

Measuring the Benefits of Smallholder Farmer Membership in Producer-Controlled Vertical Value Chains: Survey Findings From a Development Project in East Africa

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The question addressed in this article is what precisely are the benefits that small-scale farmers in the developing world receive from being members of producer-controlled vertical value chains? A baseline comparative survey was conducted of members and non-members of four vertically coordinated dairy cooperatives, three in Kenya and one in Uganda (N=3,986), which are part of a larger five-year longitudinal cooperative study. The study measures both objective income gains and subjective satisfaction gains from cooperative membership. Cooperative members have a small but statistically significant advantage over non-members in income from dairy, but other incentives for membership are based on selective incentives (i.e., provision of non-income services to members) and social capital (i.e., trust that the cooperative will purchase their milk and pay them a fair price). These findings suggest that the motivations for cooperative membership in developing countries are not dissimilar from motivations of cooperative members in more developed countries. This coupled with similar organizational design issues suggests that greater attention should be paid to larger-scale vertically coordinated collective action models in development theory and research.

KEY WORDS: East Africa, cooperatives, vertical value chain

Introduction

The producer-controlled vertical value chain model has played a critical role in raising the living standards of farmers in developed countries. It would seem that these organizations might have the potential to provide similar benefits for smallholder farmers in developing countries. The critical question, however, is what kinds of strategies can be employed to attract smallholders to become members and contribute to the costs of operating these organizations?

One of the major challenges for development theory is to identify ways in which to motivate households to make *sustained* contributions to collective efforts.

For this reason, scholars have been critical of top-down models that merely reinforce corruption and inefficiencies of post-colonial regimes while, at the same time, creating disincentives for household engagement at the local level (Brett, 2009; Preston, 1982). The top-down model not only has adverse effects on economic development but also limits the development of civic participation and its associated skills as well. As Stiglitz points out, however, simply imposing economic liberalization while ignoring existing social arrangements, as occurred with the post-Soviet “shock therapy” in Russia, not only creates hostility toward market solutions necessary for economic development but also generates negative attitudes toward liberal democracy itself (2002, pp. 133–165).

Because of limitations of traditional development models, there is a shift in thinking in some quarters toward the development of business models that incorporate existing informal institutional arrangements into plans to improve the economic returns that households receive from their labor. In this regard, considerable attention is given to small-scale micro-enterprises built upon informal social networks and trust in local villages. Much less attention, however, is given to more commercially oriented coordinated forms of collective action that also are built from local informal village institutional bases but through successive degrees of linkages in the value chain permit smallholders to increase their incomes.

While much is written about smallholder involvement, especially of women, in micro-finance (Counts, 2008; Kempner, 2012) and micro-enterprise (Midgley, 2008) organizations, much less is known about what motivates smallholder households to join and maintain their involvement in more complex producer-owned commercial entities. Using survey data, we examine the incentives for households to become members in four vertically coordinated dairy cooperatives, three in Kenya and one in Uganda. Our analysis will examine the relative impact of three types of incentives for households to make sustained contributions to their cooperatives: (1) *direct income* gains from membership, (2) other types of *selective incentives*,¹ and (3) *social capital*² related benefits that are built upon trust in the ability of the cooperative to maintain stability in the household economy over time.

Organizational Models and Incentives for Smallholder Engagement in Collective Action

Micro-credit associations, made famous by Muhamad Yunus, the founder of the Grameen Bank, who was awarded a Nobel Prize in 2006, operate on the principle of embedding small-scale enterprises in existing local institutions and organizations. This approach is especially appealing because it provides a clear alternative to a top-down development approach that has received so much criticism (see, e.g., Carboni, Calderon, Garrido, Dayson, & Kickul, 2010; Counts, 2008).

From an organizational design point of view, these small-scale associations contain the collective action advantages of small groups, where interpersonal relations provide self-monitoring devices to keep them pointed toward their collective goals (Olson, 1971, pp. 22–42). Moreover, these associations have high

levels of social capital, including trust and networking (Coleman, 1988; Putnam, 1993; Woolcock & Narayan, 2000), and are conceptually similar in many ways to certain types of small business enterprises in industrialized countries that rely on a family or quasi-kin "moral economy," such as successful Greek restaurants or Korean liquor stores (Light, 1972; Portes & Sensenbrenner, 1998).

Some ethnic enterprises, such as those operated by Japanese American farmers in the Central Valley of California, have managed to use their "quasi-kin" ties to develop extensive supply chain networks (Fugita & O'Brien, 1991, pp. 47–92), but a vast number of successful ethnic enterprises in developed countries have been restricted to very small niche markets. Therefore, this model may not be the most appropriate for small-scale farmers in developing countries who are trying to compete in markets that have been dominated by either foreign or domestic large enterprises. In addition, empirical evidence suggests that despite the widely cited successes of micro-enterprises, their total impact on poverty alleviation is, at best, quite modest (Kempner, 2012). One reviewer who is sympathetic to micro-enterprises concludes that "their contribution should be put in proper perspective and viewed as a valid antipoverty resource which is most effective when incorporated into a wider set of social development policies and programs designed specifically to address the problem of global poverty" (Midgley, 2008).

The Fair Trade Movement, which began shortly after World War II, attempts to link small-scale producers in poorer countries with consumers in rich countries who want to purchase products that are made under good working conditions and for which the local producers receive a fair price. This movement has improved the lives of local producers by providing them with access to upscale markets, but there is limited evidence that it has achieved the movement's primary goal, which is to create sustainable development in poorer countries (Lyon, 2006; Straight, 2012). Moreover, in the fair trade model, persons in rich countries essentially control the marketing and much of the other business decision making. Another variant on this approach, which draws upon the poultry and pork industries in the United States, is the agricultural contract model where farmers in developing countries produce some commodities for large agri-business firms under strict contractual arrangements that regulate inputs, production facilities, and marketing (Kirsten & Sartorius, 2002). Here again, the local rural producer has very little input into the decision-making process.

The Producer-Controlled Vertical Value Chain Model

The producer-controlled vertically coordinated value chain model receives less attention in the development literature. To put this organizational model into perspective, it is useful to review some salient features of its origins and growth in developed countries.

American agricultural cooperatives emerged as an outgrowth of social movements in the 19th and early 20th century that focused on improving the ability of farmer producers to achieve some countervailing power to deal with the concentration of ownership of railroads, grain dealers, and elevators. The formation of the

cooperatives, which received critical assistance from enabling federal and state legislation, such as exemptions to anti-trust laws, securities waiver, and single-issue provisions, have provided an institutional and organizational alternative to either an unfettered, unregulated market or a top-down command economy (Cook, 1995; Galbraith, 1956; Schneiberg, King, & Smith, 2008).

In addition to their common economic interests and federal and state institutional supports, farmers seeking to form cooperatives had a large reservoir of social capital. This social capital of trust and reciprocal supportive social network relationships was built in small rural communities where farm families were members of local churches and their children attended local schools. While cooperatives in developed countries have evolved into multimillion-dollar firms, they remain dependent on *member engagement* in a way that is not found in investor-owned firms. In a recent survey of cooperative performance, using financial indicators as dependent variables, the level of social capital, measured by *processes for communication between members and the board*, especially feedback loops so that members could provide input into board decisions, was found to be a more important predictor of member satisfaction and overall financial success than some other *structural* factors that have been found to be important in investor-owned firms. Communication channels, voting policies, timing, and the format of member meetings were found to be essential in the ability of boards to obtain member feedback, which, in turn, was critical to their performance (Cook & Burrell, 2013).

Another feature of the cooperative model, which lends itself directly to a solution to the problems faced in emerging economies, is that its income-generation strategies can evolve from purely *defensive* to *offensive*. Typically, the initial rationale for forming cooperatives is to use collective action to defend the value of the physical assets of relatively powerless actors in the marketplace against much more powerful adversaries. But, the organizing strategies of cooperative leaders depend for their success on employing “selective incentives” (Olson, 1971, pp. 133–134) such as insurance, inputs, and access to credit, which can only be received if members contribute to the organization and can be lost if members try to be free riders. Some of these cooperatives have evolved to “offensive strategies” where they extract a dual set of rents, at the household and at the cooperative levels, by gaining access to financial benefits from processing, marketing, and establishing profitable brand names (Cook & Plunkett, 2006). Potentially, all producer-controlled cooperatives have certain advantages over investor-owned firms in developing successful net-chains, since ultimately networks are based on trust and social relationships as well as economic interests (Lazzarini, Chaddad, & Cook, 2001).³

In short, small-scale entities have the potential to provide small-scale producers with considerable leverage to grow in newly liberalized economies, eventually providing them with opportunities to achieve a significant gain in household income. To realize this potential, however, calls for increased knowledge by producer leaders about the challenges brought about by increased complexities in the micro-, mezzo- and macro-environments. A critical component

in developing effective organizational strategies to deal with these complexities is to identify what types of benefits will attract and retain members to contribute to the collective efforts of the cooperatives.

Research Design

The central question in our research is how effective are (1) direct income gains, (2) other selective incentives, and (3) social capital in attracting and maintaining the contributions of smallholder farmers to cooperative organizations in a developing economy? The data for answering this question are found in a baseline survey of smallholder household members and non-members of four dairy cooperatives, three in Kenya and one in Uganda. These cooperatives were selected because they were engaged in, or were in the process of becoming engaged in, a producer-controlled vertical value chain (CDP, 2012). The interdisciplinary team of experts in finance, dairy operations, organizational economics, and rural sociology utilized multiple primary data collection methods. These included *listening* to the cooperative board members, senior management, and member leaders on-site and in workshops.

The baseline contains vast amounts of data. These include focus group interviews with household members and non-members, cooperative-level financial and operational data, business plans, and in-depth interviews with board members and management. Findings from these data sources will be reported in other papers.

Two of the cooperatives in Kenya have a two-tier federated structure. Cooperative A is made up of five primary cooperative members, with a total of 6,000 occasional patron-members and 1,200 active patron-members.⁴ Cooperative B is made up of 13 primary cooperative members. Each of the primary cooperatives has approximately 2,000 occasional patron-members and 600 active patron-members. Cooperative C, the third Kenyan organization, is a 9,700 producer-member centralized cooperative made up of individual member producers. The cooperative in Uganda has a three-tier federated structure, with seven district cooperative unions that own the apex cooperative. There are 103 collection centers or primary cooperatives, made up of 30,000 members. The three Kenyan cooperatives are involved in dairy processing, while the Ugandan cooperative is involved in building a processing facility.

The cooperatives in the project are attempting to take advantage of new opportunities as their respective markets have become liberalized.⁵ The challenge for these cooperatives in both countries is to improve the business model with which they have operated. This involves a complex array of factors, including operational issues in processing plants, debt and acquisition of capital for new equipment, better understanding of the competitive environment, and especially training for cooperative board members. But, equally important is what do the members see as the current benefits of belonging to their cooperative, what do they see as the main problems with their cooperative, and what do these judgments suggest in terms of the long-term success of large-scale cooperatives in developing countries?

Tango International (2012), a technical support organization that provides survey assistance to international aid organizations, conducted the household surveys of cooperative members and non-members. A stratified sample of approximately equal numbers of members and non-members was drawn from the primary cooperatives—that is, the bottom-level cooperative in each of three cooperatives—in two of the cooperatives in Kenya and the cooperative in Uganda. Later, a smaller sample was drawn from the third cooperative in Kenya. Professionally trained and local-language-proficient staff conducted face-to-face interviews.

Findings

Income Gains From Cooperative Membership

Table 1 provides an overview of the demographic characteristics as well as the mean levels of monthly income from both dairy and non-dairy sources for members and non-members of the four cooperatives in the sample.

Members are older than non-members ($p < .001$) and have somewhat larger households ($p < .01$), more cows ($p < .001$), higher production per cow ($p < .01$), and higher levels of income from dairy than non-members ($p < .001$). Overall, there are no statistically significant differences between members and non-members with respect to the amount of milk consumed in the household or the amount of non-dairy income. Interestingly, in the only cooperative in which there is a statistically significant difference in the percentage of female-headed households, Kenya Cooperative C, 29 percent of the members are from female-headed households, compared to 18 percent of non-members ($p < .05$). Cooperative C also is the Kenyan cooperative with the highest level of non-dairy as well as dairy income.

There are some important differences in the demographic structure of households between the cooperative areas sampled. The educational level of the Ugandan sub-sample is lower ($p < .001$), and the average number of persons living in the household is higher ($p < .001$) than that of all three Kenyan sub-samples. These differences reflect the greater economic development in Kenya.

The average size of dairy herds in the Ugandan sub-sample of members (12.82) and non-members (8.25) is substantially higher than the size of herds in all three of the Kenyan sub-samples. The means for Kenya range from 1.48 to 2.01 cows for members and 1.36 to 1.59 for non-members ($p < .001$), but the production per cow in Uganda is much smaller (5.32L for members and 4.83 for non-members) compared to means of 9.86 to 11.46L per cow for members and 9.69 to 10.98 for non-members in the Kenyan sub-samples ($p < .001$). This difference in productivity also reflects the higher level of farm management practices in Kenya than in Uganda. Because of their larger number of cows, however, households in the Ugandan sub-sample have a statistically significant larger income from dairy than two of the three Kenyan samples, Cooperative A and Cooperative B ($p < .001$). Despite its smaller herd size, the dairy income of the third Kenyan sub-sample is

Table 1. Characteristics of Cooperative Members' and Non-Members' Households

	Coop. A Kenya		Coop. B Kenya		Coop. C Kenya		Coop. Uganda		Total	
	Member	Non-Member	Member	Non-Member	Member	Non-Member	Member	Non-Member	Member	Non-Member
Age of household head	54.38 (n = 691)	50.09 (n = 665)	53.65 (n = 704)	48.91 (n = 638)	58.36 (n = 173)	50.29 (n = 133)	56.08 (n = 675)	52.84 (n = 637)	54.97 (n = 2,243)	50.59 (n = 2,073)
Educational level ^a , HH	3.83 (n = 692)	3.70 (n = 667)	3.79 (n = 705)	3.77 (n = 638)	3.47 (n = 174)	3.60 (n = 134)	3.30 (n = 675)	2.94 (n = 639)	3.60 (n = 2,246)	3.48 (n = 2,078)
% Female head HH	22.83 (n = 692)	23.24 (n = 667)	17.87 (n = 705)	16.69 (n = 641)	29.31 (n = 174)	17.91 (n = 134)	18.37 (n = 675)	20.19 (n = 639)	20.44 (n = 2,246)	19.94 (n = 2,081)
No. persons in HH	4.67 (n = 689)	4.70 (n = 667)	4.47 (n = 703)	4.40 (n = 642)	4.46 (n = 173)	4.58 (n = 134)	9.04 (n = 674)	8.18 (n = 638)	5.91 (n = 2,239)	5.67 (n = 2,081)
Monthly non-dairy income US\$	255.78 (n = 522)	177.24 (n = 514)	239.58 (n = 547)	211.10 (n = 491)	436.47 (n = 137)	156.75 (n = 107)	366.43 (n = 589)	431.54 (n = 558)	300.94 (n = 1,795)	270.85 (n = 1,670)
No. of cows being milked	2.01 (n = 657)	1.59 (n = 600)	1.48 (n = 673)	1.36 (n = 592)	1.95 (n = 165)	1.41 (n = 123)	12.82 (n = 672)	8.25 (n = 615)	5.19 (n = 2,167)	3.63 (n = 1,930)
Normal milk production per cow	11.46 (n = 648)	10.98 (n = 583)	9.86 (n = 662)	9.69 (n = 583)	10.49 (n = 164)	9.96 (n = 123)	5.32 (n = 640)	4.83 (n = 583)	9.02 (n = 2,114)	8.59 (n = 1,872)
% Milk consumed	8.189 (n = 683)	6.79 (n = 652)	4.08 (n = 694)	4.20 (n = 626)	7.56 (n = 173)	5.94 (n = 130)	8.58 (n = 656)	5.75 (n = 627)	6.96 (n = 2,206)	5.62 (n = 2,035)
Monthly dairy income US\$	131.58 (n = 670)	93.78 (n = 651)	65.27 (n = 697)	54.66 (n = 641)	179.98 (n = 171)	95.18 (n = 132)	217.44 (n = 662)	120.11 (n = 622)	140.17 (n = 2,200)	89.62 (n = 2,046)

Note: ^aEducation HH head: 1, no school; 2, some primary/read write/adult ed/mandrassa; 3, complete primary; 4, some secondary; 5, complete secondary; 6, post secondary.

not statistically different from that of the Ugandan sample. Moreover, the larger size of the Ugandan households (members average nine household members and non-members eight) compared to the Kenyan households, which are approximately half the size (slightly more than four persons per household for both members and non-members), means that the per capita dairy income is actually lower in Uganda than in Kenya.

The results of the regression analysis shown in Table 2 address the following question: is the higher income from dairy that members of the cooperatives receive due to a unique effect of cooperative membership, or is this difference due, in part at least, to other factors that distinguish the member from non-member sub-samples?

The R^2 in equation (1) shows that the amount of variance explained by cooperative membership without any control variables is 1 percent. Adding the household demographic characteristics (equation 2), age of household head, educational level, and number of persons in the household increases the amount of explained variance by slightly more than 4 percent. Female-headed household is not a statistically significant predictor. The effect of cooperative membership remains small but statistically significant. The effect of household size on dairy income is consistent with other studies of the peasant “moral economy” (see Chaianov, 1966; O’Brien & Patsiorkovsky, 2006, pp. 75–93; Scott, 1976).⁶

Adding the amount of income a household earns from non-dairy sources, mostly other types of agricultural production, increases the amount of explained variance in dairy income to 11 percent (see equation 3), whereas the effect of cooperative membership remains small but statistically significant. Households that have higher incomes from dairy have higher incomes in general.

The characteristics of the household’s dairy operation—that is, number of cows being milked, the normal production of milk per cow, and the amount of milk consumed in the household—double the amount of explained variance in dairy income, to 24 percent, whereas the effect of cooperative membership remains small but statistically significant (equation 4). Finally, despite the wide variations in dairy income from one cooperative to another (see Table 1), the addition of the dummy variables to measure the impact of belonging to specific cooperatives increases the amount of explained variance by only three-tenths of 1 percent, whereas the effect of cooperative membership is slightly reduced but remains statistically significant.

Thus, we can conclude that although there is a statistically significant dairy income advantage for cooperative members compared to non-members, the actual amount of this difference is quite small. This suggests that there are other reasons for households to become members of the cooperatives. These factors are explored in the remainder of the article.

Selective Incentives, Trust, and Social Capital

Tables 3 and 4 provide insights into why some households join cooperatives and others do not. Table 3 summarizes the reasons given by non-members for not

Table 2. Regression of Dairy Income (Monthly US\$) on Cooperative Membership, Household Demographics, Non-Dairy Income, Current Milk Production, and Cooperatives (N = 3,406)

	Equation (1)	Equation (2)	Equation (3)	Equation (4)	Equation (5)
Constant	91.739	-80.212	-48.981	-111.408	-118.768
Member coop. (1 = member)	52.231*** (8.588)	43.288** (8.547)	38.948** (8.308)	17.451 (7.743)	17.338 (7.747)
Age of household head		.769* (.305)	.490 (.297)	.451 (.275)	.399 (.275)
Educational level ^a HH		16.293*** (2.750)	8.300** (2.734)	2.801 (2.573)	3.016 (2.577)
% Female-headed household		4.145 (10.742)	3.706 (10.434)	3.729 (9.660)	6.100 (9.664)
Number of persons in household		12.774** (1.194)	10.679** (1.169)	3.798* (1.226)	4.022* (1.322)
Monthly non-dairy income US\$.099*** (.007)	.067*** (.007)	.067*** (.007)
Number of cows being milked				9.252*** (.616)	9.494*** (.645)
Normal milk production per cow				6.091*** (.821)	5.729*** (.885)
Percent milk consumed				7.566*** (.696)	7.166*** (.715)
Coop. A Kenya (0,1)					17.325 (10.164)
Coop. C Kenya (0,1)					59.221*** (15.978)
Coop. Uganda (0,1)	36.992	36.470	63.667	108.717	5.369 (12.380)
F-value	.011	.054	.107	.236	83.051
Adjusted R ²					.239

Note: Unstandardized coefficients; standard errors in parentheses. ^aEducation HH head: 1, no school; 2, some primary/read write/adult ed/mandrassa; 3, complete primary; 4, some secondary; 5, complete secondary; 6, post secondary. *p < .05, one-tailed. **p < .01, two-tailed. ***p < .001, two-tailed.

Table 3. Non-Members' Reasons for Not Joining the Cooperative (Percent)

	Coop. A Kenya (n = 674)	Coop. B Kenya (n = 649)	Coop. C Kenya (n = 134)	Coop. Uganda (n = 640)	Total (N = 2,097)
Other buyers offer higher price	36.1	63.0	61.9	32.5	45.0
Poor coop. services	41.1	41.1	34.3	26.7	36.3
Does not produce enough milk	15.3	17.9	25.4	45.8	26.0
Membership fees too expensive	22.3	9.2	47.8	23.6	20.3
Long distance to collection point	13.8	10.6	16.2	28.8	17.2
Conflict with coop. leadership	14.1	10.3	18.7	10.0	12.0

joining. Close to half (45 percent) of the non-members cite the higher price that they receive for their milk from other buyers. The survey shows that close to 60 percent of the non-members report that "hawkers" are the primary buyers of their milk, with another 10 percent of the non-members selling to other entities, primarily schools. Conversely, close to 80 percent of the cooperative members report that the cooperative is their primary milk buyer.

Approximately one-fifth of the non-members mention that "membership fees are too expensive." In short, non-members appear to be basing their decision not to join their local cooperatives primarily on the basis of direct financial return on the sale of their milk.

Conversely, Table 4 shows that members do not mention milk price as a reason for joining their cooperative. Instead, the top six reasons for membership are "purchasing inputs on credit" (ranging from 52 percent to 66 percent of the Kenyan cooperatives, but only 11 percent of the Ugandan cooperative), "timely payment for milk" (41 percent for the total member sub-sample), "convenient payment for milk" (34 percent for the total member sub-sample), "training/cross visits" (ranging from 25 percent to 35 percent), "general credit" (ranging from 13 percent to 42 percent), and "purchase of excess milk" (ranging from 14 percent to 36 percent).

Four of the six benefits of membership reported by the respondents—purchasing inputs on credit, training/cross visits, general credit, and purchase of excess milk—are examples of what Olson refers to as *selective benefits* (1971,

Table 4. Benefits of Cooperative Membership Reported by Members (Percent)

	Coop. A Kenya (n = 692)	Coop. B Kenya (n = 705)	Coop. C Kenya (n = 174)	Coop. Uganda (n = 675)	Total (N = 2,246)
Purchase inputs on credit	51.7	65.7	53.5	10.5	43.9
Timely payment for milk	36.0	31.9	41.4	54.2	40.6
Convenient payment for milk	30.4	37.3	41.4	33.0	34.2
Training/cross visits	25.0	34.9	33.3	35.3	31.8
General credit	33.8	41.8	27.0	12.7	29.5
Purchase of excess milk	14.0	20.9	14.9	36.0	22.8

pp. 132–166). These benefits are selective because they are only receivable if a household is a member of the cooperative. As a “by-product,” the cooperative is able to use the member’s contribution—that is, a portion of the milk price—to pay the costs of collective non-divisible goods that will benefit all members, such as the bargaining power of the cooperative vis-à-vis milk buyers and/or by building processing plants to provide vertically integrated value-added services.

As we will note later, this selective benefit or by-product strategy for collective action works imperfectly, due to a lack of enforcement of cooperative rules mutually agreed to in the by-laws and articles of incorporation. Nonetheless, the use of selective incentives in these East African cooperatives is analytically similar to the use of this strategy in the United States, such as the provision of insurance, which was critical in forming the powerful Farm Bureau lobby, or membership dues that are used by professional associations to pay for the costs of collective lobbying efforts in legislatures (see Olson, 1971, pp. 132–167).

Additionally, five of the benefits mentioned by the respondents—timely payment for milk (41 percent), convenient payment for milk (34 percent), purchase of excess milk (23 percent), purchase of inputs on credit (44 percent), and general credit (30 percent)—fall under the rubric of *trust and social capital*. That is, members of the cooperative trust that they will receive payment in a timely and convenient way for their milk, which suggests a longer-term relationship with the cooperative than if they were selling milk to a buyer who could decide not to purchase it and/or could not be trusted to pay them in a timely or convenient way. This is an important factor in the local economy because even if a household has other sources of income, such as coffee, it cannot provide the weekly or biweekly “cash flow” that milk provides. Moreover, respondents report that the cooperatives purchase members’ milk during the “flush” season when there is an excess of milk, in which case individual buyers—“hawkers” in local parlance—are not buying because they cannot make a margin given the excess of milk. These incentives guaranteeing the household some level of stability and security are similar to the network relationships benefits employed by many successful businesses in developed countries, where firms are willing to sacrifice temporary gains in profit for longer-term confidence that suppliers or purchasers in a supply chain will be there when they are needed (see, e.g., Dore, 1988; Lazzarini et al., 2001).

Members’ Reports of Problems With the Cooperatives

Table 5 shows what members identify as the main problems with the performance of their cooperatives. Not surprisingly, low price for milk is mentioned by 40 percent of the total sample. Delay in milk payments is second, mentioned by 29 percent of the respondents, which is actually 10 percent less than the number of respondents who mentioned timely payment as one of the benefits of cooperative membership (see Table 4). These two complaints might result from relatively high degrees of operational inefficiencies in the cooperatives.

Table 5. Members' Reports of Main Problems With Their Cooperatives (Percent)

	Coop. A Kenya (n = 692)	Coop. B Kenya (n = 705)	Coop. C Kenya (n = 174)	Coop. Uganda (n = 675)	Total (N = 2,246)
Low price for milk	24.1	42.8	53.5	51.1	40.4
Delay in milk payments	24.4	36.9	20.1	25.9	28.5
Personal conflict with management or other coop. members	11.4	9.7	20.1	12.2	11.8
Collection times	9.7	13.1	5.8	11.0	10.8
Distance to collection point	4.5	4.5	8.6	19.3	9.3
Capital retain	6.9	3.1	1.7	16.2	8.1
Testing	3.8	7.5	11.5	8.0	6.8

Only 12 percent of the members complain about conflicts with other members or cooperative management, suggesting a high level of trust in the cooperatives. Moreover, this trust appears to be reinforced on a daily basis by the consistency and apparent fairness with which the cooperatives collect and test the quality of the milk that the farmers sell to them. Only 11 percent of the respondents complain about the times that their milk is collected, and only 9 percent see a problem in the distance they have to travel to a collection point. An even smaller number, 8 percent and 7 percent of the respondents, respectively, cite the capital retain and testing at the milk collection center as problems.

It appears that cooperative members, by and large, are satisfied with the performance of their cooperatives in a number of areas and recognize the benefits that they receive from them.

Selective Incentives, Member Engagement, and Effective Business Models

In spite of the aforementioned complaints, the cooperatives do draw a considerable share of the milk produced in their milk sheds. Why might this be? The data suggest that it is because of popular selective incentives.

Table 6 shows that there are substantial differences between cooperatives in the proportion of members who are aware of a given selective benefit, that is, a

Table 6. Members' Knowledge and Use of Services Offered by Their Cooperatives (N = 2,251)

	Coop. A Kenya (n = 691)		Coop. B Kenya (n = 709)		Coop. C Kenya (n = 175)		Coop. Uganda (n = 676)	
	Know About	Use	Know About	Use	Know About	Use	Know About	Use
Dairy inputs	78.4	68.7	80.0	68.4	78.29	66.9	16.7	13.9
Artificial insemination	63.5	46.9	64.6	53.0	72.57	47.4	4.1	2.7
Animal health services	32.2	24.9	34.6	22.6	68.57	52.0	28.4	29.9
Dairy inputs on credit	32.1	29.8	44.3	37.5	57.14	40.6	9.0	7.8
Savings and credit service	18.8	12.7	31.4	17.8	44.00	18.9	16.9	14.9

service that is provided only to members. These include the ability to purchase dairy inputs, such as feed, artificial insemination services, animal health (veterinarian) services; the purchase of dairy inputs on credit; and access to general credit and savings services. Additionally, there are differences in the gap between knowledge of the availability of a service and the number of members who actually use that service.

Before discussing the findings shown in Table 6, however, an important caveat is in order. Empirical verification of the services offered in the different cooperatives is tenuous at best. This confusion arises in part from the fact that a given service may be offered in one primary cooperative that is a constituent part of a federated cooperative but not in others, and/or that a service may be provided intermittently. Nonetheless, the data do reveal some relevant challenges that the cooperatives face and some potential opportunities with which they might increase member loyalty.

The biggest gap in reported availability of services is between members of the Kenyan and Ugandan cooperatives. This is seen especially in the case of the provision of dairy inputs—that is, forage, grains, and supplements—and artificial insemination (AI) services. Close to eight out of ten members of the Kenyan cooperatives are aware of dairy input services offered by their cooperatives, compared to only 17 percent of the members of the Ugandan cooperative. Similarly, high numbers of Kenyan cooperative members—ranging from 64 percent to 73 percent—are aware of AI services, but fewer than 5 percent of Ugandan respondents report the availability of this service, suggesting this service has different distribution channels in the two countries.

The level of availability reported by the Ugandan respondents is considerably lower than that of the Kenyan respondents, even in areas where the Kenyan respondents report lower levels of services being provided by their cooperatives, animal health, dairy inputs on credit, and savings and credit services for general purposes (e.g., some members mentioned the need for credit to pay school fees for their children or to buy additional human food for holidays).

The significantly higher level of service provision by the Kenyan cooperatives reflects the higher level of general economic development in that country compared to Uganda. The challenge for these cooperatives is to identify the types of selective incentives that can compete effectively with those delivered by other private or governmental sources in a particular market. The specific services that can become selective incentives are going to differ from one country to another and from one region to another within the same country. This involves a clear understanding of local and regional markets and the development of effective plans that take into account the exigencies and opportunities present in each environment.

Table 6 shows that even within the same country, there are substantial differences in the kinds of selective benefits that are offered by individual cooperatives. Kenya Cooperative C, which is a centralized cooperative, has higher levels of member awareness of availability on four of the five services listed than the two federated Kenyan cooperatives. Moreover, Cooperatives A and C share

overlapping areas for milk production that are not far from Nairobi, the capital and largest city in Kenya. This suggests that it is not only fixed market or geographical factors that influence the viability of a cooperative but also the ability of any given cooperative board and management to develop a strategy that includes effective selective incentives to reflect members' preferences. This interpretation is reinforced by another portion of the baseline project in which the past performance and current business plan of Cooperative C was rated much higher than that of the other Kenyan cooperatives.

The other portion of Table 6 that is relevant to our analysis is the differences between members' knowledge of the availability of services and their actual use of those services. A relatively low gap (10–12 percent) between knowledge of a service and its use by members, as is the case with "dairy inputs" in all three of the Kenyan cooperatives, would suggest that a particular service is desired by members and the cooperative is able to compete with other providers in delivering that service. Alternatively, when there is a large gap between members' awareness of the availability of a service but they do not use this service, it is likely that members either make a judgment that the service does not provide enough benefit for them or that they can obtain the same or better quality of service from other providers at the same or a lower price.

For members of all three Kenyan cooperatives, for example, the gap between awareness of the availability of AI services and the use of those services is larger than the gap between awareness and use of dairy inputs. A simple explanation here is that for many small farmers, the benefits of AI would take from 5 to 10 years to realize and thus they might opt to use a bull instead. Finally, there are some services in which there are both low levels of awareness of their availability and use. This includes animal health, dairy inputs on credit, and general savings and credit services.

The critical question is, to what extent are differences in awareness of service availability, and perhaps even more importantly, gaps between availability and use, due to relatively fixed local environmental conditions, such as distance from metropolitan areas or presence of other service providers, versus differences in the way individual cooperatives have business strategies to match the services they provide to local conditions and their preferences of their members?

Discussion

The most important conclusion to be drawn from the findings we have presented is that, despite differences in the scale of farms and their political and economic histories, there are fundamental similarities in the opportunities and challenges facing vertically coordinated cooperatives in developed and developing countries. There appear to be three commonalities between cooperatives in these two different contexts. The first is that the primary motivating factor driving formal collective action in both economies is to generate net income to enhance the socioeconomic welfare of their member-patrons. While not minimizing net income as a motivating factor for membership in a cooperative, however, there

are two other factors that determine cooperative performance. These are *selective incentives* and *embedded social capital*.

Cooperatives in both the developed and developing world strategically utilize *selective incentives* to attract and maintain member patronage. The third factor employed to attract and maintain member patronage is *embedded social capital at the grassroots level*. Social capital is a necessary condition for transparency and trust. In addition to fostering democratic practices in organizational governance, social capital embedded in cooperative membership has additional benefits for the long-term development of civil society in developing countries by reinforcing positive relationships between formal and informal institutional arrangements (see, e.g., O'Brien, 2012; Szelenyi & Kostello, 1998).

Rather than viewing formal and informal institutional arrangements as competing with one another, as is the case with either the command economy or the purely unregulated market models, our findings suggest that the cooperative model combines the complementary features of both of these institutional arrangements. On the formal institutional side, this includes support such as third-party enforcement of rules regarding "countervailing power" in the marketplace, whereas on the informal institutional side the cooperative model builds upon the social networks and trust that have been established through generations of informal collective action at the local level. Importantly, small farmer members' experiences in learning about governance, bylaws, and other formal institutional mechanisms of participatory democracy are likely to have a positive effect on the development of the larger institutional fabric of civil society.⁷

Nevertheless, there are important, unique challenges facing cooperatives in developing economies. Some of these challenges can be met simply by providing cooperative board and management access to formal education and training programs that deal with the complexity of a market economy and the ambiguity in designing and operating successful firms.

The more difficult challenge, however, is to find ways to solve the problem of linking the benefits of collective action with the responsibilities of individual members *in the local cultural context within which the cooperative is operating*. Our study found, for example, that despite the fact that members do appreciate the services they receive, they do not always sell their milk to their cooperative. Although the financial performance of the cooperatives in the study varied widely, one of the problems that all of them faced to a greater or lesser extent, especially the Kenyan cooperatives with processing plants operating at less than breakeven capacity, was member "side selling" to other firms or to informal "hawkers" who buy milk house to house and sell in the informal, unregulated market. An obvious remedy to this problem is for members to sell all of the milk they do not consume at home to the cooperatives. Yet, there was a persistent reluctance to impose what Ostrom refers to as "graduated sanctions" (1990, pp. 185–192) on those who did not meet this patronage requirement. During our interviews with board members, it was clear that they recognized that this was an essential problem they faced but seemed quite perplexed as to how to solve it.

Yet, solutions do exist. The challenge for cooperative boards and management, governments, donors, academics, and practitioners is to identify ways in which members will respond to specific positive incentives and enforced sanctions. To survive and succeed, the primary objective of collective entities is to minimize ownership costs—particularly agency, collective decision-making, and risk-bearing costs. Minimizing these organizational costs requires precise measurement techniques, including the use of mixed-methods empirical approaches such as experiments, game theory, surveys, focus group case studies, and multivariate data-intensive analysis. Especially relevant here is the need to understand how local cultural norms and informal institutional arrangements inform formal organizational entities by providing bridges and/or barriers to the efficacy of different types of selective incentives, trust, and graduated sanctions.

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Notes

1. Mancur Olson argues that *selective* or *individual incentives* play a critical role in the formation of collective action organizations for persons in a *latent group* with a common economic interest, such as potential members of labor unions, agricultural cooperatives, and various types of lobbying organizations. He contends that “only a *separate* and *'selective'* incentive will stimulate a rational individual in a latent group to act in a group-oriented way. In such circumstances group action can be obtained only through an incentive that operates, not indiscriminately, like the collective good, upon the group as a whole, but rather *selectively* toward the individuals in the group” (1971, p. 51).
2. James Coleman states that “social capital is defined by its function. It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors—whether persons or corporate actors—within the structure. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that in its absence would not be possible. Like physical capital and human capital, social capital is not completely fungible but may be specific to certain activities. A given form of social capital that is valuable in facilitating certain actions may be useless or even harmful for others” (1988, p. 16).
3. Ronald Dore (1988) describes how a crucial element in the ability of Japanese firms to gain a significant share of the post-World War II textile market was their “flexible rigidity,” which was predicated on the development of long-term, trusting relationships between specific firms.
4. Patrons are those who transact with a cooperative, whether by selling (e.g., raw materials such as milk) or by purchasing goods (e.g., feed or grass seed) or services (e.g., artificial insemination). Member-patrons control cooperatives and net income is returned to patrons as patronage refunds.
5. Uganda has a per capita GDP of \$1,400 (2012 est.), which ranks 206 out of 229 countries and regions, and its real GDP rate was 2.6% in 2012 (The World Factbook, 2013). The World Bank “Doing Business” index ranks Uganda as 120 out of 185 (World Bank, 2013). The country has a history of agricultural cooperatives that goes back to 1913, when smallholder farmers organized defensive collective organizations to obtain better prices from colonial administrators and middlemen who controlled the coffee and cotton markets. At the time of independence,

cooperatives were an important part of Ugandan civil society as well as economic life. With the emergence of the dictator Idi Amin, however, agricultural cooperatives were weakened. In the post-Amin period, the liberalization of the economy has generated new challenges as well as opportunities for revitalized Ugandan cooperatives. Economic and political stability has expanded markets for processed milk and dairy products, but dairy cooperatives are competing in a very concentrated market structure (Kwapong & Korugyendo, 2010a, 2010b). Our baseline research has found that today one firm owns much of the established dairy cold chain infrastructure throughout the country.

Kenya has a per capita GDP of \$1,800 (2012 est.), which ranks 198 out of 229, and its real GDP rate in 2012 was 4.7% (The World Factbook, 2013). The World Bank's "Doing Business" index ranks Kenya as 121 out of 128 (World Bank, 2013). A brief summary of agricultural cooperative development in Kenya from independence in 1963 to the end of the 1990s is found in an FAO case study report on capital formation in Kenyan-owned cooperatives (FAO, 1999). The report concludes that following independence in 1963, the Kenyan government promoted a cooperative development movement, which focused on smallholder farmers. This movement was linked to a government-controlled program in which the Kenya Cooperative Creamery (KCC) operated in a monopoly position in collecting milk from producers. Since 1992, however, cooperatives have had to compete in a liberalized milk market. This has led some cooperatives to attempt to move further into the processing of value-added products (FAO, 1999). Our baseline research, however, has found some serious problems facing the cooperatives that are seeking to gain more producer control over the vertical value chain.

6. Unfortunately, the survey did not provide a complete enumeration of the ages of household members.
7. A more extensive development of this theme will be presented in a forthcoming paper.

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