

# What determines women's participation *in* and *within* cooperatives?

## Evidence from a coffee cooperative in Uganda<sup>1</sup>

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**Abstract:** Women face greater constraints than men in accessing resources and markets in sub-Saharan Africa. Participation in cooperatives is held as one way for female smallholders to remedy those disadvantages. Using data from 421 female members and 210 non-members of a coffee and microfinance cooperative in the Rwenzori Mountains of Western Uganda, this paper examines the factors that influence (i) women's participation in cooperatives (ii) and women's intensity of participation within cooperatives. The empirical results highlight the importance of access and ownership of land for women to be able to join the cooperative. Women's intensity of participation is modelled through their decision to participate in collective marketing of coffee and their share capital contributions. It is found that more equal intra-household power relations and length of membership positively influence women's participation in collective marketing and share capital contributions. Group characteristics appear less important.

**Keywords:** cooperatives, participation, women, smallholder farmers, coffee, Uganda

**JEL classification:** J54, J16, N57, O13, Q13

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## 1. Introduction

Women play a key role in agricultural production, household food security and rural poverty alleviation (Udry 1996, World Bank 2011, FAO 2011, Duflo 2012). However, at the same time, in many parts of the developing world, higher poverty levels among women mirror the fact that women face unequal access to economic opportunities compared to men (UNDP 1995, Meinzen-Dick *et al.* 2011). In particular in sub-Saharan Africa, women face greater barriers than men in accessing markets to sell their produce (at reasonable prices) and access capital in order to raise productivity and farm incomes (Jiggins 1989, World Bank 2009: 173-228, World Bank 2011, Peterman *et al.* 2014). Furthermore, women are particularly vulnerable to exploitative trading practices and have weak bargaining positions with typically male buyers and other value-chain actors (Mayoux *et al.* 2009, Jones *et al.* 2012). As a result of these disadvantages, women achieve lower agricultural productivity levels than men (Goldstein & Udry 2008, Peterman *et al.* 2011), which constrains women's ability to move from subsistence agriculture to more profitable higher-value chains (World Bank *et al.* 2009).

Against this background, participation in cooperatives has been recognised as a promising strategy for female smallholders to overcome market imperfections by facilitating access to distant markets and agricultural technologies, which increase their productivity and farm income (Birchall 2003: 20, Pandolfelli *et al.* 2008, Markelova *et al.* 2009, Quisumbing & Pandolfelli 2010, Jones *et al.* 2012). Agricultural cooperatives pool farmers produce, and link them to international and domestic markets. Collective marketing realizes economies of scale and enhances smallholder farmers' bargaining power to negotiate for better prices and tap into high-value markets, otherwise unreached with intermediary buyers (Bacon 2005, Wollni & Zeller 2007, Markelova & Mwangi 2010, Shiferaw *et al.* 2011, Poole *et al.* 2013). Furthermore, cooperatives can raise female members' productivity and social inclusion through the provision of additional services (Barham & Chitemi 2009), such as access to credit and thrift, technical assistance, agricultural inputs, and information sharing.

Understanding what drives membership is important for cooperatives' survival and growth in the long-run because they depend on members' contributions in order to generate economies of scale in processing and marketing (Bruynis *et al.* 2001, Birchall & Simmons 2004, Jussila *et al.* 2012). However, nominal participation alone does not explain how intensively female farmers (are able to) participate and commit themselves to their organisation. Often producer groups are not successful, because expected benefits do not always materialize, resulting into members' passive participation or exiting, and groups dissolving (Agarwal 2001, Markelova *et al.* 2009; Shiferaw *et al.* 2011). Because

cooperatives depend on members' delivery of crops, side-selling becomes can cause problems for cooperatives. Furthermore, cooperatives also rely on members' voluntary share capital contributions as a primary source of capital to develop the cooperative business (Von Pischke & Rouse 2004, Cazuffi & Moradi 2012).

Various recent studies have explored African smallholders' determinants of membership in cooperatives (Fischer & Qaim 2012, Bernard & Spielman 2009), as well as their intensity of participation (e.g. Fulton & Adamowicz 1993, Mensah *et al.* 2012, Mujawamariya *et al.* 2013, Fischer & Qaim 2014, Wollni & Fischer 2014). However, although gender is held as a key determinant of people's ability to participate in collective action, there has been little empirical research on women's participation surrounding cooperative membership.<sup>3</sup> While the literature on participation in collective action has largely examined male participation in cooperatives or failed to analyse how gender influences participation, this study analyses the determinants of women's membership and intensity of participation in cooperatives. In addition, whereas previous works have emphasized the institutional conditions, hitherto little attention has been paid to intra-household power dynamics as drivers of participation in collective action.

This article aims at filling this research gap, using a newly collected dataset of female smallholders from rural Uganda, comprising 421 members of a coffee and microfinance cooperative, as well as 210 randomly selected non-members from the same treatment area. The two main goals of the paper are to better understand: what factors influence women's (i) membership in cooperatives, (ii) and intensity of participation within cooperatives. Women's degree of participation within cooperatives is measured through (a) collective marketing of coffee through the cooperative vs. side-selling, and (b) members' share capital contributions.

The article proceeds as follows. Section 2 reviews the literature. Section 3 presents background information. Section 4 describes the data. Section 5 analyses the determinants of female cooperative membership, while Section 6 explores the factors behind women's intensity of participation. Section 7 concludes.

## **2. Conceptual Framework**

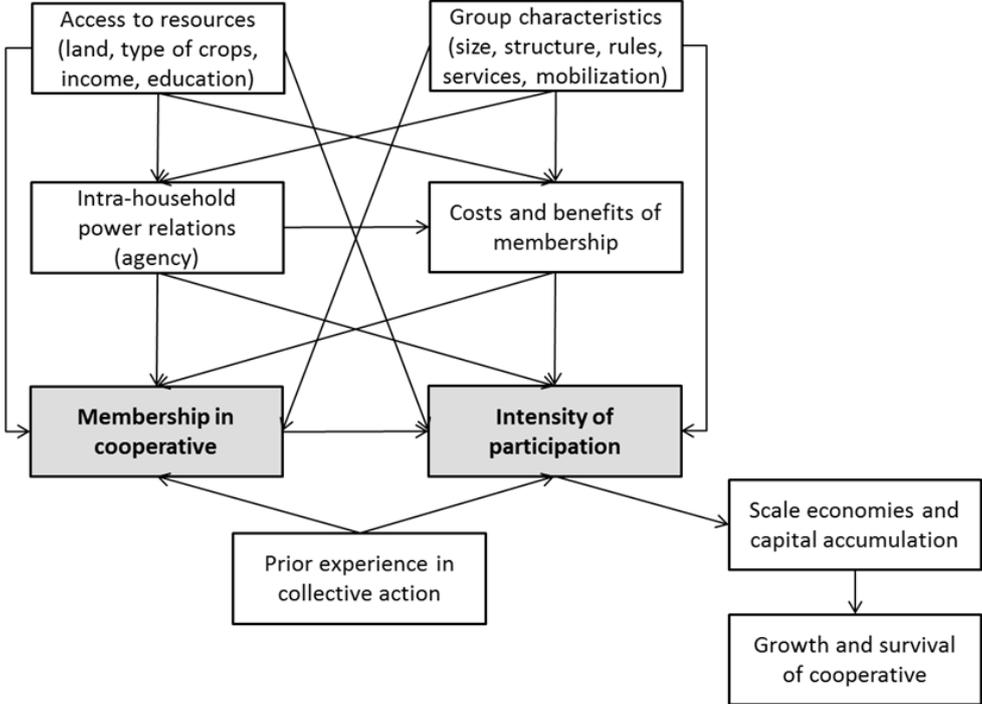
### **2.1. Determinants of participation in cooperatives**

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<sup>3</sup> Notable exceptions include: Mayoux (1995a), Meinzen-Dick & Zwartveen (1998), Pandolfelli *et al.* (2008).

Figure 1 presents a conceptual framework of factors that are likely to influence female farmers’ membership and participation intensity in cooperatives. While marginal costs and benefits and group characteristics have been previously emphasized in the literature on collective action (Ostrom 2000, Birchall & Simmons 2004, Markelova *et al.* 2009), socio-economic characteristics and intra-household power relations play an equally important role for women’s participation within the context of patriarchy and poverty. In her oft-cited article, Naila Kabeer (1999) highlights women’s ability to exercise strategic life choices within three measurable and interrelated dimensions: *resources*, *agency* and *achievements*. Participation in collective action clearly presents a strategic life choice for women. Hence, building on Kabeer’s concept might be useful for the analysis of female participation in cooperatives.

**Figure 1:** Conceptual framework for women’s participation in cooperatives



*Access to resources*

Women’s unequal access to productive resources often limits their opportunities to participate in collective action, leading to male dominated cooperatives (Meinzen-Dick & Zwarteveen 1998, Weinberger & Jütting 2001, Abebaw & Haile 2013). One important determinant of access to cooperatives among smallholder farmers is land ownership. Because land usually belongs to husbands, women are not eligible to join many cooperatives or receive credit and are not targeted in technical trainings. Moreover, land tenure insecurity lowers women’s agricultural productivity in the medium-run (Goldstein & Udry 2008).

Although land ownership per se cannot be equated with control over it, this irrespectively indicates women's ability to own productive resources within the household which may strengthen women's bargaining position, as access to productive resources within the household is typically considered as a function of women's bargaining power (Agarwal 1997). Numerous studies have found land size positively influencing farmers' decisions to join agricultural marketing cooperatives in Ethiopia (Bernard & Spielman 2009), Kenya (Fischer & Qaim 2012) and Costa Rica (Wollni & Zeller 2007) while land security perceptions were lower among coffee cooperative members in Rwanda (Mujawamriya *et al.* 2012) and not significantly different between female members and non-members in Chad (Weinberger & Jütting 2001). Furthermore, women with more productive resources and entrepreneurial experience in crop cultivation may expect greater benefits from participation in cooperatives.

Beyond land, women's access to education may also affect their participation in collective action. On the one hand, the level of education and the acquisition of literacy skills may pre-determine women's ability to work outside the agricultural sector in wage labour markets, and thus women's necessity of joining cooperatives. On the other hand, skilled women may be able to process the benefits and costs regarding cooperative membership more effectively, may possess a greater long-term horizon, and may have a better relative social position within the household. Spielman & Bernard (2009), and Wollni & Zeller (2007) found that the level of education and entrepreneurial experience positively influenced participation in cooperatives in Nigeria, Ethiopia and Costa Rica respectively, while Weinberger & Jütting (2001) and Fischer & Qaim (2012) could not find a statistically significant relationship.

### *Agency*

Access to resources per se does not automatically lead to social change (Calás *et al.* 2009) but also depends on women's ability to take autonomous choices in life and to control resources, commonly referred to as agency (Kabeer 1999). In particular, culturally embedded patriarchal conditions may restrict women's agency, creating barriers to exploit their economic opportunities and personal capabilities (Sen 1999). Women's participation in cooperatives already reflects agency in itself, as it mirrors their ability to participate in collective action outside the household. Hence, one needs to look for indicators that pre-conditioned this achievement.

One of the earliest and most important turning-points in girls' life is marriage. Whether the timing of marriage and the choice of husband was freely taken by the bride or whether this

was arranged, potentially in the girls' teens, is a reasonable indicator for female agency early in life (Jensen & Thornton 2003, Carmichael 2011). Generally, young girls who are married off to much older men are likely to be left with little over deciding the terms of the union, drop out of school and start having children at an earlier age. This lack of free choice at an early stage of women's life is likely to translate into large age and educational gaps between spouses which can further prevent women from gaining a better bargaining position within the household, hypothetically reducing their freedom of engaging in collective action. Moreover, bridewealth and polygamy may introduce an additional obstacle for women's agency (Dolphyne 1991, Rani *et al.* 2004). Moreover, the notion that women may participate in collective action as a response to constraints within the household is not straight forward, as within contexts of patriarchy women require a certain level of agency, such as freely moving outside the household and the husbands' permission of becoming a member in a cooperative.

## **2.2. Determinants of participation within cooperatives**

So far, most studies on farmers' participation in cooperatives have treated participation as a binary choice variable equating membership with participation. However, within collective action institutions the commitment of members is voluntary and can thus vary. Commitment generally captures the extent to which a member is likely to choose to maintain the membership (Jussila *et al.* 2012). Farmers' participation intensity has been measured in multiple ways in the cooperative literature.

For example, Fischer & Qaim (2014) analyzed smallholders' intensity of participation in a Kenyan banana cooperative using frequency of participation in group meetings and both the quantity and the share of marketable bananas sold through the cooperative. While they document that women's intensity of participation within banana groups is not significantly different from males, they did not study the factors that affected male and female participation separately. They find that more specialized and medium-sized banana farmers, and past beneficiaries of group services were more likely to participate in collective marketing and meetings. In another recent work, Wollni & Fischer (2014) found an inverse relationship between farm size for and collective marketing among cooperatively organized coffee farmers in Costa Rica. Also, Mujawamariya *et al.* (2013) used the proportion of collectively marketed coffee versus side-selling to traders as an indicator for member commitment in four Rwandan coffee cooperatives. They explain farmers' preferences for side-selling through the existence of long-standing and trustful relationships between traders and farmers, the attractiveness of immediate cash payment by traders, and the additional transaction costs involved in producing

high-quality coffee. Likewise, Mensah *et al.* (2012) look at the share of marketable cashew nuts delivered to a cooperative in Benin, and find that the price offered by the cooperative compared to traders and additional transaction costs along the value-chain negatively affected collective marketing. Finally, Cazuffi & Moradi (2012) chose members' share capital contributions of cocoa cooperatives in colonial Ghana as a proxy for member commitment, concluding that capital accumulation was positively related to members' wealth and negatively to membership size.

Those studies have largely paid attention to marginal costs and benefits influencing members' level of commitment to their cooperative. However, socio-economic factors on the household and group level may be also important predictors within the context of poverty and patriarchy, in particular when studying female participation (Kabeer 1999, Fischer & Qaim 2014). Although, most of the studies above control for gender, as binary variable in the regression analysis, a separate and deeper analysis of the gendered determinants of participation in and within cooperatives is still missing.

As for nominal membership, women's access to and control over household resources is expected to influence women's intensity of participation. Within households, preferences over resource allocation are typically not identical, and largely depend on spouse's decision-making power (Deere & Doss, 1996, Alderman *et al.* 1997). In this regard, the mutual sharing (or pooling) of income, women's participation in various types of household decisions and joint ownership of land by spouses, would signal cooperation between spouses with potential gains for women's participation within cooperatives. Also, fertility and household size may increase women's opportunity costs of time to participate in group meetings (Meinzen-Dick & Zwartveen 2003).

In addition, it is hypothesized that group characteristics, such as group size and the gender composition of groups influence women's decision on their degree of participation. Smaller groups typically are presumed to allow for greater interaction and social cohesion which ensures cooperation and avoids free-riding (Olson 1965, Hardin 1982). According to Poteete & Ostrom (2004) there exists no consensus about the role of heterogeneity in collective action. In view of the context of patriarchy it is hypothesized that women may feel more open to speak out and participate within groups with greater female conformity. Length of membership (in particular being a founding member) and the magnitude of past group benefits (e.g. credit, extension services) also influence women's attitude towards participation. Physical distance to the cooperative may influence the decision of collective marketing taking into account opportunity costs.

Also husband's co-membership in his wife's group is presumed to matter (Hambly Odame 2002), although the direction of the effect is debated. Husbands' co-membership entails a tradeoff between reducing household frictions (Goetz & SenGupta 1996) on the one hand and a loss of autonomy over marketing and borrowing decision on the other. Further, male inclusion might impede women's speaking out at meetings (Meier zu Selhausen & Stam 2014). Also, the distribution of tasks along the value chain may also affect women's intensity of participation in their cooperative, as it reflects their workload and control over crop production.

### **3. Background and Setting**

#### **3.1. Coffee production and cooperative development in Uganda**

In 2012, 84% of the Ugandan population lived in rural areas and depended heavily on agriculture for their livelihoods. Agriculture is the most important sector of Uganda's economy, employing around 65% of the labour force (World Bank 2014). Coffee accounts for 30.6% of Uganda's export earnings in 2012 (AfDB & OECD 2014). Next to Ethiopia, Uganda is Africa's largest coffee exporter, producing 21.9% of African coffee in 2013 (ICO 2014). The coffee sector almost entirely depends on approximately 500,000 smallholder households – 90% of whose average farm size ranges between less than 0.5 and 2.5 hectares (UCDA 2012). The majority of Ugandan smallholder farmers cultivate Robusta coffee and approximately one quarter of Ugandan coffee production is Arabica, grown above 1,200 metres in the highland areas of Mount Elgon (east), the Rwenzori Mountains (west) and Mount Muhabura (south-west). Since 2002 world market coffee prices have been on the rise. However, due to price information asymmetries between coffee farmers and traders, they rarely fully trickled-down to coffee growers (Fafchamps & Hill 2008).

Prior to the colonial era (1894-1962) Ugandan farmers were not connected to world markets and had no indigenous experience in cooperative organization. In the early colonial era, the British administration and Christian missionaries introduced commercial growing of cotton, followed by coffee which was rapidly adopted by African smallholders by the 1920s.<sup>4</sup> Colonial land alienation from Africans did not occur; instead freehold land was introduced, which encouraged the growing of cash crops by African peasants within the new capitalist context (Zwanenberg & King 1975). The cooperative movement in Uganda was born in 1913

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<sup>4</sup> Coffee was already indigenously grown and mainly chewed in pre-colonial Buganda (Roscoe 1911, Reid 2002).

in response to British and Indian interests that sought to monopolize marketing, processing and export of cotton and coffee. Yet, African cooperatives remained unsupported by the colonial state until 1946 when cooperatives became legalized (Develtere *et al.* 2008). In 1961, there were 1,662 cooperatives with a membership subscription of over 250,000 (UCA 2012).

During the post-colonial period farmers sold their produce at fixed prices, largely detached from international prices, to primary societies which delivered it to unions. Unions sent the produce to government marketing boards which sold it into export markets. When Idi Amin came to power, in 1971, there were 2,500 primary cooperatives, mainly engaged in cotton and coffee with about 750,000 family members (UCA 2012). Yet, Amin's military governance and warfare combined with low international prices for cash crops led to the collapse of most primary cooperatives in Uganda. When agricultural markets were liberalized and decentralized from state-controlled marketing boards in the early 1990s, cooperatives were largely unprepared to compete in international markets. This led to a further decline of the Ugandan cooperative movement with cooperatives' export market share dropping to approximately 1% in 2006, while multinational coffee firms were increasing their share (Kyazze 2010, Wanyama *et al.* 2009). Yet, over the last years the cooperative movement is experiencing a revival in both Uganda and other African economies (Develtere *et al.* 2008). In 2012, there were 9,967 permanently registered cooperatives in Uganda characterized by open membership with a membership subscription of over 1.2 million<sup>5</sup> (MoTCC 2012) - 46.7% being agricultural marketing cooperatives, and 28.2% savings and credit cooperatives (SACCOs). Recently, Kaganzi *et al.* (2009) highlighted the new market opportunities for agricultural cooperatives in Uganda to supply higher value chains, such as supermarket chains and fast-food restaurants in rapidly expanding East African urban markets. While, women participated mainly in groups that focused on traditional handicrafts in the 1970s, more recently this has broadened to include agricultural production (Pickering *et al.* 1996).

### **3.2. The cooperative under study**

Bukonzo Joint Cooperative Microfinance Society (henceforth referred to as BJC) is a joint microfinance-coffee cooperative, located in Bukonzo Country along the northern slopes of the Rwenzori Mountains in Western Uganda, near to the Congolese border. Bukonzo County comprises a population of 280,500 and is an exclusively agricultural area with poor infrastructure (e.g. no electricity connection at time of survey) and large distance to producer markets. The area was further marginalized in the 1990s due to civil strife and abduction

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<sup>5</sup> Figure based on 2009 estimates. No member distribution over men and women available.

through rebel groups (ADF). Most settlements lie between 1,300 and 2,300 metres of altitude, all suitable for the growing of Arabica coffee. Annually, the area experiences two rainy seasons, concentrating in March to May and August to November and two dry-seasons resulting into two coffee harvesting seasons. Coffee is the most important income earner in the region. Socio-economically this means that farmers are almost all the year round involved in some way with coffee cultivation of planting, tending, harvesting, processing and selling the crop.

The cooperative was founded in 1999 and initially started-off as a microfinance cooperative that organized its members into self-help groups (SHGs) to provide access to credit and thrift facilities and establish a network of mutual support within a context of poverty. Almost all group members were female at the start and came together because of prior social ties and their common experience of deprivation. There are no official selection-criteria concerning membership in farmer groups related to gender, age, education or land ownership, except that existing group members need to accept a new member who then pays the membership fee and subscribes to at least one capital share of the cooperative worth 10,000 Ush (\$4) which may create a barrier for poor women with limited control over cash.

**Table 1:** Average group characteristics

	Obs.	Mean	SD	Min	Max
Year group was formed	74 <sup>a</sup>	2004 <sup>c</sup>		2000	2010
Year group was formed (sample)	26 <sup>b</sup>	2004 <sup>c</sup>		2000	2010
No. of group members	66 <sup>a</sup>	31.03	15.13	15	114
No. of group members (sample)	26 <sup>b</sup>	35.39	18.06	22	108
Share of female members	66 <sup>a</sup>	0.76	0.12	0.46	1.00
Share of female members (sample)	26 <sup>b</sup>	0.79	0.10	0.50	1.00
Average savings per group member (in Ush) <sup>d</sup>	66 <sup>a</sup>	96,753	74,390	1,790	302,273
Average share capital per member (in Ush) <sup>d</sup>	64 <sup>a</sup>	135,213	83,262	19,063	344,642
Distance to cooperative (in walking min.)	26 <sup>b</sup>	33.27	30.56	0	120
Frequency of meetings per month	26 <sup>b</sup>	3.8	0.54	2	4

Notes: <sup>a</sup> based on cooperative statistics from March 2012. <sup>b</sup> based on July/August 2012 survey of 26 groups. <sup>c</sup> Median. <sup>d</sup> The U.S. dollar amount is calculated at the July 2012 exchange rate of 1\$ = 2,450 Ush.

Initially, the cooperative comprised of 11 women-only groups. In 13 years, BJC has grown to serve 2,220 local small-scale farmers, distributed over 74 groups by March 2012. On average, each farmer group comprises 31 members (see Table 1) and ranges from 15 to 114 members. On average, 76% of the members are female. The share of female members is negatively correlated with group size, which may suggest that women prefer smaller groups with closer social ties. Group meeting locations are situated 33 minutes average walking

distance from the nearest main road (which is not a tarmac road) and ranges from 0 to 120 minutes. On average, group members had saved \$39 while the average share capital per member amounted to \$55. As a collateral substitute, loans (with a monthly interest rate of 2%) are tied to member savings at a ratio of 1:2 and require the guarantee of 3-5 members within each producer group. The share capital combined with external aid funding has been used in the past to build stores, purchase scales and bags, a hulling machine and a generator (due to the lack of electricity supply).

Over the years the group model offered the opportunity for BJC to integrate complementary services for its members<sup>6</sup>. Since 2005, an internal marketing association pools and markets internationally smallholder farmers' coffee in order to provide easier market access. As a result, members can expect higher and more stable prices for their Arabica coffee (type: Nyasaland, SL 14, SL 28). In 2010, BJC bulked about 300 tons of coffee. The cooperative buys coffee from non-members as well, in order to maximize the use of washing stations and increase the quantity of coffee. Thus, non-members indirectly benefit from the organization, even without membership, but these do not have access to financial or agricultural services, or rebate distribution at the end of the sales season. Also, the cooperative follows rigorous quality requirements associated with exportation - cherries of bad quality are rejected. BJC buys both wet-processed and sun-dried coffee as not all members possess a micro-washing station for wet-processing (i.e. floating and de-pulping). Wet-processing ensures higher quality and is preferred by the cooperative. The cooperative provides the final stage in the green coffee value chain by hulling members' dried coffee (i.e. removing the parchment) before export to retailers in Europe, Japan and the United States. In order to increase the quality of members' coffee, since 2007, Bukonzo Joint has provided a comprehensive training scheme for its members in best practices and post-harvest management of organically grown coffee, as well as participatory trainings on how to improve gender relations along the coffee value-chain and within the household.<sup>7</sup>

## **4. Data and Descriptive Statistics**

### **4.1. Household survey**

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<sup>6</sup> The expansion of BJC's services was partly achieved through the external support from development organizations, such as USAID, Oxfam, Novib, Rabobank, and Solidaridad.

<sup>7</sup> Gender Action Learning System (GALS) based on inclusive and participatory principles and simple mapping and diagram tools has been introduced at BJC in 2007:  
[http://www.wemanglobal.org/2\\_GenderActionLearning.asp](http://www.wemanglobal.org/2_GenderActionLearning.asp)

Data used in this study were collected in July and August 2012 in seven sub-counties of Bukonzo County in Western Uganda. All sub-counties are major coffee regions located in the highlands of the Rwenzori Mountains (above 1,200 m). Using a carefully designed and pre-tested questionnaire, structured household-level interviews were conducted with coffee growers of all 7 sub-counties of Bukonzo County lasting approximately 30 minutes. The sub-counties are all located within the same agro-ecological zone, are situated above 1,200m altitude which is suitable for the growing of Arabica coffee, and have similar access to road infrastructure and markets.

Cooperative members were selected using stratified random sampling. Using a list of 74 producer groups of BJC the producer groups were clustered into four groups according to their year of creation (1999-2001; 2002-2004; 2005-2007; 2008-2010) in order to capture time variation. Next from each stratum six producer groups were randomly selected. Additionally, two extra groups were sampled anticipating the possibility of non-response. In total, 26 groups (35% of all groups) were randomly selected. Next, within each group 16 female members who had a husband at the time<sup>8</sup> were randomly drawn, using a lottery game, resulting into a total of 421 group member observations (24% of total female cooperative members). Moreover, within the treatment area of each sampled producer group eight married women were randomly sampled, coming to 210 observations in total. Interviews were conducted in private without the husband present. Thus, the total survey sample size comes to 631 observations.

In addition, Table 1 raises confidence that the 26 randomly sampled groups of BJC make a fairly representative match concerning average group characteristics: size, composition and length of existence. Moreover, because marriage is almost universal in rural Bukonzo County, the selection of only married women is not expected to exclude any significant share of women within the region or members of BJC. The sample only contains BJC members that were active at the time of the survey. Information on those members who exited their group in the past was not possible to survey. This may improve the standing of the surviving members relative to non-members. Furthermore, the survey data were supplemented with interviews with the leadership of BJC.

## **4.2. Descriptive statistics**

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<sup>8</sup> We are particularly interested in intra-household power relationships affecting participation in collective action and therefore only sample married women.

Table 2 presents the different ways the sampled cooperative members participated in the year 2011/2012 within their organisation. Almost all members saved money in their individual saving accounts; three-quarters sold coffee through the cooperative; two-fifth received credit; and about one in five attended participatory gender and technical coffee trainings.

**Table 2:** Types of member participation at BJC in 2011/12

	Total	%
Saving deposits	375	89.1
Coffee sales to cooperative*	317	75.3
Credit	168	39.9
Participatory gender training	82	19.5
Technical coffee training	70	16.6
<b>Observations</b>	<b>421</b>	<b>100.0</b>

*Notes:* \* This value increases to 305 out of 387 (78.8%) when only those members are considered who earned an income from coffee in the last year.

Seventy percent of the sampled BJC members stated that coffee constitutes their most important income source, followed by the sale of field crops (17.1%) and small trading and farming activities (8.6%). This is supported by the fact that on average income from coffee constitutes about a quarter of total household income and is the largest lump-sum income-earner. The majority of members stated that access to financial means (62%) and coffee market access (21%<sup>9</sup>) were primary motivations for engaging in the cooperative. Interestingly, 88.1% of non-members reported that they would like to become a member of BJC but that their current lack of resources (40.9%), lack of understanding of the functioning of cooperatives (17.1%), lack of trust in cooperatives (11.0%) and their husbands’ disapproval (4.4%) has impeded them thus far. The majority of cooperative members already grew and sold coffee before membership (71.9%), which back then was sold to private buyers (86.6%), other cooperatives (6.3%) or friends and relatives (6.0%). On average, membership seems to have yielded important gains for women in coffee cultivation, increasing their control of coffee sales from 22% before cooperative participation to 35% today, which goes with an increase in joint-selling and a reduction of pure husband control over sales from 38% to 21%.

We find evidence for competition between spouses over coffee sales, as 24% of wives sold unprocessed coffee at a lower price (to private buyers) to avoid their husband taking the coffee. In turn, also 17% of husbands have taken coffee in the last year and sold it at a lower

<sup>9</sup> 32% in households that cultivate coffee.

price so that they could get the money before the wife. Lack of cooperation in home coffee production potentially reduces households' quality and quantity of coffee to be sold to the cooperative. This problem is exacerbated by the fact that 21.2% of coffee-growing cooperative members<sup>10</sup> decided not to sell any of their coffee through the cooperative but preferred to sell to local buyers who offered immediate cash. Thus, a relevant question is why individual marketing continues to represent an important strategy for almost one quarter of female members.

Coffee cultivation of BJC members and non-members is a family business with a clear gender division of tasks and roles in the coffee value chain. The construction and characteristics of the distribution of spouses' coffee production tasks are presented in Table A1. In all coffee producing households women are significantly involved in the coffee cultivation and processing tasks. Men are particularly involved in the initial heavy-duty tasks of clearing the land, digging terraces, and planting coffee trees. The bi-annual harvesting of coffee is largely organised jointly. Processing, generally the more time-intensive task, is largely done together by spouses. Still, at least a third is exclusively done by the wife. Wet processing is used as a dummy variable, capturing how much a member has invested into her coffee production quality. Despite that transport of coffee to the cooperative is largely performed by the wife or jointly, 40% of husbands received the payment for it. Overall, members seem to contribute more to the coffee value-chain and are more likely to join forces with their husband than non-members.

As explained in the literature overview, several individual, household and group characteristics are expected to influence women's intensity of participation in collective action. Therefore, a wide set of farm, household and group characteristics are used as explanatory variables which are explained in Table 3.

Farm size of both wife and husband is used as gendered wealth indicators over productive resources. Furthermore, we include households' annual income from coffee to account for the quantity of coffee produced and the degree of coffee specialization. Larger coffee producers are likely to profit more from collective marketing and related inputs and extension services. On the other hand, larger producers may find it easier to market their crop individually. In addition, we control for years of entrepreneurial experience in coffee cultivation. Veteran coffee growers may be more resistant to change their traditional marketing channels.

Furthermore, intra-household power dynamics may explain women's participation in collective action. Women's *decision-making agency* on the household level is measured

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<sup>10</sup> Includes only those farmers that earned an income from coffee in the last year.

through an index of four variables that include decision making concerning household expenditures on health, education, food and general household expenditures. The variable is so constructed to take into account both women's fully autonomous decision-making, joint decision-making and no influence (Meier zu Selhausen & Stam 2014). The household income pooling variable, measures the mutual sharing of *financial resources* between spouses and is constructed as a dummy variable of each of the spouses sharing at least half of their income. Further, we are also interested in the level of sharing of *productive resources* and include the binary variable of joint land ownership.<sup>11</sup> More than a third of husbands of female members were also members of BJC. We expect spouses' joint membership to enhance women's participation, as it potentially reflects spouses' mutual sharing of preferences and trust towards collective marketing and microfinance. On the other hand, men might dominate group participation and thus hamper their wives' speaking out at group meetings.

Because present-day agency indicators would cause endogeneity issues in the first regression of determinants of initial cooperative membership, and in absence of agency variables prior to membership, we use age at first marriage, spousal age gap, women's level of own choice concerning her marriage, as explained in the conceptual framework. We also include a dummy for husband's control over coffee sales before membership and also control for polygamy by including the number of co-wives.

Personal and household characteristics such as age, literacy, and household-size can also influence the opportunity costs of time. Members' more frequent interaction with the cooperative may enhance commitment. In particular members who received credit from the cooperative in the last year are expected to attach greater value to the services of the cooperative, and thus show reciprocity in their behaviour.

Finally, group characteristics are considered, such as group size, gender homogeneity, and distance to cooperative. All producer groups receive the same treatment by BJC. It was opted not to include group fixed effects (FEs) to avoid multi-collinearity between these group characteristics. Still, it was tested for any difference in the significance of the outcome variables in both following regression models and find that the significance of the variables are robust when substituting group characteristics with group-level dummies. Finally we also controlled for enumerators' sex to account for systematic response differences in the private interview situation between male and female enumerators.

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<sup>11</sup> The correlation matrix in Table A4 shows that the three explanatory variables capturing household gender dynamics barely correlate with each other.

**Table 3: Summary statistics of variables used in regressions by respondent groups**

Variable	Description	Members (n = 421)		Non-members (n = 210)		Dif.
		Mean	S.E.	Mean	S.E.	
<i>Member coop#</i>	Member of BJC or any other SACCO	1.00	0.00	0.34	0.48	***
<i>Age wife</i>	Age of female member (in years)	36.92	11.57	30.24	10.28	***
<i>Spousal age gap</i>	Age difference husband & wife (in years)	6.10	5.63	5.64	5.56	
<i>Literacy wife</i>	Wife is able to write her name (1 = yes)	0.59	0.49	0.80	0.77	***
<i>Literacy husband</i>	Husband is able to write his name (1 = yes)	0.86	0.34	0.92	0.32	**
<i>Skill training</i>	Agriculture skill training > 2 months (1 = yes)	0.15	0.36	0.07	0.25	***
<i>Marriage age</i>	Age at first marriage (in years)	18.25	3.23	18.24	2.89	
<i>Catholic</i>	Catholic faith (1 = yes)	0.52	0.50	0.55	0.49	
<i>Arranged mar</i>	Husband not chosen by wife (1 = yes)	0.17	0.38	0.16	0.37	
<i>Co-wives</i>	Number of co-wives	0.43	0.65	0.33	0.60	
<i>Land wife before</i>	Ln land owned by wife before BJC (in acres)	0.50	0.57	0.17	0.333	***
<i>Husband sale</i>	Husband control over coffee before BJC membership (1 = yes=	0.36	0.55	0.30	0.46	
<i>Mobility</i>	Born in Bukonzo county (1 = yes)	0.86	0.34	0.90	0.29	
<b>Additional variables used in members' intensity of participation regression</b>						
<i>Collective sale<sup>a†</sup></i>	Member sells coffee to BJC in last year (1 = yes)	0.75	0.02			
<i>Ln share<sup>†</sup></i>	Number of capital shares purchased (ln)	1.64	0.06			
<i>Ln and wife</i>	Land owned by wife in acres (ln)	0.19	0.41			
<i>Ln land husband</i>	Land owned by husband in acres (ln)	0.79	0.54			
<i>Ln income cof<sup>a</sup></i>	Annual coffee income in Ush (ln)	13.16	0.94			
<i>Household size</i>	Number of individuals eating from same pot	7.53	4.93			
<i>Coffee grower</i>	Cultivates coffee on own land (1 = yes)	0.97	0.16			
<i>Ln years coffee<sup>a</sup></i>	Years of coffee cultivation (ln)	2.61	0.70			
<i>Coffee process<sup>a</sup></i>	Member responsible processing coffee (index)	0.61	0.25			
<i>Wet process<sup>a</sup></i>	Member wet processes coffee (1 = yes)	0.36	0.48			
<i>Wife controls cof sale<sup>a</sup></i>	Member is in control of delivery of coffee to market and receives payment (1 = yes)	0.57	0.37			
<i>Prior coop</i>	Member of cooperative before BJC (1 = yes)	0.22	0.43			
<i>Motivation BJC</i>	Motivation for membership: coffee sales (1=yes)	0.20	0.40			
<i>Credit BJC</i>	Member received BJC loan last year (1=yes)	0.46	0.50			
<i>Decision-making power wife</i>	Index of 4 household decision-making areas of wife's, joint or husband decision-making	0.18	0.28			
<i>Pooling</i>	Spouses share at least half of their income (1 = yes)	0.26	0.43			
<i>Joint land agree</i>	Spouses have a joint land agreement (1 = yes)	0.29	0.45			
<i>Husband member</i>	Husband is co-member at BJC (1 = yes)	0.35	0.47			
<i>Enumerator sex</i>	Enumerator is male (1 = yes)	0.62	0.48			
<b>Observations</b>		<b>421</b>		<b>210</b>		

Notes: Statistical significance of differences between the mean values of non-cooperative members and cooperative members at \* 10% level, \*\* 5% level, \*\*\* 1% level. Group characteristics are provided in Table 1.

<sup>†</sup> Dependent variables; \* Dependent variable refers only to farmers that disclosed their number of capital shares (n = 320). <sup>a</sup> Refers only to coffee growers with reproducible coffee plants (i.e. with any income from coffee in the last year) (n = 387)

## **5. Determinants of women's cooperative membership**

### *Method*

The first objective is to identify what determines women's cooperative membership. For that purpose a probit model is estimated. The sample is confined to cooperative members and non-members from treatment regions. Because, current income, decision-making power, asset endowments, women's socio-economic position, fertility and land size may be endogenously affected by participation, given that enhancing income and agricultural productivity represent a main focus of cooperative activities, such indicators are not included. Hence, to avoid endogeneity only variables are included that can be identified before membership. In addition, because 34% of non-BJC members reported to be members of local savings and credit cooperatives (SACCOs), a binary dependent variable was constructed of "any cooperative membership" which includes both BJC and non-BJC SACCO membership to test whether the coefficients differ in significance. In the empirical analysis below several individual and household characteristics are included. We also control for migration and religious faith.

### *Results*

Estimation results of the probit model are presented in Table 4. Female smallholders' access to productive resources, such as the size of land owned before membership has a positive and highly significant effect on their probability of cooperative membership. One additional acre of land owned increases women's probability of becoming a member at BJC by 28.3 percentage points (column 1) and 19.5 percentage points for any cooperative member (column 2), which aligns with Wollni & Zeller (2007), Bernard & Spielman (2009), Fischer & Qaim (2012). This is plausible, as women with larger farms may be more inclined to participate in collective marketing because of the larger perceived gains from improved access to markets and related inputs and services. Moreover, women with greater possession and control over arable land have greater decision-making agency to choose to participate in collective action (Agarwal 1997). This argument is partly strengthened by the fact that women's experience in coffee production also increases their probability of joining cooperatives. Moreover, women that have been growing coffee for more years potentially are more likely to value the benefits from accessing new inputs and extension services.

**Table 4:** Determinants of women's membership in cooperative (probit model)

	(1)			(2)		
	BJC participation			Any Coop participation		
	Coef.	S.E. <sup>a</sup>	M.E.	Coef.	S.E. <sup>a</sup>	M.E.
Age wife	0.014	0.007	0.004	0.005	0.00	0.001
Literacy wife	-0.209**	0.099	-0.072**	-0.086	0.093	-0.023
Literacy husband	-0.052	-0.048	-0.016	-0.158	0.201	-0.042
Skill training	0.600***	0.182	0.177***	0.662***	0.215	0.137***
Land at membership wife (ln)	0.821***	0.126	0.283***	0.732***	0.131	0.195***
Years coffee experience (ln)	0.201***	0.073	0.067***	0.184**	0.076	0.049**
Arranged marriage	-0.078	0.157	-0.027	-0.059	0.163	-0.016
Age at first marriage	0.002	0.018	0.000	0.012	0.019	0.003
Spousal age gap	0.003	0.011	0.001	0.002	0.012	0.000
No. of co-wives	-0.046	0.093	-0.015	-0.050	0.100	-0.013
Husband controls coffee sales	0.094	0.104	0.032	0.032	0.107	0.008
Catholic	-0.056	0.111	-0.019	0.094	0.117	0.025
Born Bukonzo	-0.282	0.181	-0.091	-0.190	0.188	-0.047
Constant	-0.400	0.458		0.053	0.022	
<b>Observations</b>		<b>631</b>			<b>631</b>	
<b>Pseudo R<sup>2</sup></b>		<b>0.158</b>			<b>0.109</b>	

\* Significant at 10% level, \*\* Significant at 5% level, \*\*\* Significant at the 1% level, <sup>a</sup> Robust standard errors  
*Note:* The level of significance is unchanged when using respondents' age at cooperative entry or age at the time of the survey.

Against our expectations, female non-members were better educated than cooperative members. Possibly, better educated and informed women depend less on cooperatives for gaining access to financial and agricultural markets but can rely on formal labour opportunities which improves their chances of receiving bank loans. Yet, female members of either BJC or a nearby SACCOs are not significantly different than non-members in terms of literacy (see column 2). However, women committed to advance their agricultural production skills through trainings (exceeding one month and independent from BJC) are more likely to be more aware of and attracted by perceived gains from cooperative membership. This holds for both specifications and controlling for educational difference with husband. Related to that, one additional year in smallholders' experience of coffee cultivation increased the probability of membership by 7 percentage points. Likewise, women with longer experience in the coffee business may be more aware of the benefits from collective action efforts.

Surprisingly, female members and non-members were not statistically different regarding the three measures of female (household) agency in the past: women's free choice of marriage partner, spousal age gap and age at first marriage. Also, polygamy did not affect female smallholders' cooperation: an additional co-wife did not influence the membership decision.

In addition, husband's control over coffee sales before membership was not statistically different for members and non-members.

## **6. Determinants of female participation within the cooperative**

### **6.1. Participation in collective coffee marketing**

#### *Method*

After farmers have decided to join the cooperative, they next decide on their degree of participation within the institution. Active participation is critical to cooperatives' performance, depending on members selling their produce exclusively through the cooperative for the sake of achieving economies of scale and fetching higher market prices for members' bulk produce. We use the information on member coffee sales through BJC vs. side-selling of those 387 female cooperative members (91.9%) who cultivated coffee and earned an income from it during the last year. Among those coffee-selling cooperative members, 78.8% sold their produce through the cooperative in the last year - 21.2% side-sold to buyers at the farm gate or nearby markets. This indicates that the cooperative competes with local buyers for their member's coffee and creates a dilemma, as the more farmers decide for individual marketing, the lower the marginal benefit for members who sell collectively. Members may have opted to sell to private middle buyers because they have to wait a couple of weeks until a bulk buyer has been identified, while local buyers pay promptly in cash (Fafchamps & Hill 2005). Immediate cash requirements for school fee payment or hospital bills are common place. Note that, although BJC emphasizes members' exclusive coffee sales to the cooperative, they do not face expulsion or financial penalty for coffee sold "illicitly".

The quantity and marketable share of members' delivered to the cooperative has been commonly applied in recent works as a measure of member's commitment to their cooperative (Fischer & Wollni 2014, Fischer & Qaim 2014, Mujawamariya *et al.* 2013, Mensah *et al.* 2012). Because information about the quantity and share of coffee side-sold is unavailable, we exploit study the more extreme cases in this paper: members who sold their coffee to the cooperative versus members who decided not to participate in collective marketing.

#### *Results*

Table 5 presents the regression results, reporting probit coefficients and marginal effects on women's sale of coffee to their cooperative. The empirical results confirm the importance of intra-household dynamics for women's commitment to collective marketing. When spouses pool their incomes, i.e. each sharing at least half of their income, women are more likely to sell the family's coffee to the cooperative, signalling that spouses' mutual sharing of resources increases the likelihood of trading with the cooperative. This also yields to be true for marital sharing of land via joint land ownership positively predicts the likelihood of selling to the cooperative which indicates institutionalized spousal cooperation through shared land ownership. This mechanism is reinforced by the fact that husband's size of land holding adversely affected his wife's ability to sell coffee to the cooperative. This indicates that greater relative male land ownership over productive resources (coffee plants) is likely to increase men's control over the coffee crop and marketing.<sup>12</sup> This seems in line with Wollni & Fischer (2014) that found that with larger farm size, members were increasingly attracted to market a share of their coffee through private buyers. Yet, we do not observe any significant effect of women's intra-household decision-making power on collective marketing.

The empirical results show that husband's co-membership in the cooperative significantly increased the probability of collective marketing. This is plausible, as spousal co-membership mirrors that spouses have a shared interest in collective coffee marketing. Overall, the results emphasize the importance of intra-household power relationships for women's participation in collective action. Encouraging spousal co-membership and joint-land ownership may be promising strategies for agricultural cooperatives to enhance collective marketing vs. side-selling at the farm gate.<sup>13</sup> This resonates with the claims of various studies that the management of natural resources is more effective when both sexes are actively involved in community groups (Sultana & Thompson 2008, Were *et al.* 2008).

Length of membership positively affects the likelihood of selling to the cooperative at the 10% significance level: each additional year of membership increases the probability of members' selling through the cooperative by 6 percentage points. However, an additional year of experience in coffee cultivation does not significantly influence marketing through the cooperative. However, income from coffee in the last year positively predicts trading with BJC. Treating income from coffee as a measure of the quantity of coffee produced or as the

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<sup>12</sup> The relationship between men's land ownership and control of the coffee crop and marketing was already emphasized by Mayoux *et al.* (2009). This is true despite women investing much more in time in production and processing than men.

<sup>13</sup> Meier zu Selhausen & Stam (2014) have shown that spousal co-membership on the self-help group level can have negative effects on women's household decision-making power, while husbands' co-membership in the cooperative per se does not significantly affect women's decision-making power.

number of reproducible trees (from which coffee can be harvested) tells us that larger farms had an increased likelihood of trading with BJC. As expected, women who indicated that coffee marketing was the main determinant in their choice of joining the cooperative were more committed to collective marketing.

**Table 5:** Determinants of collective marketing of coffee (probit model)

Dependent variable: Coffee sales through BJC	Coef	S.E. <sup>a</sup>	M.E.
Age wife	-0.008	0.010	-0.002
Literacy wife	0.039	0.179	0.009
Literacy husband	0.072	0.228	0.017
No. of co-wives	0.081	0.118	0.019
Household size	-0.014	0.013	-0.003
Land wife (ln)	-0.030	0.212	-0.007
Land husband (ln)	-0.299*	0.177	-0.072*
Decision-making power wife	0.140	0.313	0.033
Income pooling	0.700***	0.210	0.142***
Joint land ownership	0.431**	0.201	0.095**
Credit BJC	-0.127	0.167	-0.030
Motivation: coffee sales	0.647**	0.256	0.127***
Husband co-member	0.519***	0.182	0.115***
Length membership (ln)	0.247*	0.146	0.059*
Income from coffee (ln)	0.167*	0.095	0.040*
Years coffee cultivation (ln)	0.026	0.160	0.006
Processing coffee	0.517	0.325	0.124
Wet processing coffee	0.380**	0.184	0.086**
Wife controls coffee sales	0.117	0.225	0.123
Group size	0.010	0.006	0.002
Group distance	0.002	0.003	0.000
Group share female	3.139***	1.124	0.753***
Enumerator FE	Yes		
Constant	-5.683***	1.615	
<b>Observations</b>		<b>387</b>	
<b>Pseudo R<sup>2</sup></b>		<b>0.203</b>	

\* Significant at 10% level, \*\* Significant at 5% level, \*\*\* Significant at the 1% level, <sup>a</sup> Robust standard errors  
*Note:* Due to multicollinearity between group characteristics (size, distance and female share) with group dummies the probit regression excludes group FEs. The significance level of the coefficients does not change when substituting the group characteristics with group FE.

Group characteristics, such as group size and distance to markets did not influence trading with the cooperative. However, female group homogeneity positively affected members' coffee sales to their cooperative, indicating that a greater share of women within producer groups can be particularly effective for ensuring (other) female members' loyalty. Moreover, the dummy of wet-processing coffee has a positive effect, which reflects women's higher ability and willingness to invest in upgrading the coffee crop through inputs and equipment. Because the cooperative supports the acquisition of mini washing stations and drying racks through credit and extension services this result may also indicate that reciprocity motives may

play a role. In contrast, women who have received credit from BJC in the last year were not more committed to deliver their crop to BJC. Moreover, women's relative labour input within coffee production (both processing and sales) did not affect trading with the cooperative.

## **6.2. Committing to cooperative share capital**

### *Method*

Secondly, this paper offers a first pass at using member share capital as a measure of participant's long-term commitment to the cooperative's form of business and ownership of the cooperative.<sup>14</sup> Mobilising members to voluntarily invest into share capital is critical for the growth of cooperatives, typically representing the most important source of capital to fund investments which enhances the efficiency, competitive performance and can enlarge the value-chain frontier (Von Pischke & Rouse 2004). However, why would members contribute their capital to the cooperative beyond the minimum subscription if coffee rebates are distributed according to the quantity of coffee marketed through the cooperative – not proportional to shares?

After becoming a member at BJC and having subscribed to the minimum of one capital share, each member obtains the full benefits from membership irrespective of their equity invested. Also, the size of loans is not conditioned by share ownership and there is no limit to the amount and timing of share purchases. Moreover, member shares can be redeemed. The cooperative permits withdrawal of shares, once a new buyer has been identified by the cooperative.<sup>15</sup> It's important to note that members' investment into cooperative shares represents a careful decision within the context of poverty and large families with children's school fees and health costs<sup>16</sup> to be paid on a regular basis during the year.

Motivations for the investment of shares present commercial interest, as cooperative annual surplus earnings from microfinance services are distributed in proportion to each member's level of financial patronage. In contrast, coffee rebates are distributed according to members' marketable share of coffee sales to the cooperative. Furthermore, because each farmers group is entitled to send one member per a total of 10 group shares to the annual general assembly (AGM)<sup>17</sup> members' likelihood of being able to attend and vote on behalf of their group increases with the number of shares purchased. Although also non-members can

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<sup>14</sup> Members' collective coffee marketing and logged share capital are positively correlated ( $R^2 = 0.166$ ).

<sup>15</sup> However, the money is only returned when a buyer is found – usually a new member.

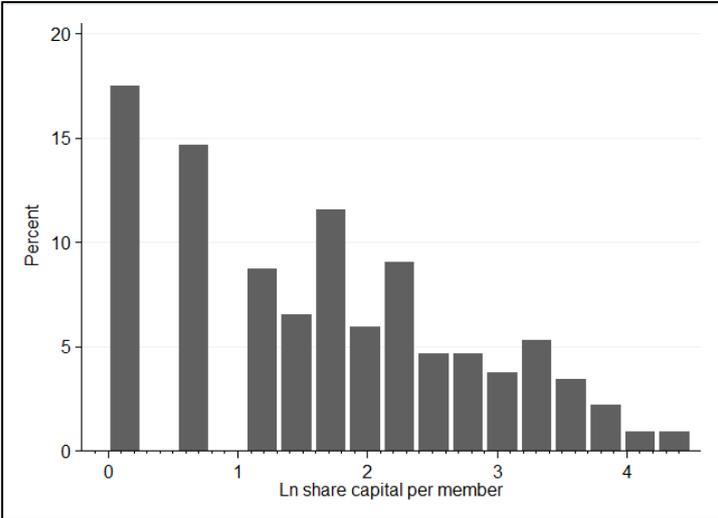
<sup>16</sup> Approximately households earn 243,000 Ush (\$100) per month of which 23% are spent on health bills.

<sup>17</sup> In other words, a SHG with a total of 100 member shares is entitled to send 10 members to the annual general assembly. Thus, groups with a higher number of per capital shares are able to increase their attendance.

sell their coffee to BJC, share capital investment and coffee rebates are restricted to members only. Thirdly, capital shares can be purchased at any time.

There are no restrictions to the number of member shares that can be purchased. However, out of the 421 sampled female cooperative members 101 members did not disclose their number of capital shares owned (for reasons unknown). The number of shares varies from 1 to 90 shares. Yet, not normally distributed, thus we take the natural logarithm. Figure 2 shows the distribution of shares in a log-scale, indicating a great variety in the distribution of member share capital.

**Figure 2:** Distribution of natural log of member capital shares ( $n = 320$ )



Using the truncated sample of 320 non-censored observations may lead to biased OLS estimates. To further investigate a potential selection bias between the two member groups Table A2 reports the probit estimates testing for the equality of means between members who disclosed share ownership versus those that failed to do so. It shows that there are no systematic significant differences between any of the independent variables of the censored and non-censored samples, except for length of membership, indicating that veteran members were more likely to report share ownership. Yet, the marginal effect is relatively small. Next, we specify the share model without length of membership (column 3) and find that its exclusion has no impact on the other variables of interest. As an additional robustness check, the same regression equation with collective marketing of coffee as a dependent variable, presented in Table 5, is estimated including only those members who disclosed share ownership. Table A3 reveals that all variables of interest from Table 5 remain significant, at least at the 10% level in the model without shares, except for length of membership and

logged coffee income. Both robustness tests raise confidence that the censored shares sub-sample is not systematically different from those non-censored sub-sample. However, an appropriate instrument predicting women's disclosure of shares was not found among survey variables, which inhibits the application of a heckman selection model (Heckman 1977). In order to account for the time dynamics involved in past share purchases we control for length of membership in the cooperative. Future research should be conducted using panel data, which can account for the fact that shares have been accumulated over time in the past.

### *Results*

Estimation results of the OLS regression are reported in Table 6. Column 1 presents the specification including personal characteristics. Column 2 extends the model by including group characteristics and coffee production controls.

Unlike recent studies that point to group characteristics, such as membership size, homogeneity and market distance, we do not find group characteristics predicting women's capital commitment within BJC. However, the results rather seem to point to intra-household power dynamics. Women, from households in which spouses pool at least half of their incomes tend to own a greater financial stake of the cooperative. It suggests that increased household cooperation is likely to materialize into enhanced financial patronage within cooperatives. This argument is strengthened by the finding that wives' increased decision-making power concerning household expenditures has a positive and highly significant influence on wife's commitment to her cooperative. Significance of both coefficients persists when we control for various group characteristics (column 2) and length of membership (column 3).

Both results suggest, as well as keeping in mind the gains from women's agency regarding coffee sales, that women's ability to intensify their participation within cooperatives would benefit from more gender-equal household relations. Thus, one way for cooperatives to strengthen female members' capacity and willingness to increase commitment, and thus contribute to the expansion of the cooperative's capital base, may lie in raising women's social position within the household. Because cooperatives' are community-based and build on members' trust they may also represent a good entry-point for additional activities that aim at challenging and changing gender inequalities in resources, time availability and intra-household power relationships which in turn can increase women's participation in collective action (Mayoux 1995a, Mayoux 1995b).

**Table 6:** Determinants of member share capital accumulation (OLS)

Dependent variable:	(1)		(2)		(3)	
No. share capital (ln)	Coef	S.E. <sup>a</sup>	Coef	S.E. <sup>a</sup>	Coef	S.E.
Age wife	0.003	0.006	0.009	0.010	0.019	0.009
Literacy wife	0.422***	0.137	0.355**	0.147	0.307**	0.155
Literacy husband	0.106	0.166	0.088	0.180	0.191	0.188
No. of co-wives	-0.030	0.080	-0.056	0.086	-0.105	0.094
Household size	-0.000	0.006	-0.002	0.006	-0.005	0.007
Land wife (ln)	0.128	0.136	0.068	0.142	0.076	0.157
Land husband (ln)	-0.045	0.117	-0.087	0.124	-0.073	0.141
Decision-making power wife	0.739***	0.192	0.778***	0.197	0.946***	0.228
Income pooling	0.388***		0.358**	0.153	0.386*	0.156
Joint land ownership	-0.078	0.136	-0.178	0.139	-0.096	0.155
Length of membership (ln)	0.139***	0.018	0.124***	0.018		
Prior coop member	-0.289**	0.142	-0.236	0.158	-0.182	0.159
Motivation: coffee sales			-0.019	0.154	-0.089	0.157
Husband co-member			0.015	0.122	0.002	0.130
Income from coffee (ln)			0.029	0.031	0.043	0.036
Years coffee cultivation (ln)			-0.128	0.122	-0.057	0.136
Processing coffee			0.191	0.249	0.225	0.280
Wet processing			0.365***	0.135	0.510**	0.141
Wife controls coffee sales			0.031	0.161	0.122	0.181
Group size			-0.001	0.004	0.000	0.005
Group distance			0.000	0.002	-0.000	0.002
Group share female			0.455	0.852	0.638	0.922
Enumerator FE	Yes		Yes		Yes	
Constant	-0.202	0.294	-0.860	1.003	-1.227	1.083
<b>Observations</b>		<b>320</b>		<b>306</b>		<b>306</b>
<b>R<sup>2</sup></b>		<b>0.291</b>		<b>0.307</b>		<b>0.192</b>

\* Significant at 10% level, \*\* Significant at 5% level, \*\*\* Significant at the 1% level, <sup>a</sup> Robust standard errors

*Note:* The dependent variable is the natural logarithm of share capital (in Ush) per member. Due to multicollinearity between groups size, distance and female share with group FE the regression excludes group FE. Yet, the significance level of the coefficients do not change when substituting the group characteristics with group FE. Because length of membership is the main driver of differences between members that disclosed shares vs. those who did not we also run the specification in Column 2 without length of membership. The exclusion has no impact on the significance of the main variables, except for prior cooperative membership and income from coffee.

Literate women were more inclined to purchase cooperative shares. This may be because better educated women have a stronger relative intra-household bargaining position regarding investment decisions, are more likely to have acquired numeracy skills and possess a greater long-term investment horizon than less educated women. Moreover, the ability of female farmers to contribute capital is likely to depend on their individual and family wealth. Hence, it is somewhat surprising that the size of wives' and husband's land holdings, as well as income from coffee did not predict share capital contribution. Larger farmers may have had sufficient income to purchase shares, and may arguably be less risk averse than smaller farmers who are more reluctant towards costly investments. We find that members who were committed to invest into new production techniques and better quality of their coffee were not only more likely to sell their coffee through the cooperative as found above (see 6.1) but also

increasingly contributed capital. Hence, technical and financial support (via loans and extension services), encouraging members to switch to more efficient and viable processing methods may be an important strategy for cooperatives to retain members and increase their participation.

As one would expect, duration of membership is highly significant and positively affects members' share capital investment, indicating that members over time extend their share capital beyond their required capital subscription, reflecting trust into the future functioning of the organization. Column 3 illustrates that the significant variables from the first specification remain robust when excluding length of membership – the main driver of differences between members that disclosed their shares and those who did not. Contrary to the positive effect of husband's co-membership on collective marketing, men's co-membership has no statistically significant effect on women's capital commitment, suggesting that spousal co-members do not compete for capital shares.

## **7. Conclusions**

Collective action through agricultural cooperatives can be an effective strategy for female smallholders in developing regions to overcome market discrimination, and gain access to agricultural and capital markets. Equally, cooperatives depend on members' commitment for achieving efficiency in processing and marketing. Using data from female cooperative coffee farmers and non-cooperative farmers from Western Uganda, this paper offers a first pass at explaining the determinants of women's participation *in* and *within* cooperatives.

First, women's membership in the cooperative was explained. It was shown that women's participation in the cooperative is strongly influenced by her size of land holding owned prior to membership. Contrary to expectations, less educated women were observed to be more likely to seek out membership, while their attendance of agricultural trainings positively affected women's participation in the cooperative.

Second, because participation within cooperatives can vary, we also explored the factors of women's intensity of participation in the cooperative, using members' collective marketing of their coffee crop and their amount of share capital contributions. While the regression results concerning women's intensity of participation somewhat differ, there are a number of interesting parallels. Unlike recent studies that point to group characteristics, such as size, homogeneity and market distance, these did not play a significant role for women's commitment within BJC. Also, the distribution of labour between spouses along the coffee

value chain did not affect women's degree of participation. However, the results rather point to the importance of intra-household power relations conditioning women's participation. In each of the two regression models predicting women's commitment, two out of the three gender-equity proxies stand out significantly: spousal income pooling and joint land ownership positively affected coffee sales through the cooperative, while women's household decision-making authority and income pooling increased women's capital contribution to their cooperative. Furthermore, greater husband's land size adversely affected collective marketing, implying that men's relative control over productive resources is likely to impede his wife's cooperative marketing.

In line with this, husbands' co-membership in their wives' cooperative increased the probability of collective marketing, which suggests that organisations which integrate both spouses can be more effective in terms of collective marketing. In addition, women with greater investment into the quality of the her household's marketable coffee crop through wet processing methods, were more likely to participate in collective marketing and invest into capital shares. These findings imply that women's ability to intensify participation within cooperatives would benefit from more equal intra-household power relations. Conversely, cooperatives that fail to address gender, or that target women without a clear understanding of gender relations, risk not setting the right conditions for female participation.

Because cooperatives' are closely entrenched with their community they represent a good entry-point for additional activities which can strengthen female members' capacities for more active cooperative participation. Firstly, one way for cooperatives to increase female members' level of participation could lie in raising women's social position within the household, accomplished through participatory trainings and learning approaches (Mayoux 1995b, Mayoux 1998), which challenge gender inequalities in households by sensitizing men and women jointly about the potential (income) gains from a more balanced workload and power relationship within the household and along the coffee-value chain. Moreover, the cooperative model offers the opportunity to promote joint-land ownership titles between spouses and its legalization at the local municipality, which may not only strengthen women's bargaining position for participation in collective action but can protect women's future claims if their marriage dissolves or the husband deceases.

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## Appendix

**Table A1:** Gendered distribution of tasks in coffee cultivation of sampled coffee growers (%)

Task	Members			Non-members		
	Women	Men	Jointly	Women	Men	Jointly
<b>1. Cultivation</b>						
- Planting trees	5.2	57.6	37.2	5.5	61.7	32.8
- Mulching, weeding & fertilising	17.4	10.6	72.0	20.8	19.7	59.6
- Digging terraces	10.5	39.5	50.0	7.7	56.3	36.1
- Pruning branches	12.0	36.0	52.0	11.5	44.8	43.7
- Harvesting coffee cherries	15.5	2.5	82.0	12.6	7.7	79.8
<b>2. Processing</b>						
(a) Wet processing (35.6%)						
- Floating and pulping	32.2	15.1	52.7	25.6	23.3	51.2
- Washing and soaking	32.2	9.6	58.2	25.6	16.3	58.1
- Drying	27.7	8.8	63.5	23.3	20.9	55.8
(b) Dry processing (64.4%)			76.5%			
- Drying	49.2	8.3	42.4	42.1	15.0	42.9
- Hulling (to extract beans)	22.1	18.3	59.7	21.4	28.6	50.0
<b>3. Coffee marketing</b>						
- Carrying coffee to market & coop	44.8	8.7	46.5	38.3	25.1	36.6
- Receive payment	41.6	40.8	17.6	29.5	58.5	12.0
<b>Observations</b>		<b>409</b>			<b>183</b>	

**Table A2:** Determinants of member's share disclosure (probit model) ( $n = 421$ )

Dependent variable: Capital share disclosed (1/0)	Coef	S.E.	M.E.
Age wife	-0.003	0.009	-0.001
Land wife (ln)	0.040	0.177	-0.012
Land husband (ln)	0.200	0.140	0.060
Prior cooperative	-0.204	0.167	-0.061
Literacy wife	0.024	0.159	0.007
Literacy husband	0.268	0.201	0.087
No. of co-wives	0.057	0.108	0.017
Household size	0.034	0.025	0.010
Income pooling	0.058	0.172	-0.017
Decision agency	0.241	0.249	0.073
Joint land contract	0.060	0.166	0.018
Motivation BJC	0.121	0.183	0.035
Husband BJC	0.207	0.148	0.061
Distance	0.002	0.003	0.000
Length BJC (ln)	0.066***	0.024	0.020***
Share female	-1.480	0.962	-0.449
Group size	-0.004	0.006	-0.001
Income coffee (ln)	0.018	0.022	0.005
Years coffee (ln)	-0.064	0.117	-0.019
Enumerator	Yes		
Constant	0.852	0.996	
<b>Observations</b>		<b>421</b>	
<b>Pseudo-R<sup>2</sup></b>		<b>0.066</b>	

**Table A3:** Determinants of collective coffee marketing of members who disclosed share capital information ( $n = 294$ )

Dependent variable: Collective marketing of coffee	Coef	S.E.	M.E.
Age wife	-0.012	0.013	-0.002
Ln land wife	-0.186	0.226	-0.044
Ln land husband	-0.323	0.200	-0.077
Literacy wife	0.039	0.210	0.009
Literacy husband	0.095	0.258	0.023
No. of co-wives	0.116	0.140	0.027
Household size	-0.020	0.013	-0.005
Income pooling	0.527**	0.237	0.110**
Decision agency	0.308	0.353	0.073
Joint land contract	0.474**	0.221	0.103**
Motivation BJC	0.543*	0.282	0.110*
Husband BJC	0.725***	0.209	0.156***
Distance	0.003	0.003	0.000
Length BJC (ln)	0.258	0.172	0.258
Wife loan BJC	-0.223	0.197	-0.053
Share female	2.527*	1.314	0.602*
Group size	0.007	0.007	0.002
Ln income coffee	0.071	0.105	0.017
Ln years coffee	0.140	0.190	0.033
Wet processing	0.510**	0.206	0.115**
Processing	0.209	0.398	0.049
Wife control sales	0.194	0.215	0.046
Enumerator	Yes		
Constant	-3.998	1.841***	
<b>Observations</b>		<b>294</b>	
<b>Pseudo-R<sup>2</sup></b>		<b>0.206</b>	

**Table A4:** Correlation matrix explanatory variables

(forthcoming)