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Exploring double side-selling in cooperatives, case study of four coffee cooperatives in Rwanda

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ABSTRACT

Apart from the difficulty to attract new members, leakage of sales outside the cooperative is a major challenge for the coffee cooperatives in Rwanda. Local (independent) traders still constitute a major market for coffee producers. Yet, cooperatives also accept the produce from non-members and pay them the same price. Our objective in this paper is to analyse the importance of this phenomenon of double side-selling. We collected data from a sample of 170 coffee farmers. We use a probit model to analyse characteristics linked to cooperative membership and to study double side-selling. We describe the trade relationships between farmers and the cooperative on the one hand, and between farmers and traders on the other by the attributes of transaction costs involved in the trade of coffee. Membership characteristics include easy access to labour, land tenure, risk aversion, and mutual trust between farmers and cooperatives' management. Preference to sell to traders can be explained by the trust farmers seem to have in them after the repeated transactions in credit and basic consumption items and by long-term relationships in the community.

Introduction

Agriculture is the main economic activity in rural Rwanda, mainly because of the quasi absence of minerals or other natural resources, the landlocked location of the country, the low level of industrialisation, and the low purchasing power of the population (MINECOFIN, 2002). The sector is characterised by small family subsistence farming on less than one hectare, with mixed farming systems. The sector employs more than 70% of the rural population and its contribution to the country's GDP amounted to 34% in 2009 (World Bank, 2009).

Coffee production is predominantly a smallholders' activity. It was introduced by German missionaries as early as 1904. In 2004, Rwanda had approximately 400,000 active coffee producers (OCIR, 2005; similar figures are given by OCIR for 2009; OCIR is the Rwanda Coffee Development Authority). Coffee cooperatives emerged in the last decade as a result of government and NGO support (see e.g. Loevinsohn et al., 1994) with the purpose of improving the producers' incomes through (a) providing services and inputs for production, (b) processing high-quality coffee, and (c) increasing farmers' bargaining power (OCIR, 2005). The Rwandan government promoted cooperatives by issuing a cooperative legal and statutory framework in 2006 with the aim to support the establishment of autonomous cooperatives and to contribute to their functioning and their growth[1] (MINICOM, 2006). OCIR (2008) lists 224 active coffee cooperatives in Rwanda and estimates that 20% of the coffee farmers are members of one of these.

Cooperatives are renown as institutional devices to increase market access for individual smallholder producers (see references in the next section, including Bernard and Spielman (2009), Poole and de Frece (2010)). Coffee cooperatives increase farmers' inclusion in high quality, specialty or fair trade markets in which the farmers may fetch better prices. Fair trade certification should reduce the effect of world price decreases on farmer income levels. There is ample evidence for Latin American fair trade cooperatives (see, e.g., Wollni and Zeller (2007), Chaddad and Boland (2009), Bacon (2010), Valkila and Nygren (2010) and Barham et al. (2011)), but recent work on African coffee cooperatives is scarce. Exceptions are the studies by Kodama (2007) on Ethiopia, Parrish et al. (2005) on Tanzania, and Mude (2006, 2007) on Kenya.

[1] Strategies were therefore developped to promote cooperatives. These included (1) sensitizing the population in favour of the cooperative movement membership; (2) establishing an agency for the promotion of the cooperatives that will be entrusted to promote, supervise and evaluate continuously the activities of the cooperatives; (3) facilitating the registration of the cooperatives; (4) education and cooperative training; (5) facilitating and intensifying the computerization of the cooperatives and their connection to the National Telecommunication Network; and (6) establishing a guarantee Fund for the cooperatives in order to solve the problem of accessing to the bank financing due to the inadequacy of the guarantees and credibility of cooperatives (Minecom, 2006).

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Studies have listed several internal and external problems that reduce the cooperative's efficiency and effectiveness such as free-riding, noncompliance, underinvestment, poor management, membership desertion and heterogeneity among members (see references below). Side-selling is also mentioned, but its impact on the sustainability of the cooperative is not established and it has, to our knowledge, not been quantitatively analysed before. Work by Pascucci and Gardebroek (2010) considered the problem of cooperative delivery and showed an important relationship between membership and delivery, but they failed to explain the reasons for the observed side-selling behaviour. In the context of contract farming side-selling or leakage is usually explained as a way in which farmers avoid paying for subsidies they received (Fafchamps, 2004; Bellemare, 2010). Yet, in the case of the cooperatives studied in this paper, leakages seem to be associated with loyalty, trust and interlocked contracts of farmers with local traders, as well as with the absence of exclusion mechanisms from the side of the cooperatives. This created a reality of 'double side-selling': cooperative members selling to traders, and non-cooperative members selling to cooperatives.

For a case study of four cooperatives in coffee producing regions in Rwanda, this paper aims to describe characteristics of membership and to show the rationale behind double side-selling. Double side-selling may explain the limited commitment and loyalty to cooperatives. The main claim of this paper is that farmers trade-off costs and benefits related to the two market channels (cooperatives and traders), but that a classical cost-benefit analysis fails to capture the transaction costs involved. Moreover, we need to acknowledge the importance of interlocked contracts with traders and the effects of trust and loyalty to fully understand the farmers' behaviour. Side-selling may seem economically irrational, but is a reasonable decision from a farmer's livelihood perspective. Whereas cooperatives seek to buy better quality berries, traders accept lower quality coffee. Traders also provide extra services such as credit (mostly in kind) which is supposed to be paid for at harvest time. Hence, market segmentation is made possible to the traders' activities in the coffee market.[2] Yet, side-selling may become problematic for cooperatives in the long run as they build on member loyalty.

Literature overview

Cooperatives or more generally producer organisations[3] are common in developing countries, particularly in agriculture. It is estimated that worldwide about 250 million farmers belong to a producer organisation (WDR, 2007). Common characteristics of producer organisations are detailed in Bijman (2007) and include a democratic decision-making structure, bottom-up establishment and ownership and control by members.

The cooperative movement in Sub-Saharan Africa dates from colonial times (Holmén, 1990; Poole and de Frece, 2010). In East Africa, the growth of member-initiated cooperatives in the colonial era was associated with an attempt to break up the monopolies of Asian traders and middlemen. The purpose was to support European settlement by establishing native farmers' societies into the externally controlled, monetized economy, where they could be taxed more easily, while guaranteeing to produce for the export markets. Holmén (1990) viewed this as a system of politically controlled production. As much as the native farmer societies were concerned, little attention was paid to the voluntary and democratic aspects of cooperation. On the contrary, cooperation in the colonies was strongly flavoured by the omnipresent paternalism of foreign rule. Moreover, power over local cooperatives was often captured by or given to elites. This power enabled elites to convert cooperatives as assets into supplementary resources and to establish themselves as private moneylenders (Holmén, 1990). After independence, many African governments viewed cooperatives as suitable vehicles for agricultural development and socio-political change (Attwood and Baviskar, 1988). Their aim was to help small and poor farmers without radically changing the distribution of economic power (Attwood and Baviskar, 1988).

The current focus on the potential of cooperatives to support local farmers in developing countries (e.g., WDR, 2007) has less to do with these top-down, government controlled, cooperatives[4] but more with what we could call NGO-supported or 'philanthropic' cooperatives and 'grass root' cooperatives that emerge from social capital. Producer organisations with philanthropic support (e.g. NGOs, and development aid organisations) are common in developing countries. In coffee, they are especially active in speciality markets such as fair trade (e.g., Parrish et al. (2005) amongst many others). Grass root cooperatives emerge from local farmer unions. Social capital provides the necessary trust to support collective action between the members. An example of a very successful grass root coffee cooperative is Cooxupé, the largest coffee cooperative in Brazil. It was founded in 1957 by 24 coffee producers with the motto of '*trust and work*'. In 2005, it counted more than 10,000 members selling 2.5 million bags of coffee (Chaddad and Boland, 2009).

The support which the two latter forms of cooperatives receive from policy makers and international institutions (e.g., WDR, 2007) is undeniably linked to their potential contribution to rural development. Poole and de Frece (2010) summarise the benefits of producer organisations as economic and social inclusion. Economic inclusion refers to the importance of collective action to achieve (a) managerial economies of scale (cost reduction of inputs, transformation and transaction functions, increased production volumes, improved quality and timing of services, and deliveries to market), (b) improved market power, and (c) improved performance. Social inclusion through collective action increases social and other forms of capital assets (Poole and de Frece, 2010). Markelova et al. (2009) conclude that collective action can contribute to a pro-poor market development because farmers may benefit from better market arrangements and access to new domestic and international markets. This is for example confirmed in the work of Loevinsohn et al. (1994), Bebbington (1996), Staal et al. (1997), D'Haese et al. (2005) and Wollni and Zeller (2007).

Yet, in order to succeed in social and economic inclusion, producer organisations need to adapt to the ever faster changing and globalising external market environment (see Poole and de Frece (2010) for Africa). Producer organisations need to develop managerial capacity and new technical and communication skills to participate in high-level negotiations (WDR, 2007). They need to be well-equipped, organised and sufficiently financed (Ruben and Lerman, 2005). These external requirements may reduce effectiveness of the producer organisations.

Internal problems of the producer organisation may result in reduced efficiency because of reduced interest of members, difficulties to align members or managerial problems. This is because collective action is costly (Olson, 1965). Markelova et al. (2009) emphasise that collective marketing may not be profitable or

[2] We thank an anonymous reviewer for pointing this out to us.

[3] A producer organisation is defined as a 'voluntary organisation, with a democratic decision making structure' (Bijman, 2007), such as cooperatives, producers associations, producer groups and other form of economic structure. It excludes farmer unions, interest groups and non-economic associative bodies (Bijman, 2007).

[4] Governmentally-based cooperatives are described in Brass (2007) for Peru as institutional forms for poverty eradication. State-run cooperatives in Nicaragua are described in Ruben and Lerman (2005) where the Sadinista regime encouraged individual farmers to join Agricultural Project Cooperatives based on collective land ownership and state support. In South Africa, cooperatives were a policy instrument in the support to white commercial farmers during the Apartheid regime (Ortmann and King, 2007).

sustainable when 'the incentives and enabling conditions for farmer groups to form and operate successfully are missing' (p. 6).

A challenge for producer organisations is to resolve conflicts between efficiency and equity. They need to serve all members equally, but their members often constitute a heterogeneous group. Furthermore, they need to establish strict rules based on performance which excludes non-compliers (WDR, 2007). But, members are found to desert or free-ride (Ruben and Lerman, 2005). Limited members' participation in organising, implementing and managing the cooperative's activities, was found to contribute much to the failure of cooperatives, especially in developing countries (Braverman et al., 1991). Brass (2007) analysed the failure of agrarian cooperatives in the 1970s in Peru from a socio-political perspective and found that class distinctions within the cooperative and relationships between members and bureaucrats were the major causes of failure. The production inefficiencies may be even aggravated by mismanagement of the cooperative. Mude (2006, 2007) explains how corruption, political opportunism and mismanagement reduces efficiency of coffee cooperatives and its members in Kenya. In Kenya, all smallholder coffee farmers (farms with less than 5 acres of land) are legally bound to sell their coffee output trough cooperatives. Due to a lack of a formal regulatory structure, corrupt and incompetent members are able to capture and exploit cooperative management. This lowers the performance of the cooperatives and the smallholder coffee producers (Mude, 2006, 2007).

Furthermore, the level of external influence, linked to financial support and strategy definition, may create pressure on the organisation. Africa's historical record of success of state-owned/controlled organisations has been low. The excessive government involvement often aggravated by donor support turned cooperatives into indirect arms of external organisations such as lending institutions or extension services instead of being member-directed bodies (see also Poole and de Frece, 2010). In the past, the rationale was often that ill-informed and illiterate members should be protected from abuses and mismanagement. The success of cooperatives was measured by the number of members, but as membership was sometimes made compulsory this made little sense. Moreover, members had little interest in actively contributing to the organisation's share capital (Braverman et al., 1991).

Much has been written on cooperative development and its possible problems, but several issues with regards to membership alignment and loyalty deserve our attention. The first issue concerns the inclusion of members. Bernard and Spielman (2009) argue that cooperatives in Ethiopia fail to include the poorest farmers; and if poor farmers participate in the cooperative, they are often not involved in decision-making. It is interesting to know on what base do farmers (self)select to become member or not. A second topic is the relationship between members and the cooperative. In particular the issue of side selling is recognised but not sufficiently studied. Parrish et al. (2005) mention leakage of coffee sales by cooperative members as one of the reasons why cooperative unions used to fold in Tanzania. Donovan et al. (2008) explain that side-selling is an important problem for several of the rural community enterprises they studied. They mention a case of side-selling in the cacao cooperative El Ceibo in Bolivia. Yet, to get insight in these farmers' decisions, we need to go beyond a comparison of prices, costs and benefits. We need to explore the importance of transaction costs and benefits that result from relationships in livelihood creation of farmers, their loyalty and trust vis-à-vis traders in the community.

Trust, trustworthiness and reputation reduce enforcement costs and strengthen credible commitment for joint activities (Keefer and Knack, 2005). Hansen et al. (2002) discuss the role of trust in the sustainability of agricultural cooperatives and members' commitment to cooperatives over time. They distinguish cognitive and associative trust. Cognitive trust is a judgement that an individual, group or organisation is trustworthy as a result of a rational, methodical process; associative trust is subjective, and based on moods, feelings and emotions. The authors relate cognitive trust to trustworthiness between members and the management of a cooperative; associative trust is linked to trustworthiness among members. They conclude that the impact of trust varies with the organisational context (Hansen et al., 2002).

Methodology

Research setting

The field study was conducted in the Western and Southern Provinces of Rwanda in July/August 2006. Coffee is produced all over the country but the Western Province is more productive than the other provinces due to its rich volcanic soils. Of the 224 coffee cooperatives in the country, 56 are in the Southern Province and 70 in the Western Province (OCIR, 2008). We selected four cooperatives, namely (*Abahuzamugambi ba*) *Maraba* and *Koakaka* from the Southern Province, and *Coopac* and *Kopakama* from the Western Province (see map in Appendix A).

A first criterion in the selection of these four cooperatives was the location in one of the two important coffee producing provinces. Secondly, the cooperatives should (i) be registered with the Coffee board, (ii) be in operation, and (iii) possess a washing station. Finally we looked for variation in terms of (i) creation (whether creators were farmers, mergers or just one farmer) and (ii) the external involvement.

Primary data was collected from 121 members of the four case study cooperatives and from a control group of 50 non-members. The members in the study were selected randomly out of members' lists provided by cooperatives. In order to construct a representative control group, a snowball selection of non-members was done. Neighbouring non-members are believed to have the same geographic and environmental coffee growing conditions, and are assumed to be as near to the cooperative as the members selected. The use of the cooperative membership lists made it easier to approach members, than to find non-members. This is reflected in our sample, which therefore in terms of the ratio between members and non-members is not representative for the entire population.

Data analysis

With regards to the statistical tools used in the study, the differences in quantitative characteristics of cooperative members versus non-members are described by ANOVA estimates, while Chi-square tests are used to estimate the independence of categorical variables. Membership characteristics are analysed in a probit model. As explained above, we assume that members will differ from non-members in terms of levels of human capital (age at membership, gender, education level of the producer and household size, motivation for growing coffee), a proxy for financial capital (farmer's estimation of the security of the ownership of their land[5] as land is their prime productive asset), proxies for natural

[5] Coffee production requires long term investments associated with the coffee productive cycle: 2–3 years are needed for seedlings to grow and yield berries, 3–4 years for the trees to be fully productive and then they will keep producing for about 20–25 years. Trees are then cut for regeneration and after 1 year they become productive again. The farmer will probably not start planting coffee trees unless he has some security about the ownership of land. Yet, in Rwanda, historical problems of unsecure land tenure have worsened during the war and genocide of 1994. Current changes in land policy are expected to affect the tenure system in Rwanda. The land security dummy is '1' for farmers who considered the policy as secure towards their land use and '0' otherwise.

and physical capital (distance to the cooperative, province in which the farm is located), and social capital (personal relationships in the cooperative, perception towards risk, cognitive trust in cooperatives).

The farm livelihood characteristics are similar to those used by Wollni and Zeller (2007) to estimate the probability of participation of coffee producers in cooperative market channels in Costa Rica. The importance of farmers' attitudes towards the cooperative management and other members is shown by Hansen et al. (2002). Relationships with family and friends are included in this study as aspects of social capital. Family relationships were also used as an indicator of social capital by Fafchamps and Minten (2002) in a study of returns of social capital to trade in Madagascar. They distinguish relationships with other traders, relationships with potential lenders and family relationships as measures of the social capital of a trader.

The operationalization of these proxies for social capital used in our analysis deserves some more clarification. Respondents were asked to estimate the importance of certain factors that could influence their decision of where to sell. First, farmers were asked if it was important for them to have family, neighbours or friends in the cooperative. They were asked to assess on a Likert scale whether they did not find the relationship important (−1), they were neutral (0), or found it important (1). For the estimation of risk, respondents were asked whether they felt it likely to be a victim of theft and cheating by traders. This cheating is associated with changing the weighing machine in order to indicate a quantity of coffee lower than the real weight measure. The score on this risk variable is −1, 0 and 1 for disagree, neutral and agree answers, respectively.

The perception of the level of trust in the preference towards the cooperative (versus trader) was measured by following indicators: payment date, price offered, and access to credit. Based on this perception, a trust score variable was constructed such that a value 0 was given to those who did not mark trust in any of the elements for preference, and 1, 2 or 3 for a low, medium and high rank of trust, respectively. Furthermore, cooperative members were presented a separate list of questions to probe the trust they have in the cooperative.

Coffee production in Rwanda has been promoted (even forced upon the farmers to some extent) by the colonial authorities and later by governments. It is not clear whether the farmers choose to grow coffee out of tradition while inheriting the coffee fields from their parents, or as an economic livelihood choice. Arguably, this difference in attitude will have consequences on their production and marketing decisions. The motivation of farmers towards coffee cultivation is measured by a 'growing purpose' dummy. Farmers were asked whether they grow coffee out of tradition (dummy takes value 0) or as a commercial choice to grow cash crops (dummy takes value 1).

We felt that comparing the characteristics, including the costs and benefits, by membership and by trade choice, did not sufficiently explain the reasons of the double side-selling. We therefore turned to an institutional approach, with an analysis of the transaction costs that are involved in each of the trading structures. It should be noted that this analysis is merely descriptive because quantifying transaction costs is notoriously difficult. The attributes of transaction costs (asset specify, uncertainty and frequency (see Ménard (2004, 2005) for details) are compared for members and non-members, and for side-sellers and those who do not. High transaction costs are associated with high asset specificity, high uncertainty and low frequency, while farmers as any other economic actors are believed to search for trading arrangements that reduce transaction costs (Williamson, 1991, 2005).

Results

Cooperatives and traders in the coffee marketing chain

Cooperatives buy coffee berries from members. The cooperatives accept berries from non-members as well, but these farmers do not get support nor rebates or profit shares at the end of the sales season. The berries are processed into dry (parchment) coffee by depulping (i.e. removing the berry's outer skin) at the cooperatives' washing stations. Traders also buy berries mainly from non-members on behalf of private operators who own mini–washing stations and undertake the same processing into parchment coffee. The berries of bad quality rejected by cooperatives, and the produce of non-members, which they choose not to sell to the cooperatives, are processed by farmers themselves into dry coffee which is then sold to traders. It should be emphasised that farmers can only process small quantities of coffee themselves of which the quality is said to be not good. Cooperatives process large quantities of coffee and follow rigorous quality requirements associated with exportation.

The exportable coffee from Rwanda is green coffee. The transformation of dry coffee into green coffee by hulling (i.e. removing the parchment) is performed either by cooperatives (few own the hulling machines) or specific companies. Local companies are *Rwacof*, *Rwandex*, *Sicaf*, *Coffee Business Center*, *Agrocoffee* and *Caferwa*. Besides hulling, these companies also export coffee. A small part of the green coffee, mainly of lower grade is roasted and domestically consumed, while the higher grade coffee is mostly exported. Roasting is performed by companies closely linked to the cooperatives (e.g. *Coopac* and *Maraba*) or by departments of the hulling companies (e.g., *Rwandex*). After obtaining the necessary certificates from OCIR, coffee is exported to Europe (main partners are France, Belgium and Switzerland), USA or new niche markets in Asia, such as China.[6]

Before entering into a more detailed discussion of the farmers' behaviour in the marketing chain, we describe the functioning of cooperative and trader businesses in the case study area in the following sections. This description is based on survey data and interviews with key-informants.

Coffee cooperatives

Cooperatives in Rwanda are regulated by the law No. 31/1988 of the 12th October 1988 according to which a cooperative is "an autonomous association of persons united voluntarily to meet their common economic, social and cultural aspirations through a jointly-owned and democratically-controlled enterprise". Key conditions required to establish a cooperative are a minimum of seven members and a shared capital fully subscribed and paid (MINICOM, 2006).

Table 1 summarises the major characteristics of the cooperatives included in this study. Maraba, Kopakama and Koakaka are cooperatives initiated by farmers with external support ('philanthropic cooperatives'). The latter is a merge of three associations of coffee growers, which were already in operation. The fourth cooperative, Coopac, was created by an individual entrepreneur ('grass root cooperative').

[6] Some cooperatives are part of coffee marketing unions that provide assistance for export. At the time of research, there were two such unions: *Rwanda Smallholders Speciality Coffee Company (Rwashoscco)* that includes Abahuzamugambi ba Maraba and Koakaka and *Misozi* that includes Kopakama. The role of these unions is to act as intermediaries with international buyers i.e. in finding markets for these cooperatives, (re)negotiating prices and sending coffee samples to potential buyers, designing contracts on their behalf and ensuring that these are enforced. For cooperatives that are not part of any union, such as Coopac, these functions are internally performed.

Table 1
Characteristics of cooperatives. *Source*: Rwandex (2006).

	(Abahuzamugambi Ba) Maraba	Koakaka	Coopac	Kopakama
Year of creation	1999	1998	2001	1998
Creators	Growers	Associations merge	Individual founder	Growers
External support	PEARL	PEARL	–	PDCRE
Year of starting washing station operations	2001	2002	2003	2004
Washing station processing capacity (dry coffee) in tonnes	200	250	350	150
Membership at start	230	900	110	94
Rate of membership evolution[a]	10.2	5.5	11.9	10.8
Membership fees (Rwfs)	5,000	500	10,000	3000

[a] *Note*: Yearly rate of membership (M) growth from initial time (0) to 2006 (t): $R = \{[M_t - M_0]/M_t\} * 100/T$. T is the number of years in operation.

Managers confirm that the external financial support was mainly directed at constructing washing stations. Figures from Kopakama's financial report show that the average cost of building a washing station is estimated at around 80 millions of Rwandan francs (approximately 120,000 euro); this cost obviously varies with the processing capacity. The smallest station in terms of capacity is that of Kopakama with 150 tonnes of dry coffee per year. PDCRE, a smallholder cash and export crops development project through IFAD (International Fund for Agricultural Development), offered low-interest loans to Kopakama to set up the washing stations. PEARL, a project for Partnership for Enhancing Agriculture in Rwanda supported by the Michigan State University offered grants to several cooperatives including Maraba and Koakaka. Coopac financed its instruments by loans from the *Banque Rwandaise de Développement*.

In almost all cooperatives, members are encouraged to actively participate in the organisation through different organs. All studied cooperatives have decentralized structures[7] and farmers can always participate in decision making through assemblies, which are held two to four times per year. At these assemblies decisions are usually taken through a one-member one-vote system.

Also shown in Table 1 is that membership rates increased at an annual rate of around 10% from the cooperatives' time of creation to 2006 (except for Koakaka, which started at a relatively high membership level). This increase is associated with the performance of the cooperatives, but it is probably also partly the result of the reduction of the membership fees. For instance, to be a member of Coopac, a farmer was previously required to own at least 1000 coffee trees and buy two shares of 25,000 Rwfs (about 37 euro) each. At present however, the membership fee is reduced to 10,000 Rwfs (about 15 euro). This reduction is motivated by the trade-off between the cost of enforcing the membership requirements and the quantity of berries needed by cooperatives to financially survive through their washing stations' operations. To attain the desired production volume in the washing stations, cooperatives also started to accept berries from non-members. The price paid for the berries of these non-members is the same as that paid to members. This decision of the cooperative opens a first door to side-selling, namely giving non-members a market for their berries of good quality.

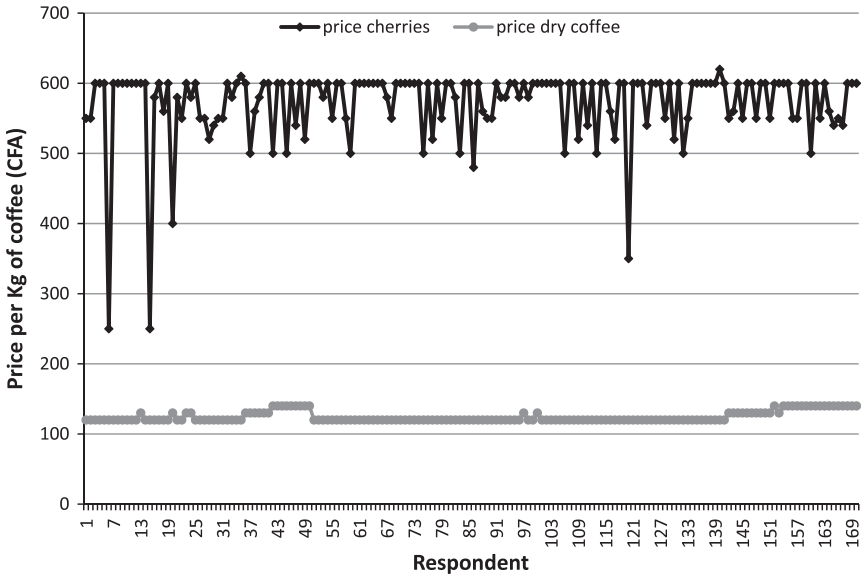
The second issue of side-selling is the leakage of berries by members to local traders. Farmers outweigh costs and benefits of selling to cooperatives while being member or selling to cooperatives as non-member. First, cooperatives offer easier access to inputs such as fertiliser, pesticides and seedlings. Inputs are supplied by OCIR and distributed to farmers through the cooperatives. Second, cooperatives are giving farmers credit as reported by 46% of the members (average amount borrowed was 55,000 RWfs). Third, in partnership with OCIR, cooperatives are able to organise trainings for their members on production practices towards improving the coffee quality. The cooperatives are considered as a source of information on coffee production, marketing (including market prices), market tendencies, and government policies. Finally, cooperatives give farmers market assurance; cooperative members are almost sure that the cooperative will accept their berries if these meet the quality specifications.

Cooperatives also seem to give farmers more security on the price they will receive for their coffee. Even though a price was fixed by OCIR for dry coffee and berries, farmers felt uncertain about the amount that they would actually receive on the market. The level of uncertainty was lower for berries sold to cooperatives because prices paid by the cooperatives were quite stable (Fig. 1). However, for trade in dry coffee, traders seemed to have a habit of changing prices for no particular reason by speculating on the farmers' ignorance; for example, farmers were told that their coffee was of very bad quality, sometimes without this being checked. As a result, the prices for berries are more stable than the prices for dry coffee which show large variations.

Fixed prices per kg were 120 Rwfs (about 18 eurocents) for berries and 600 Rwfs (about 90 eurocents) for dry coffee (both in 2006) (and one needs about 5 kg of berries to produce 1 kg dry coffee). There were occasional and small variations in the price of berries. Many and large variations were observed in the price of dry coffee, which seemed to create a feeling of uncertainty on the price that farmers who sold to traders were to receive.

Finally, members receive rebates or patronage funds in proportion to the volume of coffee they have sold to the cooperatives. These rebates are distributed as shares of the profits from coffee exports. They are distributed in addition to dividends, which depend on their membership contribution. The cooperative's general assembly decides on the proportion that will be distributed to the members as rebates. It is important to note that we failed to record the level of these rebates in the case study cooperatives, because they were not yet distributed in the coffee season and farmers could not well recall the rebates received in previous seasons. However, cooperative managers explained that generally 60–70% of the profits are redistributed among the farmers as rebates (patronage funds/dividends) and about 10% are distributed as share-capital. The remainder proportion of profits is held by the cooperative as capital. The patronage funds amount to an average of 30–50 RwF/kg of berries. With the recent price hikes in coffee (200–300 RwF/kg), the dividends went up to 100 RwF/kg. Compared to the prices mentioned above, these rebates seem to increase the income for the farmer significantly.

[7] A decision requiring farmers' consent at a higher level, such as the elected committees, is made through the leaders of each decentralized zone. The following elected committees are found in the cooperatives in the case study area: (a) an Administrative Committee is in charge of executing all the decisions agreed upon by the General Assembly and monitoring all the cooperative's activities; (b) an Oversight Committee is charged with the task of supervising cooperatives and following up their accounts; (c) a Management Service is under the supervision of the Administrative Committee. Its task is to monitor the daily activities and finances of the cooperative; and (d) the General Director is a farmer who, de facto, is a member of the Administrative Committee.



N=170; SDprice of berries=7.542; SDprice ofdry coffee= 52.387

Fig. 1. Price of berries and dry coffee received by farmer from selling to cooperative or trader or both (coffee harvesting season: 2006).

Besides the benefits listed above, members face some costs linked to selling to the cooperative. First and most obvious are the membership fees. Second, cooperatives only accept good-quality berries. Farmers have to invest more time and labour to produce coffee of better quality, and to harvest and supply the coffee immediately after harvest in order to meet cooperatives requirements. These requirements are less constraining in case of the sales of dried coffee.

Traders

Traders are not only involved in coffee buying and selling but also in other businesses such as small boutiques at the rural markets or trading centres. Farmers confirmed that the preference to transact with traders is because of repeated transactions related to basic needs in their daily life and because of long-term relationships in the community. Some farmers are found to sell to both the cooperatives and the traders (Fig. 2).

In coffee transactions, traders act as intermediaries on behalf of larger operators who own washing stations or deal with coffee hulling companies. Traders are mainly interested in dry coffee; yet, they also seem to compete with cooperatives in gaining a share of the market for coffee berries. The main difference with cooperatives is that traders were found not to be interested in high-quality production but more in quantity. Therefore they accept berries without stringent quality requirements. Another distinguishing factor was that traders were less concerned with the improvements of coffee production. They did not provide specific information, inputs, or training.

Traders are often qualified as 'opportunists' (Sogestal, 2001) because they interlock trade, in this case of coffee with credit provision. Coffee sales are concentrated in the harvesting season thereby making the related earnings a 'once-a-year lumpsum' income. Farmers use this income to make large investments such as buying a plot of land, and building or repairing a house (Karekezi, Personal Communication). It is a common practice for traders in the study area to propose their so-called financial services when farmers are facing unexpected expenses. During the farmer interviews, it was also clear that credit provided by traders is used differently than credit that was given by the cooperatives to mem-

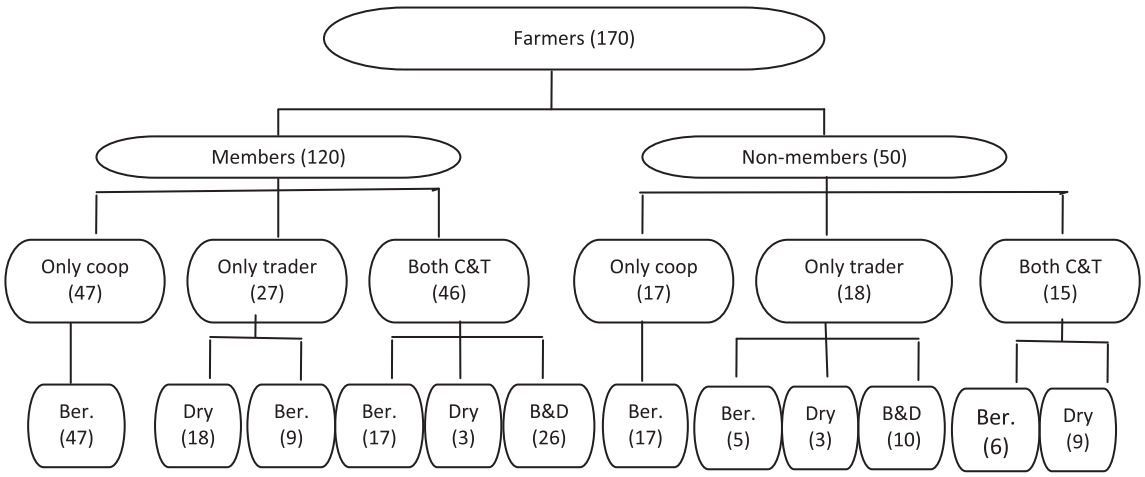


Fig. 2. Farmers' transaction partner per type of coffee.

Table 2
Characteristics of coffee growing per membership status and province.

	Southern Province		Western Province		Equality test[a]
	Member	Non-member	Member	Non-member	
N	63	20	58	30	
Experience in coffee growing (years)	24 (13.27)	21 (13.79)	28 (14.17)	22 (13.70)	2.75*
Total number of coffee trees	791 (968.30)	268 (145.68)	765 (680.99)	305 (271.40)	16.31***
Reproducible trees	628 (727.87)	160 (109.18)	528 (473.32)	232 (221.90)	14.97***
Quantity of berries (kg)	621 (583.84)	120 (59.67)	1366 (1519.09)	476 (261.36)	7.45***
Quantity of dry coffee (kg)	84 (72.29)	53 (57.24)	71 (82.28)	52 (44.55)	1.93
Income from coffee, 2005 ('000Rwfs)	71.22 (66.24)	27.00 (20.73)	23.81 (494.42)	56.39 (38.86)	2.69+
Income from coffee, 2006 ('000Rwfs)	86.25 (80.08)	22.67 (14.52)	284.76 (543.00)	81.30 (80.52)	4.08**

[a] Equality test pertains to membership categories. *F* values are given for continuous variables; in brackets are standard deviations.
+ If significant at 15% level.
* Significant at 10% level.
** Significant at 5% level.
*** Significant at 1% level.

bers. Loans from cooperatives or banks were productive in the sense that they were used for investment in coffee production. Half of the respondents that took out loans from traders or other informal sources said to use it unproductively on consumption smoothing or health-related emergencies.

Traders are physically present in the community and are said to 'sympathise' more with farmers during difficult times. As such, traders remain a reliable source of income. The unpleasant outcome is that farmers are forced to pay exorbitant interests or are held up on their agricultural products (including coffee). In selling these products, farmers are left with no choice but to accept whatever price the traders are offering.

Membership characteristics

Tables 2 and 3 compare members and non-members; Table 2 gives an overview of production characteristics and makes an extra comparison between the two provinces in the case study, while Table 3 compares the farmers' household characteristics and farmers' perceptions.

The descriptive characteristics show that cooperative members in the case study area had more experience in coffee production. They owned relatively more trees and hence produced more coffee. Ownership of trees includes reproducible trees (from which coffee can be harvested) and non-reproducible trees (young trees, or trees trimmed for regeneration by farmers, which implies that no coffee can be harvested from these trees during some time). We noted higher incomes of members; in particular for farmers in the Western Province. Data also confirmed higher coffee production and incomes in the Western Province compared to the Southern Province.[8]

With regard to the characteristics of members, significant differences were found in the relatively higher household size of members and the distance to the cooperative (Table 3). Members expressed that they were more risk averse, and were relatively more motivated by economic incentives to produce coffee. Members included fewer women but more educated farmers. Furthermore, a higher share of the members felt relatively less secure towards ownership of land. Finally, they indicated to have a higher level of cognitive trust.

Table 4 shows the estimates of the probit model.

[8] Due to potential endogeneity problems, the number of trees, berry production and income could not be included in the probit model that explores membership. These factors (number of trees, production and income) could be influenced by cooperative membership and are hence not exogenous anymore to the decision to become a member of the cooperative.

Members were more likely to (a) have a larger family (probably because this means that more labour was available for coffee maintenance and harvesting); (b) live further out from the cooperative office (we assumed that farmers nearer to the cooperative were more likely to be members. The coefficient for distance is unexpectedly positive, probably because farmers who lived close by the cooperative were less enthusiastic about membership given that they could get benefits offered by the cooperative 'trickled-down' to them, e.g. possibility to sell coffee and access to technical advice without any compelling need to abide by membership requirements. It is easier for them to free-ride); and (c) have a higher estimation of the respondents' perception of risk (of being cheated at sale or coffee being stolen during storage). Farmers who had more attention to risk were more likely to be a member of the cooperative.

Members seem to have a high trust in the cooperative as shown by the results of the extra questions that were posed to them (Table 5). It is worth to note that the average Likert score on these question was never below 3 points on a scale of 1–5 varying respectively from strongly disagree to strongly agree. The score of members who were committed to the cooperatives are slightly higher than those who side-sell to traders.

An unexpected result of the probit model was the negative estimation for the relationship dummy. We would have expected that farmers with relatives or friends who are members would feel more inclined to be members themselves. However, it may be that farmers who have family and friends that are members, could benefit – or in other words free-ride – through them for the advantages of the cooperative. Furthermore, perceived land insecurity discouraged membership. We think this is because farmers without land security were restricted in enlarging production and more reluctant to invest.

Cooperatives versus traders as transaction structures and side-selling

As shown in Fig. 2, we indentify four main groups of famers, namely (1) members who sell to the cooperative only; (2) members who sell at least partly to traders; (3) non-members who sell to cooperatives only; and (4) non-member who sell to traders or both. Table 6 compares their characteristics.

Non-members who sell to the cooperative were relatively younger and had less experience in coffee growing. Furthermore, the motivation to grow coffee differed. More members and non-members who sell to the cooperative said that they grew coffee for economic reasons. As further analysis of the statistics did not reveal many other distinguishing factors, we explore potential differences in transaction costs that could explain the trading structures.

Table 3
Comparison of members and non-members.

	Members	Non-members	Equality test[a]
N	121	50	
Continuous variables (average values)			
Age at membership (years)	40	43	1.68
Household size (persons)	7	6	4.58**
Distance to cooperative (min)	75	40	10.90***
Score personal relation in cooperative (Likert score)[b]	−0.26	−0.12	1.09
Risk score (Likert score)[c]	0.67	−0.32	85.46***
Categorical variables (%)			
Gender (1: female)	30	42	18.45***
Education dummy (1: higher than Primary School level)	16	8	90.45***
Motivation for growing coffee (1: economic rationale)	68	46	8.49***
Land security dummy (1: secure)	54	66	22.16***
Trust score_0 (1: score of 0)	25	30	36.21***
Trust score_1 (1: low trust)	25	32	34.38***
Trust score_2 (1: medium trust)	19	22	61.93***
Trust score_3 (1: high trust)	30	16	38.10***
Location dummy (1: Southern Province)	53	40	0.09

[a] Equality test pertains to membership categories. *F* values are given for continuous variables and Pearson χ^2 for categorical variables.
[b] Three-point Likert scale indicating potential importance of personal relationship (family members, neighbours of friends) in choice of membership.
[c] Three-point Likert scale indicating the risk perceived by the respondent for theft and cheating.
* Significant at 10% level.
** Significant at 5% level.
*** Significant at 1% level.
+ If significant at 15% level.

Table 4
Probit results of membership characteristics[a] (1: member; 0: non-member).

Variables	Estimates	Standard errors	Marginal effects (dy/dx)
Age at membership (years)	−0.02	−0.02	−0.00
Gender (1 = female)	−0.04	−0.30	−0.01
Education (1: higher than primary)	0.38	0.55	0.06
Household size (persons)	0.13	0.07*	0.02
Distance to the cooperative (min)	0.01	0.00**	0.00
Motivation for growing coffee (1: economic rationale)	0.28	0.30	0.06
Land security dummy (1: secure)	−0.68	−0.31**	−0.13
Trust score_1 (1: low trust)	−0.37	−0.38	−0.08
Trust score_2 (1: medium trust)	0.09	0.43	0.02
Trust score_3 (1: high trust)	0.71	0.45+	0.11
Relation score[b]	−0.64	−0.24***	−0.12
Risk score[c]	1.24	0.23***	0.24
Location dummy (1: Southern Province)	0.03	0.32	0.00
Constant	−0.25	−0.74	
n = 154			
LR χ^2 (14) = 71.93***			
Log likelihood: −51.18			
Pseudo R^2: 41.27%			
Probability of membership status: 0.89			

[a] Those who indicate not to have trust in any of the preferences is the reference group.
[b] Three-point Likert scale indicating potential importance of personal relationship (family members, neighbours of friends) in choice of membership.
[c] Three-point Likert scale indicating the risk perceived by the respondent for theft and cheating.
* Significant at 10% level.
** Significant at 5% level.
*** Significant at 1% level.
+ Significant at 15% level.

As mentioned above, farmers indicated that membership status was the main determinant in the choice of selling to the cooperative; yet, it does not explain the reasons why some producers side-sell. The following paragraphs attempt to compare and contrast selected elements of transaction costs and bring out the differences that could help in explaining the farmers' behaviour.

Asset specificity

A first determinant of asset specificity we consider is the size of the coffee plantation and hence, production and supply. Coffee plantation refers to that plot of land used exclusively for coffee growing because intercropping with coffee is not practiced. If this plot is sold before the end of the coffee tree lifecycle, the investment in coffee cannot be recovered. This puts farmers in an early situation of dependency. Furthermore, all coffee produced needs to be sold. This implies that a larger coffee plantation (reflecting the production capacity assuming constant tree productivity across plots) creates a higher dependency of the farmer to the cooperative or the trader.

Cooperatives in turn are very dependent on the supply of coffee by the farmers (see above). This results in a high bilateral dependency between cooperatives and farmers. Transactions with traders

Table 5
Statements probing member's trust towards the cooperative and average score of the Likert scale (1–5).

Statement	All members	Members to cooperatives	Members to traders or both	Equality test[a]
1. Most people who are in this cooperative can be trusted	3.87 (0.840)	3.97 (0.802)	3.76 (0.668)	0.481
†2. In this cooperative one has to be alert or someone is likely to take advantage of you	1.94 (1.156)	1.77 (0.937)	2.07 (0.972)	2.394+
†3. There are people in our community who are excluded from joining the cooperative without reason	1.82 (1.250)	1.52 (0.804)	1.97 (1.450)	3.202*
4. Being in the cooperative reduces uncertainty with regard to the returns from coffee	3.70 (1.198)	3.71 (1.111)	3.69 (1.263)	0.006
†5. I would like to leave my cooperative but I feel I do not have any other option but staying	1.55 (0.832)	1.41 (0.622)	1.66 (0.958)	2.313+
6. I implicitly trust the decisions made by the cooperative leaders	4.42 (0.586)	4.45 (0.504)	4.40 (0.536)	0.002
7. Overall, I am satisfied with the results of my membership in my cooperative	4.69 (0.748)	4.72 (0.701)	4.60 (0.715)	0.013

† Statements with a negative connotation, scores have to be reversed; in brackets are standard deviations.
[a] Equality test pertains to membership categories. *F* values are given for continuous variables;
* Significant at 10% level.
** Significant at 5% level.
*** Significant at 1% level.
+ Significant at 15% level.

Table 6
Comparison of determinants for side-selling.

	Member to cooperative	Member to traders or to both	Non-member to cooperative	Non-member to traders or to both	Equality test[a]	
					Trade partner	Member X partner
N	47	73	17	33		
Experience in coffee growing (years)	24	28	19	24	3.279*	0.028
Total number of coffee trees	715	820	202	335	0.884	0.10
Income from coffee, 2006 (Rwfs)	182,420	184,440	39,310	72,390	0.075	0.059
Age at membership (years)	40	40	36	46	5.650**	4.140**
Household size (persons)	6	7	6	6	0.279	0.072
Distance to cooperative (min)	90	110	65	50	0.000	0.260
Score personal relation in cooperative (Likert score)[b]	−0.17	−0.32	−0.18	−0.09	0.045	0.686
Risk score (Likert score)[c]	0.72	0.63	−0.41	−0.27	0.042	1.076
Gender (1: female)	26	33	53	36	0.024	4.356
Education dummy (1: higher than Primary School level)	19	14	6	9	0.385	2.676
Motivation for growing coffee (1: economic rationale)	77	62	71	33	8.258***	16.117***
Land security dummy (1: secure)	57	52	77	61	0.990	3.521
Trust score_0 (1: score of 0)	23	26	29	30	0.168	0.542
Trust score_1 (1: low trust)	23	27	35	30	0.035	1.065
Trust score_2 (1: medium trust)	23	16	18	24	0.326	1.681
Trust score_3 (1: high trust)	30	31	18	15	0.007	3.881

[a] Equality test pertains to membership, trading partner categories and interaction of membership and trading partner. *F* values from two-way ANOVA are given for continuous variables and Pearson χ^2 for categorical variables.
[b] Three-point Likert scale indicating potential importance of personal relationship (family members, neighbours of friends) in choice of membership.
[c] Three-point Likert scale indicating the risk perceived by the respondent for theft and cheating.
* Significant at 10% level.
** Significant at 5% level.
*** Significant at 1% level.
+ If significant at 15% level.

arguably involve relatively less bilateral dependency because traders are only intermediaries in the marketing chain and do not need to be involved in other coffee processing stages nor invest in machinery. Furthermore, traders are also engaged in transactions of other commodities, and their investments such as storerooms can easily be shared by coffee and other commodities. Hence, traders are arguably less dependent on the size of the farmers' coffee supplies.

Another determinant of asset specificity is the perishability of coffee. The significance of perishability for transaction costs is associated with the economic loss that arises when the good is not offered at particular moments in time (Masten, 2000), which also applies to coffee. Berries are highly perishable and quality standards of the cooperatives require farmers to bring berries to collection points within 4–6 h after harvesting.

The proportion of coffee that is sold as berries was high for transactions with cooperatives for members or non-members alike. The specificity is lower in transactions with traders because: (1) the quality of berries is less of a problem as traders are found to accept all farmers' coffee, even when berries are sluggish or overripe; and (2) if coffee is transformed into dry coffee, there are less problems with perishability and farmers can take their time to process coffee.

Table 7
Uncertainty associated with difficulties to access inputs (percentage 'yes' answers within main trading partner category).

	n	Cooperatives	Traders	Equality test[a]
Organic fertiliser (mulching)	159	62	74	17.15***
Chemical fertiliser	151	30	28	66.09**
Pesticides	155	8	20	28.82***
Labour	160	44	51	0.85

[+] if significant at 15% level.
[a] Equality test pertains to categories of transaction partners. *F* values are given for continuous variables.
[*] Significant at 10% level.
[**] Significant at 5% level.
[***] Significant at 1% level.

Table 8
Summary of transactions characteristics.

	Cooperatives	Traders
Asset specificity		
Coffee plantation	++	+
Perishability of produce	++	+
Uncertainty		
Access to inputs	+(+)	++
Price variations	+	++
Payment at a later date	++	+
Frequency		
	++	++

Uncertainty

Major aspects of uncertainty for farmers are related to access to inputs and to payment modalities (including price, payment delays). In general farmers are advised to apply fertiliser, mainly mulch (from crop residues) which improves the quality of coffee. More farmers selling coffee to trader reported having problems obtaining organic fertiliser (mulch) and pesticides (Table 7). However, for farmers transacting with cooperatives, access to chemical fertiliser seems more difficult. This is rather surprising, because chemical fertiliser imported by OCIR is distributed to the farmers through the cooperative based on the number of trees cut for regeneration. Yet, we assume that members of the cooperative feel that the fertiliser that is provided to them is not sufficient to produce the quality berries required by the cooperative. Finally, no difference was found in the perception of access to labour.

As mentioned above, cooperatives seem to give farmers more certainty on the price they may expect to receive. This concurs with the findings on cooperatives that are part of the fair trade chains (Valkila and Nygren, 2010). The prices are fixed for the season and individual price variations seem to be smaller than for transactions with traders. Yet, 49% of the farmers who transacted with the cooperatives reported later payments as problematic while with traders this proportion was lower (27%).[9] An important aspect to consider here is the need for cash in the rural areas. Farmers sold their coffee with the expectation of satisfying the current household consumption requirements. Farmers reported that traders paid immediately after sale, while farmers who sold berries to the cooperative had to wait up to 2 months to get their money.

[9] Payments from traders are straightforward, made immediately after sale. However with cooperatives, payments are not made immediately after the transaction, mainly due to work associated with the harvest season (recording purchases from each farmer brought at different points of time; handling and processing berries, etc.). The quantity of coffee supplied and due payments are indicated on card-indexes so that the farmer may take the money at a later date. About 86% of farmers reported receiving late payments by cooperatives while for traders this proportion is much lower to 13%. Cooperatives make payments after a month or two, but in a few cases the delay can even go to 3 or 4 months. While some farmers accept this as a reality, others, in the proportion of 27% openly complain about these late payments.

Frequency

As explained above transactions with coffee cooperatives are not only based on buying-and-selling. They also entail other contractual interventions such as regular monitoring of the coffee trees as well as training and advising farmers, supplying them with inputs, rewarding the best farmers with prizes in cash or kind and distributing rebates and dividends from the profits made after exporting the coffee. All these interactions seem to evolve mainly around coffee.

The presence of traders in the community is natural. To farmers, they are the neighbours or relatives whom they meet regularly. These traders not only buy coffee but also sell daily consumption items to the farmers and their families or provide credit when needed. About 12% of respondents mentioned that instead of turning to formal credit institutions they prefered to ask the traders because they do not complicate procedures for lending money. This occurs despite farmers knowing they will be held-up to sell their coffee at relatively lower prices or forced to pay high interests.

A statistical comparison of the expected frequency of transactions in coffee throughout a farmer's career (computed as a weighted difference of farmer's age from the life expectancy in Rwanda in proportion to experience in coffee growing) between the cooperatives and traders showed no significant differences between cooperatives and traders (F statistic = 0.46). However, it should be mentioned that measuring the full intensity of frequency requires an assessment of what a particular intervention either by the cooperative or trader means to a particular farmer in a particular period/season, how fast the intervention is made and how effective it responds to the farmers' need. Yet, these questions were not part of this study and remain issues for further research.

In conclusion, the levels of asset specificity, uncertainty and frequency associated with transactions with cooperatives and traders are summarised in Table 8.

Coffee cooperatives in Rwanda indeed appear to be based on long-term relationships with farmers. Incentives through pre-harvest and post-harvest services play a role in the trust contract the cooperative tries to build with the farmers. Transactions with cooperatives seem to secure the farmers' market, but the mutual dependency in the relation between farmers and the cooperative also implies the need for cooperatives to monitor farmers in order to ensure that they respect the cultivation techniques and produce coffee that meets their quality requirements. Transaction costs also arise because cooperatives demand berries, which are more perishable than dried coffee. Transaction costs for the farmers are furthermore increased because of the payments on a later date. The cooperatives also do not seem to be able to lower transaction costs associated with uncertainty of access to inputs. Respondents do not report that they feel that this access increased because they are member of the cooperative.

The relationship between farmers and traders seems to be more complex than a spot-market transaction of buying and selling. This relationship is not limited to coffee and extends to daily life in the society. Transaction costs are incurred by both parties, yet there seems to be a trade-off between the lower price farmers receive for their coffee, on the one hand, and the lower transaction costs (mainly due to lower asset specificity) and the services in daily live traders render, on the other hand. These are the factors that attract farmers more than committing themselves to a cooperative.

Conclusions

The results suggest that members are different from non-members in their better access to labour as reflected by the household size, the importance of risk perceptions and higher trust levels between the farmers within the cooperative and towards the cooper-

ative management. Evidence on the differences in distance to the cooperative and the social capital variables point to potential free-riding problems. Farmers who are closer to the cooperative or who have relatives who are members, are less likely to be members themselves. Perceptions of insecurity with regard to access to land also restrict a membership decision in favour of cooperatives.

Yet, despite the relative important rebates that cooperatives give to farmers on top of the selling price per kg of berries, not all members sell their coffee to the cooperative. On the other hand, cooperatives accept coffee from non-members, who are not getting rebates. This double-side-selling cannot be fully explained by the benefits and costs producers incur in the choice of selling outlet. Membership is probably the most important determinant of farmer's choice to sell to traders or cooperatives, but transaction costs highly matter in the decision to side-sell. The different trading arrangements have different transaction costs saving mechanisms and therefore comparative advantages. The asset specificity remains higher in trade with the cooperative in terms of coffee plantation/site and perishability of coffee berries. High uncertainty is characteristic of the sales to traders in terms of accessing inputs and price variations. However, with regard to payments at a later date, farmers selling to the cooperative face higher levels of uncertainty. Recurring transactions between cooperatives and members are related to coffee, while with traders, diverse exchanges are common.

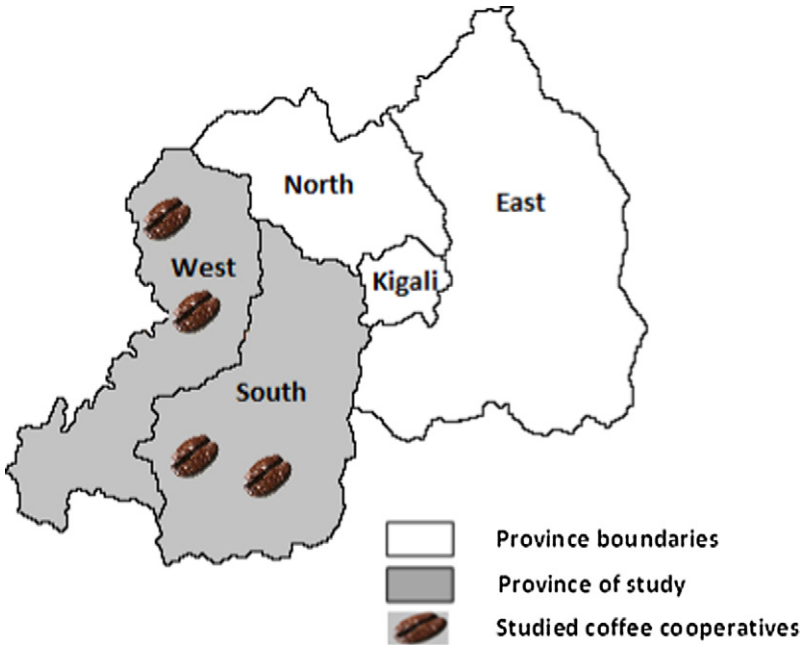
Selling to traders is easier and the farmer is paid immediately. This lowers transaction costs. Traders are involved in repeated transactions. These transactions are related to daily living requirements and as such, traders seem to build long-term relationships within the community. Traders are closer to the farmers in the society and are responsive to the farmers' immediate needs.

Then again, cooperatives may be more attractive because of the benefits of being included in a conducive market and production environment. Yet, the 'relatively' higher and stable prices offered by cooperatives remain unattractive in comparison to the additional transaction costs involved in producing and marketing the 'type' of coffee required by cooperatives especially in terms of quality. Hence, despite their possible opportunistic behaviour we find that traders are preferred by some producers because of their long-standing relationship. The personal contacts of farmers with traders reduce certain transaction costs such as payment in time and easy provision of credit. This seems to secure the farmers' commitment to the traders rather than to the cooperatives which show less flexibility towards the farmers' daily needs.

Secondly, due to the absence of an exclusion mechanism (due to high cost of monitoring, organisational problems within the cooperative or other problems), farmers may avoid having to pay membership fees and are given the 'opportunity' to side-sell. Non-members do not realise the need for subscribing to the cooperative. This might be due to the fact that they can get the same price, while additional incentives offered by cooperatives to members are not high enough to incite members or their impact is not visible.

From the farmers' point of view, side-selling may make sense when all costs are taken into account. However we argue that it is a problem for the cooperative on a longer term. One can assume that buying more berries from non-members may optimise the use of the cooperative washing stations. Yet it may undermine the legitimacy of the cooperative as a member-owned/managed organisation. By buying from both members and non-members, the cooperative reduces the incentive for farmers to become members. As a consequence, in the long run supply of coffee to the cooperative will be reduced.

While more research is needed to analyse the governance inside the cooperatives, this study points to the need of the cooperatives to rethink the relationship it have with the producers in the area where they are established. If the policy is to increase cooperative membership by for instance reducing the membership fees, the cooperatives also need to consider how to reduce side-selling. They may strengthen the social capital and trust levels in the coopera-



Map. Provinces of Rwanda with location of cooperatives studied

Source: MINALOC, 2007 (Edited)

Fig. A1. Map. Provinces of Rwanda with location of cooperatives studied. *Source*: MINALOC, 2007 (Edited).

tive by increasing the involvement of members in decision making. They need to create the necessary incentives for farmers to produce more and better quality berries. A first incentive could be to increase the coffee price (by negotiating the prices with buyers or by entering in fair trade market systems, or other contracts). Additional incentives should be related to securing the land rights to coffee and promoting the allocation of land to coffee. While the above measures are carrots to attract member sales, possible sticks to discourage side-selling may also be needed.

Appendix A. Appendix

See Fig. A1.

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