0790    .0109   -.1003    -.0576    -7.2321    .0000    -.4358
Loan1      -.3323    .0781   -.4853    -.1794    -4.2579    .0000    -.2345
```

Model 2: Random Effects Via Method of Moments
```
 *****  Inverse Variance Weighted Regression  *****
 *****  Random Intercept, Fixed Slopes Model  *****
------- Descriptives -------
     Mean ES      R-Square              N
      -.0030         .5950       25.0000
------- Homogeneity Analysis -------
                  Q            df           p
Model         21.5042        9.0000       .0106
Residual      14.6365       15.0000       .4779
Total         36.1407       24.0000       .0532


------- Regression Coefficients -------
              B       SE    -95% CI   +95% CI         Z        P      Beta
Constant 199.8974  87.6854  28.0339  371.7608    2.2797    .0226     .0000
RuralAsi   -.3975    .3971  -1.1759     .3808    -1.0010    .3168    -.1931
Savings     .0972    .2886   -.4685     .6629     .3368     .7363     .0670
NonFin      .1685    .2677   -.3561     .6931     .6295     .5290     .1219
RepayCat    .3824    .2593   -.1259     .8906    1.4746     .1403     .2829
Probit      .1295    .3126   -.4831     .7422     .4144     .6786     .0922
Gov        -.9214    .4179  -1.7404    -.1024    -2.2050    .0275    -.4969
PeerRev     .0191    .3110   -.5904     .6287     .0615     .9510     .0127
YearPub    -.1000    .0438   -.1858    -.0141    -2.2824    .0225    -.4841
Loan1      -.3474    .3001   -.9356     .2408    -1.1576    .2470    -.2386

------- Method of Moments Random Effects Variance Component -------
v   =  .28993
```

Model 3: Mixed Effects Via Maximum Likelihood Approach
```
 *****  Inverse Variance Weighted Regression  *****
 *****  Random Intercept, Fixed Slopes Model  *****
------- Descriptives -------
     Mean ES    R-Square              N
      -.0032       .5933      25.0000


------- Homogeneity Analysis -------
                 Q            df            p
Model        36.0745       9.0000        .0000
Residual     24.7330      15.0000        .0536
Total        60.8075      24.0000        .0000

------- Regression Coefficients -------
             B        SE   -95% CI   +95% CI          Z          P       Beta
Constant 198.2624  67.4783  66.0048 330.5199     2.9382      .0033      .0000
RuralAsi   -.4107    .3044  -1.0074    .1860    -1.3491      .1773     -.2008
Savings     .1088    .2228   -.3279    .5455      .4883      .6254      .0749
NonFin      .1660    .2079   -.2414    .5734      .7985      .4246      .1199
RepayCat    .3848    .2001   -.0073    .7769     1.9235      .0544      .2850
Probit      .1164    .2401   -.3541    .5869      .4848      .6278      .0830
Gov        -.9323    .3215  -1.5625   -.3021    -2.8998      .0037     -.5007
PeerRev     .0118    .2410   -.4606    .4843      .0490      .9609      .0079
YearPub    -.0991    .0337   -.1652   -.0331    -2.9416      .0033     -.4828
Loan1      -.3479    .2319   -.8025    .1066    -1.5004      .1335     -.2383

------- Maximum Likelihood Random Effects Variance Component -------
v      =   .16200 ;    se(v)   =   .05280
```

C2: For Impact of Microfinance on Income

Model 1: Fixed Effects
```
 *****  Inverse Variance Weighted Regression  *****
 *****  Fixed Effects Model via OLS  *****

------- Descriptives -------
     Mean ES      R-Square              N
      .3659        .2618        46.0000

------- Homogeneity Analysis -------
                  Q           df            p
Model      123.5699        9.0000        .0000
Residual   348.5121       36.0000        .0000
Total      472.0820       45.0000        .0000

------- Regression Coefficients -------
             B        SE    -95% CI   +95% CI         Z         P      Beta
Constant  6.9252  11.0371  -14.7075  28.5579     .6275     .5304     .0000
RuralAsi  -.2086    .0372    -.2815   -.1356   -5.6051     .0000    -.2958
Savings    .0650    .0448    -.0229    .1528    1.4498     .1471     .0870
NonFin     .1432    .0453     .0545    .2319    3.1637     .0016     .1753
RepayCat   .0915    .0417     .0098    .1731    2.1955     .0281     .1298
Probit    -.2059    .0465    -.2970   -.1147   -4.4279     .0000    -.2478
Gov       -.0201    .0551    -.1281    .0880    -.3640     .7159    -.0179
PeerRev    .2406    .0423     .1578    .3235    5.6935     .0000     .3119
YearPub   -.0033    .0055    -.0141    .0075    -.5970     .5505    -.0384
Loan1     -.0060    .0464    -.0969    .0850    -.1283     .8979    -.0076
```

Model 2: Random Effects Via Method of Moments
```
 *****  Inverse Variance Weighted Regression  *****
 *****  Random Intercept, Fixed Slopes Model  *****
------- Descriptives -------
     Mean ES      R-Square              N
      .4292        .2267        46.0000

------- Homogeneity Analysis -------
                  Q           df            p
Model       16.5143        9.0000        .0569
Residual    56.3460       36.0000        .0166
Total       72.8603       45.0000        .0053

------- Regression Coefficients -------
             B        SE    -95% CI   +95% CI         Z         P      Beta
Constant  5.3726  32.3755  -58.0834  68.8286     .1659     .8682     .0000
RuralAsi  -.2870    .1303    -.5424   -.0317   -2.2035     .0276    -.2837
Savings   -.0583    .1344    -.3216    .2051    -.4337     .6645    -.0580
NonFin     .2490    .1325    -.0108    .5087    1.8788     .0603     .2304
RepayCat   .2227    .1312    -.0343    .4798    1.6983     .0894     .2195
Probit     .0011    .1395    -.2722    .2744     .0079     .9937     .0010
Gov       -.2500    .1623    -.5681    .0682   -1.5398     .1236    -.1915
PeerRev    .1981    .1471    -.0903    .4865    1.3463     .1782     .1743
YearPub   -.0025    .0162    -.0342    .0293    -.1523     .8790    -.0211
Loan1     -.1060    .1362    -.3731    .1610    -.7783     .4364    -.1052

------- Method of Moments Random Effects Variance Component -------
v     =   .12812
```

Model 3: Mixed Effects Via Maximum Likelihood Approach
```
 *****  Inverse Variance Weighted Regression  *****
 *****  Random Intercept, Fixed Slopes Model  *****
------- Descriptives -------
      Mean ES     R-Square             N
       .4324        .2295      46.0000


------- Homogeneity Analysis -------
                  Q           df            p
Model        15.5610       9.0000        .0766
Residual     52.2441      36.0000        .0392
Total        67.8051      45.0000        .0156

------- Regression Coefficients -------
               B       SE   -95% CI   +95% CI         Z         P      Beta
Constant   4.7836  33.7736 -61.4127   70.9799     .1416     .8874     .0000
RuralAsi   -.2891    .1362   -.5560    -.0222   -2.1231     .0337    -.2831
Savings    -.0625    .1402   -.3372     .2123    -.4455     .6559    -.0616
NonFin      .2536    .1384   -.0178     .5249    1.8318     .0670     .2327
RepayCat    .2272    .1369   -.0412     .4956    1.6594     .0970     .2220
Probit      .0102    .1455   -.2750     .2955     .0704     .9439     .0089
Gov        -.2566    .1697   -.5892     .0760   -1.5120     .1305    -.1949
PeerRev     .1935    .1537   -.1078     .4948    1.2588     .2081     .1688
YearPub    -.0022    .0169   -.0353     .0309    -.1284     .8978    -.0184
Loan1      -.1114    .1421   -.3899     .1671    -.7838     .4332    -.1095

------- Maximum Likelihood Random Effects Variance Component -------
v      =   .14230 ;    se(v)  =    .03535
```

C3: For Impact of Microfinance on General Wellbeing

Model 1: Fixed Effects
```
 *****  Inverse Variance Weighted Regression  *****
 *****  Fixed Effects Model via OLS  *****

------- Descriptives -------
     Mean ES      R-Square              N
      .3865         .6337        23.0000

------- Homogeneity Analysis -------
                 Q            df            p
Model      722.9568       9.0000       .0000
Residual   417.9481      13.0000       .0000
Total     1140.9049      22.0000       .0000

------- Regression Coefficients -------
             B       SE    -95% CI   +95% CI         Z        P     Beta
Constant -192.330  17.0740 -225.795 -158.865 -11.2645    .0000    .0000
RuralAsi    .5103   .0500    .4122    .6083   10.1962    .0000    .3868
Savings    -.0038   .0648   -.1309    .1233    -.0586    .9533   -.0029
NonFin     -.4865   .0708   -.6252   -.3478   -6.8754    .0000   -.3200
RepayCat    .1946   .0777    .0422    .3470    2.5028    .0123    .1364
Probit     1.3959   .0736   1.2517   1.5401   18.9767    .0000    .9435
Gov         .5667   .0691    .4312    .7022    8.1987    .0000    .3605
PeerRev     .3249   .0949    .1390    .5109    3.4250    .0006    .1668
YearPub     .0955   .0085    .0789    .1122   11.2369    .0000    .5569
Loan1      1.2526   .0715   1.1124   1.3928   17.5124    .0000    .7369
```

Model 2: Random Effects Via Method of Moments
```
 *****  Inverse Variance Weighted Regression  *****
 *****  Random Intercept, Fixed Slopes Model  *****

------- Descriptives -------
     Mean ES      R-Square              N
      .4367         .6808        23.0000

------- Homogeneity Analysis -------
                 Q            df            p
Model       18.9472       9.0000       .0256
Residual     8.8853      13.0000       .7816
Total       27.8325      22.0000       .1813

------- Regression Coefficients -------
             B       SE    -95% CI   +95% CI         Z        P     Beta
Constant -178.091  84.2030 -343.129 -13.0535  -2.1150    .0344    .0000
RuralAsi    .8097   .3181    .1862   1.4332    2.5455    .0109    .5827
Savings     .1615   .4446   -.7099   1.0330     .3633    .7164    .1167
NonFin     -.4777   .4713  -1.4016    .4461   -1.0136    .3108   -.3069
RepayCat    .3593   .4870   -.5953   1.3138     .7377    .4607    .2491
Probit     1.2688   .5056    .2779   2.2598    2.5096    .0121    .6300
Gov         .7939   .4409   -.0702   1.6581    1.8008    .0717    .4759
PeerRev     .1590   .6169  -1.0502   1.3682     .2577    .7966    .0882
YearPub     .0883   .0419    .0061    .1704    2.1067    .0351    .6177
Loan1      1.1547   .4366    .2990   2.0104    2.6450    .0082    .7635

------- Method of Moments Random Effects Variance Component -------
v     =    .37255
```

Model 3: Mixed Effects Via Maximum Likelihood Approach
```
 *****  Inverse Variance Weighted Regression  *****
 *****  Random Intercept, Fixed Slopes Model  *****
------- Descriptives -------
      Mean ES      R-Square                N
       .4302         .6832        23.0000


------- Homogeneity Analysis -------
                  Q            df             p
Model        48.2345        9.0000         .0000
Residual     22.3673       13.0000         .0499
Total        70.6018       22.0000         .0000


------- Regression Coefficients -------
               B       SE   -95% CI   +95% CI        Z         P      Beta
Constant -179.237  53.6923 -284.474 -73.9997  -3.3382     .0008     .0000
RuralAsi    .7966    .2003    .4041   1.1892   3.9776     .0001     .5667
Savings     .1632    .2781   -.3819    .7082    .5868     .5574     .1170
NonFin     -.4775    .2946  -1.0549    .0999  -1.6208     .1051    -.3060
RepayCat    .3527    .3057   -.2465    .9519   1.1536     .2487     .2423
Probit     1.2713    .3159    .6521   1.8905   4.0241     .0001     .6368
Gov         .7908    .2789    .2440   1.3375   2.8348     .0046     .4688
PeerRev     .1626    .3862   -.5943    .9196    .4211     .6737     .0899
YearPub     .0888    .0267    .0365    .1412   3.3250     .0009     .6075
Loan1      1.1685    .2764    .6268   1.7103   4.2278     .0000     .7532


------- Maximum Likelihood Random Effects Variance Component -------
v      =   .13981 ;    se(v)  =   .04614
```

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11 CURRICULUM VITAE

PERSONAL DETAILS:

Name:	Stephen Bainous KARGBO
Gender:	Male
Nationality:	Sierra Leonean
Date of Birth:	17th September 1965
Place of Birth:	Kamakwie, Sierra Leone, West Africa
Parents:	Pa Foday and Ya Gbenday Kargbo

EDUCATION AND WORK:

1984	Graduated from Secondary School, Binkolo – Sierra Leone
1988	Graduated from Njala University College, University of Sierra Leone with a B.Sc. in Agricultural Education
1988-90	Worked as Secondary School teacher at the Kamakwie Wesleyan Secondary School, Kamakwie – Sierra Leone
1991-97	Worked as Programme Assistant, and later as Director and Head of Planning and Development for the Wesleyan Church of Sierra Leone
1993/94	Worked as Community Development Trainer and Coordinator for US Peace Corps, Sierra Leone
1997	Completed a two-year Professional Training Programme and was awarded a Post-graduate level Diploma in Organisational Development Consultancy, certified by the Swiss Association for Applied Psychology
2000	Graduated with an M.Sc. in Agricultural Economics and Rural Development from the University of Goettingen, Germany
2001	Won International Award for Best Foreign Student at the University of Goettingen, Germany
2006	Graduated with a PhD from the Department of Agricultural Economics and Rural Development, University of Goettingen, Germany