

Implications of Microfinance for Gender Inequality in Ghana

By Theresa Owusu-Danso¹

Abstract

The paper seeks to investigate whether increased access to microfinance by poor households in Ghana affects intra-household gender inequality and gender asset gap between male-headed households and female-headed households. The paper uses beta regression models and the Oaxaca decomposition to answer this question. The analysis is based on data obtained from household survey conducted in Ghana from May to July 2013. Comparative analysis of households with and without microfinance shows that on average female-headed households receiving micro-credit tend to spend equally on male and female children at the primary and secondary school levels whereas education expenditure is skewed in favor of male children relative to female children in the case of female-headed households without micro-credit. This result translates into higher years of schooling for children in female-headed households with micro-credit compared to their counterparts without micro-credit. On average, females in households receiving micro-credit have a higher share of household assets relative to females in households without micro-credit. The results from this paper suggest that microfinance helps to reduce intra-household gender inequality and gender asset gaps between male-headed and female-headed households.

Keywords: Gender Inequality, Microfinance, and Intra-household Analysis

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1. Introduction

Reducing poverty and inequality, which are two main goals of developing countries, continue to top global agenda in recent decades. In 2010, more than 460 million people in developing countries (over 20 percent), lived in extreme poverty, that is, on less than \$1.25 a day (World Bank, 2014). Despite considerable success in reducing extreme poverty, over the past decade, extreme poverty remains high in sub-Saharan Africa (SSA): 48 percent in 2010, down from 58 percent in 1999. Sub-Saharan Africa is also characterized by high levels of inequality. Perhaps more worrisome is the slow pace of reduction in gender inequality in the form of income, health, education, employment and human rights in the sub-region². In fact, in some countries within the sub-region, gender inequality is increasing, suggesting that efforts aimed at reducing extreme poverty benefit males relatively more than females.

Among the factors which have been identified as contributing to poverty and gender inequality in developing countries is the lack of access to finance. Despite the growth of the financial sector in SSA, the poor are found to be mostly excluded from the formal financial sector on account of their relatively low levels of income and lack of assets which can be used as collateral. It is expected that the proliferation of microfinance institutions (MFIs) would help bridge the gap between the demand and supply of credit for poor households. Indeed the main ideology underlying the microfinance model is to enable the poor who are mostly excluded from the formal financial sector to have access to financial services, in particular credit, to improve their livelihoods leading to a reduction in poverty and inequality. The question is to what extent access to microcredit helps to reduce inequality between men and women both at the country level and also within the household.

This paper contributes to the existing literature by examining the impact of access to microfinance services on gender inequality, in relation to ownership of household physical wealth and with regard to education expenditures on female and male children across and within households in Ghana. There is a general consensus that microfinance is mostly accessible to women (Corsi, Botti, Rondinella, & Zacchia, 2006; Hulme & Mosley, 1996; Khandker, 2003), but the central question of this paper is whether increased access to microfinance is making any significant impact on gender inequality in Ghana. The objective of the paper is two-fold. First, it examines the impact of access to microfinance on women's ownership of physical assets relative to men within the households and on the gender asset gap between male-headed and female-headed households. Second, the paper investigates the impact of microcredit on households' expenditures on education and health disaggregated by the gender of the child. The following null hypotheses are tested: (i) access to microcredit *does not* reduce intra-household inequalities; (ii) access to microcredit *does not* have an impact on the gender asset gap between male-headed households and female-headed households.

² There are some improvements observed in gender equity for selected countries in some areas such as education and political leadership. Currently Liberia and Malawi have female Presidents and in general there are recorded improvements in gender representation in national parliament of most SSA countries. Majority of countries in SSA have also attained gender equity in primary education.

In addition to comparative analysis between households with and without microfinance, the paper uses beta distribution to model the impact of access to microfinance on intra-household gender inequality. In addition, the paper uses the Oaxaca decomposition methods to explain the measured gender asset gap between the male-headed and female-headed households using cross-sectional data³ obtained from household survey conducted in Ghana from May to July 2013. The evidence shows that access to microfinance is important for reducing gender asset gaps within households and between male-headed and female-headed households. The comparative analysis also shows that having microfinance may play an important role in reducing gaps in education between male and female children in female-headed households.

The paper consists of six main sections. Following this introduction, section 2 reviews the empirical literature on the impact of micro-finance on the poor and in particular women. Section 3 provides the theoretical framework for the analysis of the impact of microfinance on gender inequality. Section 4 presents the research methodology and the data. The empirical results are discussed in section 5. Section 6 concludes.

2. Micro-finance, Women and the Poor: A Review of the Literature

The Ghana 2010 Population and Housing Census found that 65 percent (GSS, 2013, p. 267) of the working population is found in the private informal sector. Not surprising those in this group, majority of who are women, have been characterized as having limited access to credit (Osei-Boateng & Ampratwum, 2011). Access to financial services is necessary for the growth and development of the informal sector as this has the potential also to mop up excess liquidity through savings that can be channeled into investment capital for national development.

A recent analysis by the Bank of Ghana has also shown that less than 10 percent of the population has access to formal finance. Given the importance of finance to any poverty reduction strategy, it therefore becomes imperative for policymakers to examine the ways through which credit constraints facing the unbanked population can be resolved. I argue that the financing gap facing those in the private informal sector is due to their exclusion from the formal financial sector. Research has established that only a half of Ghanaian SME applications for bank loans have any chance of being considered favorably (Aryeetey, 1994). Roughly two-thirds of microenterprise loan applications were likely to be turned down. The high rejection rates according to bankers is attributed to the absence of viable or bankable projects, the entrepreneurs however indicate it was because they were not seen to have good collateral (Aryeetey, 1994).

Poor households, in particular, are at a disadvantage relative to rich households when it comes to accessing financial services from the formal financial services due to their relatively lower levels of income which makes them unable to save with the formal financial institutions and their lack of collateral which prevents them from accessing credit. Micro-finance has been touted as the solution to bridging this financing gap between the poor and the rich. It is expected

³ The survey covered 500 households, out of which 253 households were categorized as having received microfinance with 247 categorized as households without microfinance.

that by increasing access of poor households to financial services they will escape poverty as the income gap between them and the rich would be greatly reduced.

As with most developing countries, women in sub-Saharan Africa (SSA) often assume a disproportionate responsibility for the welfare of their families. However, the available empirical evidence suggest that poor women are mostly the subject of discrimination in terms of access to financial services from the formal financial sector (Baydas, Meyer, & Aguilera-Alfred, 1994). This stems from their weak bargaining position within the household leading to limited access to the required resources for accessing financial services. Most of the time, men have control of the marketable assets that can be used as collateral for accessing financial services. Several research studies, therefore, suggest that access to micro-finance for women is critical for poverty alleviation and women's empowerment.

In a cross-country empirical analysis of 61 developing countries which examined the relationship between micro-finance and inequality it was established that universally access to micro-finance lowers inequality between the rich and the poor and hence micro-finance is an effective redistribution tool (Kai & Hamori, 2009). Indeed some studies suggest that high inequality characterizing most of the developing world is as a result of credit constraints facing poor people (Deininger & Squire, 1998). This implies that access to small loans for the poor in developing countries is crucial if poverty and inequality can be reduced. The analysis of the study was however limited to inequalities between the rich and the poor without regard to intra-household inequalities and in particular if gender inequalities are reduced. There are key developments occurring within the household for which reason we cannot ignore their implications for inequality and the consequent stability thereof (Woolley & Marshall, 1994).

If micro-finance has an equalizing effect then how are women and men differently affected with access to micro-finance? That micro-finance mostly targets women is a forgone conclusion in the literature. For instance, in Asia and Africa, the available empirical evidence suggests that women constitute the majority of the clientele of micro-finance institutions. The suggestion that micro-finance targets the poor of the poor is however not supported, which my study will show. Empirical evidence on the impact of increased access to financial services provided by MFIs in reducing inequality (income, education and health gaps) between women and men in developing countries is, however, limited.

There are two major approaches adopted in the empirical literature for analyzing the welfare impact of credit on a given population. The first approach which is objective in nature uses indicators set in monetary value terms such as income and expenditures or other such indicators to assess impact. The second approach which is subjective in nature uses indicators, which are usually not set in monetary value terms, such as food security, health and women's empowerment, to examine the impact of micro-credit.

The second approach may be viewed in the light of Sen's capability approach (Sen, 1999) which fosters the use of multi-dimensional approach to the measurement of well-being rather

than the use of uni-dimensional approaches often used in the development literature. One may ask, does an increase in a woman's income necessarily imply this person is empowered or does an increase in women's income after assessing microfinance translate into women's empowerment? Researchers critical of the first approach, which assess impacts based on financial outcomes, resort to using the second approach to assess impact.

Among the studies have assessed the impact of access to MFIs on women using the first approach is Khandker (2003) who finds that in terms of contribution to the household expenditures, a 100 percent increase in credit to a woman results in a 5 percent increase in per capita household non-food expenditure and a 1 percent increase in food expenditure while a 100 percent increase in credit to a man results in a 2 percent increase in non-food expenditure of the household and a trivial change in food expenditure.

Pitt et al (2003) using a multipurpose quasi-experimental household survey data on rural Bangladesh also shows that relative to their male counterparts, credit provided to women has a large and significant positive impact on arm circumference and height of their children. Specifically, they provide evidence that shows that evaluated at their means, a 10 percent increase in credit allocated to females results in an increase in the arm circumference of girls and boys by 0.45 and 0.39 centimeters, respectively (Pitt, Khandker, Chowdhury, & Millimet, 2003, p. 110). In contrast, the same percentage increase in credit allocated to males increases arm circumference for girls by 0.21 cm and reduces that of boys by 0.14 cm. Similarly, while a 10 percent increase in credit to females leads to an increase in height of girls and boys by 0.36 and 0.50 centimeters per year respectively, the same amount of credit increase to males reduces the height of girls and boys by 0.16 and 0.11 centimeters, respectively.

Dupas and Robinson (2012) also provide experimental evidence on the role of micro-savings services in reducing poverty for market women in rural Kenya which shows that micro-savings services contributes to increased savings despite negative returns on these savings. In addition their study shows that these micro-savings services led to substantial positive impact on business investments by market women, with an estimate of about 45 percent increase of daily average investment as well as about 27 to 40 percent higher private expenditures for market women accessing these services compared to women in a comparison group. They also find evidence suggesting that market women accessing micro-savings services were less vulnerable to illness shocks relative to market women in the comparison group who tend to fall on their working capital in response to health shocks (Dupas & Robinson, 2012, p. 4).

Most other empirical studies which have examined the impact of access to MFIs on women often adopt the second approach. One such study examines the impact of access to MFIs on women's empowerment and reports that micro-finance in Bangladesh has led to a reduction in domestic violence against women (Kabeer, 2005). Yet another study finds that for one village being served by Grameen, roughly 70 percent of the borrowers experienced an increase in domestic violence on account of accessing financial services from Grameen (Rahman, 1999). Another study finds that access to micro-finance, by increasing the opportunity cost of women's

time, has contributed positively to the use of contraceptives by women and decreased women's vulnerability to family violence (Schuler, Hashemi, & Riley, 1997).

Hashemi, Schuler, and Riley (1996) have further argued that "minimalist credit programs provide access to an important economic resource" (pp. 650) and acts as "catalyst in transforming the lives of women." Hashemi et al (1996) create a composite empowerment indicator based on eight components. These include mobility, economic security, ability to make small and larger purchases, involvement in major household decisions, relative freedom from domination within the family, political and legal awareness and involvement in political campaigning and protests. They find that membership of any of the two credit programs evaluated increases the likelihood of a woman being empowered by 16 percent. They further argue that though minimal, credit programs empower women by increasing their mobility and bargaining power within the household which allows them to have control over their assets and income.

Corsi et al. (2006), from their research on the impact of micro-finance on women in Mediterranean countries, argue that empowerment through finance seem more effective than programs that are specifically targeted at reducing gender discrimination. But that begs the question, 'is the provision of microcredit alone sufficient in empowering women?' Several other studies have pointed out that the provision of credit alone is insufficient in empowering women (Beatriz & Jonathan, 2005; Corsi et al., 2006; Rankin, 2002). However, when credit is provided in conjunction with non-financial services, such as adult literacy, healthcare and management training, the impact on women's empowerment is significantly increased (Beatriz & Jonathan, 2005; Corsi et al., 2006).

Both the theoretical and empirical arguments put forth seem to suggest that assessing the impact of access to micro-finance will depend on the context and hence its positive or negative impacts on poverty reduction and women's empowerment cannot be generalized in all cases. Indeed Mayoux (1999) reports on a survey of fifteen different micro-finance programs in Africa that the extent to which micro-finance can contribute to women's empowerment is household and region-specific and mostly depends on the flexibility associated with social norms and traditions. Beatriz and Jonathan (2005) argue further that the impact on women's empowerment also depends on how particular programs are designed.

There are other studies that suggest that access to microcredit may not necessarily lead to any positive outcomes on women. For instance, Goetz and Gupta (1996), show that the increase of credit to rural women in Bangladesh and the high repayment rates they exhibit does not necessarily reflect effective loan investment strategies by women implying that the impact of microcredit on women's empowerment deserves more scrutiny. Reporting on their research work which focuses on special credit programs targeted at poor rural women, they find that despite the fact that women borrowers are solely responsible for servicing loans, a significant proportion of these women's loans are directly controlled by their male relatives. In this vein, Endeley (2001)

has argued that the objective of women's empowerment through microcredit programs will not be achieved if loans are given to women who do not have control over their incomes.

To the best of my knowledge there is currently no empirical evidence on the quantitative impact of access to microfinance on intra-household gender inequalities using the recently developed gender asset gap measure (see Oduro, Baah-Boateng, and Boakye-Yiadom (2011)). This study is an attempt to fill in the gaps in the empirical literature on the impact of access to microfinance on intra-household wealth inequality and gender asset gaps between male-headed and female-headed households.

3. Theoretical Framework

3.1 Gender Norms and its Implication for Intra-household Inequality

Chayanov's study of Russian peasant economy and the publication of the 'A Treatise on the Family' in 1981 by Becker were both instrumental in drawing attention to the family in economic analysis and the latter, in particular, has been the basis for the neoclassical approach to the study of households (Bermant, 2008). According to the United Nations, the household, which is a very complex unit of analysis, may be defined simply as "a group of people who live and eat together." There are variations to this definition and the definition applied in any research study has varied implications for the outcome of the research study. For this reason, Bolt and Bird (2003) have argued that researchers need to be clear on the assumptions underlying any research related to household level analysis.

Broadly, theories underlying analysis of household behavior and how intra-household allocation decisions are made may be classified under two categories with the key assumption about the household being the defining characteristic. Within the first category are models which operate under the assumption that the household is a single decision-making agent with second category arguing otherwise.

Doss (1996, p. 1599) identifies the common preferences and unified household models as the main classes of intra-household resource allocation models under the first category and in both of these models an aggregate household utility function is assumed. In particular, these models view the household as a collection of individuals with the same utility function where all members have the same preferences. However, as Arrow (1950) points out, in what has been generally recognized in development theory as "Arrow's General Possibility Theorem," aggregation of individual preferences to the societal or household level can only be classified as satisfactory or rational under the mechanism of dictatorship. Many have pointed to the altruistic tendency within families (Samuelson, 1956), to solve the problem of aggregation (Bergstrom, 1995; Doss, 1996; Folbre, 1986).

Indeed there are significant reasons to expect that to some extent altruism may exist within the household but that actual effect of any level of altruism on resource allocation may be

elusive. Assuming altruism, as envisaged under the unitary approach for the intra-household allocation of resources for instance provides researchers with no basis to assess conflict among members of a household either by gender, age etc. Indeed, the idea that individuals, within a household, act altruistically toward each other, especially in the allocation of resources, is a key theme in the majority of research that builds on the unitary model of the household.

Within the second category, however, are models which argue that the household utility function may be disaggregated (see Doss (1996) for a detailed review). It is important to note however, that there are two different views within this category which relates to the outcome of intra-household resource allocation decision with the first view suggesting the possibility of the household attaining Pareto efficient outcomes. These theories are mostly classified as collective models of the household. On the other hand there are theories which view the household as a place where there is significant bargaining which may lead to a definite Pareto efficient (cooperative bargaining models) or non-Pareto efficient outcomes (non-cooperative bargaining models). In particular, the bargaining models of intra-household resource allocation holds promise for analyzing conflict that may exist among members within a household.

The available empirical evidence, most of which employ bargaining models of intra-household resource allocation, shows that in terms of the distribution of resources, women are often the object of discrimination, both at the household level and the society at large (Berkner, 1973; Folbre, 1986, 1996). The literature identifies the unequal gender division of labor consequently resulting in unequal gender division of reward as a key factor driving this development. Essentially, the work most women do (mostly household activities), are considered to be of low market value resulting in lower or no rewards leading to their weak bargaining position within the household.

The weak economic position of women also mean that they have less bargaining power and are constrained in terms of making decisions regarding how many children to have, and investment decisions relating to their children, in particular, which of their children gets priority in terms of education and health etc. Micro-finance is touted as serving to improve women's bargaining position and their overall livelihood. For this reason we expect that access to microcredit should help in reducing gender inequality at both the household and country levels.

3.2 Access to Credit from Formal Credit Markets

In both the theoretical and empirical literature, access to credit has been identified as one of the effective tools that can help to reduce the poverty gap and inequalities. It is noted that access to credit can also help to smooth consumption and income following exogenous shocks. In Ghana for instance, barely 10 percent of the population is being served by the formal financial institutions which means that most small and medium scale enterprises and most of the poor population have little or no access to financial services. The lack of access to financial services from the formal financial institutions is a matter of concern especially given that the poor represents the largest share of the population and the fact that small and medium scale enterprises represent an important part of the economies of most SSA countries.

Problems relating to ability of those caught up in the poverty trap to access credit at formal financial institutions abound. These are as a result of imperfections in financial markets resulting in adverse selection and moral hazard. Adverse selection refers to situations in which there are difficulties in determining the level of risk each customer represents for which reason any attempt at raising the average interest rate could potentially result in having a high pool of riskier customers. On the other hand moral hazard refers to situations in which banks are unable to ascertain if indeed loans when granted are applied to the very projects for which they were acquired or applied to risky projects. Beatriz and Jonathan (2005) notes that these two problems resulting from imperfect information are often aggravated in situations where the judicial systems are weak as difficulties arise when enforcing contracts. A key aspect of these imperfections within the formal financial sector also shows itself in gender discrimination where access to credit has been identified to be mostly skewed in favor of men relative to women.

More often the high transactions cost involved in working in poor communities is due to the relatively high costs involved in handling several small transactions compared with one large transaction for a rich client means that formal banks shy away from providing financial services for the poor. Similarly, the absence of marketable assets for use as collateral by the poor means that banks are subject to high risks and costs of default should they be engaged with the poor (Beatriz & Jonathan, 2005).

3.3 Problem on Supply-side and Demand-side of Credit Markets

Financial markets are complex in terms of their operations, and thus cannot be characterized as perfectly competitive. The assumption of perfect information is the basis upon which some markets can be characterized as perfectly competitive. The assumption of perfect information implies that all players in the market have perfect knowledge regarding the actions of each player. In practice, however, borrowers may have valuable information that lenders do not have on the riskiness of their projects and their true ability to repay the loan. This information asymmetry results in adverse selection and moral hazard in credit markets, yielding sub-optimal supply of credit (Stiglitz & Weiss, 1981). In ‘equilibrium’ there will be potential borrowers who are willing to take loans at the going interest rate, and even higher who are turned down by lenders weary of the high risk of default that may be associated with higher interest rates. In other words, information asymmetry may generate ‘credit rationing’, shutting off some potential borrowers from the credit market. Information asymmetry in financial markets thus prevents the efficient allocation of resources (Stiglitz, 1993). In particular, asymmetric information and the high fixed cost of small-scale lending limits the access of the poor to the formal financial institutions thus pushing them to the informal financial sector or to the extreme case of financial exclusion (Stiglitz, 1993). This partly explains the difference between rural and urban access to credit from the formal financial system.

Aryeetey and Gockel (1991), after examining the rationale for the continuing existence and growth of the informal financial sector, argue that despite major investment and policies aimed at bolstering the performance of the formal financial sector, transaction costs involved

with dealing with the formal financial sector is a major constraint to small-scale business owners especially for urban people. Travel cost and time is also particularly important for those in the rural areas. Similarly political cost involved with saving with the formal financial sector is also a major factor. Also noted was the difficulties faced by petty traders in accessing credit facilities from the formal financial sector.

But also contributing to the inability of formal financial institutions' failure to give credit to the poor is the pernicious effect of orthodox financial liberalization in African countries (Mkandawire, 1999). Financial liberalization, as argued by Mkandawire (1999), was expected to result in improved efficiency. However it 'has reduced policy-making to the establishment of narrow and idiosyncratic 'fundamentals' confined almost exclusively to issues of stabilization and debt management' (Mkandawire, 1999, pp. 338-339). As witnessed in most SSA countries that have adopted an inflation-targeting framework for monetary policy, and also accompanied with greater emphasis on financial stability, the resource mobilization and allocation objectives of banks have given way to the stabilization objective. The strong emphasis placed on stabilization has compromised the possibility of financial liberalization to address the fundamental issues of development stifling efforts at poverty eradication. This development implies that other sources such informal finance and micro-finance are increasingly taking up the roles that formal banking institutions were expected, under financial liberalization, to assume.

4. Methodology and Data

4.1 Research Design

A comprehensive approach using quantitative and qualitative data is adopted to examine whether access to microcredit is important for reducing gender inequality. The analysis uses primary data obtained from a household survey undertaken from May to July 2013. The household survey collected household level data on access to credit from MFIs, overall balance sheet, and demographic characteristics.

A sample of 500 households was drawn using the methodology proposed by Krejcie and Morgan (1970). Sampling was based on the probability method which uses a combination of stratified and cluster sampling. Group A, the treatment group, comprises of households who have had access to microfinance for at least 6 months. Group B, the control group, comprises households who have never participated in any microfinance programs.

The survey covered two regions, Central and Greater Accra. The strategy was to target communities with access to microfinance institutions. Households with microfinance were randomly selected from clientele list of randomly selected microfinance institutions and households without microcredit were randomly sampled within the same communities. This was done in order to reduce selection bias. Out of the 500 households surveyed, 253 households had received MFI loans while 247 had never taken loans from microfinance institutions. The survey collected information from respondents on the terms and conditions of loans (i.e. the term

structure of loans, interest rate, collateral, etc.) and repayment enforcement criteria to examine whether there were significant differences that are likely to affect outcomes.

The survey questionnaires were administered to the household heads except in circumstances where the household head could not grant the interview. In such cases the next adult with adequate information relating to the specific household details required was interviewed in lieu of the household head. Information was collected for each adult individual in the case of income and financial assets. In such cases every effort was made to obtain this individual information, however, due to a sizeable number of missing information from other adult members relating to financial assets, financial assets are excluded from the calculation of total household gross wealth. Total physical assets, which provide a true reflection of total household wealth, are used for the analysis.

4.2 Stylized facts from the data

This section presents the socioeconomic characteristics of the sample, the characteristics of the microfinance institutions serving borrowers in the sample, and provides an analysis of the uses of the credit received.

Table 1: Socio-economic Characteristics of Households

Description	Households with MFI Credit	Households w/o MFI Credit
Mean Household Size	4.2	3.6
Mean Age of Household Head	42.1	39.1
Female Headed Household (% of Total)	35.2	34.4
Mean number of years of schooling - Household Head	10.2	9.5
Mean number of years of schooling - Male Children	5.8	4.6
Mean number of years of schooling - Female Children	5.4	4.6
<i>Marital Status of Household Head (% of Group Sample)</i>		
Never married	12.3	17.5
Married	70.2	63.8
Divorced / separated	10.3	11.8
Widow / widower	7.1	6.9
<i>Primary Employment of Household Head (% of Group Sample)</i>		
Self-employed	70.8	61.5
Government Employee	8.7	6.1
Other Employee	18.6	29.1
Retired	1.2	1.6
Unemployed	0.8	1.6

Source: Survey data

The survey data reveal that 81.6 percent of the microfinance borrowers in the sample are females. This is not surprising as MFIs mostly target women. As shown on table 1, a significant proportion of households receiving microcredit (70.8 percent) are self-employed compared to households who do not receive microcredit (61.5 percent). The economic activities engaged in

by those within the self-employed category ranged from petty trading, farming, livestock rearing, hairdressing, carpenters, clothing makers etc. On average, children (both male and female) of households with credit from MFIs tend to have more years of schooling (5.8 years and 5.4 years for male and female children respectively) relative to children of households without credit (4.6 years for both male and female children).

It is commonly believed that microfinance targets the poorest of the poor. The survey data shows that roughly half of the households in the sample live below \$2.5 per day (see table A1 in the appendix). Most importantly, ownership of a home business seems to be the main determining factor in accessing credit from microfinance institutions (see table A2 in the appendix).

A new guideline issued in July 2011 by the Central Bank of Ghana categorizes MFIs into 4 groups:

Tier 1: includes Rural and Community Banks, Finance Houses and Savings & Loan Companies which up until now operate under the Banking Act, 2004 (Act 673).

Tier 2: includes Susu Companies and other financial services providers which include Financial Non-Governmental Organizations (FNGOs) which are engaged in deposit-taking and profit-making activities; Credit Unions.

Tier 3: comprises Money Lenders, Non-Deposit taking FNGOs.

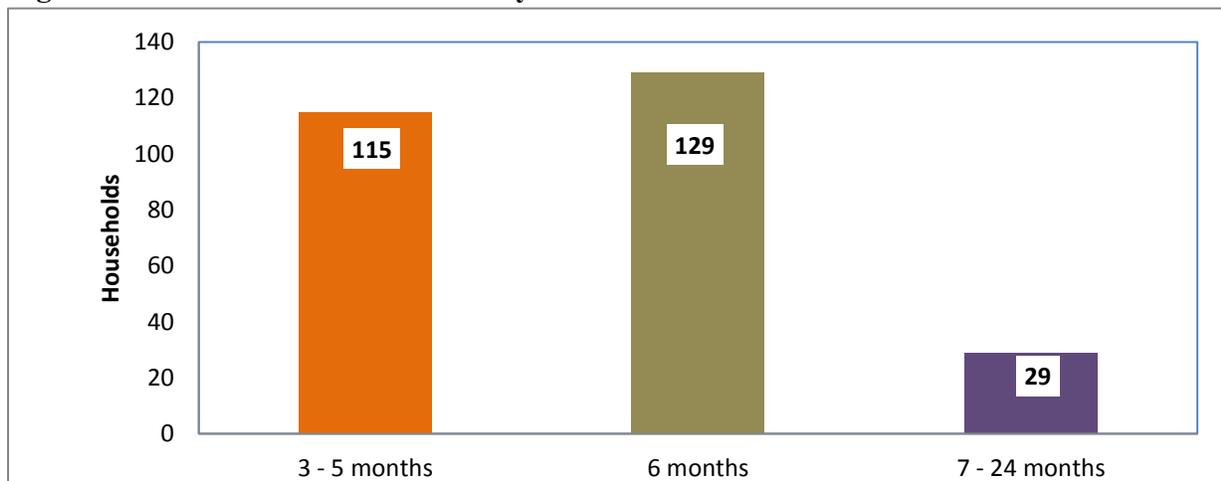
Tier 4: includes Susu Collectors whether or not previously registered under the Ghana Cooperative Susu Collectors Association (GCSCA) and individual money lenders.

Based on the above categorization, the characteristics of the microfinance institutions, providing credit to the random sample of borrowers, are constructed (see table A3 in the appendix). While some borrowers indicated that no services were provided after being allocated the credit, majority of borrowers were recipients of regular services ranging from advisory, training, workshop/seminars and book-keeping. Most of the microfinance institutions extend credit both on an individual-liability and group-liability lending basis. Contrary to perceptions that MFIs do not require collateral before extending credit, the survey data reveal that almost all microfinance institutions require some collateral mostly in the form of savings and reputable personalities to serve as guarantors.

Loan repayments were on daily, weekly, biweekly or monthly basis. The objective was to minimize defaults. This has implications for the operational cost of microfinance institutions given the small size of most of these loans. Loan officers within each demarcated area have the tedious task of keeping track of their clients to enforce repayments as agreed in the loan contract.

Most of the loans were granted on short term basis, ranging from 3 to 6 months period (figure 1). About 10 percent of the loans ranged from 7 to 24 months.

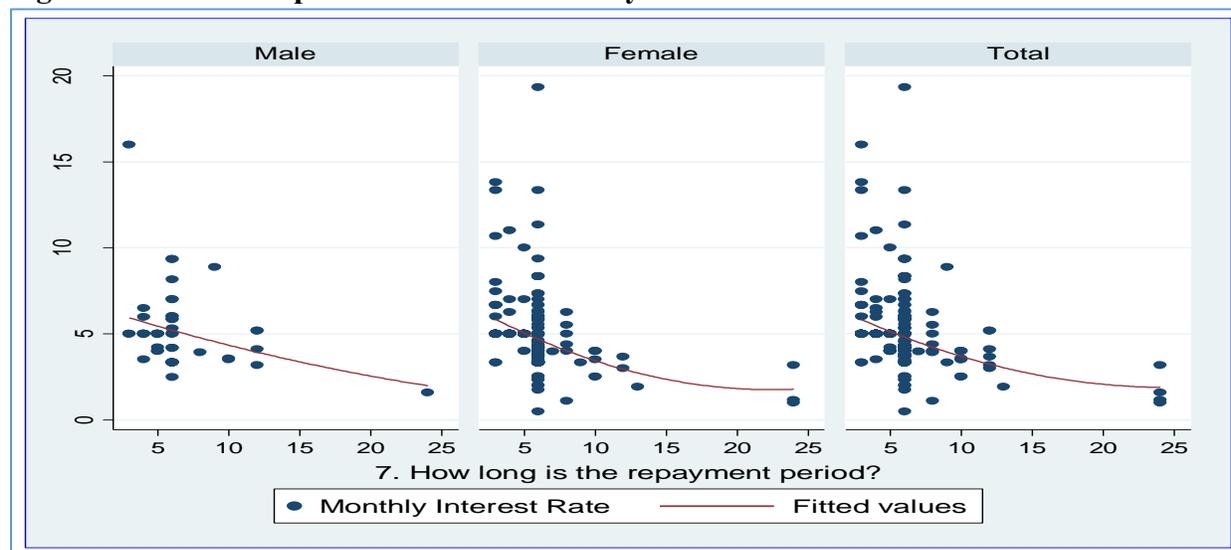
Figure 1: Microfinance Loan Maturity



Source: Survey data

The cost of the loans sourced from MFIs is generally perceived to be high relative to commercial bank loans. The survey data show that the monthly interest rates charged on these loans averages around 5 percent, with a range from 0.5 percent to 19 percent. The monthly interest rate average of 5 percent translates into an average annual percentage rate of 79.6 percent. Roughly 77 percent of respondents who have accessed credit from MFIs do not know the interest rate being charged on these loans (206 out of 268 individuals).

Figure 2: Relationship between Loan Maturity and Interest Rate



Source: Survey data

The average monthly rates was calculated using information provided on monthly debt service, the maturity of the loan, the amount of credit received and the total payments of the loan (i.e. loan including interest). The survey data further reveals that loans with longer maturity tend to have lower monthly interest rates compared to loans with shorter maturity (figure 2). The

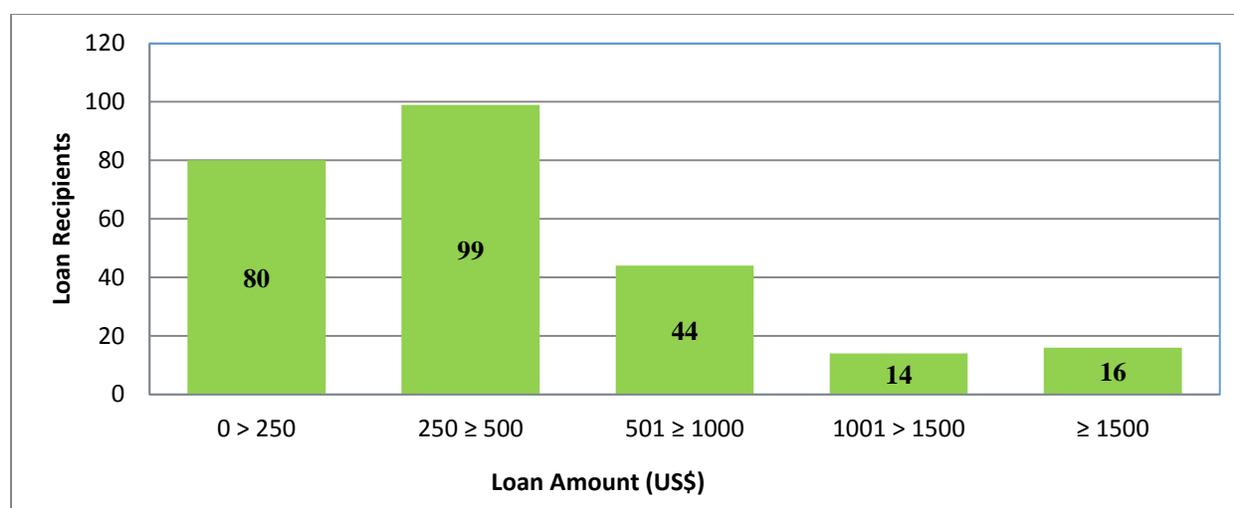
average monthly interest rate of loans with a maturity of 3 months is roughly 6 percent (see table 2). This may be compared with 5 percent and 4 percent average monthly interest rate of loans with a maturity between 4 to 6 months and 7 to 12 months respectively. On average loans with a maturity greater than 12 months up to 24 months carry a monthly interest rate of 2 percent.

Table 2: Loan Maturity and Interest Rate Relationship (In Percent)

Description	Obs	Mean	SD	Min	Max
Loan Maturity ≤ 3 Mths	37	6.2	2.8	3.3	16
3 Mths < Loan Maturity ≤ 6 Mths	204	4.9	2.0	0.5	19.3
6 Mths < Loan Maturity ≤ 12 Mths	24	4.1	1.5	1.1	8.9
12 Mths < Loan Maturity ≤ 24 Mths	5	1.8	0.9	1.0	3.2

Source: Survey data

Figure 3: Loan Amount (US Dollars)



Source: Survey data

On average, the amount of credit received was GH¢1,410 (US\$705)⁴ with a significant proportion of individuals (88 percent) receiving loan amounts ranging US\$50 to US\$1,000 (figure 3). The average amount of credit for male recipients was GH¢2,082 (US\$1,041) compared to GH¢1,116 (US\$558) for female recipients.

The loans were given specifically for engaging in small and medium scale business activities and rarely are loans given for household expenditures. Roughly 63 percent of loan recipients applied the credit received fully to their business enterprises (table 3). Eleven percent of loan recipients applied the credit to household expenditures (specifically to consumption, education, and health expenditures). The remaining 26 percent applied varying percentages to either home enterprise or to household expenditures. The main reason why this occurs is that, the strict rule by the MFIs requiring recipients to apply the credit to their business enterprises, are difficult to enforce in practice.

⁴ The exchange rate at the time of the survey was US\$ 1= GH¢2.

Table 3: Household Credit Allocation

Borrowers (In Percent)	Home Enterprise Uses (% of Credit)	Household Expenditures Uses (% of Credit)
63	100	0
7	100<=>75	0>=<25
13	75<=> 50	29>=< 50
5	45<=> 15	55>=< 85
11	0	100

Source: Survey data

5. Empirical Analysis

5.1 Definition of key variables

Access to microfinance

Access to finance can be measured in 3 different ways, by institutions, services or products (World Bank, 2006). In the literature, the mostly used measure of households' access to credit has been their participation and experiences in the credit market (Bebczuk & Haimovich, 2007; Coleman, 2006; Montgomery, 2006). This paper adopts a quantitative measure of households' access to microcredit by using the ratio of volume of credit to household income as one indicator of a household's access to microfinance. Following the literature, the paper also explores participation in MFI programs as another measure of access to microfinance.

Gender inequality

A recent study on gender asset gap in Ghana developed two sets of measures to capture gender differences in asset ownership: gender asset gap and gender wealth gap (Oduro, Baah-Boateng, & Boakye-Yiadom, 2011). The gender wealth gap can be measured in three ways: the first compares the gross value of assets owned by females and males; the second measures the share of the gross value of assets owned by women in total gross value of household assets; and the third compares the mean gross value of assets owned by females and males. This paper uses the second measure to examine the impact of microcredit on intra-household gender inequality. The intra-household inequality refers to the inequality between men and women within each household. This measure captures the distribution of gross wealth by gender of asset owners irrespective of the form of ownership or the number of the particular category of assets owned. This means that if one asset is owned by multiple people, all individuals with a claim to that asset are considered owners. The unit of observation is an individual man or woman.

Other measures of gender inequality to be used in the empirical analysis are (1) the modified gender wealth gap which captures the distribution of physical wealth by sex and relative to the share of female in the total population and (2) the share of educational expenditure on female children in total household educational expenditures at the primary and secondary school levels.

Expenditure per capita as a proxy for per capita income

Given the usual problems with income measures in developing countries, this study uses per capita household expenditures to proxy per capita income. Data was collected on households' expenditures on food, health, education, rent and utilities. Using expenditure per capita to proxy income per capita than income reported seems more appropriate as the former is subject to fewer reporting errors.

Other variables

Other variables used in the analysis include the dependency ratio, the years of schooling of the household head, the proportion of household members in the labor force and the annual non-income support received by each household.

5.2 Key Summary Statistics

Table 4 presents summary statistics of key variables related to female-headed households with and without microcredit. While female-headed household with credit tends to be better off in terms of the mean value of wealth relative to their counterparts without credit, the latter seems to be better off in terms of income, food expenditure and annual non-income support. A major factor driving lower food per capita expenditures for female-headed households with microcredit is foregoing or reducing food expenditures in order to service their loans. Households who reported that they reduce their food expenditures to service loans correspond to 14 percent of households with credit (see figure 4).

Table 4: Key Variables – Female-headed Households

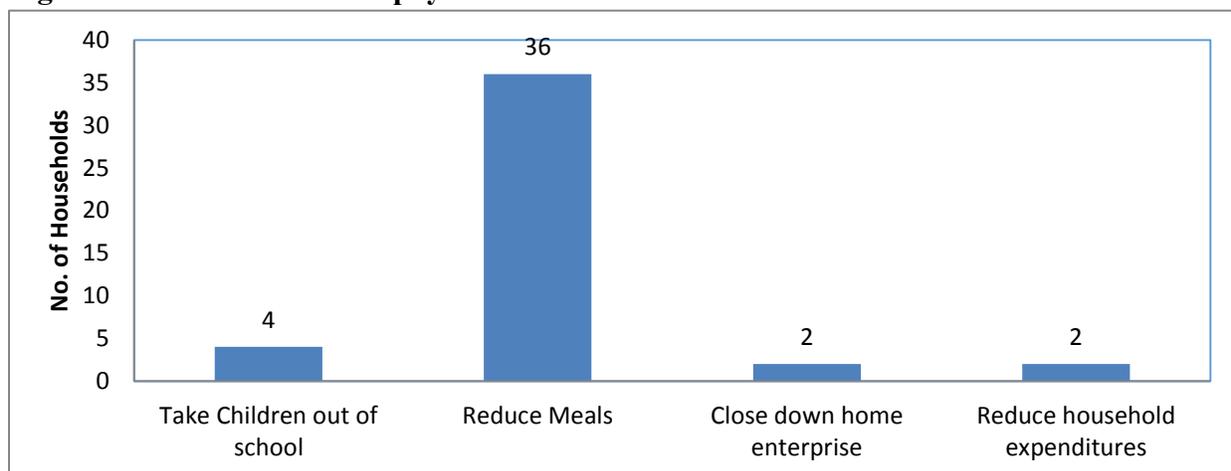
Variables	Households with MFI Credit		Households w/o MFI Credit	
	Obs	Mean	Mean	Obs
<i>Means are in Ghana Cedis</i>				
Total household physical assets*	93	13290	6332	87
Per capita income	93	1851	1985	87
Per capita food expenditures	93	937	1166	87
Per capita household expenditures	93	1150	1403	87
Annual non-income support	93	1042	2118	87
<i>Means are in Percent (unless otherwise indicated)</i>				
Household head years of schooling	93	8.1	6.3	87
Dependency ratio**	93	44.9	30.8	87
Proportion in labor force	93	49.2	59.8	87
Total microcredit to household income	93	35.8	-	0

* Does not include Financial Assets.
**This considers only children dependents.

Source: Survey data

In general, female heads of households with micro-credit tend to have more years of schooling relative to their counterpart without micro-credit. Relative to female-headed households with microcredit, female-headed households without credit have lower dependency ratio and a higher proportion of household members in the labor force.

Figure 4: Effects of Loan Repayments on Households



Source: Survey data

Table 5 presents summary statistics of key variables for households with and without micro-credit, for which there are at least one female adult and at least one male adult. The data show that on average, and for most of the key variables except for annual non-income support, dependency and proportion of household members in the labor force, households with micro-credit are slightly better off compared with their counterparts without micro-credit.

Table 5: Key Variables – Household head is Married

Variables	Households with MFI Credit		Households w/o MFI Credit	
	Obs	Mean	Mean	Obs
<i>In Ghana Cedis</i>				
Total household physical assets*	176	18089	14042	157
Per capita income	176	2449	2278	157
Per capita food expenditures	176	835	824	157
Per capita household expenditures	176	1008	1011	157
Annual non-income support	176	663	702	157
<i>In Percent (unless otherwise indicated)</i>				
Household head years of schooling	176	11.1	10.8	157
Dependency ratio**	176	46.7	42.8	157
Proportion in labor force	176	46.2	51.0	157
Total microcredit to household income	176	19.8	-	0
* Does not include Financial Assets.				
**This considers only children dependents.				

Source: Survey data

An interesting finding of the study is that female-headed households with MFI credit tend to have parity in terms of spending on education for female and male children compared to female-headed households without credit (table 6). On average, 50.4 percent of education expenditures are allocated to female children in female-headed households with micro-credit compared to 47 percent for female-headed households without credit. The share of female children's education expenditure for households with and without micro-credit and for which

there are at least one adult female and at least one adult male differed marginally, 48.8 percent and 50.2 percent respectively. This suggests that while micro-credit may be important for women it may not necessarily lead to their empowerment within the household unless it improves their ability to contribute to the decision-making process within the household which may occur through improved income.

Table 6: Education Expenditures (Primary to Secondary School)

Description	Mean Values (GH¢)			Female Children's Share in Total
	Male children	Female Children	Total	
MFI & Female-headed Households	674	684	1,358	50.4
Non-MFI & Female-headed Households	567	502	1,068	47.0
MFI & Household Head is married	858	817	1,675	48.8
Non-MFI & Household Head is married	671	676	1,347	50.2

Source: Survey data

Table 7: Years of Schooling

Description	Mean Value for Male child	Mean Value for Female Child	GAP (Years)
MFI & Female-headed Households	6.1	6.0	-0.1
Non-MFI & Female-headed Households	6.5	5.5	-1.0
MFI & Household Head is married	5.6	5.3	-0.3
Non-MFI & Household Head is married	4.2	4.5	0.3

Source: Survey data

The data also show that the mean value of years of schooling for both male and female children is higher for female-headed households with micro-credit compared to their counterparts without credit (table 7). Similarly, the mean value of years of schooling for both male and female children is higher in households with microcredit and where the household head is married (mostly in these cases the household is male-headed) compared to their counterparts without microcredit. Notably, the gap⁵ in terms of the mean years of education is relatively higher for female-headed households without micro-credit.

The share of females' health expenditures in total household health expenditures tend to be above 50 percent for all households with and without micro-credit, though on average, households with micro-credit tend to have lower shares compared to households without micro-credit (see table 8).

⁵ The gap is computed by taking the difference between the mean values for female children's years of education and male children's years of schooling.

Table 8: Health Expenditures

	Mean Values (GH¢)			Females' Share in Total
	Male	Female	Total	
MFI & Female-Headed Households	63	108	171	63.2
Non-MFI & Female-Headed Households	59	131	189	69.1
MFI & Household Head is married	82	97	179	54.2
Non-MFI & Household Head is married	74	98	172	57.2

Source: Survey data

5.3 Measuring intra-household gender wealth gap

The study uses three measures of the gender wealth gap. The first one measures overall women's share of the total gross value of household assets (Oduro, Baah-Boateng and Boakye-Yiadom, 2011) using weighted average. The second measure compares females' share (including financial assets⁶) of the total value of wealth within each household where there is at least one male and one female. The third measure compares the share of females in total value of female assets in households with and without micro-credit.

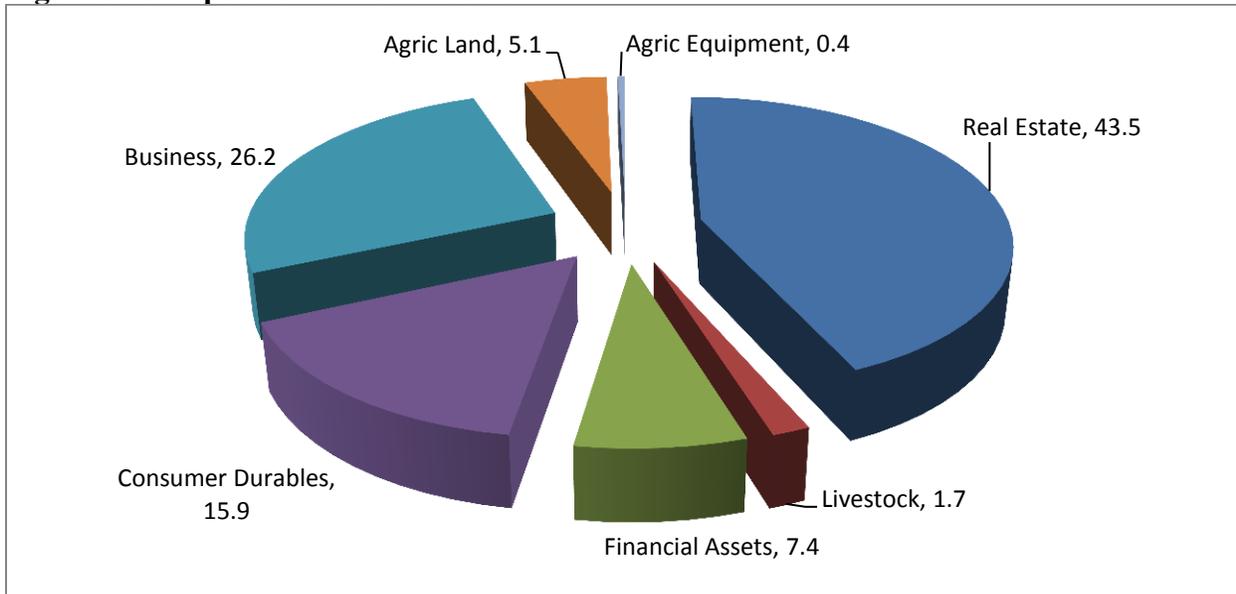
Data was obtained on 7 main household assets: real estate (including building properties and land), livestock, financial assets, consumer durables, businesses, agriculture land, and agriculture equipment. Respondents were asked to indicate the year of acquisition of each household asset, households with micro-credit were further asked to indicate whether assets were acquired before or after receiving the micro-credit. Using the reported market value of each asset, the gross value of total wealth is aggregated by sex for each household. For jointly owned assets, the value is distributed evenly across owners.

A major issue encountered was in the valuation of real estate and agricultural land. Respondents were asked how much a similar property would sell within the vicinity in which these properties were located and these differed significantly even within the same vicinity. Every effort was made to arrive at realistic selling prices for these properties by reconciling the valuations of similar properties within the same areas using significant numbers of respondents having similar values. Another major problem encountered was in the reporting of financial assets. Most respondents were reluctant to provide detailed information relating to their current financial assets.

For the entire sample, real estate, businesses and consumer durables constituted 43.5 percent, 26.2 percent and 15.9 percent of total gross wealth (see figure 5). Except for the real estate and businesses categories, the total value of gross wealth for females is lower for all the other categories of assets when the gender wealth gap is examined for the entire sample (see figure 6). Overall women owned 49 percent of total household wealth (see figure 6).

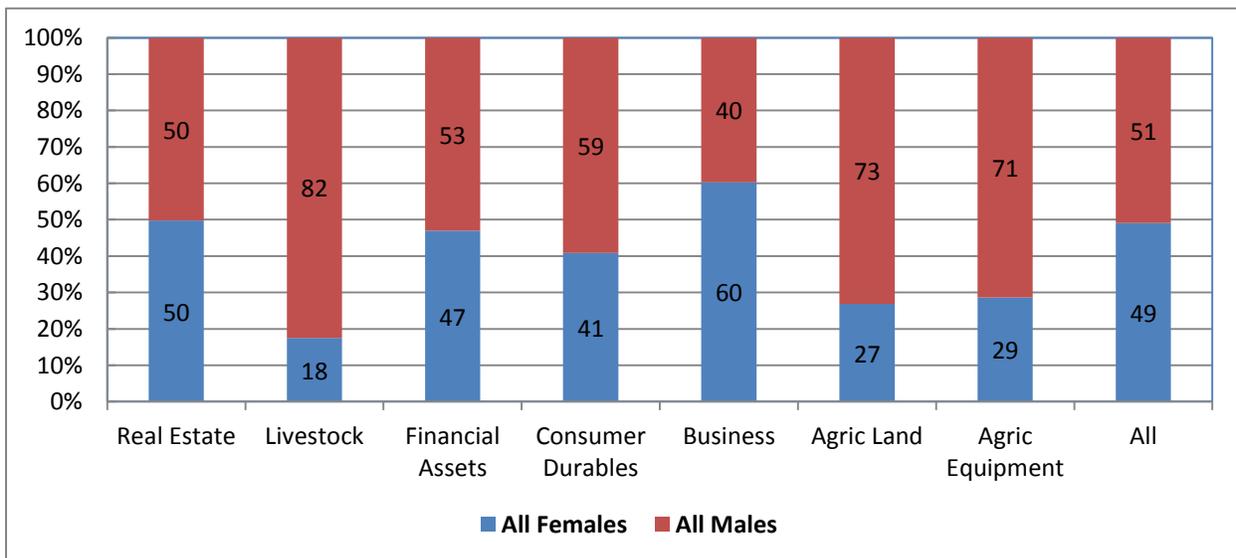
⁶ This measure was also computed without financial assets in view of difficulties encountered with reporting financial assets and the figures did not differ significantly.

Figure 5: Composition of Total Wealth



Source: Survey data

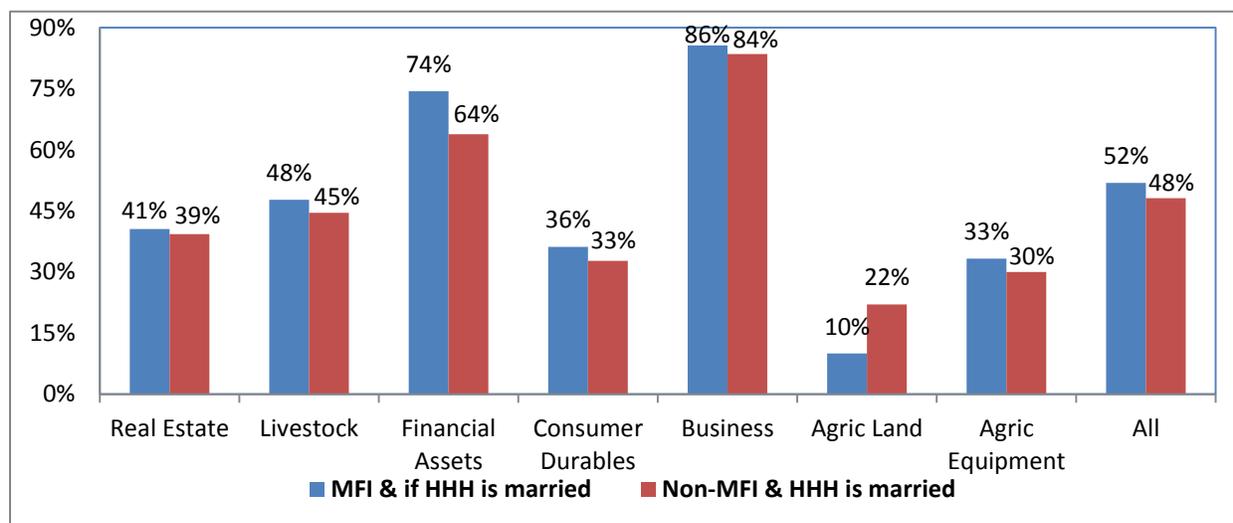
Figure 6: Females' share in Total Wealth by Asset Type – Entire Sample



Source: Survey data

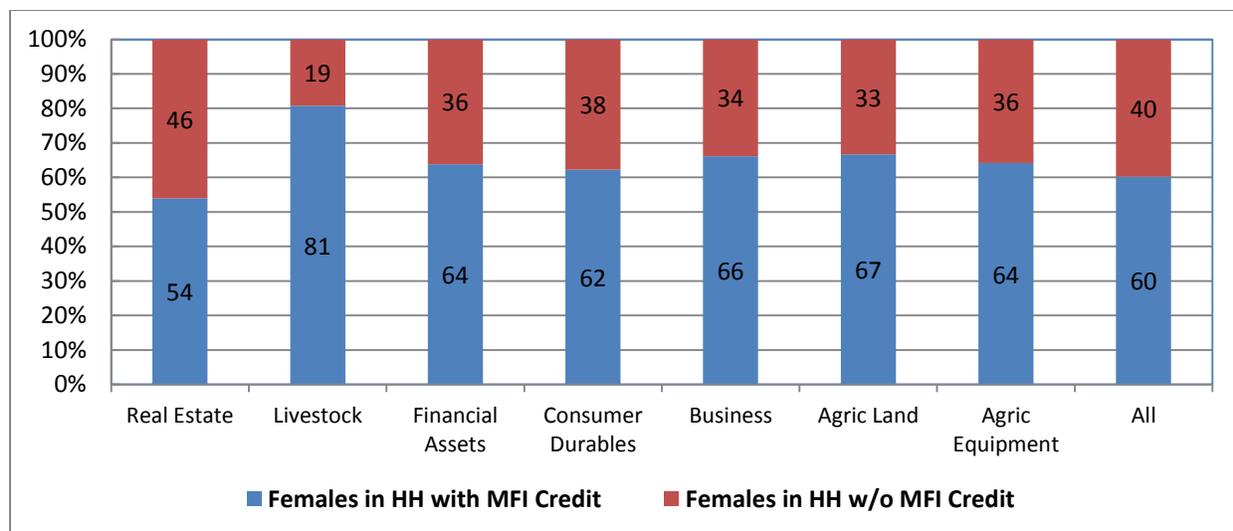
The intra-household comparison reveals that females within households with micro-credit, on average, tend to have a relatively higher share of household wealth compared to females in households without micro-credit (figure 7). The female share in the total value of gross wealth for households with micro-credit is 52 percent compared to 48 percent for females in households without micro-credit (see also Table 9). This holds even when financial assets are excluded.

Figure 7: Females' share in Total Wealth by Asset Type – Intra-household



Source: Survey data

Figure 8: Share in Females' Total Wealth by Asset Type - Category



Source: Survey data

Table 9: Gender Wealth Gaps after Credit

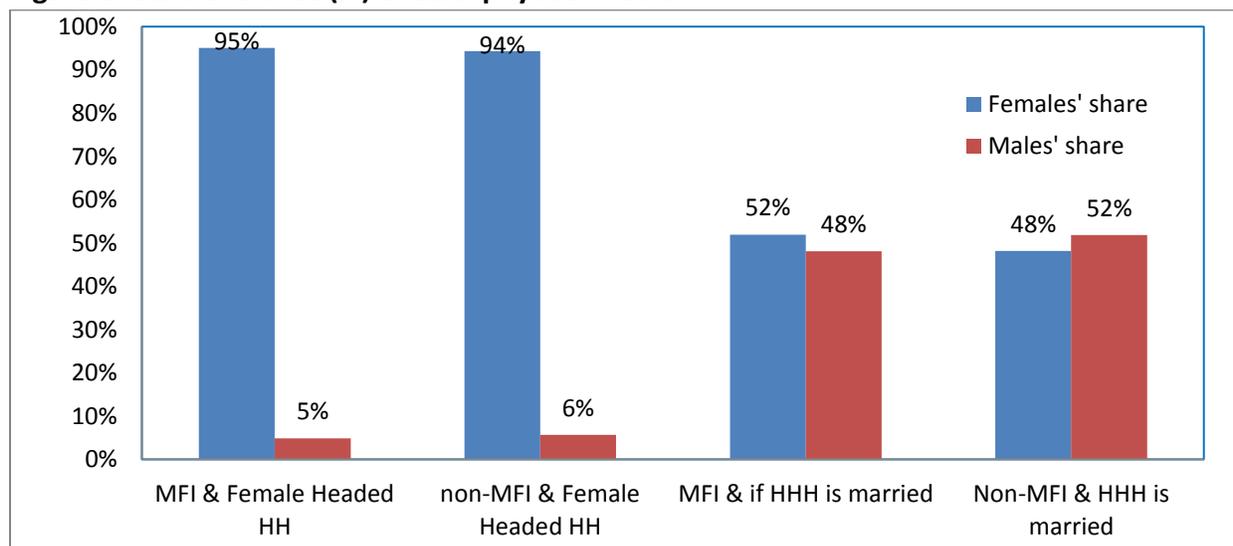
Description	Obs	Females' share	Modified GWG
MFI & Household Head is married	177	0.52	-0.004
Non-MFI & Household Head is married	157	0.48	-0.04

Source: Survey data

The share of females' with microcredit in each asset for females was higher for all categories of assets. Overall females in households with micro-credit account for 60 percent of the total asset wealth for all females in the sample (see figure 8).

Using the modified measure of the gender wealth gap (i.e. subtracting females' share of the population, 52.3 percent, from females' share in the total gross value of wealth) intra-household inequality (where there is at least one male and one female) are shown to be close to zero for households with micro-credit compared with households without micro-credit (see table 9 and figure 9).

Figure 9: Gender shares (%) of total physical wealth



Source: Survey data

5.4 Econometric Analysis

i. Regression analysis of intra-household gender inequality

The analysis of the importance of micro-credit for intra-household gender inequality is based on an empirical model specified as follows:

$$(1) \quad GI_i = c + X_i'\gamma + \alpha AC_i + \epsilon_i$$

where GI is females' share in total household durable and business assets⁷; AC_i is the total micro-credit received relative to household income; and X_i is a set of control variables⁸ (MFI and household-specific). It is expected that receiving micro-credit will reduce intra-household gender inequality, given that women are the major recipients of microfinance within the household. The

⁷ From the survey most respondents indicated that the funds were used to acquire business assets and some durable assets hence its use in the analysis. The variable ranges from 0 to 1.

⁸ See table A4 in the appendix for the definition of the variables used in the analysis.

null hypothesis tested here is that $\alpha = 0$, implying that access to micro-credit fails to improve equity within households.

In view of the fact that the dependent variable in this analysis is bounded between 0 and 1, estimating this model using ordinary least squares (OLS) is inappropriate (see Ferrari and Cribari-Neto (2004) and Buis (2010)). This study models the distribution of female's share in total household durable and business assets with a beta distribution (betafit), a zero/one inflated beta distribution (zoib) and a fractional logit (generalized linear model)⁹.

Some points about these different estimation methods are in order. The beta distribution estimation method, betafit, is ideal for a continuous variable that is bounded between 0 and 1. The estimation ignores the 0s (representing households with only male adults) and 1s (which represents households with only female adults). The zero/one inflated beta distribution method, zoib, estimates the model separately for households with only male adults (zero-inflate), households with only female adults (one-inflate), and for households with at least one male and one female adult (proportions excluding 0s and 1s) assuming that each of these separate scenarios are governed by a different process. The fractional logit estimation method – GLM (logit) - on the other hand estimates the model by including all the values (0s, proportions, and 1s) under the assumption that the 0s and 1s occur through the same process as the other proportions (Buis, 2010).

Results from the various estimation methods and the marginal effects are reported in tables 10 and 11 respectively. The results from the 3 estimation methods all show that the coefficient of micro-credit has the expected sign and is statistically significant, albeit at different levels of significance. Specifically, there is a positive relationship between the share of females' assets in total household assets and micro-credit. Also it is noted that there is a positive relationship between the share of females' assets in total assets and the level of female' income. There is however, a negative relationship between the share of females' assets in total assets and the age of the borrower on one hand and the share of health and education expenditures in total essential household expenditures on the other hand. The dummy variables, the gender of the loan user and financial literacy, both had a positive relationship with the share of females' assets in total assets.

The estimation results for the marginal effects for the 3 estimation methods show that having micro-credit leads to between 4 and 10 percentage points higher share of total household's physical assets for females than the sample average (see table 11). When the gender of the loan user is female, the share of assets accruing to females is between 24 and 33 percentage points higher than the sample average. And when the loan user has access to financial literacy programs over the period of the loan, the share of assets for females is between 15 and 17 percentage points higher. Higher spending on education and health above the average of 32 percent of total household essential expenditures, however, leads to a lower share of total

⁹ See Buis (2010) and Ferrari and Cribari-Neto (2004) for detailed review of the estimation of rates and proportions.

household assets for females from between 2 and 9 percentage points suggesting a substitution effect between physical assets accumulation and investment in human capital accumulation.

Table 10: Impact of Access to MFI Credit on Intra-household Gender Inequality

Variables	BETAFIT	ZERO/ONE INFLATED BETA (ZOIB)			FLOGIT
	Gender Inequality	Gender inequality			Gender Inequality
	(1) BETAFIT	(2) proportion	(3) oneinflate	(4) zeroinflate	(5) GLM
Log of Total Credit to Household Income	0.172* (0.097)	0.172** (0.050)	1.143*** (0.000)	-0.763 (0.334)	0.523*** (0.000)
Log of the share of Education & health expenditures in total essential household expenditures	-0.075 (0.478)	-0.075 (0.415)	-0.804*** (0.000)	1.324 (0.223)	-0.461*** (0.002)
Log of Female annual income	0.236* (0.052)	0.236** (0.012)	0.362 (0.239)	-1.970** (0.032)	0.413*** (0.002)
Age of Borrower in the household	-0.007 (0.481)	-0.007 (0.439)	-0.046** (0.022)	0.037 (0.539)	-0.019* (0.060)
Gender of Loan user ("1" if Female & "0" if Otherwise)	0.996*** (0.000)	0.996*** (0.000)	2.481* (0.056)	-2.125** (0.030)	1.667*** (0.000)
Financial Literacy Dummy - ("1" IF YES & "0" if Otherwise)	0.605*** (0.001)	0.605*** (0.001)	0.765* (0.081)	-0.234 (0.825)	0.783*** (0.000)
Constant	-2.299** (0.025)	-2.299** (0.013)	-4.062 (0.135)	11.739* (0.065)	-3.282*** (0.003)
/ln_phi	0.847*** (0.000)	0.847*** (0.000)			-
phi	2.33	-			-
Log likelihood	21.80	-			-
Log pseudolikelihood	-	-94.93			-96.47
Wald chi2(6)	32.42	37.60			-
Prob > chi2	0.000	0.000			-
Number of observations	155	227			227
note: *** p<0.01, ** p<0.05, * p<0.1. pvalue in parantheses					

Table 11: Estimation of Marginal Effects

Variables	Betafit	ZOIB	FLOGIT
	Gender Inequality	Gender Inequality	Gender Inequality
Log of Total Credit to Household Income	0.172 (0.042) [-0.008 - 0.091]*	0.172 (0.105) [0.051 - 0.159]***	0.523 (0.104) [0.058 - 0.151]***
Log of the share of Education & health expds in total essential household expds	-0.075 (-0.018) [-0.068 - 0.032]	-0.075 (-0.066) [-0.120 - -0.013]**	-0.461 (-0.092) [-0.149 - -0.035]***
Log of Female annual income	0.236 (0.057) [-0.000 - 0.115]*	0.236 (0.077) [0.027 - 0.128]***	0.413 (0.083) [0.031 - 0.134]***
Age of Borrower in the household	-0.007 (-0.002) [-0.007 - 0.003]	-0.007 (-0.004) [-0.009 - 0.000]*	-0.019 (-0.004) [-0.008 - 0.000]*
Gender of Loan user ("1" if Female & "0" if Otherwise)	0.996 (0.243) [0.125 - 0.360]***	0.996 (0.313) [0.208 - 0.418]***	1.667 (0.333) [0.215 - 0.451]***
Financial Literacy Dummy - ("1" IF YES & "0" if Otherwise)	0.605 (0.147) [0.059 - 0.236]***	0.605 (0.169) [0.080 - 0.258]***	0.783 (0.157) [0.074 - 0.239]***
Constant	-2.299	-2.299	
ln_phi Constant	0.847	0.847	-3.282
N	155	227	227

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$ and refers to the significance of the estimated marginal effects.
Marginal effects and Confidence Intervals reported below coefficients.

ii. Oaxaca-Blinder decomposition of asset inequality

The Oaxaca-Blinder decomposition technique (Oaxaca, 1973)¹⁰ is used to investigate the factors that explain asset inequality between male-headed households and female-headed households (see table A5 in the appendix). The first step is to examine the determinants of the accumulation of household assets. The effect of access to microfinance on household physical assets is modeled as follows:

¹⁰ Another decomposition method, which is regression-based and proposed by Fields (2003) is also explored but results are not reported for brevity.

$$(2) \quad Assets_i = c + X_i\gamma + \alpha MFI_Dummy_i + \epsilon_i$$

where $Assets_i$ is total household physical assets; MFI_Dummy_i is a measure of access to microcredit; and X_i is a set of control variables, (MFI and household-specific). Household-specific control variables included are the years of schooling of head of the household, the age of the household head, the marital status of the household head, per capita expenditure for the household, the household size, and whether household head is self-employed. Given that ethnicity plays a critical role in inheritance in Ghana, the paper includes ethnicity dummies to capture tribal effects on asset accumulation. It is expected that access to microcredit will be associated with an increase in asset accumulation of the household.

The mean difference in the gross value of total household physical assets in the male-headed and female-headed households is GH 6,964.11 (see table A5 in the appendix). The mean difference of this variable in logarithm is 1.01. On average, male household heads have more years of schooling than female heads of households with 11.25 and 7.25 respectively. Female-headed households tend to have higher per capita food expenditure relative to male-headed households. Female household heads are mostly self-employed relative to their male counterparts who tend to have wage employment. Male-headed households have larger household size relative to female-headed households with 4.9 and 2.9 respectively. In addition, male heads of households tend to have a higher age relative to female heads of households with 41.6 years and 38.5 respectively.

Having examined the mean differences, the paper proceeds to estimate model (2) above separately for the total sample, male-headed households and female-headed households as shown in equation (3):

$$(3) \quad Assets_i = \begin{cases} c^{male} + X_i\gamma^{male} + \alpha^{male}MFI_Dummy_i + \epsilon_i^{male}, & \text{if male - headed household} \\ c^{female} + X_i\gamma^{female} + \alpha^{female}MFI_Dummy_i + \epsilon_i^{female}, & \text{if female - headed household} \end{cases}$$

The estimation results presented on Table 12 show that the estimated coefficient on the household head's gender dummy, female household head, is -0.494 and this is statistically significant at the 1 percent level (column 1). This coefficient may simply be interpreted as the log asset differential between female-headed households and male-headed households. The antilog of this coefficient is 0.610 which indicates that, on average, the gross value of the total physical assets for female-headed households is 61.0 percent of that of male-headed households.

The effect of access to microfinance differs for male-headed and female-headed households. Having access to microfinance results in a positive impact on the log of total physical assets for female-headed households (i.e. 0.571) and is statistically significant. Having access to microfinance has a negative impact on the log of total physical assets for male-headed households (i.e. -0.007) but it is insignificant. Apart from the dummy variables for the marital status and ethnicity of the house head, most of the other variables have the right signs with most being statistically significant.

Table 12: Regression Results: Gender Physical Asset Gap Analysis

VARIABLES	(1) All	(2) Male-Headed Households	(3) Female-Headed Households
Female Household Head	-0.494*** (0.004)		
Log of per capita expenditures	0.924*** (0.000)	1.026*** (0.000)	0.833*** (0.000)
Log of household size	0.662*** (0.000)	0.595*** (0.001)	0.685*** (0.002)
Age of household head	0.103*** (0.004)	0.104** (0.015)	0.072 (0.335)
Age of household head Sqd.	-0.001** (0.033)	-0.001** (0.045)	-0.000 (0.873)
Education of household head	0.076*** (0.000)	0.054** (0.011)	0.074*** (0.001)
Self-employed Dummy	0.351*** (0.004)	0.281** (0.030)	0.356 (0.261)
Microfinance Dummy	0.114 (0.302)	-0.007 (0.955)	0.571*** (0.005)
<i>Marital Status of household head</i>			
Married	0.194 (0.399)		0.349 (0.203)
Never married	0.219 (0.354)	0.039 (0.899)	0.475 (0.103)
Widow / widower	-0.078 (0.771)	-1.306* (0.097)	-0.227 (0.485)
<i>Ethnicity of household head</i>			
Ga	0.265* (0.077)	0.538*** (0.005)	-0.168 (0.493)
Ewe	-0.153 (0.317)	-0.238 (0.185)	0.225 (0.437)
Guan	-0.805 (0.126)	-0.539 (0.332)	-1.444 (0.271)
Gurma	1.051 (0.375)		1.038 (0.415)
Mole-Dagbani	-0.269 (0.523)	0.055 (0.922)	-1.116* (0.083)
Grusi	-1.141* (0.052)	-2.372*** (0.003)	0.392 (0.661)
Others	-0.191 (0.503)	-0.578* (0.088)	1.092** (0.040)
Constant	-2.354** (0.018)	-2.310** (0.041)	-2.426 (0.219)
Observations	487	309	177
R-squared	0.443	0.422	0.404

Note: pval in parentheses *** p<0.01, ** p<0.05, * p<0.1

The regression result for all variables including Female-headed household dummy variable are reported in All (1). Male-Headed Households (2) provides the regression results for Male-headed households, while Female-Headed Households (3) provides the regression results for Female-headed households.

Table 13: Oaxaca-Blinder Decomposition of the Mean Difference of Total Physical Assets

Description	(1) Overall	(2) Endowments	(3) Coefficients	(4) Interaction
Male-headed households: Mean of Log of total physical assets	8.871*** (0.000)			
Female-headed households: Mean of Log of total physical assets	7.860*** (0.000)			
Mean difference	1.011*** (0.000)			
<i>due to endowments</i>	0.859*** (0.000)			
<i>due to coefficients</i>	0.560** (0.022)			
<i>due to interaction</i>	-0.408 (0.184)			
Log of per capita expenditures		-0.078 (0.237)	0.478 (0.711)	-0.006 (0.723)
Log of household size		0.362*** (0.002)	-0.120 (0.642)	-0.064 (0.642)
Age of household head		0.163 (0.476)	2.542 (0.435)	0.198 (0.449)
Age of household head Sqd.		0.014 (0.951)	-1.721 (0.263)	-0.277 (0.293)
Education of household head		0.218** (0.020)	-0.024 (0.913)	-0.013 (0.913)
Self-employed dummy		0.001 (0.993)	0.252 (0.408)	-0.103 (0.410)
Microfinance dummy		-0.012 (0.667)	-0.310** (0.014)	0.012 (0.668)
Ethnicity of household head		0.005 (0.895)	0.031 (0.788)	-0.052 (0.386)
Marital Status of household head		0.186 (0.268)	-0.340 (0.103)	-0.102 (0.702)
Constant			-0.227 (0.919)	
Number of observations	487			

note: *** p<0.01, ** p<0.05, * p<0.1. pvalue in parantheses.
 Estimated in Stata 13 using the Oaxaca command.

Table 14: Neumark's Decomposition

	Overall	Explained	Unexplained
Male-headed households: Mean of Log of total physical assets	8.871*** (0.000)		
Female-headed households: Mean of Log of total physical assets	7.860*** (0.000)		
Mean difference	1.011*** (0.000)		
<i>Explained</i>	0.812*** (0.000)		
<i>Unexplained</i>	0.199** (0.013)		
Log of per capita expenditures		-0.082 (0.229)	0.477 (0.702)
Log of household size		0.368*** (0.000)	-0.190 (0.605)
Age of household head		0.317** (0.028)	2.587 (0.394)
Age of household head Sqd.		-0.209* (0.066)	-1.776 (0.206)
Education of household head		0.282*** (0.000)	-0.102 (0.730)
Self-employed dummy		-0.073 (0.116)	0.223 (0.491)
Microfinance dummy		-0.003 (0.684)	-0.308** (0.012)
Ethnicity of household head		-0.021 (0.402)	0.005 (0.961)
Marital Status of household head		0.233** (0.039)	-0.489 (0.133)
Constant			-0.227 (0.915)
Number of observations	487		
note: *** p<0.01, ** p<0.05, * p<0.1. pvalue in parantheses. Estimated in Stata 13 using the Oaxaca command with the Neumark option.			

The results of the decomposition analysis help explain the gap in the means of the outcome variable between male-headed and female-headed households. The analysis shows that female-headed households have a lower mean value of total household physical assets than male-headed households. Following Oaxaca (1973), the OLS estimation of (3) can be used for inequality decomposition of the logarithm of total household physical assets.

The results of the decomposition exercise in table 13 show the mean values of log of total physical assets for male-headed households and female-headed households, and the difference between them. The results show the contribution attributable to the gaps in endowments, the coefficients, and the interaction between the endowment and the coefficients (column 1, table 13). The gap in endowments accounts for the bulk of the gap in the log of total physical assets between male-headed households and female-headed households and it is statistically significant. The coefficients account for the next bulk of the gap and it is statistically significant.

Columns 2, 3, and 4 in table 13 allow us to see how far gaps in individual explanatory variables contribute to endowments, coefficients, and their interactions. Focusing on column 2 which reports the contribution of the individual explanatory variables to the gap attributable to endowments, one notes that the gaps in household size and education actually disfavor female-headed households. The gap in access to microfinance also favors female-headed households.

Interestingly, in column 3 of table 13, which reports the contributions attributed to the coefficients, one notes that the microfinance dummy favors female-headed households and this is statistically significant. To test the robustness of these results, the Neumark decomposition method is also used. The results are reported on table 14, and they also confirm the importance of microfinance in reducing the gap in total physical assets, though in the case of the Neumark decomposition, microfinance is significantly important in the unexplained portion of the gap. While microfinance is important in explaining the gap, the analysis shows that other variables are also important, notably the gaps in the years of schooling, and household size, between male-headed and female-headed households (see tables 13 and 14).

6. Conclusion

This paper examined the importance of access to microfinance credit for gender inequality within households and across male-headed and female-headed households using both comparative and econometric analyses.

Two main findings emerge from the analyses. First, female-headed households receiving micro-credit, on average, tend to spend equally on male and female children at the primary and secondary school levels compared to female-headed households without micro-credit where education expenditure at the primary level is skewed in favor of male children relative to female children. Secondly, for households where there is at least one male and at least one female, the study finds that on average, women in households receiving microcredit have a higher share of household assets at about 52 percent compared with 48 percent for women in households without micro-credit. The econometric analysis using beta distribution regression estimations reveals that access to micro-credit contributes positively to increasing females' share in total household durable and business assets. Estimates of the marginal effects from the beta distribution

estimations show that having microcredit leads to between 4 and 10 percentage points higher share of total household physical assets for females above the sample average. Decomposition techniques used to examine the contribution of microfinance to the measured gender asset gap between male-headed and female-headed households, show that access to microfinance significantly favors female-headed households relative to male-headed households.

The stylized facts from the survey data showed that on average the loan size for female recipients of microcredit was significantly lower than their male counterparts and that the cost of microfinance is significantly high, averaging 5 percent per month or 79.6 annual percentage rate of interest. These facts combined with the results from the econometric analysis suggest that efforts aimed at increasing the size of loans granted to females are warranted. In addition, there is a need to ensure that poor households have access to low-cost credit to achieve maximum impact on gender inequality.

References

- Arrow, K. J. (1950). A Difficulty in the Concept of Social Welfare. *Journal of Political Economy*, 58(4), 328-346. doi: 10.2307/1828886
- Aryeetey, E. (1994). Financial integration and development in Sub-Saharan Africa: A study of informal finance in Ghana. *ODI Working Paper (United Kingdom)*.
- Aryeetey, E., & Gockel, F. (1991). Mobilizing domestic resources for capital formation in Ghana: the role of informal financial sectors.
- Baydas, M. M., Meyer, R. L., & Aguilera-Alfred, N. (1994). Discrimination against women in formal credit markets: Reality or rhetoric? *World Development*, 22(7), 1073-1082.
- Beatriz, A., & Jonathan, M. (2005). *The Economics of microfinance*: MIT Press.
- Bergstrom, T. (1995). A Survey of Theories of the Family. *Department of Economics, UCSB*.
- Berkner, L. K. (1973). Recent Research on the History of the Family in Western Europe. *Journal of Marriage and Family*, 35(3), 395-405. doi: 10.2307/350576
- Bermant, L. S. (2008). Intrahousehold asset dynamics and its effect on the intergenerational transmission of poverty. *Available at SSRN 1538943*.
- Bolt, V. J., & Bird, K. (2003). *The intrahousehold disadvantages framework: A framework for the analysis of intra-household difference and inequality*: Chronic poverty research centre (CPRC).
- Buis, M. L. (2010). *Analyzing proportions*. Paper presented at the Eighth German Stata Users Group Meeting.
- Corsi, M., Botti, F., Rondinella, T., & Zacchia, G. (2006). Women and Microfinance in Mediterranean Countries. *Development*, 49(2), 67-74.
- Deininger, K., & Squire, L. (1998). New ways of looking at old issues: inequality and growth. *Journal of development economics*, 57(2), 259-287.
- Doss, C. R. (1996). Testing among Models of Intrahousehold Resource Allocation. *World Development*, 24(10), 1597-1609.
- Dupas, P., & Robinson, J. (2012). Savings Constraints and Microenterprise Development: Evidence from a Field Experiment in Kenya.
- Endeley, J. B. (2001). Conceptualising women's empowerment in societies in Cameroon: how does money fit in? *Gender & Development*, 9(1), 34-41.
- Ferrari, S., & Cribari-Neto, F. (2004). Beta regression for modelling rates and proportions. *Journal of Applied Statistics*, 31(7), 799-815.

- Fields, G. S. (2003). Accounting for income inequality and its change: A new method, with application to the distribution of earnings in the United States. *Research in labor economics*, 22, 1-38.
- Folbre, N. (1986). Hearts and spades: paradigms of household economics. *World development*, 14(2), 245-255.
- Folbre, N. (1996). *The economics of the family*: Elgar Cheltenham, UK.
- Goetz, A. M., & Gupta, R. S. (1996). Who takes the credit? Gender, power, and control over loan use in rural credit programs in Bangladesh. *World development*, 24(1), 45-63.
- GSS. (2013). *2010 Population and Housing Census, National Analytical Report*. Ghana Statistical Services, Accra: GSS.
- Hashemi, S. M., Schuler, S. R., & Riley, A. P. (1996). Rural credit programs and women's empowerment in Bangladesh. *World Development*, 24(4), 635-653.
- Hulme, D., & Mosley, P. (1996). *Finance against poverty* (Vol. 2): Psychology Press.
- Kabeer, N. (2005). Is Microfinance a 'Magic Bullet' for Women's Empowerment? Analysis of Findings from South Asia. *Economic and Political Weekly*, 40(44/45), 4709-4718. doi: 10.2307/4417357
- Kai, H., & Hamori, S. (2009). Globalization, financial depth and inequality in Sub-Saharan Africa. *Economics Bulletin*, 29(3), 2025-2037.
- Khandker, S. R. (2003). *Micro-finance and poverty: evidence using panel data from Bangladesh*: World Bank, Development Research Group.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educ Psychol Meas.*
- Mattila-Wiro, P., & Wiro-Mattila, P. (1999). *Economic theories of the household: a critical review*: United Nations University, World Institute for Development Economics Research.
- Mayoux, L. (1999). Questioning virtuous spirals: micro-finance and women's empowerment in Africa. *Journal of International Development*, 11(7), 957-984.
- Mkandawire, T. (1999). The political economy of financial reform in Africa. *Journal of International Development*, 11, 321-342.
- Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International Economic Review*, 693-709.
- Oduro, A. D., Baah-Boateng, W., & Boakye-Yiadom, L. (2011). Measuring the gender asset gap in Ghana. *Department of Economics, University of Ghana, Legon and Woeli Publishing Services, Accra.*
- Olinto, P., Beegle, K., Sobrado, C., & Uematsu, H. (2013). The State of the Poor: Where Are The Poor, Where Is Extreme Poverty Harder to End, and What Is the Current Profile of the World's Poor? *Economic Premise*, 2.
- Osei-Boateng, C., & Ampratwum, E. (2011). The informal sector in Ghana.
- Pitt, M. M., Khandker, S. R., Chowdhury, O. H., & Millimet, D. L. (2003). Credit programs for the poor and the health status of children in rural bangladesh*. *International Economic Review*, 44(1), 87-118.
- Rahman, A. (1999). Micro-credit initiatives for equitable and sustainable development: Who pays? *World development*, 27(1), 67-82.
- Rankin, K. N. (2002). Social capital, microfinance, and the politics of development. *Feminist economics*, 8(1), 1-24.
- Samuelson, P. A. (1956). Social indifference curves. *The Quarterly Journal of Economics*, 1-22.
- Schuler, S. R., Hashemi, S. M., & Riley, A. P. (1997). The influence of women's changing roles and status in Bangladesh's fertility transition: evidence from a study of credit programs and contraceptive use. *World Development*, 25(4), 563-575.
- Sen, A. (1999). *Development as freedom*: Oxford University Press.
- Stiglitz, J. E. (1993). *The role of the state in financial markets* (Vol. 21): Institute of Economics, Academia Sinica.
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American economic review*, 393-410.

Woolley, F. R., & Marshall, J. (1994). MEASURING INEQUALITY WITHIN THE HOUSEHOLD. *Review of Income & Wealth*, 40(4), 415-431.

World Bank, T. (2014). World Development Report.

Appendix

Table A1: MFI targeting using poverty lines

<i>Sample below 4 Poverty lines</i>	MFI Households			Non-MFI Households		
	Mean (US \$)	Obs.	% of Sample	Mean (US \$)	Obs.	% of Sample
Absolute Poverty \$1 perday	0.69	33	13.1%	0.58	37	15.1%
\$1.25 Per Day	0.83	48	19.0%	0.79	60	24.5%
\$2 Per Day	1.27	106	42.1%	1.15	109	44.5%
\$2.5 Per Day	1.48	134	53.2%	1.40	138	56.3%

Source: Survey data

Table A2: MFI targeting using ownership of assets

Type of Assets	MFI Households	Non-MFI Households
1. Agricultural Land	17	19
2. Livestock	52	39
3. Business Enterprise*	230	207

* Ownership of Business Enterprise is a determining factor in accessing MFI Loans/

Source: Survey data

Table A3: Characteristics of Microfinance Institutions - Survey Results

Classification	Name of MFI	Total Clients Surveyed	% Clients in Total	Location	Individual/ Group Lending	Services offered	Loan Repayment Structure	Collateral?	Collateral if "YES"
Tier 1	Adehyeman	6	2.21	Dome	Individual	Training and Advisory Services	Weekly and Monthly	Yes	Guarantor or 6mths Savings
	Beige Capital	3	1.11	Madina	Individual	Training	Biweekly and Monthly	Yes	Guarantor
	Express Savings & Loan	2	0.74	Kasoa	Individual	Training	Monthly	Yes	Between 1-6mths savings
	First National Savings & Loans	2	0.74	Kasoa/Madina	Individual	Training	Monthly	Yes	Between 1-3mths savings
	Opportunity Int.	22	8.12	Kasoa/Madina	Both	Training and Workshops/Seminars	Daily, Weekly, Biweekly and Monthly	Yes	Guarantor, and/or 1-6mths savings
	Procredit	3	1.11	Kokomlemle	Individual	No services	Weekly and Monthly	Yes and No	2mths Savings
	Shai Rural Bank Microfinance	10	3.69	Dodowa	Both	Training, Book-keeping, Workshops/Seminars	Weekly, Biweekly and Monthly	Yes and No	Between 1-3mths savings
Tier 2	Advance Ghana Microfinance	8	2.95	Madina	Both	Training and Book-keeping	Daily, Weekly, Biweekly and Monthly	Yes	Between 3-6mths savings
	Adwadifoo Adanfo	3	1.11	Madina	Both	Training	Daily and Monthly	Yes	Between 1-3mths savings
	Catamount Microfinance	14	5.17	Dome/Madina	Individual	Training and Workshops/Seminars	Daily, Weekly, Biweekly and Monthly	Yes	Guarantor, Business and/or 1-6mths Savings
	Dream Finance Ltd	2	0.74	Madina	Individual	Training and Workshops/Seminars	Daily		
	Duapa Trust Microfinance	65	23.99	Kasoa	Both	Training, Book-keeping, Workshops/Seminars	Daily, Weekly and Monthly	Yes	Between 1-6mths savings
	E-Top Microfinance	2	0.74	Nungua	Group	Training and Book-keeping	Weekly and Monthly	Yes	3mths savings
	G-Life	2	0.74	Bawjiase/Madina	Individual	Book-keeping	Daily	Yes	Between 2-6mths savings
	Hopeline Microfinance	23	8.49	Madina	Both	Workshops/ Seminars and Advisory services	Weekly, Monthly and One-off payment	Yes	Guarantor, and/or 1-6mths savings
	J.H Financial Services	5	1.85	Kasoa	Both	Training	Daily, Weekly and Monthly	Yes and No	3mths savings
	Legacy Capital Microfinance	17	6.27	Osu	Individual	No services	Daily, Weekly and Monthly	Yes and No	Between 1-6mths savings
	Liberty Microfinance	7	2.58	Kasoa	Individual	Training	Daily, Weekly and Monthly	Yes	Guarantor, and/or 1-6mths savings
	Medic Microfinance	5	1.85	Haatso	Both	Training and Workshops/Seminars	Monthly	Yes and No	Guarantor
	Multi Credit Microfinance	2	0.74	Cantoment/Kasoa	Individual	Training and Workshops/Seminars	Daily	Yes	Between 2-6mths savings
	Olive Branch Microfinance	5	1.85	Madina	Both	Training	Weekly and Monthly	Yes and No	Guarantor, Business and/or 1mth Savings
	Women's World Banking	3	1.11	Madina	Individual	Training	Biweekly and Monthly	Yes	Between 1-6mths savings
Tier 2 - 4	Others*	20	7.38	See note* below	Both	Training, Workshops and Book-keeping	Daily, Weekly, Biweekly and Monthly	Yes and No	Guarantor, Insurance and/or 1-6mths savings
Tier 3	Asa Gh Ltd	26	9.59	Madina	Both	Training and Book-keeping	Daily, Weekly and Monthly	Yes	Guarantor and/or 1-6mths Savings
No Classification	Agt	2	0.74	Nungua	Both	Training and Book-keeping	Weekly and Monthly	Yes	Between 3-6mths savings
	Don't Know**	12	4.43	See note** below	Both	No services	Daily, Weekly, Biweekly and Monthly	Yes and No	Guarantor and/or Between 1-6mths savings
Total		271	100						

*These are scattered across Achimota, Dome, Kasoa, Kokomlemle, Madina, Nungua, Odumasi, Osu, Spintex and Takoradi and are MFIs categorized under Tier 2-4

** These are located in Achimota, Ashongman, Dodowa, Dome P2 and Malata

Table A4: Variable definitions and Summary Statistics – Intra-household Gender Inequality Analysis					
Variable names	Definition	Mean	Std. Dev	Max	Min
Females' share in household durable and business assets	Females' share in total household durable and business assets (ranges from 0 to 1). The choice of this variable is due to the fact that from the survey most respondents indicated that the funds were used to acquire business assets and some durable assets hence its use in the analysis.	0.66	0.35	0	1
Microfinance credit	Ratio of microcredit to household income	0.24	0.36	0.02	2.78
Social expenditures	The share of education & health expenditures in total essential household expenditures	0.32	0.20	0	0.84
Female income	Female's annual income	4152.7	3705.4	0	24000
Age of borrower	Average age of borrowers in the household	39.82	9.26	22	83
<i>Dummy variables</i>					
Gender of user of credit	"1" if female and "0" if otherwise	0.83	0.38	0	1
Financial literacy dummy	Variable measures whether a client received some form of training in the use of the credit received from the MFI. "1" if YES and "0" if otherwise:	0.70	0.46	0	1

Table A5: Summary Statistics of Regression Variables

	ALL OBS=494		MALE-HEADED HOUSEHOLDS OBS=315		FEMALE-HEADED HOUSEHOLDS OBS=179		MEAN DIFF
	Mean	SD	Mean	SD	Mean	SD	MALE_HHH-FEMALE_HHH
Log of household total physical assets	8.50	0.07	8.87	0.08	7.86	0.11	1.01
Household total physical assets	14422.99	1227.36	16946.42	1509.48	9982.31	2065.79	6964.11
Male-headed households	0.64	0.02	1.00	0.00	-	-	1.00
Log per capita household expenditures	6.77	0.03	6.74	0.04	6.83	0.06	-0.09
Per capita household expenditures	1145.52	43.76	1072.31	48.41	1274.35	84.95	-202.04
Log of household size	1.22	0.03	1.39	0.03	0.91	0.04	0.49
Household size	3.88	0.08	4.42	0.10	2.92	0.12	1.50
Age of household head	40.47	0.47	41.58	0.60	38.51	0.75	3.07
Age of household head Squared	1747.22	42.26	1840.98	55.21	1582.22	62.85	258.75
Education of household head	9.80	0.20	11.25	0.18	7.25	0.37	4.00
Self-employed Dummy	0.65	0.02	0.52	0.03	0.88	0.02	-0.37
Microfinance Dummy	0.51	0.02	0.50	0.03	0.52	0.04	-0.02

Source: Author's calculations

Table A6: Sample Means and Size of Dummy Variables

Dummy Variables	Obs.	Mean of Dummy Variables	Share of Females' Education and Health Expenditures in Total Household Expenditures	Log of household total physical assets	Household total physical assets (GH Cedis)
MFI Households	250	0.505	64.4%	8.71	16940.25
Non-MFI Households	245	0.495	67.5%	8.29	11795.48
Male-Headed Households	315	0.636	56.8%	8.87	16946.42
Female-Headed Households	179	0.364	81.6%	7.86	9982.31
Self-Employed	321	0.647	72.8%	8.45	13525.51

Source: Author's calculations

Table A7: Marital Status of household head

	Obs .	Percent
Divorced / separated	53	10.8
Married	333	67.6
Never married	73	14.8
Widow / widower	34	6.9
Total	493	100.0

Source: Survey data

Table A8: Ethnic Group of Household Head

	Obs .	Percent
Akan	298	60.8
Ga	83	16.9
Ewe	72	14.7
Guan	6	1.2
Gurma	1	0.2
Mole-Dagbani	8	1.6
Grusi	4	0.8
Others	18	3.7
Total	490	100.0

Source: Survey data