Does agency matter and do microfinance self-help groups empower women? A case study of a joint-microfinance and coffee cooperative from the Mountains of the Moon in Uganda

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Abstract: *Collective action in the form of microfinance self-help groups (SHGs) has been increasingly hailed for its positive economic impact and its empowerment of women but also for excluding those most in need of collective action. This study examines women's agency from two perspectives suggested by Amartya Sen using a case study 26 self-help groups of a joint microfinance and coffee co-operative from Western Uganda. Firstly, the study attempts to provide a new framework for exploring self-selection by comparing levels of agency of female non-SHG members and members before participation in SHGs. Results indicate that women who join and stay in SHGs are initially wealthier in terms of land than their female cohort from the community whereas autonomy over marriage and human capital formation are not systematically different. Secondly, this paper investigates the impacts of collective action on women's decision-making agency in particular whether length of membership matters. The paper finds that length of membership has no effect over spouses' joint decision-making and income pooling but reduces wives' tolerance of gender-based violence. However, other indicators such as inheritance patters, daughters' age at first marriage, occurrence of domestic violence, and freedom of movement are not statistically significant, indicating that empowerment is a process of internal change of power within and behaviors that is neither lineal, nor can be achieved over night.*

Keywords: agency; women, self-help groups; microfinance, coffee; Uganda

1. INTRODUCTION

Access to financial services (i.e. credit, savings and insurances) in sub-Saharan Africa (SSA) remains limited and lags far behind other regions of the developing world (World Bank 2011). In Uganda, 21 percent of households are formally served through formal

financial institutions[1]. That is below the sub-Saharan Africa average of 24 percent (Demirguc-Kunt and Klapper 2012). The imbalance between men and women is even more acute, given that 15 percent of Ugandan women in 2010 had a formal bank account against 26 percent for men (Demirguc-Kunt and Klapper 2012). As a result Ugandan women are more likely to be credit and savings constrained than men and therefore face greater risks and restrictions for any form of investment into income-generating activities and security arrangements. This unequal access to capital markets not only reflects unequal gender practices on the supply side of financial institutions in many lesser developed countries but also materializes into unequal gender relations on the household level resulting into less economic opportunities for women. Moreover, gender inequities on the capital market tend to spill over to other markets as well, limiting women's ability to engage in agricultural trade and gain benefit from it (Jones et al. 2012, Mayoux et al. 2009, Van Zanden 2004).

Individually women and girls have only a limited capacity to change the way (capital) markets and social institutions function. However, women's collective action has the potential to act upon problems that cannot be resolved individually. Because institutions themselves are gendered (Elson 1999), they can question or reinforce existing social norms and behaviours, including gender relations. Against this background, in the past decades self-help group-based microfinance programs for low-income households have been introduced in lesser developed countries (Birchall 2003). The great majority of microfinance customers are women.[2] One important aspect of self-help microfinance programs is the explicit empowerment of women of (Daley-Harris 2009), defined empowerment as the process of acquiring the ability to make strategic life choices in a context where there this ability has previously been opposed (Sen 1999, Kabeer 2001). In particular in rural areas microfinance organizations employ self-help-groups (SHG) in order to viably serve this disadvantaged client segment for which customers are typically formed into small groups of 20-30 members. Through SHGs, members can access savings and credit products because members guarantee each others' loan repayments. This overcomes the problem of collateral security for the financial institution. Mohammed Yunus, as Nobel Prize laureate, is probably the best known microfinance promoter and an outspoken representative of that equation.

A good example of this development is Bukonzo Joint Cooperative Microfinance Society Ltd. (henceforth referred to as Bukonzo Joint) in Uganda, founded in 1999 and owned by

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[1] These include banks and microfinance deposit-taking institutions whose deposits in the bank are insured by the Central Bank.
[2] According to the Microfinance Summit Campaign, microfinance institutions counted 205,314,502 clients - more than 150 million were women, as of December 2010.

its members. Seventy-five percent of its 2,220 members are women, all scattered in clusters of settlements in the Rwenzori Mountains of Western Uganda. Originally, the cooperative started as a microfinance association and organized its members into SHGs to access credit and savings products and establish a network of mutual support. The majority of members grow organic, hand-picked Arabica coffee and since 2005 market it collectively through the cooperative. Moreover, Bukonzo Joint combines its financial services with participatory training in understanding and changing gender relations[3], and organic and fair trade coffee growing. The empirical analysis is based on data collected by the author in July and August 2012 from the described cooperative.

This paper contributes to the growing literature of the effect of institutions for collective action on women's empowerment. This paper is in good company given that, given that the United Nations recognize cooperatives as an example 'to pursue both economic viability and social responsibility' in the 'International Year of Cooperatives 2012'. In addition, the International Labour Organization (Birchall 2003) views the renaissance of the African cooperative movement as an important driving force for economic development. The World Development Report 2012 promotes greater gender equality in order to enhance productivity and improve development outcomes for the next generation. Moreover, the Swedish Nobel Committee awards those who have contributed to build institutions for collective action (Maathai, 2004, Yunus, 2006, Ostrom, 2009). In other words, ICAs represent a good entry point for transforming gender relations and thus have the potential to have a positive effect on women's empowerment. As an increasing number of group-based microfinance programs in developing countries target women, an important research question is whether program participation results into more "agency" for women, defined as women's ability to make purposeful choices for themselves and act upon them (Sen 1987, 1999). Previous studies have generated mixed results, suggesting that there can be even negative effects from the design of the program. In this regard, this paper also addresses the question of which particular features make microfinance SHG programs successful agents of women's empowerment.

The paper sets out to explore the causal mechanisms that influence female cooperative members' decision-making agency. The first is the initial level of agency a woman enjoys before joining the cooperative. This is done by exploring the hypothesized self-selection bias by comparing initial capabilities of cooperative members and non-members. The first hypothesis is that initially more empowered women are more likely to engage in collective action and therefore are more likely join a cooperative (H.1). The second factor that is assumed to influence women's agency is the 'collective action effect' – the effect

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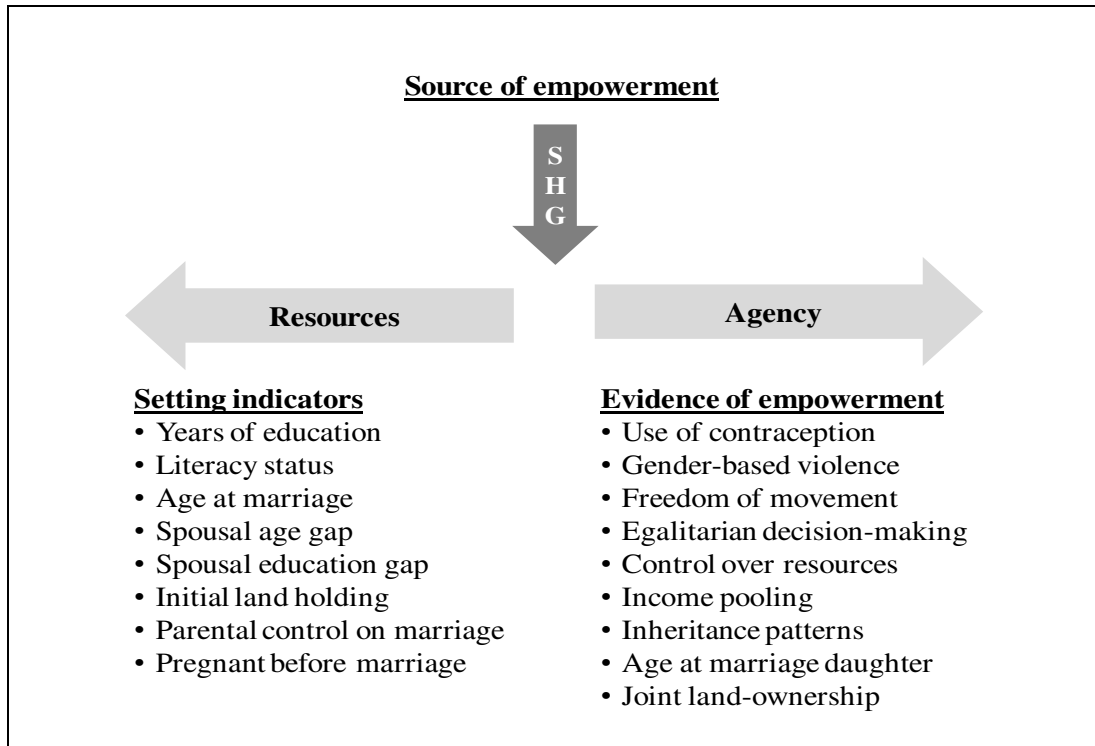[3] See http://www.wemanglobal.org/2_GenderActionLearning.asp

of membership on agency. Thus, does SHG membership contribute to more decision-making agency for women? I hypothesize a positive link between length of cooperative membership and women's decision-making agency (H.2). The two hypotheses taken together propose that agency and cooperation may reinforce each other with agency being an important determinant for joining collective action which then translates into additional agency gains.

The paper proceeds as follows. Section 2 provides an overview of the literature on the impact of group-based microfinance and women's empowerment. Section 3 describes the methodology, the cooperative under study and the data. Section 4 reports and analyses the findings. Section 5 concludes.

2. Women's agency and microfinance SHG groups

This section discusses the existing literature of two distinct types of agency. The first one is the initial set of agency individuals accumulate earlier in life, including human capital, autonomy over marriage, and land ownership. Hence, we want to estimate female SHG member's agency at the day they join the cooperative and compare it with non-members. The second one builds on women's initial agency base but then is expected to be subject to alteration from participation in the institution for collective action. Changes resulting from membership may be observed in women's physical mobility, reproductive control, level of income, decision-making agency over expenditures, and tolerance of gender-based violence. Figure 1 illustrates the two concepts.

Figure 1: Main connections to be explored

	Source of empowerment	
	SHG	

Resources ← SHG → Agency

Setting indicators
- Years of education
- Literacy status
- Age at marriage
- Spousal age gap
- Spousal education gap
- Initial land holding
- Parental control on marriage
- Pregnant before marriage

Evidence of empowerment
- Use of contraception
- Gender-based violence
- Freedom of movement
- Egalitarian decision-making
- Control over resources
- Income pooling
- Inheritance patterns
- Age at marriage daughter
- Joint land-ownership

2.1. The determinants of SHG membership

Already Karl Marx suggested that "Men [and women] make their own history, but they do not make it just as they please; they do not make it under circumstances chosen by themselves, but under circumstances directly encountered, given and transmitted from the past." (Marx, 1978, p. 9) In other words, deeply rooted gender differences with regard to social norms, human capital formation, marriage patterns and control over resources (World Bank 2011) may have a long history. However, group-based microfinance programs are fundamentally premised upon collective action which claims and has demonstrated over the past decades that these are not immutable but have the potential to change and engender new behaviour (Holvoet 2005, Swain and Wallentin 2009). Indeed, the initial set of resources and agency matter for participation in collective action because in particular marginalized groups, including women, the poor and ethnic minorities may face considerable constraints when attempting to be accorded membership (Pandolfelli et al. 2008, Meinzen-Dick and Zwarteveen 1998). As a result women who are better off are often more likely to benefit from microfinance programs. This bias comes for two reasons. First, the poorest women are least able to benefit from group-based and individual lending programs because they lack initial decision-making agency over resources, lack skills and market contacts. Second, repayment of loans puts further

pressures on SHG members to exclude those who are likely to experience greatest problems – the very poor and less empowered women (Hulme and Mosley 1996, Montgomery 1996, IPA 2012). If this is the case, control and treatment group should show statistically significant differences.

As most studies measuring the impact of microfinance program participation are fervent in controlling for self-selection, this work specifically aims at exploring a potential self-selection bias further in order to draw conclusions on whether female members of microfinance SHGs are already more empowered than non-members before joining the institution for collective action. In order to examine initial capabilities (before membership) one needs to travel back in time to both female control and treatment groups' childhood and early adulthood. These variables can offer a simple window on complex realities which gives us insights on their initial level of empowerment, defined as the combination of people's ability to access resources earlier in life (Kabeer 1999, 2001; Sen 1999). This work is embedded into the framework suggested by Nobel Prize laureate Amartya Sen, who proposed that agency, defined as people's capacity for autonomous decision making is the real measure of development.

Following, we briefly discuss three observable indicators for women's initial set of agency that potentially have determined membership. These include women's land ownership, autonomy over her marriage, and human capital formation.

Land holding

Gender patterns of ownership (e.g. land rights) and access to income is an important measure of household decision making power (Doss 2006, Field 2004), because it indicates control over resources and influences final consumption choices of the household. Doss (2006) for example finds that women's share of farmland significantly increases budget shares on food in Ghana. Moreover, women's asset ownership may increase the anthropometric status of children (Duflo, 2003) and reduce domestic violence (Panda and Agarwal 2005).

Autonomy over marriage

Marriage represents a crucial juncture in young women's lives, since it defines a large phase of their lives. This makes the conduct of marriage crucial. If marriage is arranged between spouses' parents or decided through spouse's love determines to a large degree women's agency in the relationship. Moreover; marriage at an earlier age reflects much less agency and autonomy than the free choice of a partner at a relatively advanced age. In other words, girls who marry and enter their spouses' household during their early teens are left with very little say in regard to the terms of the marriage which is likely to translate into unequal decision-making agency within the household (Carmichael 2011).

Furthermore, age at marriage also determines to a large extent the number of children a woman is expected. Theoretically this shapes their children's future human capital of those women's offspring (Becker 1992). In addition, women who marry in their mid or late twenties rather than in their early teens, have more time to build-up their human capital resulting into greater increased likelihood of free choice and employment opportunities later in life (Sen 1999).

Human capital formation

The family plays a crucial role for human capital formation during childhood which largely pre-conditions choice later in life. The level of human capital formation in many societies is determined by the income of the parents, the power of the mother to allocate income equally between male and female offspring (Thomas 1990), the quantity of children they have (Becker and Tomes 1976), and the sex of the offspring (Duflo 2003).There is evidence that young women who marry or have children early typically drop out of school more often and are less likely to participate in the labour market (Ambrus and Field, 2008, Duflo et al. 2011). Carmichael (2011) studies various indices measuring female empowerment and finds that education is key in determining at what age women marry. She reports a positive correlation between women's education levels and age at first marriage which subsequently reduces the spousal age difference in developing countries. In turn, if the level of female education is closely linked to female agency and given that mothers invest more into their children than fathers, it suggests that improvements in female decision-making agency are likely to translate into higher levels of education for offspring. Also, Hamaus and Meier zu Selhausen (2012) find a strong correlation between female-male ratio of primary/secondary school enrollment and age at marriage for 32 sub-Saharan African countries.

2.2. SHG-based microfinance and women's agency

There are two processes identified vital for women's empowerment. The first is social mobilization and collective agency, as poor women usually lack the capabilities and self-confidence to change and question existing gender inequalities individually. The second is that mobilization needs to be complemented with economic gains for women in order to strengthen women's economic situation (Kay 2003). Against this background, SHGs intermediated by microfinance services (i.e. credit, savings and insurances) have played an important role for women's empowerment and poverty reduction in developing countries (Putnam 2000). Acting collectively not only overcomes the constraints women have when it comes to financial services[4] but it can also act as vehicle for changing and

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[4] Joint-liability reduces losses in case of debtor's credit default for financial institutions in developing countries where individuals and in particular women lack ownership of land to act as collateral security.

challenging persistent gender relations in the household and thus increase women's agency.

Household spending patterns ultimately depend on each member's information set and bargaining power. If both spouses had the same preferences and desires, then, who owns the money or other assets (e.g. land) would not matter within the household. All resources would flow into a common pool with the intention of being channelled towards the optimal uses for the family. However, in practice individual preferences and decision making power between wife and husband is not as harmonious as described. For example, various studies about female versus male control over resources and household spending patterns reveal that women tend to spend more on children's health and education than their husband's when their incomes increase (Benhassine et al. 2011, Duflo and Udry 2004, Duflo 2003, Lundberg et al. 1997, Thomas 1990). Naturally, this makes women to key actors in poverty reduction. In other words, when women acquire agency, they improve their social-economic position and the ones of their offspring (Kabeer 2005) - theoretically, this is what microfinance is about. Also Thomas (1990) finds that in Brazil unearned income in the hands of a mother has a bigger effect on child survival, anthropometric health than income under control of the father. Moreover, Attanasio and Lechene (2002) report increased wife's decision making power with a greater share of income contributing to total household income using the Progresa dataset from Mexico.

There also exists a school of thought that suggests that access to microfinance by itself does not automatically contribute to women's empowerment (Adams and Mayoux 2001). However, women's empowerment does not come over night but entails a process of change which often credit by itself cannot solve. Therefore, if group-based microfinance fails to embed it services into a wider framework of transformation of gender subordination on both individual and household level, microfinance will fail to become a path out of poverty, as husband's cooperation and land represents an important partner in assisting loan repayment (Gibbons 1999, Goetz and Sengupta 1996).

Impact evaluations have generated mixed results on the ability of group-based microfinance programs to mutually act as "magic bullet" or stimulate "virtuous spirals" for women's agency on the household level (Kabeer 2005, Mayoux 1999). In fact there exists a growing strand of literature that recognizes the limitations of microfinance to

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Hence, SHG members' achieve loan recoveries through peer monitoring (Stiglitz 1993). In lesser developed countries property rights are usually unclear and therefore few farmers have legal land titles that can be used as collateral to access credit (De Soto 2001). Despite the fact that women provide more than 60 percent of agricultural labour in Uganda, they only owned 16 percent of formally registered land in the mid 2000s MoGL&SD (2007).

empowerment. Previous randomized evaluations by Banerjee et al. (2010) found no impact of access to microcredit on offspring's health/education and women's decision making power within households in communities of India's Hyderabad. Husain et al. (2012) compares empowerment levels of newly inducted and older members of SHGs in West Bengal, India in order to measure the effects of the program. They find that differences in empowerment scores between newly inducted and older SHG members are insignificant in most cases, except tolerance of domestic violence and the status of female members within the household. However, the exclusion of drop-outs and their exceptionally small sub-sample sized of 45 newly inducted members versus 195 older members raise questions of representativeness. Their results run contrary to Holvoet (2005) who reports evidence from India that women's SHG membership shifts decision-making to more joint and female decision-making while longer-term membership strengthens those patterns. However, she does not control for members that dropped out in the past and overall her sample is relatively small and therefore can only detect large program effects (what she does).

Although women gain access to financial services, the money is often controlled by their husbands or other male members of the household (Goetz and SenGupta 1996, Montogomery and Hulme 1996). Rahman (1999) find that female Grameen Bank SHG participants in Bangladesh experience increased domestic violence because husbands felt increasingly threatened in their role as primary bread-winner. Another 'pessimistic' recent study concerning female employment and violence is led by a recent field experiment from Ethiopia by Hjort and Villanger (2011). In their study they randomize job offers to women to work in flower farms in rural Ethiopia. Their results portray a significant 13 percent increase in physical violence when women get employed, and a 34 percent increase in emotional abuse. Moreover, Gonzalez-Bernes (2004) concludes that female labor force participation in Zambia, Rwanda and Tanzania is not associated with lower levels of violence. In cases of husband's control over loans and gender-based violence, women will have difficulties to retain loans and use them for economic activities, which barely results into positive household-level welfare effects. That's because excluding men may result into husbands not supporting their wives' loan repayment because they did not understand the particular procedures of receiving and repaying loans as well as other particular rules of the SHG (Armendáriz de Aghion and Murdoch 2010).

Also, gender-based violence by husbands is likely to reduce because group lending entails peer monitoring. This can act as a deterrent against violence given that non-attendance of group meetings, due to the physical and emotional state of women, would alert other co-members, in particular the solidarity members. Moreover, Pronyk et al.

(2007) finds that when loans are coupled with participatory educational programs it reduces the incidence of intimate partner violence in rural South Africa. De Mel et al (2009) find that in more cooperative households, women invest more money into their microenterprise when they received a grant by microfinance institutions, while the grant to women with less autonomy was "captured" by other household members.

Another way in which microfinance can affect women's empowerment is the use of contraception, and thus women's influence over planning of childbearing, number of children to have, and protect themselves from HIV and other STDs. Rahman and Da Vanzo (1998) and Schular and Hashemi (1994) found an increased willingness to limit numbers of children for beneficiaries of microfinance programs in Bangladesh. This can be explained by the fact that microfinance increases the opportunity costs of women's time. On the other hand, Pitt et al. (1999) find no evidence that women's access to microfinance services does translate into fewer children or more contraceptive use in Bangladesh. They suggest that access to microfinance theoretically raises income which allows for more children in life.

3. METHOD AND DATA

The difficulty of causal inference of any microfinance program is the absence of a counterfactual. The gold standard for a systematic and rigorous impact evaluation is a randomized control trial (RCT). The power of RCTs lies in its ability to generate an unbiased picture of the causal impact a program has on its participants. In this case the comparison group allows researchers to measure what would have happened had the program never existed.

They allow for rigorously testing what really works on the grassroots level. The recent works of Duflo and Banerjee (2011), as well as Karlan and Appel (2011) marked the institutionalization of this methodological paradigm. However, the Western Ugandan coffee and microfinance cooperative under study was already operational at the time of the survey which meant it was not possible to assign female participants randomly into treatment and control groups. Therefore, this work does not attempt to answer the question whether female members' agency changed with the program, compared to how it would have changed without it. The reason lies in pre-existing observable and unobservable differences of women that chose to participate in the cooperative compared to individuals that chose not to. In other words, if women who join a cooperative already have a greater probability to own land or have a greater stake in decision-making at home than those who do not join before membership, then the comparison between patterns of decision-making between members' and non-members' agency would yield biased estimates. Thus, it would most likely overestimate the impact of cooperative membership for which participants self-select themselves. Statisticians call this problem self-selection

bias which leads to biased estimates of a program's impact. There are several potential sources of bias in microcredit impact assessments. Therefore, non-RCT based evaluations on the effectiveness of microfinance need to demonstrate creativity to overcome those biases (Karlan 2001, Karlan and Goldberg 2007).

This work takes a different approach than previous studies. Firstly, it sets out to explore the bias in self-selection. That is, it explores initial differences in female agency between treatment and control group for initial women's agency that is unaffected by program participation, and therefore lies prior to SHG membership. If those marginal differences are statistically insignificant it would justify a comparison between comparison and treatment group. Secondly, in search of the effect of membership on women's agency on the household level, we compare systematic differences of cooperative members' agency with the length of their membership. However, this method does not erode all biases resulting from a cross-sectional impact study, in particular the bias from drop-outs. The following sections describe in more detail the research setting, the study population and the sample.

We have no information about members that dropped out over time. Members generally drop out because they are unable to repay their loans and thus were excluded by the SHG. Hence, the sample of members is a selection of the more successful members. This possible attrition bias may overestimate the effects of length of membership in the cooperative and women's empowerment.

The control group is randomly picked from the same area as the SHG group. Previous SHG impact evaluations included women and men from villages where no women's SHGs were present reasoning that that the mere proximity of individuals to women's SHGs, without being a member oneself, could have enabled the spread of the program impact from participants to non-members (e.g. Holvoet 2005, Schular and Hashemi 1994). However, they do not control for possible village-level heterogeneity. Moreover, identical socio-geographic areas which provide the same cultural characteristics and geographic and socio-economic opportunities (e.g. market size) and challenges to respondents are difficult to find. Therefore, this paper regards spillover effects from SHGs to non-members less severe than systematic village or regional differences.

This work takes a different approach. First, it does not compare the control group with the treatment group in terms of variables specific to female agency that would be affected by membership. However, first it compares treatment and control group for variables that are unaffected by program participation, and therefore lie prior to SHG membership. Subsequently, the survey explores initial differences in female agency that seeks to explain the determinants behind participation and non-participation. Are women that join

cooperatives are already more empowered than female non-members? Second, in search of the impact of membership on women's agency on the household level, this work compares systematic differences of cooperative members' agency with the length of their membership. However, not all biases resulting from a cross-sectional impact evaluation can be ruled out entirely. The following sections describe in more detail the research setting, the study population and the sample.

3.1. The cooperative and its setting

The district of Kasese has a population of 671,000 and is located just on the Equator. It is bordered by Kabarole District to the north, Kamwenge District to the east, Bushenyi District to the south and the Democratic Republic of the Congo (DRC) to the west where the Rwenzori Mountains formed a natural boundary millions of years ago. Bukonzo Joint Cooperative operates in the mountainous area of Bukonzo County which has 7 sub-counties with a population of 280,500. Bukonzo County is located in the west of Kasese district in the Rwenzori Mountains bordering the DRC. Bukonzo County is an exclusively agricultural area with most of the region without electricity connection. The main cash crop is coffee – Uganda's major export earner and employer. Most villages lie above 1,200 metres sea-level which enables small-scale farmers to grow Arabica coffee, typically grown on slopes between 1,300 and 1,500 metres. Annually, the area experiences two rainy seasons (March to May and August to November) and two dry-seasons (June to August and December to February). Agricultural yields (i.e. coffee) during a rainy season are considerably higher than during a dry-season. For this reason the time of the year for field research was chosen during a dry-season which eased transport during data-collection and ensured respondents availability for questionnaire-based face-to-face interviews since they were not busy harvesting yet.

Bukonzo Joint Cooperative (BJC) was founded in 1999 with the mission to provide microfinance services to the poor and remote mountainous farming communities in Western Uganda's Rwenzori Mountains. The isolated mountainous area was further marginalized in the past due to civil strife and abduction by the Allied Democratic Force (ADF) in the mid-1990s. This has been an important raison d'être for households in the region to cooperate. At the beginning the cooperative comprised of ten almost purely female groups. In thirteen years of microfinance operations, BJC has grown to serve 2,220 local small-scale farmers, 76 percent women, distributed over 74 mixed-sex groups SHGs in 2012 (Appendix A). Members are organized into voluntary SHGs comprised of 15-30 members, each provided with an individual passbook. New members need to be approved upon by all SHG members. SHGs allow small-scale farmers in the region with relatively low incomes and absence of land titles, to gain access to credit that is difficult

or impossible for them to get from formal financial institutions. Each SHG elects a chairman, cashier, loans officer and secretaries. When group members want to apply for a loan they need to explain the purpose of the loan to their group members in order to get a recommendation for it. At each weekly group meeting the progress repayment schedule and proper end-use is checked upon by solidarity group members. In the case of late-repayment or credit default, solidarity group members, comprising of 3 to 5 members within the SHG, are liable for repayment after liquidation of the creditor's savings. Contrary to the general model of SHGs, loans are not given from a common SHG savings fund but individually by Bukonzo Joint on the basis of a recommendation by the applicant's SHG. Savings are collected at weekly group meetings. The cooperative's field officers collect those weekly to cut down member's expenses on travel (to and from the branch) given the mountainous terrain.

The SHG model offers opportunity to integrate complementary interventions into its lending programs. BJC provides trainings for SHG member in transforming gender relations on the household and community level, and best methods of pre and post-harvest management of organically grown coffee. Additionally, since 2005 an internal marketing association pools and markets internationally smallholder farmers' coffee from the region, including SHG members. As a result members can expect higher prices for their Arabica coffee, and thus an increase in household income.

SHGs formed at different time periods between 1995 and 2010. Baseline information on the characteristics of the SHGs as of March 2012 supplied by BJC showed that the average SHG has 28 members: 21 female and 7 male members. As the survey is interested in the effect of length of membership on female participants, the population is limited only to female members of which the sample is to choose from a population of 1,691. In other, words, male participants of BJC are excluded from the survey's sample size. In order to explore intra-household decision-making power the study population was limited furthermore to those female members of BJC and female non-members that had a husband at the time of the survey.

3.2. Sample size and power calculations

The quality of the impact evaluation depends directly on the quality of the data. Therefore, properly constructed sample sizes are crucial. The next step in planning an impact evaluation is first to determine the sample size required to precisely estimate differences in the outcome indicators between treatment and comparison group. Second, because we are interested in testing whether the effect is different in 4 different sub-populations, we must know how many of the sub-groups of the cooperative need to be randomized to be able detect a given treatment effect at a certain level of statistical

power. Moreover, how many female participants per sub-group should be sampled? The associated method for calculating a precise and statistically required sample size is called power calculations (Raudenbush et al. 2011). The statistical power is the probability of detecting an impact if there is one. Subsequently, an impact evaluation has high power if there is a low risk of not detecting real program impacts (Gertler et al. 2010). In other words, power calculations avoid collecting too few or too much data. Usually, power calculations are conducted for powers of 0.9 and 0.8. It indicates that one finds an impact within 80 or 90 percent of cases where one occurred. This work applies the standard power of 80 percent. Furthermore, we apply the common 95% confidence interval which tells us that, for 95% of any samples that we could have drawn from the same population, the estimated effect would have fallen into this interval.

Table 1 illustrates the associated power calculations required for different minimum detectable effects. Standardized effect sizes are small ($\delta = 0.2$) medium ($\delta = 0.4$) and large ($\delta = 0.5$). The standardized effect size is the effect size divided by the standard deviation of the outcome (Gertler et al. 2010). In other words, the effect size with a given sample depends on how variable the outcome is. For example, if the majority of women in Bukonzo County have a similar decision-making agency without a program, a small impact will be easy to detect. The standard deviation captures the variability in the outcome, and thus the more variability, the higher the standard deviation.

Table 1: Sample size required for various minimum detectable effects, Power = 0.8, Maximum of 74 clusters

Minimum detectable effect	Number of clusters	Units per cluster	Treatment sample with clusters	Comparison sample without clusters
Small ($\delta = 0.2$)	Not feasible	Not feasible	Not feasible	787
Medium ($\delta = 0.4$)	24	16	384	198
Large ($\delta = 0.5$)	16	16	256	128

Table 1 illustrate that the smaller the effect size to detect, the larger the sample size for a power of 0.8 (see Appendix B for power of 0.9). Moreover, sample requirements increase since the evaluation aims to compare impacts between 4 sub-groups. From Table 1 one can conclude that for a small effect size the number of clusters exceeds the total number of operational SHGs and therefore is not feasible. However, both medium and large effect sizes can be calculated. The sample size naturally increases from a large to a medium effect. There is no indication to presume a large effect; consequently we stick to the more conservative medium effect. For a power of 0.8 to detect a medium effect of 0.4, an increase of women's agency due to BJC program, a total sample of at least 24

clusters (or SHGs) with a total of 384 respondents would be sufficient for the treatment group. Since, the comparison group does not contain any clusters, 198 respondents are sufficient for a medium effect at power of 0.8. In total, the sample size is 592 (see Appendix C).

3.3. Randomization

Once the sample size for both comparison and treatment group has been chosen, the next step is to choose a method that estimates program impacts accurately. From each of the 6 groups of the 4 clusters a random sample of 16 female respondents was drawn. The survey took into account the possibility of non-response, and thus included one extra group per cluster, increasing the total number of groups per cluster to 7.

Random selection of the treatment sample followed a two-step process: First, stratified random sampling for which 74 self-help groups were divided into 4 groups (or strata) where self-help groups shared the characteristic group maturity. Groups were clustered into blocks according to the year they started operation and randomized within each block: 2000-2002, 2003-2005, 2006-2008, and 2009-2011 (Appendix D). Second, within each of the 4 strata a sub-set of 6 self-help groups were randomly assigned to treatment using a spreadsheet (Appendix A). Randomized assignment is ideal to produce treatment groups that have a high probability of being statistical identical to the ones not in the sample because every single group is potentially eligible for the face-to-face interview.

Second, on the treatment group level, 16 female members (average arithmetic mean of female participants in self-help groups) were randomly drawn from each SHG. Individual respondents also could have been assigned on a first-come-first-served basis or selection based on unobserved characteristics (e.g. motivation and knowledge). However, in order to minimize self-selection tendencies treatment once more is assigned at random which generates a robust estimate of the counterfactual. In order to ensure the latter, group members were asked to pick a wooden chip from a bag containing the precise number of chips as group participants. Fourteen chips were of the color green while plain chips (wooden colour) filled the number of remaining members. For example for randomization of respondents of a group of 30 women, a bag contained 16 green and 14 plain chips. All together the number of chips reflected the number of group members. The randomly selected group members with a green chip were then interviewed individually by the research assistants. Those women on the group level who were randomly selected did not receive any financial compensation during or after the interviews.

Respondents in the comparison group were chosen to reflect a comparable socio-economic group as the female SHG respondents and thus were randomly visited at the

household level in the same area of each of the SHGs. In order to ensure honest answers of respondents, research assistants conducted the interviews exclusively with household's female heads that had a husband at the time of the survey, which implies that no other family member was present during the interview. In order to diminish the likelihood of non-response an incentive program containing a package of salt, soap and matchbox worth US$0.34 was given to respondents after the interview. It was opted to hand out the "incentive gift" at the end of the interview because in the local culture of Bukonzo County giving out small gifts before the interview situation would have generated a feeling of buying or manipulating on the respondents' side.

After pre-testing the questionnaire interviews took place between 19th July and 3rd August 2012, prior to the coffee harvesting season. Individual data collection interviews were commissioned to independent and specifically trained enumerators to ensure that it was perceived as objective. Enumerators spoke the local language of Lukonzo fluently and were at ease translating the questions from English into Lukonzo from the questionnaire. Field officers of BJC led the group of enumerators to the various SHGs. The study gained approval from the Uganda National Council for Science and Technology (UNCST) and Office of the President in June 2012.

3.4. Data

A total of 631 married women were surveyed during June and July 2012 – 421 SHG members from Bukonzo Joint, and 210 non-SHG members. Table 2 presents some summary statistics on household characteristics. Religious and tribal values are identical for both respondent groups. The average household in the non-SHG had just above 6 members compared to 7 to 8 in households that joined a SHG. Polygamy is prevalent – 34 percent of SHG members' households compared to 28 percent non-member households' are polygamous. Respondent households who joined a SHG (husband and wife accumulated) in the study area owned 1.9 acres of land, whereas non-SHG households owned 1.5 acres. Husbands of both SHG members and non-members own on average about five times as much land as their wives which translates into respective spousal land gaps of 1.2 acres for SHG members and 0.9 for non-members. Table 3 presents individual characteristics of respondents and of their husbands. It states that respondents who joined a SHG are on average more than 6 years older than non-members which explains why they have on average one more surviving child, and thus larger households. Average schooling levels are low for both SHG members and non-members, although the mean years of schooling is considerably lower for SHG members - 4 versus 5.3 years. SHG members had considerable had close to twice as much savings at the time of the survey. This can be attributed to the fact that members have a savings account and thus a safe place to save in order to accumulate lump sums.

SHG households have earned just above 53,000 Ush (equivalent to $20 at time of survey) per week in comparison to 63,000 ($24). Both households spent on average large sums on the wife's and children's health – 64,400 Ush ($25) for SHG members and 44,700 Ush ($17) for non-members. Few households treat their drinking water (with chlorine, UV, or boil it). Malaria or other febrile diseases are common – 47% of respondents that joined SHG and 39% reported had malaria last month. Both households share almost identical living conditions - 90% live under an iron roof and 10% have a cement floor. Both groups live in mountainous and remote areas, on average 34 minutes food walk from the next main road (which is not a tarmac road).

Virtually every household in the community is engaged in agriculture, as 98 percent of SHG-members and 89 percent of non-members grow coffee and represent the most important income generating activity for wives followed by sale of field crops (e.g yams, cassava, plantain, ground-nuts) and small shop sales.

Those household that grow coffee generated on average 803,000 Ush ($309) in comparison to 670,000 Ush ($258) for non-members per year. This difference has possibly to do with larger land holdings for SHGs. However, weekly incomes are smaller for SHG members relative to non-members suggesting that more land also demands more hours of work. In addition, households in which wives have joined a SHG income inequality is half as high as for non-members, given that non-member households have a spousal income gap twice as large as non-members.

Table 2: Household characteristics

	(1) SHG	(2) Control
Household size	7.53	6.19
Polygamous household	0.34	0.28
No. of children	5.31	4.36
Household health expenditures last month (Ush)	64,442	44,730
Household treats drinking water	0.13	0.18
Wife had malaria last month*	0.47	0.39
Iron roof at home	0.92	0.90
Cement floor at home	0.12	0.10
Wife owns land (%)	0.24	0.22
Land holdings wife (acres)	0.36	0.26
Husband owns land (%)	0.81	0.77
Land holdings husband (acres)	1.58	1.19
Spousal land gap (acres)	1.21	0.92
Weekly household income excluding coffee (Ush)	53,259	62,865
Spousal income gap (Ush)	13,521	29,715
Income from coffee per year (of those growing coffee) (Ush)	803,059	669,793
Current total savings (Ush)	156,544	86,017
Distance to main road (in walking minutes)	34	34
No. of observations	**421**	**210**

Standard deviations in parentheses. Monetary values in Ugandan shillings (Ush). Exchange rate was around 2,200Uhs to US$1 on average during the sample period.
*Malaria is typically self-diagnosed and households tend to call 'malaria' any febrile illness (Cohen et al. 2012). However, self-reported malaria incidents are still relatively severe sicknesses and therefore represent a reasonable indicator for health status.

Table 3: Individual characteristics

	(1) SHG	(2) Control
Bakonjo tribe (%)	97.9	96.7
Christian faith (%)	99	100
Age female	36.9	30.2
Age male	43.1	35.9
Spousal age gap	6.1	5.7
Age at first marriage	18.3	18.2
Age at first child	19.5	19.0
Wife did not choose husband (%)	16.9	15.7
Pregnant at marriage (%)	12.4	23.8
Years of education female	4.0	5.3
Years of education husband	6.2	6.8
Wife at least 5 years schooling (%)	44	66
Can write her name (%)	60.0	80.0
Husband can write his name (%)	86.5	91.9
Mean no. of children	6.1	4.4
Mean no. of male children	2.6	1.9
Mean no. of female children	2.7	2.1
Wife landownership initially (%)	24	22
Use of contraception (%)	17.1	27.6
Divorced in the past (%)	10.5	27.6
No. of observations	**421**	**210**

* Percentage of non-members' that own land at the time of the survey.

4. RESULTS

This section reports the results of the empirical analysis. It starts with exploring the hypothesized self-selection bias for observable indicators of women's agency before membership. The logistic analysis provides us with insight on the statistical differences of SHG members and non-members. The second section focuses on whether group membership resulted into differences in decision-making patterns for different sub-groups of length of membership. Then OLS regression controls for group and individual characteristics and provides additional insights into the impact of length of membership on other dimensions of women's agency. Finally, this section explores the determinants of participation and ownership of the institution for collective action.

4.1. Who joins a SHG?

What determines cooperative membership for married women in rural Western Uganda? And do self-selection mechanisms play a role? In other words, are cooperative members already more empowered than non-members, as SHG as hypothesized earlier? In order to answer this question one needs to travel back in time to the female respondent's childhood and early adulthood well before cooperative membership. These variables can offer a simple window on complex realities which gives us insights on their initial level of empowerment, defined as the combination of the ability to access resources and agency they had earlier in life (Kabeer 2001 and Sen 1999). The results of initial empowerment from the analysis of agency in the past are presented into three categories: human capital formation, autonomy over marriage, and land holding. Table 4 reports the regression results.

Table 4: Marginal effects after logistic estimates for cooperative membership

	(1)	(2)	(3)	(4)
	Full	**Full**	**<51 years**	**<51 years**
Literacy	-0.0530		-0.0752	
	(0.210)		(0.109)	
Years of education		-0.0069		-0.0078
		(0.300)		(0.292)
Initial land holding (acres)	0.1614***	0.1609***	0.1807***	0.1795***
	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.0081***	0.0079***	0.0101***	0.0101***
	(0.000)	(0.000)	(0.000)	(0.000)
Age at first marriage	-0.0013	-0.0001	-0.0007	0.0003
	(0.829)	(0.986)	(0.919)	(0.960)
Spousal age gap	-0.0009	0.0007	-0.0002	-0.0005
	(0.804)	(0.843)	(0.941)	(0.894)
Parental control on marriage	0.0076	0.0136	-0.0245	-0.0174
	(0.881)	0.791)	(0.650)	(0.749)
Pregnant at marriage	-0.1111*	-0.1126*	-0.1331*	-0.1363*
	(0.029)	(0.036)	(0.027)	(0.023)
No of obs.	**631**	**631**	**575**	**575**
Pseudo R²	**0.1339**	**0.1333**	**0.1389**	**0.1369**
Percent correctly predicted	**62.34**	**62.85**	**66.47**	**64.01**
Log Pseudo Likelihood	**-347.6775**	**-347.9095**	**-320.4455**	**-321.1725**

*Significant at 10% level, ** significant at 5% level, *** significant at 1% level

Human capital

From Table 3 we observe that married women who joined a SHG are generally less educated than their peers in the community. Forty-four percent of them report having had at least 5 years of schooling, with 60 percent being literate, compared to 66 percent and 80 percent respectively for non-members. Members' husbands are on average more educated than their spouses receiving more than 2 years of schooling compared to a spousal education gap of 1.5 years for non-members. Women's literate and educational status was estimated separately given their high correlation (Appendix F). Also, the correlation matrix shows that respondent's age is strongly and positively correlated with literacy and education. The logistic regression when controlling for age in Table 4 does not find that wife's education and literacy are significantly different between the two sub-groups. In order to find out whether it is the age difference of more than six years

between the sub-groups that explains those results I exclude respondents above age 50 in Column 3 and 4. One loses 56 observations. However, both human capital indicators remain statistically insignificant, although literacy comes closer to the 10 percent significance level.

Autonomy over marriage

Marriage patterns can be illustrative of the degree to which women had a say in the formation of the union. This is likely to continue and materialize in later unequal decision-making agency for women within marriage and the household. However, we cannot find any statistical significant differences between members and non-members indicators on women's ability to influence the formation of the union do not disclose any statistical difference between cooperative members before they joined and non-members. First, age at first marriage is identical (18.3 years) for both female members and non-members. The most important motivation behind marriage is to get children - 57 percent for members and 66 percent for non-members. This is line with both female panels receiving their first child one year after marriage at the age of about 19. Given the overall identical means between the sub-groups the logistic regression in Table 6 also does not report any statistically significant differences between the two groups for age at marriage. Age at marriage is 2 years lower than the national Ugandan average in 2002 (Hamaus and Meier zu Selhausen 2012). This comes as no surprise since the survey area is both mountainous and remote where traditional and earlier marriage in life is more common than in urban areas. Second, there is only a small difference when it comes to spousal age difference with SHG member's husbands being more than 6 years older compared to 5.6 years for non-members. Also, the means in Table 3 illustrate that SHG members and non-members do not differ largely given that 84% of members and 83% of non-members decided on their marriage. However, SHG members had decreased probabilities of being pregnant before marriage by eleven percentage-points. When women in mountainous Bukonzo County get pregnant before marriage they typically lose their ability of making a free choice over their marriage partner and marry the father of that child. This loss of ability to decide when and whom to marry is then likely to materialize into disadvantaged decision-making power on the household level. In turn, this suggests that group-members had greater autonomy over marriage than non-members which potentially translated into greater decision-making agency already before membership.

Land holding

Married women who joined a SHG had increased odds of initial land holding (acres) of 16 percentage points (Column 1 and 2). At first this is surprising since in the Table 4 indicates that the number of both SHG and non-SHG members who own land does not vary considerably. However, women in non-SHGs tend to farm significantly smaller

plots than SHG members. In sum women in SHGs have greater access, ownership and control of land and livestock is important for women's economic independence and choice which crops to grow. Those women are more likely to be and stay in SHGs.

In order to put those results into perspective they can be compared to the preliminary results from a country-wide randomized control trial by Innovations for Poverty Action measuring the impact of savings groups in Uganda. IPA (2012) shows that primary respondents who decided to join village savings and loan associations (VSLAs) were on average more literate, wealthier, more likely to have had a business before the program than non-members (IPA 2012). This study finds similar results. Members are indeed wealthier in terms of land ownership and freer to choose their marriage partner than their peers in the community. However, when controlling for respondent's age there is no statistically significant difference in terms of human capital between the two sub-groups. A likely explanation for the self-selection bias is that SHG members select women with greater empowerment levels (e.g. economic independence) to ensure effectively recovery of loans and excludes those households perceived having high credit risks - generally the poorest and neediest (Hulme and Mosley 1996; Montgomery 1996; Noponan 1990, Krishnaraj and Kay 2002)..

4.2. Does length of membership matter for women's agency?

The second factor that influences women's agency is the impact of SHG membership – the collective action effect. We test the second prediction which assumes a positive link between SHG membership and women's decision-making agency, with the period of cooperative membership determining the intensity of the effect. The survey asked who is involved in making decisions about offspring's school fees and health expenditures, durable goods for the household and food purchases. To test whether women become increasingly empowered after joining SHGs this study compares levels of decision-making agency between non-members, relatively newly inducted SHG members (those who joined within the past 3 years) and "veteran" members (>3 years membership). Appendix E shows that membership duration is distributed over the 14 years of existence of the cooperative with peaks at 3 and 4 years of membership. Members that joined the cooperative at an earlier stage in time are expected to have gained more say with regard to decisions at "home". For that purpose we use information on specific decision-making patterns within households of married female SHG members. That is, whether either wife or husband is the solemn decision-maker or if spouses bargaining intra-household resources. Table 4 presents the results for different dimensions of decision-making power. If we assume that only the program effect operates, then both non-members and newly inducted members should have lower levels of empowerment, while older

members are empowered. However, one type of self-selection problem remains. Since we are applying a cross-sectional impact methodology, we cannot rule out the possibility that already more empowered women joined a SHG at an earlier point in time, while less empowered join gradually.

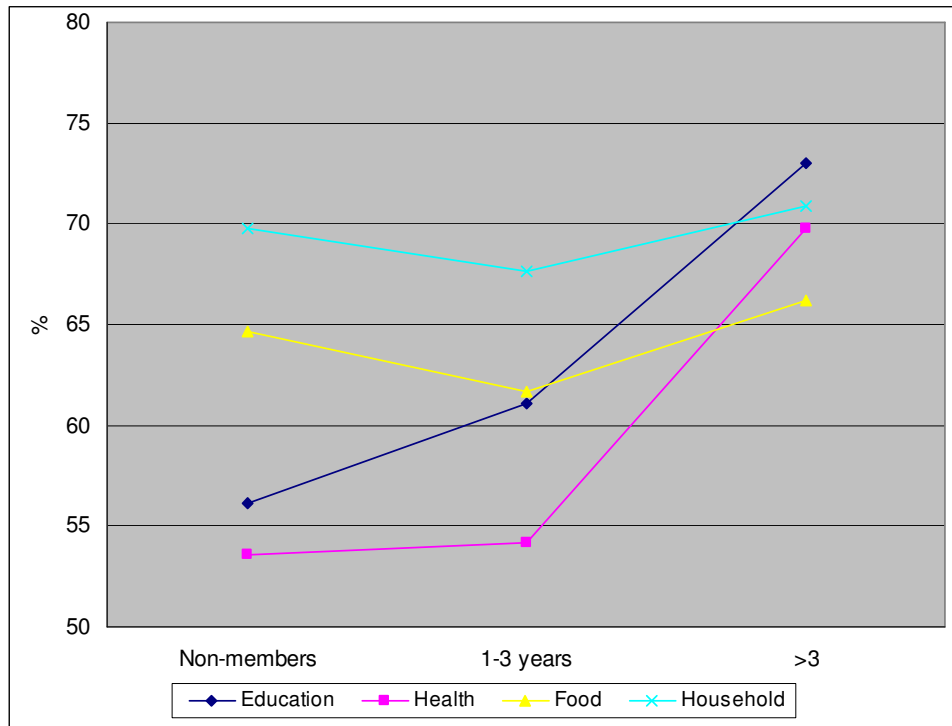**Figure 2:** Joint-decision-making and length of membership of female members and non-members

Figure 3: Average decision-making agency over expenditures and length of membership
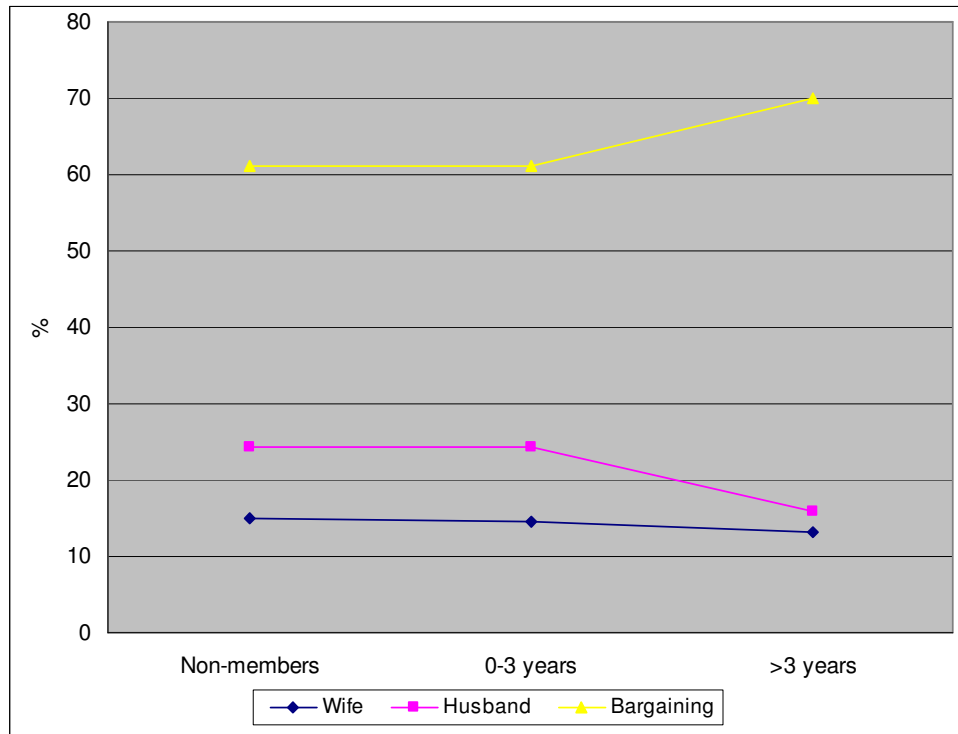

Table 4: Prevalence (%) of different processes of decision-making agency

		Wife	**Husband**	**Bargaining**	**N**
Children's education	Control	12.3	31.6	56.1	173
	New	11.5	27.4	61.1	113
	Old	8.5	18.5	73.0	271
Health expenditures	Control	10.0	37.3	53.6	209
	New	11.3	34.5	54.2	142
	Old	9.4	20.9	69.8	278
Food purchases	Control	16.5	18.9	64.7	210
	New	15.6	22.7	61.7	143
	Old	16.9	16.9	66.2	278
Household purchases	Control	21.0	9.3	69.8	209
	New	19.7	12.7	67.6	143
	Old	21.6	7.6	70.9	278

Note: Control = Non-members; New = newly inducted members 1-3 years; Old = >3 years

Table 4 presents the means for four different areas of decision-making agency subdivided over three sub-samples. These are non-members (Control), new SHG entrants with length of membership no more than 3 years (New), and veteran participants with length of membership greater than 3 years. The general hypothesis is that the longer women are in a SHG the more decisions in the household are bargained between spouses and are taken less solemnly by the husband.

Despite the fact that women's decision-making agency differs among sub-samples, from Table 6 it is possible to examine some general patterns for different areas of decision-making for the three sub-samples. For all three sub-samples the majority of decisions are arrived at through bargaining between spouses. From Figure 2 we can observe that with increased length of membership expenditure decisions concerning children's education and health are increasingly bargained. Joint decision-making with regard to purchases of food and household assets are for both non-members and SHG members equally high and not subject to considerable changes with increased length of membership. Figure 3 illustrates the means of the before graphically illustrated four indicators for decision-making sorted by three sub-groups. Interestingly, we find no considerable changes of decision-making between non-members and newly-inducted members. However, between newly inducted and veteran members we can observe a considerable shift toward increased joint decision-making and fewer decisions taken by the husband alone. In case of a self-selection bias we would expect newly inducted members to be more empowered than non-members. However, for all three it is identical.

Interestingly it can also be observed from Table 4 that wives' solemn decision-taking is largely absent of any changes with increased length of membership. This inelasticity suggests that cultural norms related with patterns of decision-making can be softened only to the degree of spousal joint-decision-making and additional shift towards female decision-making from bargaining is subject to a barrier of cultural norm-following.

I do not only want to compare aggregated individual scores for areas of decision-making but also want to see whether there is a statistically significant difference between the empowerment indicators and membership sub-groups. For that purpose the data is coded differently: 0 if decision of expenditures in different areas is taken by the husband; 0.5 if spouses make decisions jointly (bargain); and 1 if respective decisions are made individually by the wife.

The assumptions for the one-way analysis of variances are normal distribution and homoscedasticity. Since the data was not normally distributed, the assumptions are not met. Therefore, I use the Kruskal-Wallis test for comparing more than two sub-samples that are independent. The test does not assume normal distribution, unlike the one-way

analysis of variance. Furthermore, the test does assume that the populations from which the samples originate have the same median. In our case, all p-values for the four areas of decision-making are significant at least at the 10 percent level – decision-making about health and education expenditures even at the 1 percent level. Now we know that at least one sub-group is significantly different from the others. However, the Kruskal-Wallis test does not identify between which sub-groups differences occur. Therefore, one applies the Mann-Whitney U test in order to analyze the specific sample pairs for significant differences. The results in Table 5 show adjusted p-values for Holm-Bonferroni method for comparisons between the differences of sub-groups. Firstly, they indicate that the positive mean-differences from Table 4 or all 4 areas of decision-making are statistically significant between veteran and non-members at least the 10 percent level. However, differences between veteran and newly inducted sub-groups are only statistically significant for decisions regarding health. Differences between non-members and newly inducted members between remain insignificant however.

Table 5: Differences in decision-making for non-members, newly inducted and older members

EDUCATION		
	New	**Control**
Control	0.6770	-
Old	0.2507	0.0678
HEALTH		
Control	0.5348	-
Old	0.0312	0.0012
HOUSEHOLD ASSETS		
Control	0.3240	-
Old	0.2837	0.0232
FOOD		
Control	0.4517	-
Old	0.3577	0.0622

*p-values adjusted for Holm-Bonferroni method for multiple comparisons.

In sum, Table 4 and 5 provide evidence that women gain significant say about how to spend money on the household level when joining a SHG. However, an empowerment effect between member's length of membership (newly inducted and veteran members) is statistically significant only for decision's regarding health expenditures. Table 4 indicated an age difference of more than 6 years between member and non-member respondents. Theoretically, a self-selection bias between members cannot be ruled out

entirely. Differently put, why did those in the veteran SHGs joined at least three years ago whereas those in the veteran group just joined recently? This has been dealt with to some extent; given that SHGs were chosen from 26 multiple remote and mountainous sites where the program has been introduced gradually at different points in time (see Section 3).

However, the results in Table 4 fail to control for socioeconomic factors as well as individual and SHG characteristics. Next, this is done in order to validate the detected trends. Other indicators for women's empowerment are included as well. The results are presented in Table 8. The four variables used to measure women's decision-making agency are merged to one index (Column 1). Overall length of membership has no statistically significant effect on decision-making power over expenditures when introducing control variables. Also, the related indicator of "spousal income pooling" is unaffected by membership duration (Column 3). However, length of membership has a positive effect on wives actually receiving payment for household's coffee beans sold to the cooperative (Column 2), indicating increased control over resources. Moreover, duration of membership has a positive effect on husband`s agreeing to have shared land titles, given that the majority of land belongs to the husband. Also the size of the spouses' land gap plays a role in this regard and reduces the likelihood of joint land titles, indicating that husbands are less willing to share when more is at stake. Moreover, with each additional year of membership female members tolerate less gender-based violence (Column 6). On the other hand, length of membership does not translate into less gender-based violence as such (Column 8), nor inheritance patterns and use of contraception. Finally, surprisingly neither husband's SHG co-membership, neither membership before marriage resulted into changes in empowerment levels of married women in SHGs in West Uganda. Moreover, inheritance patterns and use of contraception

Table 8: Regression results

Indicator	(1) Say over expenditures	(2) Wife takes payment coffee	(3) Spousal income pooling	(4) Inheritance	(5) Joint land agreement	(6) Tolerance of gender-based violence	(7) Use of contra-ception	(8) Gender-based violence
Method	OLS	OLS	Logit	Logit	Logit	OLS	Logit	OLS
Length	0.0019	0.0180***	0.0064	-0.0005	0.0191**	-0.0281***	-0.0024	-0.0014
	(0.525)	(0.006)	(0.422)	(0.941)	(0.005)	(0.001)	(0.682)	(0.649)
Group heterogeneity	0.0005	0.0107*	-0.0124*	0.0052	0.0038	-0.0057	0.0035	-0.0037**
	(0.848)	(0.088)	(0.062)	(0.399)	(0.516)	(0.393)	(0.329)	(0.037)
Group size	-0.0006	0.0012	0.0010	0.0007	0.0025	-0.0009	0.0001	-0.0004
	(0.380)	(0.415)	(0.535)	(0.641)	(0.099)	(0.565)	(0.908)	(0.581)
Distance	-0.0002	0.0007	-0.0022**	-0.0009	-0.0013	-0.0000	-0.0008	0.0000
	(0.553)	(0.421)	(0.026)	(0.335)	(0.142)	(0.943)	(0.235)	(0.991)
Member before marriage	0.0640	-0.0334	0.0856	0.0061	-0.0969	-0.0105	-0.0456	-0.0158
	(0.114)	(0.680)	(0.341)	(0.948)	(0.191)	(0.904)	(0.282)	(0.659)
Husband SHG member	-0.0122	-0.1339	0.0776	0.0792	0.0145	-0.0372	-0.0674*	-0.0394*
	(0.583)	(0.004)	(0.149)	(0.132)	(0.761)	(0.481)	(0.043)	(0.052)
SHG	0.0042**	0.0047	0.0039	-0.0001	0.0009	-0.0054	0.0025	-0.0000
	(0.003)	(0.212)	(0.278)	(0.968)	(0.756)	(0.135)	(0.264)	(0.958)
Age	0.0018*	0.0032	-0.0003	0.0028	0.0057**	-0.0018	-0.0070***	-0.0014
	(0.079)	(0.175)	(0.888)	(0.275)	(0.010)	(0.493)	(0.000)	(0.116)
Spousal age gap	0.0011	0.0097**	-0.0090*	-0.0014	0.0001	0.0024	0.0036	0.0010
	(0.547)	(0.012)	(0.057)	(0.744)	(0.977)	(0.603)	(0.210)	(0.561)
Age at marriage	-0.0027	0.0074	-0.0064	-0.0057	-0.0007	0.0061	0.0076	-0.0011
	(0.656)	(0.284)	(0.430)	(0.495)	(0.909)	(0.437)	(0.120)	(0.671)
Polygamy	-0.0103	-0.0266	-0.0800	0.0968*	0.0062	0.0340	-0.0129	0.0102
	(0.654)	(0.578)	(0.148)	(0.065)	(0.894)	(0.532)	(0.723)	(0.624)
Spousal education gap	-0.0027	0.0171**	-0.0080	-0.0011	-0.0013	0.0084	0.0032	-0.0048
	(0.362)	(0.008)	(0.303)	(0.848)	(0.854)	(0.255)	(0.504)	(0.119)
Spousal land gap	-0.0068	-0.0289*	-0.0390**	-0.0335*	-0.0801***	0.0231	-0.0119	0.0019
	(0.279)	(0.036)	(0.032)	(0.059)	(0.000)	(0.201)	(0.363)	(0.394)
Ln(income)	0.0030	0.0023	-0.0045	-0.0011	0.0016	0.0096	-0.0002	0.0050**
	(0.200)	(0.671)	(0.480)	(0.848)	(0.763)	(0.140)	(0.959)	(0.023)
Loan (ln)	0.0006	0.0025	-0.0026	-0.0026	0.0044	0.0008	0.0052	0.0019
	(0.715)	(0.514)	(0.565)	(0.554)	(0.261)	(0.850)	(0.092)	(0.295)
Constant	0.3747***	-0.0679**	1.2207	-0.4927	-2.6791***	0.2419	-0.9879	0.1812**
	(0.000)	(0.685)	(0.124)	(0.542)	(0.002)	(0.760)	(0.323)	(0.009)
N	421	393	421	411	419	421	421	421
R² (pseudo)	0.0509	0.1310	0.0525	0.0221	0.1116	0.0398	0.0872	0.0435

Note: Figures in parentheses are t-statistic. * Significant at 10% level, ** significant at 5% level, *** significant at 1% level.

5. CONCLUSION

Collective action in the form of microfinance self-help groups has been increasingly hailed for its positive economic impact and its empowerment of women but also for excluding those most in need to seek collective action out. In this study women's agency was examined from two perspectives suggested by Amartya Sen using the case study of 26 self-help groups from a joint microfinance and coffee co-operative in Western Uganda. Firstly, this work suggests a new framework for exploring self-selection by comparing levels of agency of female non-SHG members and members before SHG participation. Results indicate that women who join and stayed in SHGs are initially wealthier in terms of land than their female cohort from the community which contributed to increased independence and decision-making agency and explains membership. However, autonomy over marriage and human capital formation are not systematically different between members and non-members. Secondly, this paper investigates the impacts of collective action on women's decision-making agency, in particular whether length of membership matters employing multiple indicators for women's empowerment. The paper finds that length of membership has no effect over spouses' joint decision-making and income pooling but reduces wives' tolerance of gender-based violence and increases likelihood of joint land holding of spouses. However, other indicators such as inheritance patters, daughters' age at first marriage, occurrence of domestic violence, and freedom of movement are not statistically significant. This suggests that empowerment is a process of internal change of power from within and norm-guided behaviors that are usually is not linear nor, can be achieved over night. However, the combination of enabling institutional dynamics, including access to credit and savings opportunities, income-generating coffee marketing, external technical training, and mutual group support ultimately will yield positive results for women's empowerment in the context of persistent poverty and restrictive gender norms. However, the needle of the compass is pointing to more balanced gender relations for some indicators although a "New World" is not in sight yet.

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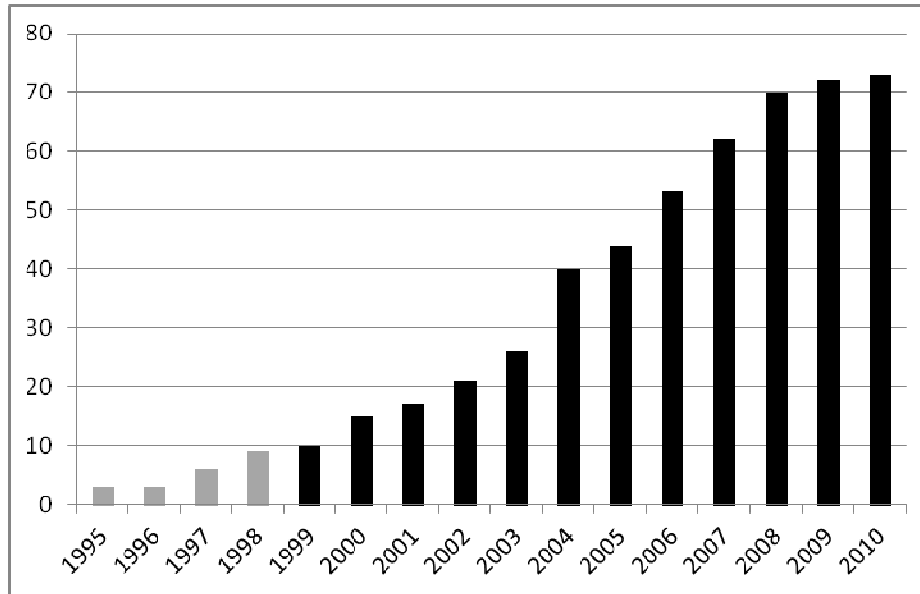Armendáriz de Aghion, B. and Murdoch, J. (2010). *The Economics of Microfinance*. MIT Press.

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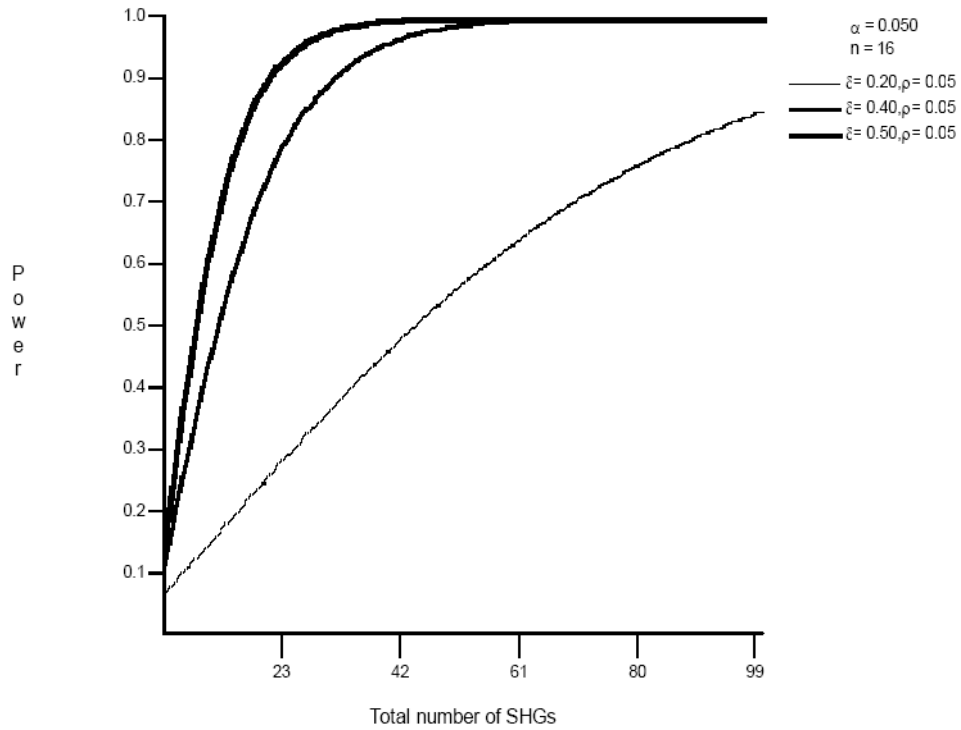
Appendix

Appendix A: Trend of formation and number of SHGs since 1995 (grey bars: SHGs that formed before cooperative's formation)
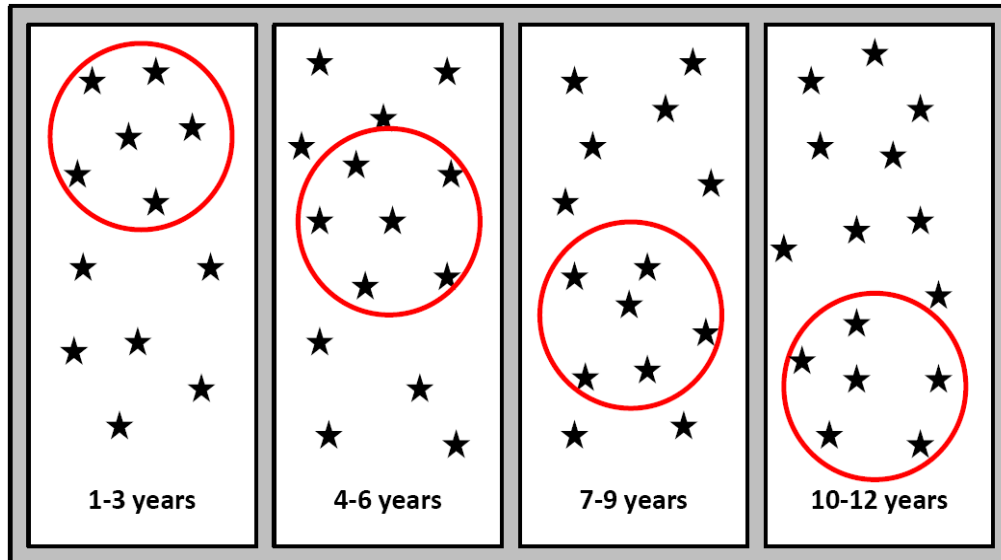

Appendix B: Sample size required for various minimum detectable effects, Power = 0.9, Maximum of 74 clusters

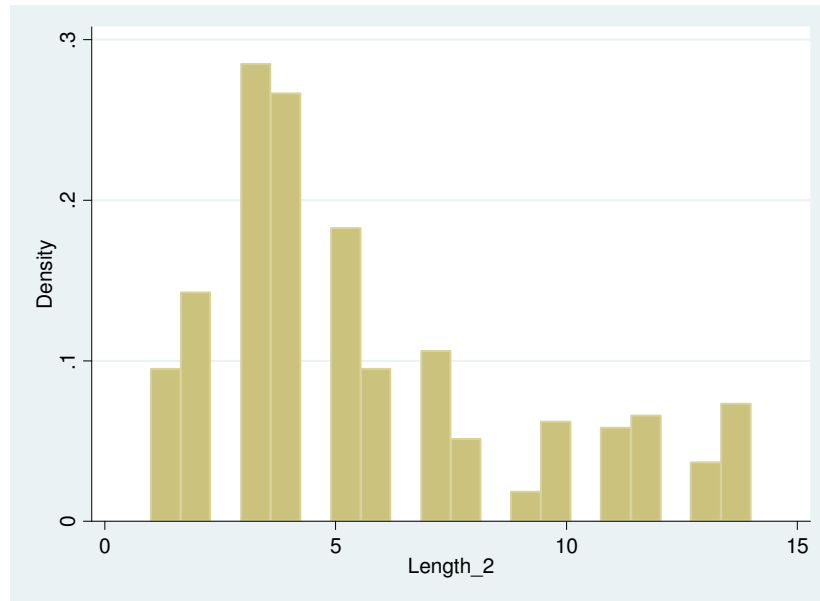| Minimum detectable effect	Number of clusters	Units per cluster	Total sample with clusters	Total sample without clusters
Small ($\delta = 0.2$)	Not feasible	Not feasible	Not feasible	1053
Medium ($\delta = 0.4$)	31	16	496	265
Large ($\delta = 0.5$)	21	16	336	170

Appendix C: Power calculation for 16 respondents per SHG and different effect sizes

Appendix D: Randomized assignment to treatment group in 4 strata according to group's maturity

Appendix E: Distribution of length of self-help group membership

Appendix F: Correlation table for the selection of variables for initial agency

	Educ	Literacy	Land	SAG	SMAM	Marriage	Pregn	Age
Education	1.0000							
Literacy	**0.7032**	1.0000						
Land	-0.1540	-0.0881	1.0000					
SAG	-0.1117	-0.0453	-0.0023	1.0000				
SMAM	0.2464	0.0871	0.0549	-0.0748	1.0000			
Marriage	0.1112	0.0097	-0.0432	-0.0534	-0.0320	1.0000		
Pregnant	0.1469	0.1316	-0.0925	-0.0692	-0.0095	0.0680	1.0000	
Age	**-0.4976**	**-0.4040**	0.2822	0.0805	0.0834	-0.1432	-0.1460	1.0000