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**Microfinance Works: A Meta-Analysis of its Effect  
on Poverty Reduction**

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## List of Acronyms

BRI	Bank Rakyat Indonesia
CFPR/TUP	The Challenging the Frontiers of Poverty Reduction-Targeting the Ultra Poor
FATs	Funnel Asymmetry Tests
FEE	Fixed Effect Estimate
GRCC	German Raiffeisen Credit Cooperatives
ILF	Irish Loan Fund
MRA	Meta-Regression Analysis
PCCs	Partial Correlation Coefficients
PETs	Precision Effect Tests
RLFI	Reproductive Loan Fund Institution
WLS	Weighted Least Square

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With limited experience, science and literature review, I realize that this research paper is still many shortcomings and further development to be really helpful. Therefore, I am looking forward criticisms and suggestions so that this paper is more perfect as well as an input for my research and writing scientific papers in the future.

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## **Abstract**

We performed a meta-analysis to review 17 studies with a total of 53 empirical estimates of the impact of microcredit on poverty. We formulate a hypothesis to examine the empirical evidence and to provide general conclusions about the impact of microfinance among the variations of existing studies. The hypothesis under study is microcredit has a positive impact on poverty. We consider income, consumption and poverty index as a proxy for poverty.

The hypothesis testing through calculating the fixed effects weighted average for each primary study reported, examining publication bias using a funnel plot, FAT and PET, and testing a multivariate meta-regression analysis (MRA) on the model of heterogeneity. Overall, we found evidence that microfinance had a significant impact on poverty. However, that effect did not have a strong positive impact. Evidence indicates a positive and significant impact but it hardly provides a major economic impact.

## **Relevance to Development Studies**

Microfinance is small-scale financial institutions that target the poor and the marginalized. The purpose of establishment on microfinance is improving the lives of those people. The improvement in the lives of poor people will reduce overall poverty. The government policies is needed to reduce barriers and push factors that support the positive impact of microfinance on poverty alleviation. The government can also create policies based on the factors that lead to the positive effects of microfinance on poverty eradication. All these policies are expected to synergize with microfinance to work together on eradicate poverty.

The results of research on the effect of microfinance on poverty alleviation are inconclusive and contradictory questioning the validity of evidence-based policy advice to use microfinance as a strategy to reduce poverty. This study provides an estimate of the meta-effect across studies. Our meta-analysis tries to find the genuine effect of the impact of microfinance on poverty reduction. The genuine effect can be used as the basis of government policy-making in the field of development, particularly in poverty reduction. The policy may be to attend the microfinance program that has been around or fix the program to make it more effective.

## **Keywords**

Microfinance, Microcredit, Poverty Reduction, Poverty Alleviation, Meta-analysis

# Chapter 1

## Introduction

### 1.1. Background Information

Microfinance has become an industry that attracted the attention of various people. For decades, microfinance is a good tool to use as a poverty eradication program, especially for people who are under the poverty line (Morduch and Haley 2002). The microfinance industry is increasingly growing because it gives hope of a poverty alleviation worldwide. Meanwhile, the ability of microfinance in reducing poverty still being debated. Morduch (1998) shows that poverty reduction indicators such as income and consumption expenditure have not improved after getting a loan from microfinance. The difference of opinion led to doubts for the government, donors and policy makers about the positive effects of microfinance. Then, they tried to understand what factors are making microfinance successful and what factors impede the success of microfinance.

Economists (such as Morduch, Khandker, Imai, Arun) have examined how microfinance influences poverty. The literature on the topic has grown over the four decades. A lot of theoretical literatures and empirical journals (Khandker et al. (1998), Morduch (1998), Imai et al. (2010), and Imai and Azam (2012)) have been produced to evaluate the effects of microfinance on poverty reduction.

The modern of microfinance is introduced by Mohammed Yunus in Bangladesh. Before him, the majority of economists believed that the poor cannot pay the debt if the debt were given because they do not have the ability to pay. This was reinforced by the fact that the poor do not have the goods as collateral, so that banks did not give them access to credit. To realize his idea, Yunus founded the Grameen Bank, as a microfinance institution, to provide the credit for the poor.

Within the empirical literature, many studies have tried to assess the impact of microfinance on poverty reduction. However, the results are not consistent. On the one hand, group of studies have found a positive impact of microfinance. On the other hand, a number of studies have reported a negative effect of microfinance on poverty alleviation. Furthermore, the empirical papers differ to a lot of methodological points, for example the regional areas or countries, the data set, the techniques of statistics and the specification of the poverty.

Previous studies turned out to produce a different conclusion. Based on this, we felt the need for empirical testing to get overall conclusion. We will conduct a meta-analysis to synthesize the primary studies. Meta-analysis performed using empirical evidence from previous studies on the impact of microfinance on poverty. A meta-analysis uses statistical techniques to review the different studies in the same research question. Glass (1976:3) defines a meta-analysis “refers to the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings”. The meta-analysis reviews a large number of studies using objective methods, then summarizes the studies through quantitative scale, next explains the treatment of the studies by means of a magnitude of effect size, finally utilizes statistical procedures to study outcomes (Kulik and Kulik 1989:228). The advantage of meta-analysis is to summarize the results of all the studies using systematic procedures, remove subjectivity and

diminish the possibility of wrong interpretations and misleading conclusions (Shadish, as cited in Neves et al. 2016: 386).

Furthermore, a meta-analysis was first used in medical studies and then psychological research. Today, it has reached to other several social domains. In economics field, it has been used during the last two decades in the empirical studies that there is a debate among the results (for example Dominicis et al.(2006); Neves et al. (2016); Misselhorn (2005)).

A meta-analysis on the effects of microfinance on poverty is needed because of two reasons. First, it describes more understandable about the causes of the different empirical results on the effect of microfinance using quantitative approaches and provides more objective explanations. Second, the policy makers urgent to understand the effects of microfinance on poverty and use it to guide their policy on alleviation of poverty.

## **1.2. Justification of the Study**

This study will give a background on the existing studies on the relationship between microfinance and poverty reduction from many countries. Furthermore, the study will give insight on limitations of the current policies and possibilities of improvement strategy in the future for Indonesia.

The contribution of this study as follows; First, this study provides general conclusions based on empirical data on the impact of microfinance on poverty. Second, based on the meta-analysis study, results can be used as the basis for other studies in the future. Third, the conclusions obtained from this study are expected to provide advice for policy makers, especially to the Indonesian government. In general, this study is an important step in providing a solution regarding the impact of microfinance, the impact is positive, negative or no impact on the eradication of poverty.

## **1.3. Research Questions**

To achieve the objectives, this research will focus on the main research question: Using meta-analysis, is it true that microfinance can reduce poverty?

Sub-questions are:

- What is the sign of the relationship between microfinance and poverty reduction using meta-analysis?
- How much the effect size of microfinance on poverty reduction?

## **1.4. Research Hypothesis and Objectives**

Theoretical papers as well as empirical applications have, however, produced controversial results. Although there is a considerable part of the literature that considers microfinance reduce poverty, more recent studies have challenged this result. In this paper, we provide a contribution to the empirical puzzle by using meta-analysis to systematically describe, identify and analyse the variation in outcomes of empirical studies. Based on literature findings, suggest policy recommendations to improve the microfinance regulation for the poor.



This study applies microfinance size used in much literature, namely micro-credit to the poor, and three proxies to measure poverty, namely consumption, income and poverty index. Then, the paper formulate hypotheses to guide this research, namely microcredit provide a positive effect on poverty (H1). Appropriate regulations and policies of the government will further strengthen microfinance as a strategy to reduce poverty.

## **1.5. Structure of the Paper**

This research paper is structured as follows. Chapter 2 discusses primary studies and relevant literature. Chapter 3 provides the methodology of the research paper and the conceptual framework. Chapter 4 presents the detailed results of the study. Chapter 5 concludes and offers policy recommendations.

## **1.6. Limitations of the Study**

This study brings some limitations given some of the conditions in the data gathering and analysis processes. Due to the limitations of time and funding, we do not provide independent coder in checking the data from the primary studies. Therefore, the recapitulation of data obtained from each primary study is the responsibility of the author.

Another limitation is the number of empirical studies that examine the impact of microfinance on poverty alleviation is few. Most research on microfinance using descriptive and qualitative analysis so that we cannot synthesize. In addition, we do not apply a qualitative analysis on our meta-analysis.

## **1.7. Previous Research**

Yang and Stanley (2012) conducted a meta-analysis of relevant research literature on the effects of micro-credit to the income of the participants. Their meta-analysis identified eighteen estimates. They found that the micro-credit does not give effect to the fixed income of the participants. Yang and Stanley (2012) states two reasons why the absence of the effects, specifically the primary study on the effects of micro-credit to income are poorly designed and microcredit programs now does give a very small effect or no to the income of the participants. They stated that it also possible because of the combination among them.

# Chapter 2

## Literature Review

### 2.1. Introduction

This chapter reviews literature which is related to microfinance and poverty reduction. The review looks at the primary studies of the influence of microfinance on reducing poverty.

### 2.2. Microfinance

Formal financial institutions typically do not provide financial services to the poor. It also occurs in developing countries. In developing countries, the poor do not have access to formal financial services institutions. The absence of formal financial services for the poor led to informal financial services sector. Informal financial sector usually provides inferior financial services. They provide a very high interest rate so that the poor cannot afford to pay debts. This situation resulted in poor communities not having access to the informal financial sector. In Bangladesh, moneylenders ask for high interest rates because of lack of competition between them (Morduch 1998). The high interest rates restrict poor people to borrow money as their capital. Poor people who do not have the capital will not be able to escape from poverty.

The practice of microfinance has been carried out from centuries ago. It is described by Hollis and Sweetman (1998). They describe six microfinance practices in several countries in the Middle Ages. In England, Samuel Wilson founded the Corporation of London which aims to provide a loan of £ 100 and £ 300 to the youngsters who already have businesses. The loans have a term of not more than 5 years and the interest rate is 1% for the first year and 2% in the year thereafter. This institution stood for 50 years went bankrupt because of unpaid debts. Unlike in the UK that provides a sizable loan, in Ireland appears Reproductive Loan Fund Institution (RLFI) which offers small loans, less than £ 10, to the very poor farmers, farm workers and dealers. RLFI established after the 1822 famine in Ireland. The agency was created to maximize the use of charitable donations fund a £ 55,000 for hunger alleviation. Small loan has an interest rate of about 12% and the borrower will be fined if you pay late. Loan repayment is twenty weeks. Besides RLFI, also appeared in Ireland Irish Loan Fund (ILF) established comes from individual donations altruistic.

The development of small loans also penetrated Germany. In 1840, German Raiffeisen Credit Cooperatives (GRCC) established to accommodate the collection of funding and lending. The cooperative is growing very rapidly in the late 19th century. In 1910, the cooperative Raiffeisan have 14,500 rural cooperatives with a membership of about 1.4 million people. The borrower get a loan ranging from £ 10 up to £ 250 on the condition that guarantees two co-signer. Prior to approval of the loan, the cooperative committee will check the completeness of the terms and reasons of borrowing money. The most important principle of this cooperative is their unlimited liability for its members, which means that if the GRCC went bankrupt, each member held liable for the entire debt of the cooperative. The obligation is to serve as collateral when the cooperative will be submitted to the bank capital. Practicing cooperative of Raiffeisenis relatively successful then imitated Irish Credit Union in Ireland.

In 1883, the first Italian cooperative was founded. The very fast growth of cooperatives aided by the Roman Catholic Church. In 1916, the cooperative has 2,100 branches and 115,000 members. Casse obtaining funds from public deposits and bank loans are getting a guarantee of unlimited liability of member casse. Each member has one share and one vote. They are also obliged to be cooperative management for free. Casse relatively positive impact for borrowers because the cost of borrowing is lower than moneylenders.

Practices of microfinance institutions such as the above demonstrates that microfinance is not a new trend (Yang and Stanley 2012). The increasing of development on microcredit demonstrate their importance in the field of development in the world. Mechanical operations of microfinance institutions that have been tested and continued to develop better new methodologies (Yang and Stanley 2012).

The concept of modern microfinance institution is started by Muhammad Yunus. In 1974, Muhammad Yunus, an economist from Bangladesh, introduced the idea of giving small loans to the poor. The idea came when he met a woman who sold bamboo bench. The woman only benefit a few cents from each seat sold. Then, Yunus thought that she will be able to raise the sales figures if given a loan with favorable interest rates. In 1983, he founded the Grameen Bank (which means village bank).

The emergence of microfinance institutions due to lack of financial institutions that already exist in providing access to loans to the poor. Currently, microfinance institutions has grown into the world with a variety of models. There is a microfinance institution that type with the Grameen Bank, some microfinance institutions without interest based on public social funds. Microfinance institutions improve the welfare of society, not just for the sake of their families, but also for the life of their community.

Institutions of modern microfinance in developing countries, such as the Grameen Bank, claiming that they empower women to wear a low interest rate (Yang and Stanley 2012).

Imai and Azam (2012) stated that formal financial institutions are less likely to lend to the poor for several reasons, including poor do not have property that can be pledged as collateral, lending procedures are complicated so that only people who highly educated who can access, and the supply of credit in the countryside is still lacking. Microfinance institutions try to cover the limitations of the formal financial institutions.

Microfinance, according to Barr (2004: 278) is "a form of financial development that is primarily focused on alleviating poverty through providing financial services to the poor". Barr (2004: 278) also states that "... is also broader microfinance, including insurance, transactional services, and importantly, savings". This definition is also revealed by Otero (1999) and Ledgerwood (1999). Another definition proposed by Schreiner and Colombet (2001: 339), they states that "microfinance can be defined as the attempt to improve access to small deposits and small loans for poor Households neglected by banks". This implies that microfinance provides financial services for the poor that include savings, loans and insurance that is not provided by the formal financial sector (Nanor 2008). Thus, microfinance is one of the forms of financial services through the establishment of financial institutions that aims to provide financial services to low-income communities. Therefore, Microfinance institutions provide savings, loans, insurance and entrepreneurship training.

Microcredit is one form of microfinance financial services to the poor, especially in developing countries. Microcredit provides an opportunity for the poor to make loans that previously they could not do in conventional banks. The loan is given in a short period of time,

usually a maximum of one year. Small loans can be used to start entrepreneurial ventures so that the poor get an income to improve their welfare.

In addition to microcredit, microfinance is usually also provide micro savings services. Poor people can save money, usually small, to keep their money and earn interest. Micro savings can be used for life assurance in the future. Micro savings can also be used to raise capital for their ventures.

Micro insurance is also a form of microfinance services. This insurance is provided to low-income people who are at risk of natural disasters, illness or accident. Insurance is used by the poor as a precaution if they are unfortunate.

Microfinance lending procedures are relatively easier and less costly (Nanor 2008). The borrower does not pass the flow of lending long with complex requirements such as conventional banks. The borrower also does not require a large fee to process a loan application, such as the cost of transportation to the nearest bank office that normally existed in urban areas. In addition, the borrower does not have to have a guarantee as a condition for lending. Microfinance uses other methods to replace the collateral, such as cash flow evaluation of the borrower or using group methods. Microfinance can also provide incentives in the form of lower interest rates from the previous year so that borrowers pay on time. Borrowers who have paid on time can be given incentives such as the right to borrow greater funds than before.

### **2.3. Poverty Reduction**

United Nations Development Program (2015) states that the number of poor people in the world by 2015 about 836 million, down nearly half from 1.9 billion in 1990. These people had incomes under \$ 1.25 per day. They are included to the very poor category. In fact, living on less than \$ 2 per day is certainly very uncomfortable. Very poor communities have less opportunity to meet their basic needs, such as food, clean water, clothing and adequate housing (Appah et al. 2012). Juanah (2005:17) states that

"Poverty has no precise definition. It is a multi-dimensional phenomenon related to the inadequacy or lack of social, economic, cultural, and political entitlements. Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being Able to see a doctor. Poverty is not being Able to go to school and not knowing how to read. Poverty is not having a job, is fear for the future and 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 ".

Furthermore, Juanah (2005) states that there are four types of poverty. First, income poverty is a common definition that is often used to describe poverty, that is, people who lack the income that cannot cover their need. Second, the absolute poverty is people who are starving, people who do not have adequate housing, people who do not have enough clothes, as well as people who do not get adequate medical care. They are people who are struggling to survive. Third, the relative poverty is, people whose standard of living below the common standard in a community, usually in the developed countries. Lastly, consistent poverty is a combination between income poverty and deprivation.

Oyeranti and Olayiwola (2005) states that there are three views in defining poverty. The first view explains that poverty is a deficiency in some of the basic human needs that can be valued in money. Thus, this view does not explain poverty in the form of non-material, such as lack of education and social discrimination. The second view states that poverty is the inability of

a person to achieve basically the ability to meet the economic and social life, which includes nutrition, healthy living, as well as participation in community activities. The third view points out that the conception of poverty should be defined solely by the poor. This view is called subjective poverty which states that poverty consists of psychological and physical factors. Karlsson in Oyeranti and Olayiwola (2005: 4) concluded subjective poverty, the first, viewed in multidimensional poverty, including hunger, powerlessness, voicelessness, and humiliation; second, the ineffectiveness of the state in addressing poverty; third, limited role of non-governmental organizations so that the use of informal networks more reliable; Fourth, households experiencing prolonged stress due to poverty; Fifth, the social structure that is not pro-poor.

Furthermore, Ogwumike (2002: 6-7) mentions four approaches to poverty alleviation.

1. Economic Growth Approach

Economic growth must be increased so that the workers should be employed in industrial companies. Economic growth is conducted by adding capital capacity, while labor skills enhanced through education, improved health, and the provision of home.

2. Basic Needs Approach

Poverty can be reduced by providing the basic needs of society as appropriate, such as the provision of food, water, education, health, and transportation.

3. Rural Development Approach

Poverty reduction is focused on development in rural areas. The focus is based on that poverty is a multidimensional problem that must be addressed by a multi-pronged approach. The construction is done by the provision of the basic necessities of human life, such as the provision of food, health, education, employment, and shelter.

4. Target Approach

Poverty carried out on specific targets based on specific programs, such as social health insurance, micro-credit, and so forth.

Poverty is a multi-dimensional problem that must be addressed in a comprehensive manner. Combating poverty is a complex task and should be carried out jointly by the various elements of society. To alleviate poverty will not be solved by a single institution, no single strategy, not just a step, but it is a joint action by all agencies (Oyeranti and Olayiwola 2005:6).

Additionally, Adebayo in Appah et al. (2012: 44), which was also delivered by Gerster in Oyeranti and Olayiwola (2005: 7-8), grouping into four approaches poverty alleviation. First, the pro-poor growth models mentioned that macroeconomic policies should be directed to increase the incomes of the poor. Macroeconomic policies in the form of a guarantee of economic stability, good business environment, high-tech innovations, so that the economy grows optimally. Second, rights and empowerment explained that poverty eradication is done by increasing the political participation of the poor, increased skills in poor communities through training, good governance and fair law enforcement, as well as increased credit supply. Thirdly, the redistribution of resources and models of sustainable livelihoods approach states that poverty reduction through social interaction between community groups, social risk insurance against illness and natural disasters, and building physical and social infrastructure is good. Instruments used in this approach is the increase in salaries and wages and the elimination of gender. Fourth, the people-centered sustainable development approach is a combination of the three previous approaches. The objective of poverty alleviation through this approach is people-centered development that focuses not only on economic growth but also fair distribution of benefits, and

that does not marginalize the poor but empowering. This approach focuses on the poor that increase choice and opportunity for them to improve their lives.

#### **2.4. Microfinance and the Poverty Reduction: Empirical Literature**

Yunus (2007) argue that free markets provide good products and services to consumers. The abundant needs of consumers lead to capital market players producing much goods and services. Abundant production resulting in cost per item becomes cheaper so that producers get a greater profit. The benefits of the free market will be shared between producers and consumers. Consumers get the cheaper price of goods and manufacturers obtain greater profits. However, the economic prosperity exacerbates social problems. One reason is the capitalist economy not to solve social problems, but to get the highest possible profit.

To reduce social problems, Yunus (2007) introduced a social business, the business motive is not to maximize profit, but based on social values. A social business is a vendor who has a principle to provide social benefits rather than maximizing profits. Abera (2010) states that this business will provide opportunities and benefits to the poor in order to improve their social situation. Basically, the poor have motivations to get out from poverty, but the structure of the market environment does not provide that opportunity. This needs to be corrected by the provision of microfinance, especially microcredit.

Yunus said in Abera (2010: 12) that microcredit is not a miracle tool to cure poverty in one swallow, but microcredit should be combined with other tools to eliminate poverty. It is also agreed by Barr (2004: 296) which says that microcredit is not a panacea, but microcredit has a promising potential to reduce poverty. This suggests that microfinance is only one variable in the alleviation of poverty, in addition to other variables, such as education, health, economic stability, good governance, less corruption, and so forth (Abera 2010: 12).

Poverty is a complicated and complex problems that require comprehensive strategies. Microfinance is just one of the tools of these strategies. Other development programs, such as the provision of infrastructure, health education, provision of fertilizers and seeds for farmers, and so on, should be done in conjunction with microfinance. Furthermore, microfinance cannot stand alone but must be supported by education and training for the poor.

However, economists are still arguing about the role of microfinance in reducing poverty. Some economists argue that microfinance alone is not capable of fighting poverty and needed another strategy to complete it (Appah et al. 2012). Most experts believe that microfinance is not a panacea for all ills of poverty. Regardless, they believe that microfinance institutions play an important role as a means to discover the potential of the poor to be able to move towards a better life (Appah et al. 2012).

Muhammad Yunus, as the originator of the idea of the modern microfinance institutions, believe that the poor have a right to obtain a loan from a microfinance institution. After the poor get a loan, the next step is to empower them by creating entrepreneurs to generate a profit. Fulfillment of these rights allow the poor to buy the assets and get profit. This situation proves that microfinance institutions as an appropriate tool to reduce poverty.

Literature about the positive impact of microfinance have been found. Empirical studies show that microfinance institutions can improve the living conditions of the poor, the household income of the poor, increase consumption, accumulate assets and improve the education of children from the poor. This situation shows that microfinance institutions have a significant role in reducing the poor.

Littlefield, et.al (2003) argues that microfinance institutions were able to reduce poverty by increasing the incomes of the poor, the increase in household spending and decrease in the threat of financial problems. Research projects on the success of microfinance institutions spread in various countries, including Bolivia, Ghana, Indonesia, India, Zimbabwe and Bangladesh. However, the success of microfinance institutions depend on the ability of the poor communities to manage the money that has been borrowed (Khandker 2003). Therefore, other facilities should be provided to support microfinance institutions, such as skills training in entrepreneurship, empowerment of others and family financial management. Weiss et al. (2003) states that increased access to micro-loans by microfinance institutions to the poor will increase the ability of the poor to finance productive activities that will enhance the growth of incomes. They argued that it will happen if there are no obstacles. Thus, these conditions is a way out for the poor to escape from poverty.

The study of Bank Rakyat Indonesia (BRI) as a microfinance institution in Lombok, Indonesia concluded that the average income of borrowers increased by 112% from 90% of respondents, while 12 respondents did not experience an increase in revenue because their husbands used the money instead for productive business (Panjaitan-Drioadisuryo and Cloud 1999).

Barnes et al. (2001) found that the participants of Zambuko program in Zimbabwe experienced an increase in the number of income per capita per day. They also stated that the client remains in the program experienced improvements in food consumption and other needs. Research in Bangladesh stated that the poorest people get the greatest benefit from microfinance institutions in the form of poverty reduction among its members (Khandker 2003). The study also found that microfinance institutions have a positive spillover effect on poverty reduction in their village.

The Challenging the Frontiers of Poverty Reduction-Targeting the Ultra Poor (CFPR /TUP) program in Bangladesh increase household assets ultra-poor people who participated (Rabbani et al. 2006). They have assets such as cattle and furniture, as well as savings. Haseen (2006) states that the selected ultra-poor households (SUP) who take the program CFPR/TUP have higher economic status than domestic non-selected ultra-poor (NSUP) households. SUP households tend to consume more food and higher quality than households NSUP.

Mahjabeen (2008) concluded that the financial institutions in Bangladesh have a positive impact for the poor in the form of an increase in household income, an increase in the consumption of commodities, the creation of employment, reduction of income inequality and increased social welfare. Imai and Azam (2012) states that a loan from a microfinance institution for the poor has increased income and consumption in Bangladesh.

On the other hand, researchers found a negative effect of microfinance on poverty. Yang and Stanley (2012) suggests three weaknesses of microfinance. First, there is no proper way to measure the social goals of microfinance. Secondly, microfinance does not reach the poorest of the poor from their corresponding targets. Finally, microfinance led to polarization between the poor through stratification among them.

Additionally, Copestake et al. (2005) points out the negative impact of microfinance because of the rigidity of the loan repayment schedule. Borrowers have to pay at a certain time at a time when they do not get money from the crops, for example, borrowers who are trying in agriculture and animal husbandry. Block (2012) criticizes microfinance because of giving money

to people who are not able to empower the money. Instead of the poor with microcredit will be freed from poverty, they would be trapped in debt.

## 2.5. Primary Studies

We found 17 primary studies that examined the relationship between microfinance and poverty alleviation. The research will be used as our meta-analysis. The table below is a summary of the methods and the results of these studies.

**Table 1 Summary of the Primary Studies**

No	Authors	Methodology	Results
1	Cuong (2008)	The research objective was to test whether VBSP really target the poor as a recipient of a credit or not and test the effects of these programs on poverty alleviation in Vietnam. Source of data derived from the survey VHLSS 2002 and 2004.	The study shows that only 12% of credit recipients are the poor, while amounting to 75.9% are the non-poor. The result found that VBSP provide a positive and significant impact on consumption expenditure per capita and income per capita from loan recipients.
2	Imai and Azam (2012)	The data covered household panel data of the poor from 1997 to 2004. Data were obtained from Bangladesh Rural Employment Support Foundation (PKSF) panel. For data control, this study used from nearby villages.	Microfinance has positive and significant impact on household income and consumption of food. In addition, the study also found that non-productive loans reduce BMI.
3	Annim and Alnaa (2013)	They Used quasi-experimental survey data from 250 beneficiaries and 250 non-beneficiaries in 2011. Respondents were selected at random and then interviewed directly. Questions were given consisted of how access to microfinance, consumption expenditure, the number of business activities, business location and more.	The rural women who gain access to microcredit have a positive impact on household consumption, which in turn will reduce poverty. Microfinance has a 0.12% impact on poverty reduction. Another conclusion obtained is an area that has a very poor population can get positive effects of microfinance. This study suggests that the scale of credit extended to the number of credit recipients can be improved.
4	Li, et al. (2011)	Welfare is measured using household income and household consumption. This study used survey data for rural households from November 2008 to January 2009 in Hubei province, China.	Participants of RCC program benefited more than non-participants. It is characterized by an increase in household income and consumption. The positive impact of microfinance showed promising potential for rural economic development.
5	Miled and Rejeb (2015)	The data used is the cross-sectional data from 596 microfinance institutions in 40 developing countries. The data used comes from the	This study shows that the country has a per capita gross loans from microfinance institutions tend to rate lower poverty rates than other



No	Authors	Methodology	Results
		Microfinance Information Exchange (MIX) and the World Development Indicators 2011. Poverty measures based on the poverty line of US \$ 1.25.	countries per capita consumption and expenditure is higher. This is an indicator of the positive role of microfinance on poverty reduction.
6	Annim (2009)	A survey of the recipient and non-recipient randomly on the location of the same area. The survey was conducted in 2004.	There is a difference in the operation of other types of microfinance institutions. Microfinance institutions that receive funding from government and grants better target lending to the poor. This relates to the profit to be achieved. This study offers a new perspective on the future of microfinance institutions more pro-poor poverty reduction to occur.
7	Kienlein (2016)	The data used is the panel data from 42 countries over the period 1999 to 2013. The scale of measurement for microfinance is gross loans and the measurement scale for education is the amount of government funds used for education. While poverty is measured using the ratio of poverty, the poverty gap and squared poverty gap.	Education and microfinance have negative effects on measures of poverty. The average increase in relative poverty ratio by a factor of 2 in gross loans of microfinance institutions whereas education is an improvement factor of 1.15 from government spending on education.
8	Alnaa and Ahiakpor (2015)	Interviewing of 500 women comprising 250 loan recipients and 250 non-recipients of loans. Data taken from June 2011 until August 2011.	Microfinance institutions that provides loans to the poor will increase household consumption. This can be achieved if the technical efficiency of beneficiaries increased because the efficiency of the client's loan repayment. To improve efficiency, microfinance institutions do not only provide loans, but also provides training and business consulting to their clients.
9	Hoque (2004)	Data analysis based on a survey of Matlab Health and Socio-Economic Survey survey (MHSS) in one of the rural Bangladesh named Matlab in 1996. The data found amounted to 108 households. The data is then compared with the data 108 households in Matlab entitled to receive microcredit from BRAC but do not take the loan.	The average household receives from BRAC microcredit poorer than those not receiving credit from BRAC, respectively 63.6% and 61.2%, although the majority of the population in Matlab were below the poverty line. This suggests that microcredit gives very little effect on poverty reduction in Matlab. However, BRAC microcredit by giving a significant impact on household consumption for the recipient BRAC in Matlab. Hoque (2004) assume that households in Matlab who received micro credits used half of the money for household

No	Authors	Methodology	Results
			consumption. The funds are used for productive enterprises only about 54.7% of the total micro credit received. On the other hand, non BRAC households when borrowing money, they will use all these loans to productive enterprises.
10	Doci (2016)	The data is taken from the World Bank and the MIX database. Poverty is measured using a number of household consumption. While the size of microfinance is the number of microfinance institutions and the number of micro loans disbursed.	The research concludes that microcredit had a positive impact in the reduction of poverty.
11	Bhuiya, et al. (2015)	Income and household consumption is a proxy of welfare representing the poverty level. The data used is the result of a survey of 439 households in 20 villages in four districts. The first phase of the survey asked to the village leaders to choose the characteristics of ownership of land and wealth. Then, the interview was conducted to the participants of microfinance institutions and households that do not receive a loan as the control data.	The households who participate in micro-credit experience an increase in income and consumption, respectively 0.19% and 0.16%. Nevertheless, households following the microcredit program average are poorer than households who are not members of microcredit.
12	Franco (2011)	The impact of microfinance on poverty ratio at \$ 2 per day and \$ 1.25 per day. The object of this study are countries in Latin America and the Caribbean.	Microfinance provides a significant positive impact on the ratio of poverty. Franco explained that microfinance can make structural changes to improve the welfare of the poor because the poor opening of opportunity in accessing credit. In addition, physical development in developing countries often do not touch directly to the poor economy.
13	Sayvaya and Kyophilavong (2015)	Extent of poverty is represented by household income and expenditure of the poor. The data is a survey of members and non-members VDF which has the characteristics of the same household. Respondents amounted to 361 households, of which 113 are members of VDF and 248 non-members. The survey was conducted in June 2012.	The VDF program had a positive impact on increasing household income and expenditure, but not statistically significant. Based on this, Sayvaya and Kyophilavong (2015) states that the program VDF only minimal impact on poverty reduction in Lao PDR. It might be because the number of loans used to finance productive business too little. In addition, the borrower uses the loan funds for the non-productive expenditure.
14	Bui (2014)	Microfinance is measured using the	The microcredit has a positive and

No	Authors	Methodology	Results
		total amount of loans received by households, while poverty is measured using real household expenditure, food and non-food. The data used is survey data VHLSS2008 comprising some 9189 households.	significant relationship to the household expenditure per capita and non-food expenditure per capita. However, micro-credit was negatively related to household expenditure for food. The findings concluded that microfinance institutions can be used as an effective strategy to reduce poverty in Vietnam. Bui also stated that the alleviation programs such as the need for increased efficiency and diversification of micro-credit loans.
15	Kaboski and Townsend (2012)	The Million Baht Village Fund (MBVF) is a microcredit program in villages to improve the overall credit in the economy of Thailand. The data is taken from a survey of Townsend Thai for five years (1997-2001) before the program and six years (2002-2007) after the program. The data is 800 households surveyed for 7 years and 655 households participated in the survey for 11 years.	There was an increase in total short-term credit, consumption, investment in agriculture, and income from business and labor due to the distribution of village funds. However, overall growth declining asset related to the village fund. Microcredit from village funds also have a positive impact on the wages received.
16	Abera (2010)	The data is the household survey and the Focus Group Discussion (FGD) which conducted in 2007 and 2009. The FGD performed at 8 random households. Household welfare is measured by household monthly expenses and assets.	Microfinance had a significant impact on the increase in household productive assets. However, microfinance is not a significant impact on the amount of fixed assets and monthly household expenditure. Abera conclude that microfinance is not a panacea for eradicating poverty.
17	Imai, et al. (2010)	The data used is the data cross-country and panel data from the Microfinance Information Exchange (MIX) and the World Bank poverty data in 2010. The number of samples is 48 developing countries in 2007 and data is added to the panel two periods of 61 countries in 2003 and 2007. The poverty indicators based on data from the World Bank which is the ratio of the poor who have incomes under \$ 1.25 per day in 2005.	Microcredit has a significantly negative impact on the ratio of poverty, the poverty gap and squared poverty gap. This is an indication that the loan from a microfinance institution have an impact on poverty reduction in the world's poor. In addition, Imai, et al. (2010) stated that microfinance is not only able to reduce poverty, but micro-finance can also reduce the severity of poverty in the community

The majority of the primary study revealed that there is a positive relationship between microfinance and poverty alleviation. Studies that resulted significant effects are Cuong (2008), Imai and Azam (2012), Doci (2016), Franco (2011), Bui (2014), and Abera (2010). However, some studies did not produce significant effects such as Sayvaya and Kyophilavong (2015).

Another study states that negative effects on poverty, in other words microfinance actually exacerbate poverty, such as the study of Imai, et al. (2010). The studies also suggest that there is potential to alleviate poverty through microfinance, as revealed Li, et al. (2011).

Some empirical studies stated a positive and significant relationship of the impact of microfinance on poverty reduction using income or consumption as a proxy of poverty, such as Cuong (2008), Imai and Azam (2012). Whereas, Bui (2004) points out that micro-credit was negatively related to household expenditure. Research from Imai, et al. (2010) showed the negative effects of microfinance on poverty index. Based on this, we assume income, consumption and poverty index as a proxy to represent poverty. If the income and consumption increase, there is a reduction in poverty. In addition, if the poverty index decrease, poverty reduction is happening. Furthermore, we will investigate the impact of microfinance on income, consumption, poverty index and the poverty reduction (a combination of three proxies).

# Chapter 3

## Research Methodology

### 3.1. Introduction

This chapter discuss the methodology how to achieve the objectives. Chapter 3 presents the conceptual framework, theoretical framework and empirical model. Furthermore, the chapter shows the data.

### 3.2. Meta-analysis

Meta-analysis allows the use of a combination of all the literature that has been there before. The statistical analysis used in the meta-analysis aim to evaluate and synthesize the existing empirical evidence (Card and Krueger 1995: 239). Dominicis et al. (2008: 661) state that “meta-analysis provides an in-depth quantitative review of the empirical literature, employing statistical techniques to summarize the empirical evidence”. Then, the meta-analysis combines the size of the various studies to identify the pattern of findings of relevant relationships. Effect sizes that will be used in the meta-analysis is a weighted average that is derived from the effects of each of the study report. Merging the empirical results in the form of effect size weighted average aims to improve the accuracy of the analysis of the object under study.

This is understandable due to the high increase of the amount of research published in various economic fields. Such increase resulted in additional degree of heterogeneity of the results of research that has been done. Then, the meta-analysis is a statistical method that is appropriate to address heterogeneity.

However, meta-analysis are facing problems in publications bias. Meta-analysis cited as problematic in the publication may be biased because the studies used in the analysis do not represent all the existing studies and relevant to the object under study. However, there are several techniques that can be used to address this problem.

Dominicis et al. (2008: 662) point out that they “... use meta-analytical techniques to further characterize these empirical findings and subsequently identify the heterogeneity across estimates as a function of observable differences in research design and data characteristics, and a random component reflecting unobservable differences across estimates”. There are two estimators:

- 1) “The fixed effects method assumes that there is no heterogeneity among study results and that the different magnitude of the estimates is solely due to sampling variation” (Dominicis et al. 2008: 662).
- 2) “The random effects method assumes that every study estimates a different effect size, randomly drawn from a larger population with a fixed mean and variance” (Dominicis et al. 2008: 664).

To synthesize this study, we will use meta-regression analysis. According Stanley (2001: 132-3), meta-regression analysis refer to “the dependent variable is a summary statistic, perhaps a regression parameter, drawn from each study, while the independent variables may include characteristics of the method, design and data used in these studies”.

This study follows the methodology of the Meta-Analysis of Economics Research Network (Maer-Net) described by Stanley et al. (2013) in the search for relevant studies, encode variables

and construct the data found. In search of relevant studies, we used Google Scholar. The key words used including "microfinance +poverty reduction", "microfinance + OLS + poverty reduction", "poverty reduction + microfinance + OLS + developing countries." In the process of identification, we read the titles and abstracts then examine the introduction and conclusion. Subsequently, we look for it manually by reading them one by one and checking it systematically review with the aim that all primary studies related have been included.

The hypothesis states to analyze the impact of microfinance on poverty reduction. Our research using microcredit as a measure of microfinance and evaluate the effects of income, expenditure and poverty index, which is used as a measure of poverty reduction. Therefore, this meta-analysis study using only the variables mentioned above and this study using microcredit as an independent variable. Thus, we did not include studies that examine the impact of the asset to the reduction of poverty, as practiced by Cotler and Woodruff (2008), Garikipati (2008) and Takahashi et al. (2010). We also excluded studies that examine the impact of growth (see Copestake (2002)) as well as the impact on labor supply (see Augsburg et al. (2012)).

The criteria that must be met by studies that have been entered so that the research can be used for meta-analysis, are the research using analysis Ordinary Least Square (OLS) or the like, number of samples, and carries the t-statistic, or standard error. Based on these criteria, we found 17 relevant studies. Furthermore, the data characteristics of these studies is extracted and incorporated in Microsoft Excel. Once all the data from the various studies are recorded in Excel, then transferred to STATA. Coding is done based on the characteristics of the study aims to eliminate subjectivity and improve the reliability of the findings (Demena and Bergeijk 2016).

Typically, a meta-analysis using the average forecast for avoiding heavy single study as described Stanley (2010). However, as explained Demena and Bergeijk (2016), analyzes the impact of using estimation techniques and the different models is an impossible thing to do because researchers possible loss of important information from empirical studies. Additionally, Demena and Bergeijk (2016) mentions three reasons for the shortcomings of the average estimate. First, many researchers do not specify explicitly the best estimate. Second, it is possible to experience a selection bias investigators if they mention the best estimate. Third, the best estimates possible researchers will be underweighted. Thus, this study used estimates of all data sets.

Based on the identification process, we included 17 studies of primary with 53 meta-observations in this study. Table 1 presents a summary of the research that we've included in this meta-analysis.

### **3.3. Meta-Data Set**

Data of this study consisted of 17 major studies of primary studies that have been found and the number of observations by 53 observations. The study has been carried out in developing countries and published from 2004 through 2016.

**Figure 1 Mean and Median of the Empirical Studies**

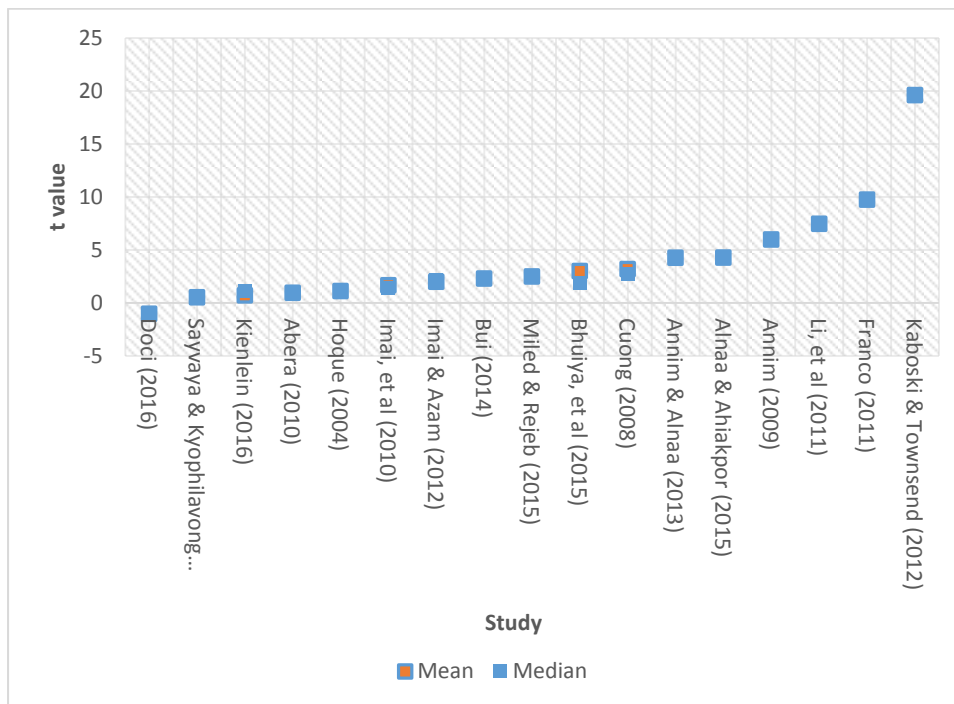


Figure 1 shows the mean and median of each study we report in relation to the impact of microfinance on poverty reduction. From Figure 1 shows that the findings of the primary studies tend to agree positively to the relationship. The average t-value is 4.00 with a standard deviation of 4.84 and an average median is 3.94 with a standard deviation of 4.85.

Figure 1 also shows the difference in positive and negative effects on the impact of microfinance on poverty alleviation among the primary studies. Of the 17 studies, one study showed that the negative effects (see Doci (2016)).

Primary studies that we use consists of nine peer-reviewed articles, four working papers, and 4 dissertation, unpublished studies, and reports. The oldest studies published in 2004 and 2012 is the median. The study, published in the last 5 years amounted to 13 studies. This shows that the topic of the effect of microfinance on poverty alleviation is an interesting topic, especially in recent years.

**Table 2 Primary Studies the Impact of Microcredit**

Studies	Number of Estimates	Simple Mean	Weighted Mean (FEE)	Minimum	Maximum	Significance
Impact on Poverty Income						
Imai and Azam (2012)	6	0.0068	0.0065	0.0051	0.0109	Yes
Sayvaya and Kyophilavong (2015)	1	0.0722	0.0722	0.0722	0.0722	No
Cuong (2008)	4	0.7126	0.7790	0.6271	0.9679	Yes
Bhuiya, et al (2015)	1	0.1900	0.1900	0.1900	0.1900	Yes
Li, et al (2011)	1	0.0029	0.0029	0.0029	0.0029	Yes
Impact on Poverty Consumption						
Imai and Azam (2012)	6	0.0041	0.0043	0.0005	0.0102	No
Annim and Alnaa (2013)	2	0.3045	0.2535	0.2120	0.3970	Yes
Sayvaya and Kyophilavong (2015)	1	0.0527	0.0527	0.0527	0.0527	No
Abera (2010)	2	0.2461	0.0519	0.0436	0.4486	No
Cuong (2008)	4	0.6899	0.6943	0.6857	0.7018	Yes
Bhuiya, et al (2015)	1	0.1600	0.1600	0.1600	0.1600	Yes
Li, et al (2011)	1	0.0023	0.0023	0.0023	0.0023	Yes
Bui (2014)	2	0.0036	0.0025	0.0015	0.0057	Yes
Docì (2016)	1	-0.0018	-0.0018	-0.0018	-0.0018	Yes
Miled and Rejeb (2015)	3	1.2133	1.1904	-0.2600	2.0000	Yes
Kaboski and Townsend (2012)	2	0.0013	0.0022	0.0002	0.0024	Yes
Alnaa and Ahiakpor (2015)	1	0.3970	0.3970	0.3970	0.3970	Yes
Hoque (2004)	1	0.0800	0.0800	0.0800	0.0800	No
Impact on Poverty Index						
Bhuiya, et al (2015)	1	0.0700	0.0700	0.0700	0.0700	Yes
Annim (2009)	2	0.3430	0.1086	0.0790	0.6070	Yes
Imai, et al (2010)	3	0.9600	1.0730	0.4100	1.7100	Yes
Miled and Rejeb (2015)	3	2.2467	2.3744	1.4000	3.1300	Yes
Kienlein (2016)	3	0.1320	0.2928	-0.6110	0.7020	No
Franco (2011)	1	0.0018	0.0018	0.0018	0.0018	Yes

Table 2 describes the effect of fixed weighted average impact of microcredit on income. From table 2, we can see that the five studies with a total of 13 estimates of the impact of microcredit on income. The FEEs are positive for all estimates, but not all significant estimates because the study was not significant, for example, research from Sayvaya and Kyophilavong (2015).

In connection with the relationship between microcredit and consumption, 27 estimates were obtained from 13 primary studies. Of the 27 estimates, Table 1 presents that about 37.03% (10 estimates) were not statistically significant. 17 Other estimates are positive and significant, but one estimate is negative, the research is the study of Docì (2016). Thus, based on the FEEs, we conclude that there is a relationship between micro-credit to household consumption. On the whole, micro-credit will increase household consumption of the poor.



Seven studies reported by the 13 estimates that explains the relationship between microcredit and poverty index. Of the 13 estimates, three estimates were not significant (23.08%) statistically. Meanwhile, all forecasts are positive.

### 3.4. Publication Bias and Genuine Effects

Our meta-analysis research through several stages of analysis. First, this study calculates the Fixed Effects Estimates (FEEs) as a measure of the mean weighted by the estimated each primary study has found. FEEs are used for original research that has been found to have the same number of population and the general average (Stanley et al. 2008). Second, we use a funnel asymmetry tests (FATs) and the precision effect tests (PETS) to determine the presence or absence of publication selection bias. FATs test whether the size of the micro-finance have genuine effects on poverty alleviation or not after the publication of selection bias is controlled. Finally, we analyze the variation in estimates associated with the evaluation of the characteristics of each primary study. Meta-regression tests the original effects of the outcome variable after controlling for selection bias, and the effects of other variables, for example the period of the data and methodology of the primary study. The third phase of this meta-analysis using the Partial Correlation Coefficients (PCCs) are derived from estimates of the primary study. PCCs measure microfinance relationship to the dependent variable, while the independent variables are fixed.

The dependent variable in this study is poverty reduction. Then, the proxy of poverty reduction is income, consumption and poverty index. The sign of the coefficients (PCCs) of microcredit in every estimate in each of the primary study, which is positive or negative, the rules are as follows: to estimate the dependent variable is income and consumption, the coefficient signs correspond to those reported, while the poverty index, a sign of the coefficient is the opposite of reported. The argument of these provisions is that if the poor who borrow microcredit led to an increase in income or consumption, poverty will decline, which means the positive effect on poverty reduction. Conversely, if the poverty index increases, poverty will increase, which means a negative effect on poverty reduction.

PCC against each estimate a correlation coefficient of the effect of microfinance on poverty reduction in each of the observations in each primary study. While the standard error is the value of standard error from each observation in each primary study. If the value of the standard error is not listed in the primary study, we calculate the standard error by dividing the correlation coefficient with the value of t-statistics. Standard errors are variants generated due to sampling error. Standard error will be used to calculate the weighted FEEs as a basis of measurement means.

Weighted means are calculated using the approach of Stanley (2008). Weighted means calculation formula is described as follows;

$$X_{WM} = \frac{\sum wm_i pc_i}{\sum wm_i}$$

where  $X_{WM}$  is a measure of the weighted means based on estimates of each study,  $pc_i$  represent partial correlation coefficient for each estimate, and  $wm_i$  is the weight that is calculated based on whether  $X_{WM}$  included in the random effects or fixed effect mean.

In the FEEs, the weight is a calculation of 1 divided by the square of the standard error of the estimate is the same as its PCCs. Thus, the equation X be as follows;

$$X_{FE} = \frac{\sum pc_i \frac{1}{SE_{pc}^2}}{\sum \frac{1}{SE_{pc}^2}}$$

where  $X_{FE}$  is the fixed effect estimate slightly its estimate of the weighted average,  $pc_i$  is the partial correlation coefficient for each estimate, and SE is the standard error of each estimate  $pc_i$ . The Fixed Effect Estimate (FEE) is to distribute the load, where less precise estimate has a lower weight, while a more precise estimate illustrates the higher weight. This suggests that the FEE is more reliable than the simple means. However, the FEE can be considered not consistent with the partial correlation when estimates of the primary study is biased publications. This is due to the assumption that the sampling errors in the size of the effect have been covered by the standard error.

To determine whether there is publication bias, we will do a Funnel Asymmetry Tests (FATs) and the Precision Effect Tests (PETs). The tests are carried out to ensure that PCCs that have been found of any estimate is not biased publications and to ensure that they are representative measure of actual original effects beyond bias. Analysis of FATs and PETs use bivariate estimates Weighted Least Square (WLS).

Before doing FATs and PETs, we draw a funnel plot based on the reported data. This is done to determine whether or not it an indication of publication bias by looking at the distribution of the data in the chart. Because of the small sample size, the data are widely spread in the bottom of the funnel if there is no publication bias (Stanley 2008).

To test the FAT, this study followed Stanley (2008). WLS models of Stanley (2008) tested the publication of selection bias and the actual effect of publication bias outside. The equation is described below.

$$\frac{pc_i}{SE_{pci}} = t_i = \beta_0 + \beta_1 \left( \frac{1}{SE_{pci}} \right) + \mu_i$$

Where  $\frac{pc_i}{SE_{pci}}$  which is also  $t_i$  positioned as the dependent variable, while the independent variable is  $\frac{1}{SE_{pci}}$  that is measure actual effects. FAT is used to test the null hypothesis and the alternative hypothesis. If  $H_0$  is rejected, then the equation is not experiencing publication bias, in which the sign of the coefficient of  $\beta_0$  determine the direction of publication bias selection.

$$H_0; \beta_0 = 0$$

$$H_1; \beta_0 \neq 0$$

To test the actual effect outside publications, we also use the null and alternative hypotheses below. If  $H_0$  is rejected, then the effect of that appears is genuine.

$$H_0; \beta_1 = 0$$

$$H_1; \beta_1 \neq 0$$

### 3.5. Explaining Heterogeneity

We follow Demena and Bergeijk (2016) in explaining heterogeneity with minimal modifications required. The variables that have the potential sources of heterogeneity based literature were

found. Four categories of potential sources of heterogeneity are characteristic of data, estimates characteristics, characteristics of programs and the characteristics of the publication.

1. Characteristics of data

We use a dummy variable for the dimension of time, including the data panel vs. cross-section, length of the data, and the number of observations. We enter the number of observed data to determine variations between small and large samples (Demena and Bergeijk 2016).

2. Characteristics of Estimates

Most studies on the effect of microfinance used OLS as its econometric method, of approximately 32%. Percentage of 35% is fixed effects, but it is only used in a few studies that do a lot of estimates, not used in most studies.

3. Characteristics of Programs

We control the characteristics of the borrower as a moderating variable. Borrowers women become one of the moderating variables to determine whether lending by women affect the effect or not. We also control the effect of microfinance on households because most estimates of the primary study examined at the household level by 74%.

4. Characteristics of Publications

We use a dummy variable for publication in peer-reviewed journals, the rankings of the journal publication, and the year of publication of the journal. This is done to determine the quality of a journal that will be used in the meta-analysis. Year of publication is included as a control variable from year to year because of research increasingly on developing micro-credit using large datasets and methodology as an analytical tool. Data base year is 2004 because the number is increasing after years of research, especially in the last five years.

Furthermore, to determine the heterogeneity in the meta-analysis, we accommodate moderator variables mentioned above into the equation MRA. We used multivariate Meta-Regression Analysis (MRA) for testing the moderating variables and examine the role of these variables to the original effects on the estimates (Stanley, 2008). Formulation of MRA is described below.

$$t_i = \beta_0 + \beta_1 \left( \frac{1}{SE_{pci}} \right) + \sum \beta_k \left( \frac{Y_{ki}}{SE_{pci}} \right) + \varepsilon_i + \mu_i$$

Where  $t_i$  is the t-value of each primary study estimates that have been found,  $Y_{ki}$  is the value of the various binary variable that describing the variation of various primary studies, while  $\beta_k$  is the coefficient of the independent variables were estimated.  $\beta_k$  also explain the impact of moderating variables to measure the effects. k is the sum of all reported moderating variable.

**Table 3 Description of Moderator Variables**

Variables	Description	Mean	Median	Standard Deviation
Data Characteristics				
Panel data	=1 if the primary study uses panel data	0.6604	1	0.4781
Year span	The number of years are used in the primary study	4.7736	2	4.7176
Number of observations	Total sample used (in thousand)	3.1605	0.8480	3.4577
Programme Characteristics				
Household level	=1 if the impact on household level	0.7358	1	0.4451
Female	=1 if the primary study examines impact of female loan	0.4528	0	0.5025
Productive loan	=1 if the primary study examines effect of productive loan	0.3019	0	0.4635
Econometric Methods				
Fixed effects	=1 if fixed effects used of poverty reduction estimation	0.3585	0	0.4841
Random effects	=1 if random effects used of poverty reduction estimation	0.0755	0	0.2667
Twoway fixed effects	=1 if twoway fixed effects effects used of poverty reduction estimation	0.0189	0	0.1374
PSM	=1 if propensity score matching used of poverty reduction estimation	0.1509	0	0.3614
Initial characteristics	=1 if initial characteristics used of poverty reduction estimation	0.0755	0	0.2667
OLS	=1 if ordinary least squares used of poverty reduction estimation	0.3208	0	0.4712
IV	=1 if instrumental variables used of poverty reduction estimation	0.1321	0	0.3418
2SLS	=1 if two-Stage least squares used of poverty reduction estimation	0.0566	0	0.2333
GMM	=1 if generalized method of moments used of poverty reduction estimation	0.0377	0	0.1924
LIML	=1 if limited information maximum likelihood used of poverty reduction estimation	0.0377	0	0.1924
Adjusted DD	=1 if adjusted difference-in-differences used of poverty reduction estimation	0.0377	0	0.1924
Publication Characteristics				
Date	The publication year from the base (2004)	7.9811	8	2.8250

Published	=1 if published in peer-reviewed journal	0.5849	1	0.4975
Journal rank	=1 if published in the top journal	0.4717	0	0.5040

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# Chapter 4

## Results and Findings

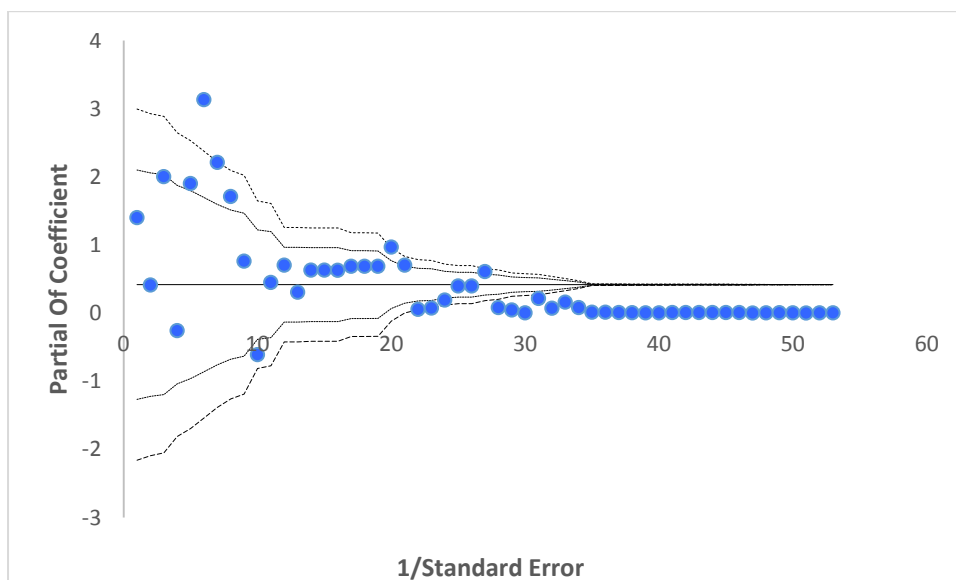
### 4.1. Introduction

This section outlines the results of the analysis and findings from secondary data that has been collected.

### 4.2. Funnel Plot

To know the publication bias, first, this paper use a funnel plot as an analytical tool. Funnel plot is a scatter diagram with poverty reduction as the horizontal axis and vertical axis is the standard error. If these effects are not biased, it must be symmetrical funnel plot because the small sample size that is not appropriate spread on the bottom of the funnel (Stanley 2008).

**Figure 2 Funnel Plot**



To determine whether the estimate was biased publication or not, we present the funnel plot as figure 2. Sutton et al. in Stanley (2008) states that the funnel plot method is the simplest and most common in detecting the presence or absence of publication bias. Figure 2 shows the funnel plot of all primary studies included in our meta-analysis study. Funnel plot above shows a positive bias. Stanley (2008: 107) states that "in the absence of publication selection, estimates will vary randomly, hence symmetrically, around the 'true' effect". Furthermore, Stanley (2008) explains that the ideal picture of the funnel plot is inverted funnel shape and approximate gathered on the effects of the original. Thus, Figure 2 shows the absence of publication bias. Estimates in figure 2is fused at one point thought to be the true effect of microfinance on poverty reduction.

Figure 2 illustrates that the estimated roughly assembled in 0.1. Estimates of poverty reduction is expected to vary randomly around that value. This suggests that the estimates are

not under threat of publication bias in the impact of micro-credit as a whole. However, a visual inspection of the funnel plot is not a guarantee of the absence of publication bias. Therefore, we do a more complete statistical tests to ensure the absence of publication bias and determine the direction and magnitude of bias if there is publication bias.

### 4.3.FAT and PET

**Table 4 FAT and PET on the Impact of Microcredit**

Variables	(1)	(2)	(3)	(4)
	Poverty Reduction	Income	Consumption	Poverty Index
Bias ( $\beta_0$ )	1.8828***	2.1925***	1.4604***	2.5596***
	(0.3579)	(0.3827)	(0.5991)	(0.6850)
Precision ( $\beta_1$ )	0.0019***	0.0019***	0.0021***	0.0013***
	(0.0001)	(0.0005)	(0.0002)	(0.0004)
Observations	53	13	27	13
R-squared	0.79	0.56	0.84	0.44

*Notes: the sign of \*\*\*, \*\*, \* are 1%, 5%, and 10% level of significance. Figures in brackets are standard errors.*

Table 4 presents the results of FAT and FET on estimates of microcredit. From Table 4, we found that microcredit has a positive and significant impact on poverty eradication as a whole with no bias publications. This is inferred from the rejection of  $H_0$  so that estimates are not biased publications. For measures of poverty, Table 4 shows that microcredit has a positive impact on the increase in income, an increase in consumption and a decrease in poverty index, in the absence of publication bias because  $H_0$  was rejected.

The original size of the effect is 0.0019 to poverty reduction. The value of this effect is included weak under the guidelines of Cohen because of below 0.01 (Cohen 1988). Overall, four forecasts are positive and statistically significant. For income, the effects of microcredit is 0.0019, which is also weak effect. For consumption and poverty index, each size is 0.0021 and 0.0013. Despite all these estimates have a weak impact on poverty alleviation, micro-credit can still be said to have a positive impact on poverty reduction.

Table 4 displays the R-squared. The value of R-squared are 79%, 56%, 84%, and 44% for poverty reduction, income, consumption, and poverty index respectively. It means the factors that affect poverty reduction can be explained by 79%, while 21% are influenced by other factors. Through the MRA, we try to explain the other moderator variables that affect the poverty reduction. This also applies to income, consumption and poverty index. However, Table 4 shows that the number of observations for income and poverty index was 13 observation. This amount is not enough to do regression because of the requirement degree of freedom is not met (see Walker (1940)). Therefore, the MRA will be made on poverty reduction and consumption.

#### 4.4. Sources of Heterogeneity

Table 5 the Impact of Microcredit using MRA

Variables	Poverty Reduction	Consumption
(1)	(2)	(3)
Precision	0.0022*** (0.0002)	0.0028*** (0.0005)
Bias Coefficient ( $\beta_0$ )	6.2942** (2.8989)	10.7241 (14.5560)
Data Characteristics		
Panel data	-1.1285 (2.3871)	-3.7225 (6.8556)
Year span	0.3388 (0.3150)	-0.1487 (1.2531)
Number of observations	-0.0516 (0.1734)	-0.3138 (0.6113)
Programme Characteristics		
Household level	2.8166 (2.0357)	-6.1645 (16.1498)
Female	0.5599 (1.4261)	1.3879 (4.1169)
Productive loan	-3.3350 (2.0041)	-0.2326 (7.1619)
Econometric Methods		
Fixed effects	-3.3380 (2.1858)	2.8374 (7.2775)
Random effects	-1.7355 (2.7458)	3.1047 (8.1806)
Two-way fixed effects	-6.7103** (3.1565)	
PSM	0.3337 1.4080	1.2305 (2.9668)
Initial characteristics	-0.0374 (1.7556)	-0.3297 (3.7685)
OLS	-3.2273 (2.5855)	2.4492 (7.7928)
IV	0.8962 (1.8205)	4.3564 (6.6975)
2SLS	-3.8692 (3.3915)	5.1068 (10.7617)
GMM	-4.3753 (3.6425)	5.1187 (12.3731)
LIML	-4.3807 (3.6425)	5.1067 (12.3731)
Adjusted DD	0.3348 (3.5863)	4.0075 (9.3006)
Publication Characteristics		



Variables	Poverty Reduction	Consumption
(1)	(2)	(3)
Date	-0.3902 (0.2409)	-0.5217 (0.6616)
Published	-5.9748** (2.3541)	-6.1577 (6.0612)
Journal rank	6.0644** (2.5023)	7.3077 (5.0630)
Observations	53	27
R-squared	0.91	0.95
Studies	17	13

Notes: the sign of \*\*\*, \*\*, \* are 1%, 5%, and 10% level of significance. Figures in brackets are standard errors.

Before performing a multivariate meta-regression (MRA), we chose a moderating variable. Based on the literature, the literature on microcredit (hereinafter referred to as microfinance), we are paying particular attention to the estimates as a control for micro-credit in the MRA. The MRA results are presented in Table 5. The moderating variables that we select based on factors that could potentially affect the effect of microfinance on poverty reduction in the primary studies and the theoretical assumptions of previous studies. Table 3 presents the moderating variables and their descriptions, while MRA results are presented in Table 5.

Characteristics of the publication as a moderating variable consists of the year of publication, type of publication and ranking of the journal publisher. Table 5 shows that the year of publication tend to not affect the effect size. Year of publication is also negative which implies that the primary studies published after 2004 are likely to produce the effect coefficient values lower than the previous primary studies. Then for the type of publication, we examined whether the journal tend to report different results than any other research. Publication type into a control variable to evaluate whether the writers and editors of journals tend to publish a journal that had a statistically significant, which is consistent with the theory, or that justifies a particular model (Stanley, 2008). Table 5 displays that the kind of publicity does not affect the estimate on the effect of income, consumption and poverty index, but in a negative value to poverty reduction. Thus, overall the kind of publicity does not affect the reported effects. Subsequently, we make a journal ranked as a moderating variable. It aims to determine whether the journal publisher which publishes the journal of the influence of variation researchers reported effect sizes. From Table 5, it can be concluded that journals with higher rankings presents a higher effect sizes on overall poverty reduction.

Furthermore, we use the methodology as moderating variable. Overall, the majority of the methodology does not significantly affect the size of the effect. We need more attention to the methods of two-way fixed effects and fixed effects since the results shown significant but negatively. This shows that the use of these methodologies tend to be less precise as an analytical tool in examining the effects of microfinance on poverty eradication. We need to consider other methods to test the hypothesis of microfinance, such as probit and logit. Probit and logit methods have been performed to evaluate the effect of microfinance on poverty reduction, for example Samer, et al. (2015), and Guriro and Pathan (2015). Studies on the impact of microfinance on poverty alleviation using probit and logit method is still very minimal.

In the characteristics of the data, we enter the data panel, time span, and the number of observations as moderating variable. All of the variables do not affect significantly the size of the effect. Nevertheless, we need to pay attention to the negative value of the intervention period. We assume that the negative values indicate a short period of intervention that will affect less well to the borrower, as the opinion Copestake et al. (2001).

Characteristics of the program is a collection of moderating variables from the household level, women borrowers, and the use of loans for productive activities. Table 5 exhibits that these three variables did not significantly affect the size of the effect. We need to pay attention to the negative value of the productive loan. This tends to show that most of the poor borrowers use the funds borrowed to cover domestic needs, not for the sake of earning. The use of these funds resulted in poor communities will be increasingly difficult to get out of poverty.

After analysis of moderating variables, Table 5 presents the original effects of microfinance on poverty alleviation through precision coefficient ( $\beta_1$ ). We found that microfinance affects significantly and positively on poverty eradication at 0.22%. We can conclude that the provision of loans through microfinance to the poor amounted to a value of 1 would lower the poverty rate of 0.0022. Moreover, consumption has significantly and positively impact on microfinance by 0.0028.

MRA results of Table 5 shows that the majority of moderator variables do not have a significant effect on measures of poverty. One reason is possible because the number of subjects is less, the number below 30 (Roscoe (1975), Hill (1998)) on income, consumption and poverty index so that no degree of freedom. Therefore, we perform MRA on the combined of subjects of proxies poverty numbering 53. In addition, we have conducted an experiment a few models to get the most appropriate model to explain poverty.

**Table 6 the MRA of Poverty Reduction**

Variables	Model 1	Model 2	Model 3	Model 4
Precision	0.0022*** (0.0002)	0.0023*** (0.0002)	0.0022*** (0.0002)	0.0022*** (0.0002)
Bias Coefficient ( $\beta_0$ )	6.2942** (2.8989)	1.5742 (1.2182)	1.4971** (0.6391)	1.1121** (0.5691)
Data Characteristics				
Panel data	-1.1285 (2.3871)	-0.6309 (1.1496)		
Year span	0.3388 (0.3150)	0.0656 (0.1333)		
Number of observations	-0.0516 (0.1734)	-0.1307 (0.1191)		
Programme Characteristics				
Household level	2.8166 (2.0357)	2.5859* (1.4114)	1.9709** (0.8694)	1.7000* (0.8496)
Female	0.5599 (1.4261)			
Productive loan	-3.3350 (2.0041)	-2.1523** (0.9381)	-2.1905*** (0.7695)	-1.9053** (0.7423)

Variables	Model 1	Model 2	Model 3	Model 4
Econometric Methods				
Fixed effects	-3.3380 (2.1858)			
Random effects	-1.7355 (2.7458)			
Twoway fixed effects	-6.7103** (3.1565)			
PSM	0.3337 1.4080			
Initial characteristics	-0.0374 (1.7556)			
OLS	-3.2273 (2.5855)	-1.2721 (0.7839)	-0.9163 (0.7105)	
IV	0.8962 (1.8205)	1.7998* (0.9895)	1.9886** (0.9525)	2.4080*** (0.9017)
2SLS	-3.8692 (3.3915)			
GMM	-4.3753 (3.6425)			
LIML	-4.3807 (3.6425)			
Adjusted DD	0.3348 (3.5863)			
Publication Characteristics				
Date	-0.3902 (0.2409)			
Published	-5.9748** (2.3541)	-3.6902*** (1.2761)	-3.2767*** (1.1800)	- (1.1881)
Journal rank	6.0644** (2.5023)	3.5887** (1.3629)	2.9148** (1.2163)	3.1984** (1.2048)
Observations	53	53	53	53
R-squared	0.91	0.87	0.87	0.86
Studies	17	17	17	17

Notes: the sign of \*\*\*, \*\*, \* are 1%, 5%, and 10% level of significance. Figures in brackets are standard errors.

Table 6 shows the four models MRA of poverty. Model 1 is equal to table 5 column 2. Variable significant moderator of model 2 is the household level, productive loan, IV, published and journal rank. Model 3 and 4 show the moderator variables that exactly matches the model 2 significantly to poverty. We have also conducted an analysis of a large selection of other models, but most results show only five variables that were significant moderator. Thus, we only pay attention to model 4 as the most reliable of MRA.

We found from table 6 that the household level is positive towards poverty reduction. This study shows that microfinance at the household level will reduce the level of poverty. While productive loan is negative, agreed to table 5. Both of these can be combined, at the household level, they use micro-credit to the needs of their household consumption and not for productive

activities. In the short term, it will reduce the level of poverty, but in the long run will lead to further exacerbate poverty. This argument is corroborated by Copestake et al. (2001) that the borrower would be poorer if they follow microcredit in the longer period of time.

We found a positive and significant coefficient for studies that apply Instrumental Variables (IV). This shows that the IV method can be adopted as an econometric model to explain the impact of microfinance on poverty eradication.

Publication type showed negative results. The studies reported in the form of journal turns negative effects of microfinance on poverty reduction. This shows that the publisher of the journal published a study likely to be honest in appropriate scientific methodology even though the outcome criticize specific models (Card and Krueger (1995), Ugur (2013)), in this case the positive effects of microfinance. Journal rank indicates a positive and significant. In other words, the quality of the journal will affect the reported estimates. Journals including high ranking will report higher effect on poverty reduction.

Table 6 also explains the original effects of microfinance on poverty alleviation through precision coefficient ( $\beta_1$ ). We found that microfinance affects significantly and positively on poverty eradication at 0.22%. It is the same as table 5 and also all of the models in table 6. R-squared in the model 4 is 86%. This shows that the model can explain the effect of microfinance on poverty reduction by 86%.

## Chapter 5

# Conclusions and Recommendations

This study is a meta-analysis based on empirical literature examining the effects of microfinance on poverty eradication. This study considers microcredit as a measure of microfinance and three proxy measures of poverty, namely income, consumption and poverty index. Based on 53 estimates derived from 17 primary studies published between the years of 2004-2016, we tested the hypothesis of the impact of microcredit on poverty eradication through meta-analysis.

The hypothesis testing through three main steps. First, we calculated the fixed effects weighted average for each primary study reported. Second, we examined publication bias using a funnel plot, FAT and PET. Finally, we used a multivariate meta-regression analysis (MRA) on the model of heterogeneity and tested whether the effect of moderating variable affecting the size or not.

Exposure of the funnel plot implies the absence of publication selection bias. This is shown on the t-value distribution that resembles a funnel. The absence of publication bias is also corroborated by the FAT and the FET caused rejection of  $H_0$ . MRA conducted after the certainty of the absence of bias. First, we perform MRA on overall poverty reduction and consumption. We did not perform MRA on income and poverty index for the issue of degree of freedom. MRA findings show that poverty reduction and the consumption is influenced by microfinance respectively 0.0022 and 0.0028 with R-squared respectively by 91% and 95%. Nevertheless, the majority of moderator variables were not significant. Therefore, we conduct the second stage of MRA on poverty reduction. The findings of the second MRA concluded the same effect of the first stage MRA, videlicet 0.0022. However, significant moderator variables are household level, productive loan, IV, published and journal rank.

The results of FAT/PET and MRA consistently concluded that microfinance affects significantly and positively on poverty reduction respectively by 0.0019 and 0.0022. However, the effect size that is too small will not have a significant economic impact. In other words, increase microfinance services by 1 would affect the poverty alleviation of 0.22%. Furthermore, as for measures of poverty partially in the MRA, consumption is significantly and positively influencing microfinance. This conclusion is in line with Yang and Stanley (2012) that microcredit does not affect or only slightly affect the income of the poor. Consequently, there is no strong evidence to support the positive effects of microfinance to the welfare of the poor.

As we know, our conclusions are based only on microcredit as representatives of microfinance. If we add other services of microfinance, the conclusion might be different. As argument of Duvendack et al. (2011) which states that the poor are not only in need of microcredit disbursement, but they also need other financial services such as micro savings, insurance and training support entrepreneurship. Furthermore, Kessy and Temu (2010) and Karlan and Valdivia (2011) also support that training on entrepreneurship may be able to give a positive effect for microfinance.

We propose some suggestions and policies based on the results of our meta-analysis. First, subsequent studies on the impact of microfinance on poverty alleviation should use all the services provided microfinance institutions, not just microcredit alone. It is based on the results of our meta-analysis in the very small of effect size. Therefore, further studies need to consider using the entire microfinance services rather than just microcredit. Second, the methodology in future studies might use a probit or logit analysis. Studies on the effect of microfinance on poverty alleviation using probit and logit analysis today is still very minimal. We did not apply the primary studies using logit and probit studies in the meta-analysis as the primary research using these methods are still very few. Third, policy makers (government) need to provide regulations which support the provision of microfinance services are thorough, so microfinance institutions do not only provide micro-lending services, but also services micro savings, micro-insurance, and entrepreneurship training. This recommendation is based on the findings of our meta-analysis that microcredit as representatives of microfinance only provide a very small effect for poverty reduction. However, further research needs to be done to convince the government about microfinance services to be thorough.

## References

- Angko, W. (2013) 'Microfinance and Poverty Reduction Nexus among Rural Women in Selected Districts in the Upper West Region of Ghana', *Developing Countries Studies* 3(9): 128–142.
- Appah, E., John, M. S., and Wisdom, S. (2012) 'An Analysis of Microfinance and Poverty Reduction in Bayelsa State of Nigeria', *Kuwait Chapter of Arabian Journal of Business and Management Review* 1(7): 38–58.
- Augsburg, B., R. De Haas, H.Harmgart, and C.Meghir (2012) 'Microfinance at the Margin: Experimental Evidence from Bosnia and Herzegovina'. WZB Discussion Paper 304. Berlin: Wissenschaftszentrum Berlin für Sozialforschung. Accessed August 2016 [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2021005](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2021005)
- Bamlaku, B. and A. Alemu (2006) 'Microfinancing and Poverty Reduction in Ethiopia'. Nairobi: IDRC.
- Banerjee, A., E. Duflo, R. Glennester, and C. Kinnan (2013) 'The Miracle of Microfinance? Evidence from a Randomized Evaluation'. MIT Department of Economics Working Paper Series 13-09. Cambridge: Massachusetts Institute of Technology.
- Barnes, C., E. Keogh and N. Nemarumdwe (2001) 'Microfinance Program Clients and Impact: An Assessment of Zambuko Trust, Zimbabwe'. Washington D. C.: Assessing the Impact of Microenterprise Services (AIMS).
- Barr, Michael S. (2004) 'Microfinance and Financial Development', *Michigan Journal of International Law* 26(27): 271–296. Accessed September 2016 <http://doi.org/10.1525/sp.2007.54.1.23>.
- Bello, W. Microcredit, Macro Issues (2006).
- Bergeijk, P. A. G. Van, and Lazzaroni, S. (2013) 'Macroeconomics of Natural Disasters Meta-analysis and Policy Options'. ISS Working Paper 567. The Hague: International Institute of Social Studies.
- Berhane, G., and Gardebroke, C. (2011) 'Does Microfinance Reduce Rural Poverty? Evidence Based on Household Panel Data from Northern Ethiopia', *American Journal of Agricultural Economics* 93: 43–55. Accessed September 2016 <http://doi.org/10.1093/ajae/aaq126>
- Block, W. E. (2010) 'A Critique of Yunus and His Micro-Finance', *Economics, Management and Financial Markets* 5(2): 57-75. Accessed September 2016 <http://doi.org/ISSN 1842-3191>
- Block, W. E. (2012) 'Micro-Finance: a Critique', *Humanomics* 28(2): 92–117. Accessed September 2016 <http://doi.org/10.1108/08288661211228870>
- Boudreaux, K. and T. Cowen (2008) 'The Micromagic of Microcredit', *The Wilson Quarterly* 32(1): 27–31. Accessed August 2016 <http://doi.org/10.2307/40262341>
- Brandt, L., N. Epifanova and T. Klepikova (1998) 'Lending Methodology Module'. The Russia Microfinance Project. Accessed August 2016 [http://depts.washington.edu/mfinance/eng/curriculum/docs/53\\_LendingMethodology.pdf](http://depts.washington.edu/mfinance/eng/curriculum/docs/53_LendingMethodology.pdf)
- Card, D., and A. B. Krueger (1995) 'Time-Series Minimum-Wage Studies: A Meta-analysis', *The American Economic Review* 85(2): 238-243.
- Cohen, J. (1988) *Statistical Power Analysis for the Behavioural Sciences*. Hillsdale, NJ.
- Copestake, J. (2002) 'Inequality and the Polarising Impact of Microcredit: Evidence from Zambia's Copperbelt', *Journal of International Development* 14(6): 743–755.
- Copestake, J., S. Bhalotra, and S. Johnson (2001) 'Assessing the Impact of Microcredit: a Zambian Case Study', *The Journal of Development Studies* 37(4): 81–100. Accessed August 2016 <http://doi.org/10.1080/00220380412331322051>
- Copestake, J., P. Dawson, J. Fanning, A. McKay and K. Wright-Revollo (2005) 'Monitoring the Diversity of the Poverty Outreach and Impact of Microfinance: a Comparison of Methods Using Data from Peru', *Development Policy Review Volume* 23(6): 703–723.
- Cotler, P., and C. Woodruff (2008) 'The Impact of Short-Term Credit on Microenterprises: Evidence from the Fincomun-Bimbo Program in Mexico', *Economic Development and Cultural Change* 56(4): 829–849. Accessed from <http://doi.org/10.1086/588169>

- Demena, B. A., and P.A.G. van Bergeijk (2016) 'A Meta-Analysis of FDI and Productivity Spillovers in Developing Countries', *Journal of Economic Surveys*. Accessed July 2016 <http://doi.wiley.com/10.1111/joes.12146>
- Dominicis, L. De, H.L.F. de Groot and R.J.G.M. Florax (2006) 'Growth and Inequality: A Meta-Analysis'. Tinbergen Institute Discussion Paper 064. Rotterdam: Tinbergen Institute Rotterdam.
- Dominicis, L. De, R.J.G.M. Florax and H.L.F. de Groot (2008) 'A Meta-Analysis on the Relationship between Income Inequality and Economic Growth', *Scottish Journal of Political Economy* 55(5): 654-682.
- Duvendack, M., and R. Palmer-jones (2012) 'High Noon for Microfinance Impact Evaluations: Re-investigating the Evidence from Bangladesh', *Journal of Development Studies* 48(12): 37-41. Accessed September 2016 <http://doi.org/10.1080/00220388.2011.646989>
- Duvendack, M., R. Palmer-jones, J. Copestake, L. Hooper, Y. Loke and N. Rao (2011) *What is the evidence of the impact of microfinance on the well-being of poor people?* London: EPPI-Centre.
- Garikipati, S. (2008) 'The Impact of Lending to Women on Household Vulnerability and Women's Empowerment: Evidence from India', *World Development* 36(12): 2620-2642. Accessed August 2016 <http://doi.org/10.1016/j.worlddev.2007.11.008>
- Ghalib, A. K., I. Malki, and K. S. Imai (2011) 'The Impact of Microfinance and its Role in Easing Poverty of Rural Households: Estimations from Pakistan'. Discussion Paper Series 28. Kobe: Kobe University.
- Ghalib, A. K., I. Malki, and K. S. Imai (2015) 'Microfinance and Household Poverty Reduction: Empirical Evidence from Rural Pakistan', *Oxford Development Studies* 43(1): 84-104. Accessed September 2016 <http://doi.org/10.1080/13600818.2014.980228>
- Ghalib, A. K., I. Malki, and K. S. Imai (2012) 'Microfinance and its Role in Household Poverty Reduction: findings from Pakistan'. BWPI Working Paper 173. Manchester: Brooks World Poverty Institute.
- Ghosh, R. (2005) 'Microfinance in India: A Critique'.
- Glass, G. V. (1976) 'Primary, Secondary, and Meta-Analysis of Research', *Educational Researcher* 5(10): 3-8.
- Goldberg, N. (2005) 'Measuring the Impact of Microfinance: Taking Stock of What We Know'. Grameen Foundation USA. Accessed August 2016 [http://files.givewell.org/files/Cause1-2/Independent research on microfinance/GFUSA-MicrofinanceImpactWhitepaper-1.pdf](http://files.givewell.org/files/Cause1-2/Independent%20research%20on%20microfinance/GFUSA-MicrofinanceImpactWhitepaper-1.pdf)
- Guriro, S., and P. A. Pathan (2015) 'Rural Poverty in Sindh and Role of Microfinance in Poverty Alleviation', *Grassroots* 49(II): 13-21.
- Hassen, F. (2006) 'Change in Food and Nutrient Consumption among the Ultra Poor: Is the CFPR/TUP Programme Making a Difference?' CFPR/TUP Working Paper 11. Gazipur: BRAC and Aga Khan Foundation Canada.
- Hill, R. (1998) 'What Sample Size is "Enough" in Internet Survey Research?', *Interpersonal Computing and Technology Journal* 6(3): 1-10.
- Hollis, A., and A. Sweetman (1998) 'Microcredit: What Can We Learn From the Past?', *World Development* 26(10): 1875-1891. Accessed August 2016 [http://doi.org/10.1016/S0305-750X\(98\)00082-5](http://doi.org/10.1016/S0305-750X(98)00082-5)
- Hollis, A., and A. Sweetman (2004) 'Microfinance and Famine: The Irish Loan Funds During the Great Famine', *World Development* 32(9): 1509-1523. Accessed September 2016 <http://doi.org/10.1016/j.worlddev.2004.04.002>
- Imai, K. S., T. Arun and S. K. Annim (2010) 'Microfinance and Household Poverty Reduction: New Evidence from India'. Discussion Paper Series 14. Kobe: Kobe University.
- Juanah, M. (2005) 'The Role of Micro-financing in Rural Poverty Reduction in Developing Countries'. Wismar Discussion Paper.



- Karlan, D. S. (2001) 'Microfinance Impact Assessments: The Perils of Using New Members as a Control Group', *Journal of Microfinance* 3(2): 75-85. Accessed September 2016 <https://journals.lib.byu.edu/spc/index.php/ESR/article/view/1359>
- Karlan, D., and J. Zinman (2011) 'Microcredit in Theory and Practice: Using Randomized Credit Scoring for Impact Evaluation', *Science* 332(6035): 1278-1284. Accessed September 2016 <http://doi.org/10.1126/science.1200138>
- Karlan, D., and J. Zinman (2010) 'Expanding Microenterprise Credit Access: Using Randomized Supply Decisions to Estimate the Impacts in Manila'. Innovations for Poverty Action Working Paper.
- Karlan, D., and M. Valdivia (2011) 'Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions', *Review of Economics and Statistics* 93(2): 510-527. Accessed October 2016 [http://doi.org/10.1162/REST\\_a\\_00074](http://doi.org/10.1162/REST_a_00074)
- Kessy, S., and S. S. Temu (2010) 'The Impact of Training on Performance of Micro and Small Enterprises Served by Microfinance Institutions in Tanzania', *Research Journal of Business Management*. Accessed September 2016 <http://doi.org/10.3923/rjbm.2010.103.111>
- Khandker, S. R. (2005) 'Microfinance and Poverty: Evidence Using Panel Data from Bangladesh', *The World Bank Economic Review* 19(2): 263-286. Accessed September 2016 <http://doi.org/10.1093/wber/lhi008>
- Khandker, S. R. (2003) 'Micro-finance and Poverty: Evidence Using Panel Data from Bangladesh'. World Bank Policy Research Working Paper 2945. Washington D. C.: The World Bank.
- Khandker, S and J. Houghton (2009) *Handbook on poverty and inequality*. Washington D. C.: The World Bank.
- Khandker, S. R., H. A. Samad and Z. H. Khan (1998) 'Income and Employment Effects of Micro-credit Programmes: Village-level Evidence from Bangladesh', *The Journal of Development Studies* 35(2): 96-124. Accessed August 2016 <http://doi.org/10.1080/00220389808422566>
- Küru, J. M. (2007) 'Microfinance, Entrepreneurship and Rural Development: Empirical Evidence from Makueni District, Kenya'. Global Poverty Research Group (GPRG).
- Kondo, T., A. Orbeta Jr., C. Dingcong and C. Infantado (2008) 'Impact of Microfinance on Rural Households in the Philippines'. Discussion Paper Series 5. Makati City: Philippine Institute for Development Studies.
- Kulik, J. A., and C. L. C. Kulik (1989) 'The Concept of Meta-Analysis', *International Journal of Educational Research* 13(3): 227-340. Accessed September 2016 [http://doi.org/10.1016/0883-0355\(89\)90052-9](http://doi.org/10.1016/0883-0355(89)90052-9)
- Ledgerwood, J., (1999) *Microfinance Handbook: an Institutional and Financial Perspective*. Washington D.C: The World Bank.
- Levin, G. (2012) 'Critique of Microcredit as a Development Model', *The Journal of Undergraduate Research at the University of Tennessee at the University of Tennessee* 4(1): 9. Accessed September 2016 <http://trace.tennessee.edu/cgi/viewcontent.cgi?article=1137&context=pursuit>
- Littlefield, B. Y. E., J. Morduch and S. Hashemi (2003) 'Is Microfinance an Effective Strategy to Reach the Millennium Development Goals?', *Focus Note* 24: 1-11. Accessed September 2016 <http://ifmr.ac.in/cmfw/wp-content/uploads/2007/06/mf-mdgs-morduch.pdf>
- Mahjabeen, R. (2008) 'Microfinancing in Bangladesh: Impact on Households, Consumption and Welfare', *Journal of Policy Modeling* 30(6): 1083-1092. Accessed September 2016 <http://doi.org/10.1016/j.jpolmod.2007.12.007>
- Misselhorn, A. A. (2005) 'What Drives Food Insecurity in Southern Africa? A Meta-Analysis of Household Economy Studies', *Global Environmental Change* 15(1): 33-43. Accessed September 2016 <http://doi.org/10.1016/j.gloenvcha.2004.11.003>

- Morduch, J. (1998) 'Does Microfinance Really Help the Poor? New Evidence from Flagship Programs in Bangladesh'. The Financial Access Initiative. New York: NYU Wagner Graduate School. Accessed September 2016  
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.170.9151&rep=rep1&type=pdf>
- Morduch, J. and B. Haley (2002) 'Analysis of the Effects of Microfinance on Poverty Reduction'. NYU Wagner - Working Papers Series 1014. New York: New York University.
- Nanor, M. A. (2008) *Microfinance and Its Impact on Selected Districts in Eastern Region of Ghana*. Master Thesis, College of Art and Social Sciences.
- Nathanael, G. and D. Karlan (2006) 'The Impact of Microfinance: A Review of Methodological Issues'. New York: Financial Access Initiative.
- Neves, P. C., O. Afonso, and S. T. Silva (2016) 'A Meta-Analytic Reassessment of the Effects of Inequality on Growth', *World Development* 78: 386–400. Accessed July 2016  
<http://doi.org/10.1016/j.worlddev.2015.10.038>
- Ogwumike, F. O. (2001) 'An Appraisal of Poverty Reduction Strategies in Nigeria', *CBN Economic and Financial Review* 39(4): 17.
- Otero, Maria. (1999) *The Evolution of Nongovernmental Organizations toward Financial Intermediation*. West Hartford, CT: Kumarian Press.
- Oyeranti, O. and Olayiwola, K. (2005) 'Policies and Programmes for Poverty Reduction in Rural Nigeria'. Paper prepared for *The African Economic Research Consortium (AERC)*.
- Panjaitan-Drioadisuryo, R. D. M. and K. Cloud (1999) 'Gender, Self-employment and Microcredit Programs an Indonesian Case Study', *The Quarterly Review of Economics and Finance* 39(5): 769-779. Accessed August 2016 [http://doi.org/10.1016/S1062-9769\(99\)00028-9](http://doi.org/10.1016/S1062-9769(99)00028-9)
- Pitt, M. M. and S. R. Khandker (1998) 'The Impact of Group-Based Credit Programs on Poor Households in Bangladesh: Does the Gender of Participants Matter?', *Journal of Political Economy* 106(5): 958-996.
- Rabbani, M., M. Sulaiman and V. A. Prakash (2006) 'Impact Assessment of CFPR/TUP: A Descriptive Analysis Based on 2002-2005 Panel Data'. CFPR/TUP Working Paper Vol. 12. Gazipur: BRAC and Aga Khan Foundation Canada.
- Roodman, D. and J. Morduch (2009) 'The Impact of Microcredit on the Poor in Bangladesh: Revisiting the Evidence'. CGD Working Paper 174. Washington D.C.: Center for Global Development
- Roscoe, J.T. (1975) *Fundamental Research Statistics for the Behavioural Sciences, 2<sup>nd</sup> edition*. New York: Holt Rinehart and Winston.
- Samer, S., I. Majid, S. Rizal, M. R. Muhamad, Sarah-Halim and N. Rashid (2015) 'The Impact of Microfinance on Poverty Reduction: Empirical Evidence from Malaysian Perspective', *Procedia - Social and Behavioral Sciences* 195: 721–728. Accessed July 2016  
<http://doi.org/10.1016/j.sbspro.2015.06.343>
- Schreiner, M. and H. H. Colombet (2001) 'From Urban to Rural: Lessons for Microfinance from Argentina', *Development Policy Review* 19(3): 339-354. Accessed July 2016  
<http://doi.org/10.1111/1467-7679.00138>
- Stanley, T. D. (2008) 'Meta-Regression Methods for Detecting and Estimating Empirical Effects in the Presence of Publication Selection', *Oxford Bulletin of Economics and Statistics* 70(1): 103-127. Accessed July 2016 <http://doi.org/10.1111/j.1468-0084.2007.00487.x>
- Stanley, T. D., H. Doucouliagos, M. J. Giles, J. Heckemeyer and R. Johnston (2013) 'Meta-analysis of Economics Research Reporting Guidelines', *Journal of Economic Surveys* 27(2): 390-394. Accessed August 2016 <http://doi.org/10.1111/joes.12008>
- Stanley, T. D., S. B. Jarrell and H. Doucouliagos (2010) 'Could it Be Better to Discard 90% of the Data? A Statistical Paradox', *The American Statistician* 64(1): 70–77. Accessed July 2016  
<http://doi.org/10.1198/tast.2009.08205>

- Steenwinkel, J. (2016) 'ISS Referencing Guide 2016, 2016 (June)'. The Hague: Institute of Social Studies.
- Takahashi, K., T. Higashikata and K. Tsukada (2010) 'The Short-Term Poverty Impact of Small-Scale, Collateral-Free Microcredit in Indonesia: A Matching Estimator Approach', *Developing Economics* 48(1): 128-155. Accessed August 2016 <http://doi.org/10.1111/j.1746-1049.2010.00101.x>
- Ugur, M. (2014) 'Corruption's Direct Effects on Per-capita Income Growth: a Meta-analysis', *Journal of Economic Surveys* 28(3): 472-490. Accessed July 2016 <http://doi.org/10.1111/joes.12035>
- United Nations Development Program (2016) *UNDP and the Concept and Measurement of Poverty*.
- Walker, H. M. (1940) 'Degrees of Freedom', *Journal of Educational Psychology* 31(4): 253-269. Accessed July 2016 [http://courses.ncssm.edu/math/Stat\\_Inst/PDFS/DFWalker.pdf](http://courses.ncssm.edu/math/Stat_Inst/PDFS/DFWalker.pdf)
- Weiss, J., H. Montgomery and E. Kurmanalieva (2003) 'Microfinance and Poverty Reduction in Asia: What is the Evidence?', *ADB Institute Research Paper* 53: 1–24.
- Yang, M. and T. D. Stanley (2012) 'Micro-Credit and Income: A Literature Review and Meta-analysis', *Bulletin of Economics and Meta-Analysis*. Accessed August 2016 <http://www.hendrix.edu/maer-network/default.aspx?id=15206>
- Yunus, M. (2007) *Creating World without Poverty: Social Business and the Future of Capitalism*. New York: Public Affairs.
- Zaman, H. (2000) 'Assessing the Poverty and Vulnerability Impact of Micro-Credit in Bangladesh: A case study of BRAC'.

## References of Meta-Analysis

- Abera, H. (2010) *Can Microfinance Help to Reduce Poverty? With Reference to Tigray, Northern Ethiopia*. Master Thesis, College of Business and Economics, Makelle University.
- Alnaa, S. E., and F. Ahiakpor (2015) 'Synthesis of Microfinance and Technical Efficiency: Implications for Poverty Reduction in Ghana', *Research in Applied Economics* 7(1), 13–25. Accessed July 2016 <http://doi.org/10.5296/rae.v7i1.6599>
- Annim, S. K. (2009) 'Targeting the Poor versus Financial Sustainability and External Funding: Evidence of Microfinance Institutions in Ghana'. BWPI Working Paper 88. Manchester: Brooks World Poverty Institute.
- Annim, S. K., and S. E. Alnaa (2013) 'Access to Microfinance by Rural Women: Implications for Poverty Reduction in Rural Households in Ghana', *Research in Applied Economics* 5(2): 19-41. Accessed July 2016 <http://doi.org/10.5296/rae.v5i2.2974>
- Belhadj Miled, K., and J. E. Ben Rejeb (2016) 'Can Microfinance Help to Reduce Poverty? a Review of Evidence for Developing Countries', *Journal of the Knowledge Economy*. Accessed July 2016 <http://doi.org/10.1007/s13132-015-0348-2>
- Bhuiya, M. M., R. Khanam, M. M. Rahman and H. S. Nghiem (2015) 'Impact of Microfinance on Household Income and Consumption in Bangladesh: Empirical Evidence from a Quasi-Experimental Survey'. Paper prepared for the *44th Australian Conference of Economists (ACE 2015)*.
- Bui, L. T. V. (2014) *Microfinance and Poverty Alleviation: Does Credit Access Contribute to Reduce Household Poverty in Vietnam*. Master Thesis, Graduate School of Arts and Sciences, Georgetown University.
- Cuong, N. V. (2008) 'Is a Governmental Micro-credit Program for the Poor Really Pro-poor? Evidence from Vietnam', *The Developing Economics* 46(2): 151-187. Accessed August 2016 <http://doi.org/10.1111/j.1746-1049.2008.00061.x>

- Doçi, E. (2016) 'Microfinance and the Interaction of Macroeconomic Factors in Poverty Reduction', *Academic Journal of Interdisciplinary Studies* 5(2): 209-218. Accessed July 2016 <http://doi.org/10.5901/ajis.2016.v5n2p209>
- Franco, N. (2011) *Does Microfinance Reduce Poverty? A Study of Latin America*. Master Thesis, Boston College, Boston.
- Hoque, S. (2004) 'Micro-credit and the Reduction of Poverty in Bangladesh', *Journal of Contemporary Asia* 34(1): 21-32. Accessed July 2016 <http://doi.org/10.1080/00472330480000281>
- Imai, K. S., R. Gaiha, G. Thapa and S. K. Annim (2012) 'Microfinance and Poverty - A Macro Perspective', *World Development* 40(8): 1675–1689. Accessed August 2016 <http://doi.org/10.1016/j.worlddev.2012.04.013>
- Imai, K. S., and M. S. Azam (2012) 'Does Microfinance Reduce Poverty in Bangladesh? New Evidence from Household Panel Data', *Journal of Development Studies* 48(5): 633–653. Accessed August 2016 <http://doi.org/10.1080/00220388.2012.661853>
- Kaboski, J. P., and R. M. Townsend (2012) 'The Impact of Credit on Village Economies', *American Economic Journal: Applied Economics* 4(2): 98–133.
- Kienlein, T. (2016) *Comparing Microfinance and Education for Poverty Reduction – A Macro Perspective*. Master Thesis, School of Economics and Management, Lund University.
- Kyophilavong, I. S. P. (2015) 'Does Microfinance Reduce Poverty in Lao PDR?', *International Journal of Development Issues* 14(3): 215-230. Accessed July 2016 <http://doi.org/10.1108/IJDI-10-2014-0072>
- Li, X., C. Gan and B. Hu (2011) 'The Welfare Impact of Microcredit on Rural Households in China', *The Journal of Socio-Economics* 40(4): 404–411. Accessed August 2016 <http://doi.org/10.1016/j.socec.2011.04.012>