COOPERATIVES
FOR STAPLE CROP MARKETING

Evidence from Ethiopia

Tanguy Bernard, David J. Spielman, Alemayehu Seyoum Taffesse, and Eleni Z. Gabre-Madhin

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Foreword

During the 1980s, agricultural-sector reforms in many developing countries led to the dismantling of rural producer organizations (RPOs)—farmers' organizations, associations, and cooperatives. This was part of a larger process aimed at reducing the role of the state in the economy, eliminating inefficiencies in food production, and encouraging the growth of competitive markets in the agricultural sector. These reforms assumed that the private sector would replace the state as the key source of agricultural inputs and marketing services for smallholder farmers. While this has occurred in some countries with respect to cash crops, it is far less common in the case of staple foodcrops—crops that are critical to the livelihoods of the vast majority of smallholders in the developing world.

In recent years, RPOs have reappeared on the international development agenda as a potentially important means of linking farmers to markets, increasing agricultural productivity, and ultimately reducing rural poverty. Innovative RPO models are being held up as the key to helping smallholders better manage the procurement and distribution of inputs, aggregate their surplus farm output, and bargain for better terms of trade in the marketplace. These same models are also being leveraged to help government agencies and nongovernmental organizations to better identify and reach out to the rural poor with an array of social and economic welfare programs.

However, it is not clear how effective these RPO models may be, particularly for smallholders who cultivate food staples. What is missing is a sufficient body of evidence on where, when, and how RPOs benefit the rural poor—a significant gap in light of the checkered history of cooperatives in many countries. While evidence suggests that cooperatives play a constructive role when high-value agricultural commodities such as dairy and horticultural products are involved, there is far less evidence of their contribution to increasing returns to farmers who cultivate staple foods, particularly cereals. This is because food staples are quite different from high-value crops in that they rarely offer the lucrative returns to farmers that high-value crops do. Staples are also more susceptible to distortions caused by urban-biased price-control policies and the competing price effects of food aid and food imports.

Ethiopia presents an important case in point. Low productivity, high transaction costs, limited use of modern inputs, and minimal levels of commercialization among small-scale, resource-poor farmers are defining characteristics of agriculture in Ethiopia. The results—endemic rural poverty and chronic food insecurity—are all too well known.

Yet farmers, policymakers, and administrators in Ethiopia have made concerted efforts in recent decades to reverse this situation. One particular effort has been to strengthen the role of farmers' cooperatives in marketing farm output, thereby reducing the costs of moving agricultural commodities from farmers to consumers and improving farmers' bargaining power in the country's expanding market economy.

This study provides some new empirical evidence that may help us understand the conditions under which cereal marketing cooperatives are promoting smallholder commercialization and generating rural welfare improvements in Ethiopia. We hope that this evidence will provide new insights for policymakers, researchers, and development practitioners who are encouraged by the re-emergence of RPOs as a means of benefiting the rural poor.

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Acronyms and Abbreviations

BoARD	Bureau of Agriculture and Rural Development
BoCP	Bureau of Cooperative Promotion
CBO	community-based organization
ECS	Ethiopian Cooperatives Survey
EDRI	Ethiopian Development Research Institute
ESCS	Ethiopian Smallholders Commercialization Survey
FCA	Federal Cooperatives Agency
GDP	gross domestic product
GoE	Government of Ethiopia
IFPRI	International Food Policy Research Institute
NGO	nongovernmental organization
RPO	rural producer organization
SNNP	Southern Nations, Nationalities, and Peoples regional state

Currency

Ethiopia Ethiopian birr (ETB)

Summary

The commercialization of crops grown by small-scale, resource-poor farmers has the potential to increase household food security, reduce rural poverty, and contribute to agricultural development and economywide growth. By encouraging the application of modern inputs and farming techniques, diversification out of low-yielding subsistence crops, and specialization in more tradable crops, commercialization can increase farming incomes, enhance purchasing power, and reduce vulnerability among smallholders. If the positive output shocks resulting from large-scale technological changes are offset by short-term policies to manage the resulting negative price and income effects, this commercialization process can rapidly shift smallholders from low-productivity, low-income traps to higher-productivity, higher-income livelihood systems that are integrated into the wider modern economy.

However, in the face of imperfect markets, high transaction costs, and agroclimatic risks, few smallholders in Sub-Saharan Africa have been able to realize the potential gains from commercialization. This is particularly true with regard to smallholders who cultivate food staples. Such crops constitute the bulk of agricultural production in Africa and employ the majority of people, and therefore hold the greatest potential for poverty reduction on the continent. Commercialization of food staples—especially cereal crops—in the region is very low due to their generally low returns to producers, nondifferentiability in local markets, susceptibility to urban-biased price controls, and vulnerability to the competing price effects of food aid and food imports.

Without appropriate institutional mechanisms to improve the market incentives for cereal production, smallholders throughout the region are unlikely to realize the benefits of commercialization any time soon. Rural producer organizations (RPOs)—such as farmers' organizations, producers' associations, and rural cooperatives—represent one such mechanism. After a 25-year hiatus, RPOs have returned to the policy agenda as a means of promoting equitable growth and poverty reduction. By leveraging the power of collective action, RPOs are expected to help smallholders gain a footing in competitive markets, help development partners in reaching the poor, and provide a voice to underrepresented communities and households in rural areas.

However, empirical evidence about how RPOs contribute to growth and development in smallholder-based agriculture is required in order to help realize the potential of RPOs. This study meets the need for evidence through an intensive analysis of data from two in-depth surveys conducted in Ethiopia in 2005 and 2006. The analysis aims to identify the conditions under which RPOs engaged in cereal marketing successfully promote smallholder commercialization and to determine how the benefits are distributed.

CHAPTER 1

Introduction

Smallholder Commercialization, Food Staples, and Sub-Saharan Africa

Smallholder commercialization and rural welfare are closely linked concepts. There is extensive theoretical and empirical evidence showing how the commercialization of small-scale, resource-poor farmers can lead to increases in household food security and reductions in rural poverty, and how these improvements can contribute to agricultural development and economywide growth (for example, Timmer 1988; Fafchamps 2005). By encouraging the application of modern inputs and farming techniques, diversification out of low-yielding subsistence crops, and specialization into more tradable crops, commercialization can increase farming incomes, enhance purchasing power, and reduce vulnerability among smallholders. If the positive output shocks—the commodity gluts—resulting from large-scale technological changes are offset by short-term policies to manage the resulting negative price and income effects, this commercialization process can rapidly shift smallholders from low-productivity, low-income traps to higher productivity, higher income livelihood systems that are integrated with the wider modern economy.[1] The evidence from the so-called Green Revolution in Asia during the late 1960s is a testament to this, as are other, more incremental processes of smallholder commercialization in Asia and Latin America since then (Hazell and Ramasamy 1991; Rosegrant and Hazell 2000; Hazell and Haddad 2001).

However, in the face of imperfect markets, high transaction costs, and significant agroclimatic risks, few smallholders in Sub-Saharan Africa have been able to realize the potential gains from commercialization. This is particu-

[1] The choice of which policies are appropriate is a matter of debate. Solutions range from market liberalization as suggested (Schultz 1978) to redistributive pricing policies (Taylor 1980; Streeten 1987) or short-term price stabilizing interventions (Timmer 1997). See Gabre-Madhin, Barrett, and Dorosh (2003) for a review of options for addressing the theory of the "agricultural technology treadmill" first posited by Cochrane (1958).

larly true with regard to smallholders who cultivate food staples—crops that constitute the bulk of agricultural production in Africa, employ the majority of people, and therefore hold the greatest potential for poverty reduction on the continent (Omamo et al. 2006; World Bank 2008). Commercialization of food staples—particularly cereal crops—in the region is particularly low (Table 1.1).

Low commercialization of cereals in Sub-Saharan Africa stems from the unique and challenging nature of cereals, including their generally low return to producers, nondifferentiability in local markets, susceptibility to urban-biased price controls, and vulnerability to the competing price effects of food aid and food imports (see, for example, Gabre-Madhin 2001; Barrett 2008). Without appropriate institutional mechanisms to improve the market incentives for cereal production, it is unlikely that smallholders throughout the region will realize the benefits of commercialization any time soon.

Over the past decade, rural producer organizations (RPOs) have re-emerged as one such mechanism. Farmers' organizations, producers' associations, and rural cooperatives have returned to the policy agenda after a 25-year hiatus as a means of promoting equitable growth and poverty reduction (see, for example, Collion and Rondot 1998; World Bank 2003, 2008). By leveraging the power of collective action, RPOs are expected to assist smallholders in aggregating their surplus output, realizing scale economies in marketing, and bargaining for better terms of trade in the marketplace. RPOs are also expected to serve as a means of identifying the rural poor, securing grassroots partners for state and nonstate development programs, and representing the voice of the rural poor in local governance systems. In short, RPOs are viewed as a key institutional mechanism to improve rural livelihoods.

This renewed interest in RPOs is of importance to Sub-Saharan Africa, where agriculture is the mainstay of the region's economy and where agricultural growth and development are decidedly smallholder-based.[2] However, without empirical evidence on exactly how RPOs contribute to growth and development in smallholder-based agriculture, it is unclear how much this newfound interest can contribute. Thus, this study aims to better identify the conditions under which RPOs specifically engaged in cereal marketing are successfully promoting smallholder commercialization and how the benefits are distributed, using illustrations from cooperatives in Ethiopia.

[2] Agriculture is the primary source of livelihood for about 65 percent of all people living in Sub-Saharan Africa, and it accounts for up to 40 percent of the region's gross domestic product (GDP) and around 60 percent of the region's exports. And more than 90 percent of agricultural production is attributable to small-scale farming (Resnick 2004).

Table 1.1 Participation in staple foodgrain markets, eastern and southern Africa

Country	Crop	Year	Percentage of sellers	Study
Ethiopia	Maize, teff	1996	25n	Jayne, Zulu, and Nijhoff (2006)
	Barley	1999–2000	10g	Levinsohn and McMillan (2007)[a]
	Maize		23g	
	Sorghum		11g	
	Teff		20g	
	Wheat		12g	
Kenya	Maize	1997	29n	Nyoro, Kiiru, and Jayne (1999)
		1998	34n	
		1999	39n	Renkow, Hallstrom, and Karanja (2004)
		2000	30n	Jayne, Zulu, and Nijhoff (2006)
Madagascar	Rice	1990	32g	Barrett and Dorosh (1996)
		2001	25n	Minten and Barrett (2008)
Mozambique	Basic food	1996–97	14g	Heltberg and Tarp (2002)
	Maize	2001–02	30g	Boughton et al. (2007)
	Maize	2005	16g	Tschirley and Abdula (2007)
	Rice	2002	43n	
Rwanda	Beans	1986–97	22n	Weber et al. (1988)
	Sorghum		24n	
Somalia	Maize	1986–87	39n	Weber et al. (1988)
Tanzania	Food	2003	33n	Sarris, Savastano, and Christiaensen (2006)
Zambia	Maize	2000	26n	Jayne, Zulu, and Nijhoff (2006)
Zimbabwe	Maize	1984–85	45n	Weber et al. (1988)
	Grain	1996	27g	Govereh and Jayne (2003)

Source: Barrett (2008).
Note: g means gross; n means net.
[a]Rural households only.

RPOs: A Historical Perspective

The historical record demonstrates just how valuable RPOs can be to agricultural development. For example, RPOs have played an important role in transforming the rural economies of many industrialized countries.[3] In the European Union there are some 30,000 agricultural cooperatives with 9 million members, accounting for 50 percent of the overall market for agricultural inputs and 60 percent of the market for agricultural products (Mercoiret, Pesche, and Bosc 2006). In the United States, cooperatives control about 80 percent of the country's dairy production system and are deeply involved in a range of specialty agricultural commodities.

[3] See Malassis (2000) for a description of how farmers' organizations were instrumental in France's agricultural and rural development.

RPOs have also played an important role in Latin America and Asia (see, for example, Damiani 2000, 2001; Berdegue 2001). In Colombia, the National Federation of Coffee Growers provides marketing services to a half-million coffee growers, most of them smallholders with less than 2 hectares of land. In India, cooperatives account for 22 percent of domestic milk production. They have played a central role not only in organizing milk production and marketing among more than 12 million small-scale producers (each holding just one or two cows) but also in moving the country out of chronic shortages and into the dairy export business (Sharma and Gulati 2003).

RPOs also have a recognized role to play in the management of natural resources, where collective action among small farmers is often a necessary condition for sustaining the equitable use of water resources, pasture lands, and other common pool resources. Syntheses by Agrawal (2001) and Meinzen-Dick et al. (2002), among others, provide insight into the importance of group size, composition, and structure as factors that contribute to success in the collective management of natural resources.

Of course, RPOs also have a well-known record of failure in many developing countries. Intractable market constraints, politicization of leadership, elite capture, and breakdowns in collective action are just some of the factors contributing to RPO failures (see, for example, Tendler [1983] on Bolivia and Banerjee et al. [2001] on India). This record of failure is a reality in Sub-Saharan Africa as much as elsewhere in the developing world. To provide some context for this study, we review here the history of RPOs in Sub-Saharan Africa in broad brushstrokes, from the 1960s to the present.

At the time of the emergence of independent African nations in the 1960s, RPOs (more commonly referred to as cooperatives) existed in many African countries. In Anglophone African countries, such as Kenya, South Africa, Zambia, and Zimbabwe, organizations representing the interests of large-scale farmers played an important role in lobbying for state support for marketing, input supply, and research (Jayne and Jones 1997). Some of these organizations, such as the Kenya Farmers Association or the Buganda Growers Association, were formed as early as the 1920s to organize the collective marketing of such cash crops as maize and were closely linked to state marketing boards and input supply monopolies (Ariga, Jayne, and Nyoro 2006; Develtere, Pollet, and Wanyama 2008).

Several exceptions in Anglophone Africa suggest that colonial authorities did have some interest in encouraging cooperatives among small farmers. Organizations established in the 1920s, such as the Kilimanjaro Native Farmers Association in Tanganyika or the Buganda Growers Association, sought to promote collective marketing of coffee and cotton by “native” smallholders. These and other smallholder cooperatives were generally based on very simi-

lar designs that drew on the colonial experience in South Asia, suggesting a one-size-fits-all approach that may have not been entirely appropriate for Africa's many and varied socioeconomic contexts (Kabuga 2005; Develtere, Pollet, and Wanyama 2008).

In Francophone countries, the experience was somewhat different. Colonial legislation dating back to 1893 encouraged the establishment of Sociétés Indigènes de Prévoyance, de Secours et de Prêts Mutuels. These Provident Societies (which later became "Mutual Societies for Rural Development") were intended to support the production of agricultural commodities among small and large farmers with both input and marketing services. As they evolved, they took on such characteristics as compulsory membership and became vehicles of state influence, though not to the extent seen in Anglophone Africa (Develtere, Pollet, and Wanyama 2008).

It was not until immediately after independence that the issue of RPOs and small-scale farmers took center stage in the region's agricultural sectors. Newly independent governments widely promoted them as a means of modernizing the agricultural sector while also building on traditional solidarity norms in rural communities (Bosc et al. 2003). For example, these RPOs played a role in improving access to household assets and agricultural services for small-scale farmers in Zimbabwe during the early 1980s and may have contributed significantly to the country's food security following the protracted struggle for independence (Bratton 1986).

In most cases, these cooperatives were closely tied to centrally planned production and marketing systems—systems that were fairly unfamiliar to smallholders and were designed without allowances for direct control by the members themselves. They were, in effect, cooperatives without the benefit of cooperators (Bosc et al. 2003). Weak economic incentives, excessive state intervention, elite capture, and other forms of rent-seeking behavior did little to modernize agriculture or to generate the surpluses needed to foster wider growth, development, and poverty reduction (Lele 1981; Braverman, Guasch, and Huppi 1991; Deininger 1995; Jayne and Jones 1997; Bosc et al. 2003).

Policy reforms introduced under the structural adjustment programs of the 1980s in many Sub-Saharan African countries significantly diminished the role and influence of state-controlled RPOs throughout the region. Yet the private investors and entrepreneurs who were, in theory, expected to replace these cooperatives as intermediaries between supply and demand failed to materialize, except in a few isolated cases relating to high-value crops (Jayne and Jones 1997; Dorward et al. 2004; Piesse et al. 2005; World Bank 2008). Smallholders whose livelihoods depended on cereals and other food staples remained largely tied to the low-productivity, low-income trap.

Since the 1990s, a new breed of RPOs has emerged in some Sub-Saharan African countries that is defined by three key characteristics. First, these RPOs are member-controlled entities (rather than instruments of the state) firmly rooted in the rural communities that they mean to serve. Second, they maintain voluntary and open membership policies, rather than compulsory membership, as in many earlier cooperatives. Third, they often provide a wide array of services to their members, ranging from marketing of members' surplus output to the provision of public goods for the community (Bernard et al. 2008; Develtere, Pollet, and Wanyama 2008). Tables 1.2 and 1.3 provide an indication of the size and extent of these cooperatives in selected Sub-Saharan African countries.

Today there is growing evidence of RPO successes from across the region, particularly in the area of agricultural commodity marketing. Examples include cotton in Mali (Tefft 2004), green beans in Kenya (Narrod et al. 2008), coffee in Ethiopia (Kodama 2007), onions in Burkina Faso (KIT and IIRR 2008), dairy in Kenya (Sinja et al. 2006), and others that are synthesized in Markelova et al. (2008). Yet few of these success stories focus on RPOs involved in the production and marketing of food staples. And apart from a review by Coulter (2007) on farmer groups and staple-food marketing in Africa and one by Shiferaw, Obare, and Muricho (2008) on dry legumes in Kenya, few studies examine grain-marketing cooperatives and their impact on production, commercialization, and poverty. And fewer still provide rigorous assessments of the extent to which RPOs include poorer households at the intracommunity level (Collion and Rondot 2001; Ferris, Engoru, and Kaganzi 2008). Only a couple of reports are based on a quantitative approach (Donnelly-Roark, Ouedraogo, and Ye 2001 on Burkina Faso; Bernard et al. 2008 on Senegal and Burkina Faso). Given the importance of food-staple production to rural livelihoods in Sub-Saharan Africa, the persistent market failures that

Table 1.2 Evolution of the number of cooperatives in selected countries, 1989–92 and 2005

	Number of active cooperatives		Number of members (million)	
	1989-92	2005	1989-92	2005
Ghana	1,000	2,850	n.a.	2.4
Kenya	4,000	7,000	2.5	3.3
Nigeria	29,000	50,000	2.6	4.3
Senegal	2,000	6,000	n.a.	3.0

Source: Develtere, Pollet, and Wanyama (2008).
Note: n.a. means not available.

Table 1.3 Incidence of cooperatives in nine African countries

Country	Population (million)	Number of cooperatives	Number of members (thousand)
Cape Verde	0.47	300	6
Egypt	73.4	13,100	10,150
Ethiopia	72.4	14,400	4,500
Ghana	21.4	2,850[a]	2,400
Kenya	32.4	10,640[b]	3,370
Niger	12.4	11,300[c]	332
South Africa	45.2	5,000	75
Senegal	10.3	6,000[d]	3,000
Uganda	26.6	7,476	323
Total	429.8	71,066	30,136

Source: Develtere, Pollet, and Wanyama (2008) based on data from various government agencies.
Note: The average penetration rate for all countries is 7 percent.
[a]Includes both registered cooperatives and village associations. An estimated 1,300 are reported to be viable.
[b]An estimated 7,000 are reported to be currently active.
[c]Includes "pre-cooperatives." Figures are thought to be problematic (see Develtere, Pollet, and Wanyama 2008).
[d]Also includes Groupement d'Interet Economique and pre- and non-cooperatives.

constrain the commercialization of food staples, and the potential contribution that collective action could make to reducing rural poverty, there is much to gain from a closer examination of RPOs as a possible solution (Uphoff 1993; Chirwa et al. 2005; Neven, Reardon, and Hopkins 2005; Mercoiret and Mfou'ou 2006; Mercoiret, Pesche, and Bosc 2006; Bernard et al. 2008).

Past studies of these issues point out that although cooperatives are potentially important in improving price incentives and encouraging small-scale production, nonprice factors (such as the composition and design of the cooperative, or the dynamics of collective action) also have a significant influence on the supply response from small farmers (Lele 1975; Bebbington 1996; Poulton, Dorward, and Kydd 2005; Develtere, Pollet, and Wanyama 2008). In its *World Development Report* (2008), the World Bank highlights the issue in terms of the unresolved conflict between efficiency and equity: RPOs must balance community norms of social inclusiveness and solidarity against business norms of professionalism and competitiveness. As policymakers and donors throughout Sub-Saharan Africa begin to invest anew in efforts to promote cooperatives, there is a need to generate new knowledge about the potential efficiency–equity trade-offs inherent in grain-marketing cooperatives.

Key Concepts and Issues

To better identify the key concepts relating to this study, we examine here three issues relating to smallholder commercialization and RPOs. The first issue focuses on the role of collective action in helping smallholders overcome marketing constraints. The second issue concerns the extent to which poorer households tend to participate in RPOs. The third issue examines the possible constraints on an RPO's marketing performance. These issues are used to guide the empirical elements of this study presented in later sections.

Issue 1: Collective Action Can Help Smallholders Overcome Marketing Constraints

Although smallholders in many developing countries have benefited in recent decades from technological advances in agriculture, they face relatively greater challenges when it comes to commercializing their surplus output (see, for example, Dorward et al. 2004; Fafchamps and Hill 2005). One way of explaining the persistently low levels of smallholder commercialization relates to the idea of transaction costs: the costs entailed in marketing surplus output create a wide differential between selling and purchase prices, limiting the benefits smallholders are able to accrue from their market-based exchanges. These transaction costs may include the costs associated with finding a partner to trade with, delivering the commodity, negotiating a contract, or enforcing the agreement (for example, de Janvry, Fafchamps, and Sadoulet 1991).

Importantly, some of these transaction costs are fixed (that is, independent of the size of the transaction); thus the unit cost of transacting tends to decrease as the amount to be sold increases. Therefore—in addition to such problems as lack of collateral, distress selling, and information asymmetries—smallholders typically face proportionally higher transaction costs than do other types of sellers because of the small size of each transaction. In some cases, it may be more advantageous for a household not to participate in the market at all (Goetz 1992; Key, Sadoulet, and de Janvry 2000). In other words, if the difference between the price received and the transaction costs is not at least equal to the reservation price demanded by the producer (based, for example, on costs of production), the producer will not engage in market transactions.

Collective action mechanisms can help smallholders reduce the transaction costs of commercializing their surplus output. By pooling their surplus output into a single tradable lot and using this larger quantity as the basis for negotiating with buyers, they can increase their bargaining power in the market and reduce per-unit transaction costs. In short, an organization that aggregates its members' outputs can reward them with increased access to market as well as better rewards through higher prices.

Issue 2: Poorer Households Tend to Participate Less in RPOs

Despite the potential benefits of collective action, there is limited evidence that the poorest of the poor either participate in or benefit from such organizations when the latter are specifically formed for the purpose of commercializing surplus output. For instance, a study by Thorp, Stewart, and Heyer (2005) examines 80 case studies of collective action organizations and finds that the chronically poor are rarely included in these types of groups; it also concludes that their exclusion contributes to a vicious cycle of chronic poverty.[4] Chirwa et al. (2005) argue that this failure to participate may reflect several factors: lack of productive assets (land, livestock, or equipment), financial assets (cash to pay membership fees), or social capital (access to a collective action organization based on ethnicity, social status, social ties, or other such characteristics).

Several types of mechanisms may contribute to this apparent exclusion of the poorest. First, RPOs may be inclusive at the community level but are likely located in more prosperous villages that have higher market opportunities, lower pressure on land, better cropping opportunities, or lower environmental risks (Chirwa et al. 2005; Bernard et al. 2008). Second, within a community, poorer households may choose not to participate in these organizations if the benefits they would derive from it would be too low. Note that the household's gains from participating in the RPO can be measured as the per-unit gain in transaction costs obtained through product aggregation, multiplied by the household's level of production. The per-unit gain itself is the difference between the per-unit transaction cost the smallholder faces when selling her product alone and the per-unit transaction cost that she faces when selling through the RPO. For very low levels of production, even though the per-unit transaction cost gains will be high, the overall benefits will be low because of the small quantity to be commercialized, so that the overall benefit may not be sufficient to outweigh the costs of participating in the organization.[5]

Third, RPOs themselves may choose to restrict their memberships to households with sufficient production levels. Indeed, in the case of a pure marketing organization, the value of each additional member will depend on her con-

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[4] Note, however, that even if groups do exclude the very poorest, they may nonetheless contribute to poverty reduction provided they are formed among the poor (Thorp, Stewart, and Heyer 2005).

[5] A similar problem arises for high levels of production. Although the quantity to be commercialized is high, the gains in per-unit transaction costs are low, leaving the overall benefits from membership relatively low. The overall gains from membership are greatest for smallholders with an intermediate level of production, suggesting an inverted U-shaped relationship between the benefit from participation and the farmer's production level.

tribution to product aggregation (and hence to reducing transaction costs) relative to the management costs of including an additional member. Because per-member management costs are fixed, selection is likely to be biased toward larger producers. Although one rarely finds explicit versions of this argument in the field, there are various types of membership criteria (including financial contribution) that can be implicitly interpreted as reflecting such cost considerations.

Finally, in spite of the above, there is some evidence to suggest that the poorest of the poor may still benefit from market-oriented RPOs—even when they are excluded from membership. Such benefits may be termed spillovers that extend beyond the RPO's membership base and are often linked to the RPO's everyday activities: for example, an RPO may provide a service that can be rendered to members and nonmembers alike that cannot be delivered in a way that excludes nonmembers.[6]

Issue 3: Marketing Performance May Be Constrained by a Wide Portfolio of Activities

Collective action is not without its costs. The time and effort needed to govern and manage the organization—to coordinate meetings among members, collect their membership fees or other contributions, resolve conflicts and disputes, monitor compliance with the organization's rules, organize the organization's activities, and so on—are transaction costs internal to the RPO. Quite naturally, these coordination costs tend to increase with the size of the organization. Further, they increase with the heterogeneity of preferences among members, as intergroup agreement becomes more difficult to reach. Another type of cost relates to the scope of the organization's activities: RPOs typically have lower management costs when performing several related activities than when simultaneously engaged in several entirely independent endeavors.

And indeed, an important feature of RPOs is their frequent engagement in wide varieties of activities. For instance, Bernard et al. (2008) find that 55 percent of market-oriented RPOs in Senegal were also engaged in providing social activities, as were nearly 70 percent in Burkina Faso. Although it seems reasonable that successful organizations contribute to their communities' development, several case studies argue that a broad scope of activities often comes at the expense of economic performance (see, for example, Lele 1981; Stringfellow et al. 1997; Coulter et al. 1999; Delion 2000; Collion and Rondot 2001; Chirwa et al. 2005; Bernard et al. 2008). Further, the engage-

[6] As documented in Bernard, de Janvry, and Sadoulet (2010), exclusive RPOs may also engage in public-good services to gain social acceptability in their communities.

ment of market-oriented RPOs in social activities is often driven by external pressures from administrative agencies of the state, foreign donors, non-governmental organizations (NGOs), or interest groups in a community (Chirwa et al. 2005; Bernard, de Janvry, and Sadoulet 2010).

With open-membership policies, such a broad portfolio of activities may entail other costs as well. As a marketing-oriented RPO expands its activity portfolio, it attracts new members with different levels of interest in its various activities. Expansion thus increases both the size of the RPO and the heterogeneity of membership's interests, raising coordination costs in the organization. Importantly, although these additional members raise coordination costs, they are likely to contribute less than the original members (or not at all) to product aggregation and hence to lowering transaction costs. Eventually, this rise in coordination and management costs may negatively affect returns for the initial members, who are primarily interested in the commercialization services offered by the organization, and discourage them from further participation.

The salience of increased coordination costs depends on the type of decisionmaking rule in the RPO. Where consensus of all members is necessary (participatory decisionmaking), reaching a decision in large and heterogeneous groups may be very costly. In such cases, concentrating the power to make decisions in a restricted number of informed individuals may help reduce coordination and management costs, provided these individuals' decisions are respected by other members (see, for example, Tendler 1983; Bianchi 2002; Bernard, de Janvry, and Sadoulet 2010). Some studies argue, however, that participatory governance is a valuable means of enhancing the sustainability and effectiveness of the organization by facilitating decisions adapted to local conditions and customs (for example, Attwood and Baviskar 1987). Particularly for an RPO engaged in the provision of public goods, this form of governance can result in outcomes that are more desirable to a larger share of members (Foster and Rosenzweig 2001). The overall picture is that of a trade-off model. A market-oriented RPO is likely to exhibit only two of the following three attributes: (1) inclusive membership; (2) participatory governance; and (3) marketing performance.

Data and Methods

The present study focuses on the recent (re)development of cooperatives in Ethiopia. Data are drawn from two main sources: (1) a nationally representative survey of smallholder commercialization conducted in 2005 and (2) a relatively large survey of smallholder cooperatives conducted in 2006.

The 2005 Ethiopian Smallholders Commercialization Survey (ESCS 2005) was jointly designed by the International Food Policy Research Institute (IFPRI),

the Ethiopian Development Research Institute (EDRI), and the Central Statistical Agency of Ethiopia, with the aim of providing an in-depth analysis of smallholders' commercialization behavior. Data were collected in mid-2005 and include 7,186 households randomly drawn from 293 *kebeles.*[7] The sample is considered representative at the national and regional levels for four regions: Amhara; Oromia; the Southern Nations, Nationalities, and Peoples regional state (SNNP); and Tigray. The survey covered a large number of issues, including demographics, human capital stock, employment, land production and input use, crop and livestock production and disposition, marketing channels and contractual arrangements, physical assets, social capital, and participation in cooperatives. However, the ESCS did not collect information on household consumption and expenditures.

The 2006 Ethiopian Cooperatives Survey (ECS 2006), conducted by IFPRI and EDRI, was designed to examine the role played by cooperatives in the commercialization of Ethiopian smallholders' surplus grain production. Data were collected in mid-2006 across four regional strata (Amhara, Oromia, SNNP, and Tigray) from 205 cooperatives in 54 *woredas.* In each stratum, 14 *woredas* were randomly selected, and a maximum of four agriculture-related cooperatives were then randomly chosen from a list available at each *woreda* cooperative office. For each cooperative, questions were asked about the organization's history, membership, activities (including marketing), governance structure, and external links. Of the 205 cooperatives surveyed, 172 (84 percent) declared that they were primarily engaged in marketing members' grain production, and these cooperatives are used in this analysis.

Because the samplings conducted under ESCS 2005 and ECS 2006 did not sufficiently overlap, household and cooperative data cannot be matched in our analysis. The regression analyses presented in the following chapters are therefore limited to one dataset at a time. Moreover, a full year separates the data collection undertaken for these two surveys. Nevertheless, we believe that the phenomena investigated in this monograph are sufficiently stable to allow for statistical analysis of data from both surveys to be used in the same discussion.

[7] In Ethiopia, *kebeles* (peasant associations), are the smallest administrative unit below the *woreda* (district) level. For purposes of comparison, *kebeles* correspond to a cluster of villages in many other Sub-Saharan African countries.

CHAPTER 2

Ethiopian Cooperatives

Agriculture, Commercialization, and Public Policy

Agriculture is the backbone of Ethiopia's economy, accounting for 40 percent of GDP, 85 percent of employment, and 90 percent of export earnings. Furthermore, agriculture in Ethiopia is largely a smallholder phenomenon: as of 2001/02, about 37 percent of the farming households in the country cultivate less than 0.5 hectares and about 87 percent cultivate less than 2 hectares; only 0.9 percent cultivate more than 5 hectares (CSA 2003). Consequently, the agriculture sector in Ethiopia is host to 90 percent of the country's poor. Cereals (mainly teff, wheat, maize, barley, sorghum, and millet) constitute the most important crop for smallholder livelihoods in Ethiopia. Some 98 percent of all cereals produced in Ethiopia are produced by small-scale farmers. Cereals are cultivated on 75 percent of cropped land and represent 69 percent of total crop production (Gabre-Madhin 2001).[1]

Cereal production by smallholders is primarily for subsistence in Ethiopia. Only 28 percent of the country's total agricultural output and 30 percent of smallholder grain production is marketed (Dessalegn, Jayne, and Shaffer 1998; CSA 2003). More recent estimates suggest that among all teff producers, only 38 percent sell part or all of their production; other estimates suggest even lower figures for other cereals (Alemu, Gabre-Madhin, and Dejene 2006).

Accordingly, the Government of Ethiopia's (GoE's) economic growth strategy, Agriculture Development–Led Industrialization, has placed high priority since the early 1990s on accelerating agricultural growth through the commercialization of smallholder production (FDRE 2002, 2005). The strategy has driven the introduction of policies to promote (1) a more supportive macroeconomic framework for growth and development; (2) liberalized markets for agricultural products; and (3) a strong extension- and credit-led push to

[1] In terms of value, the share of permanent crops is greater, given their higher market prices. This is particularly true of coffee and khat. Figures in this paragraph are computed from data generated by the Ethiopian Sample Enumeration Survey 2001/02 (CSA 2003).

intensify staple production with modern inputs, especially seed and fertilizer. The resulting reforms have liberalized many aspects of the economy: lowering tariffs and relaxing import quotas, simplifying licensing procedures and privatizing state enterprises, establishing private banks and easing foreign exchange controls, discontinuing compulsory grain delivery and forced membership in cooperatives by smallholders, and developing input-supply programs to intensify cereal output and efficiency.

Although these reforms increased market integration, market competition, and private trading in local grain markets, wider systemic and structural constraints may have limited the impact of reforms. A fundamental problem facing the country is the persistently high transaction costs associated with trading agricultural commodities (Dercon 1995; Negassa and Jayne 1997; Gabre-Madhin 2001). Inadequate market information systems that do not provide smallholders and traders with price information, when coupled with poor infrastructure and weak private-sector capacity, significantly impede commercialization of the country's largely subsistence-oriented smallholder population (Gabre-Madhin et al. 2003; Alemu, Gabre-Madhin, and Dejene 2006). Indeed, these factors are believed to have contributed to a farming crisis in 2002–03 when, following a good harvest and sizable grain surpluses, grain prices dropped dramatically by 60–80 percent (Gabre-Madhin et al. 2003). These factors may have also played a significant role in the 2007–08 food crisis when, despite good harvests in previous years, grain consumer prices increased by up to 50 percent.

This chapter describes the historical development of agricultural cooperatives in Ethiopia until their recent redeployment. We assess their relevance for the challenge of smallholder commercialization, their organizational features, and their prevalence. Finally, we present a series of statistics along with case studies, to describe "typical" agricultural cooperatives in Ethiopia today.

Public Support for Cooperative Development in Ethiopia

In spite of the challenges mentioned above, the GoE has placed cooperatives at the forefront of its efforts to boost agricultural productivity and smallholder commercialization. The GoE's current strategy aims to extend cooperative services throughout the country to supply production inputs to smallholders and to market surplus output from them.

Historical Legacy of Cooperatives in Ethiopia

RPOs have a long history in Ethiopia, particularly in the form of traditional collective action organizations, such as work groups (*jiges, wonfels, debos*), rotating savings and credit associations (*iquobs*), and burial societies (*idirs*), which are still very much present (Table 2.1). It was not until the early 1950s

Table 2.1 Households reporting membership in traditional institutions

Institution	Percentage of sampled households
Traditional institutions	
Idir (burial society)	42.2
Iquob (rotating savings and credit association)	6.9
Other credit and savings association	0.3
Mahaber (traditional collective-action organization)	3.8
Senbete (church group)	2.8
Mosque group	0.1
Other	0.3
Formal cooperative	9.1
Households reporting membership in at least one traditional institution	47.0

Source: Based on data from ESCS (2005).

that a formal cooperative movement began in the country, and only in 1961 did the imperial government introduce the first formal proclamation on cooperatives that gave rise to the institution in its modern sense (Couture et al. 2002; Kodama 2007).

During the imperial era, cooperatives were primarily created to support the production of high-value agricultural exports, such as coffee. Membership consisted of farmers with large landholdings and tended to exclude smallholders. By 1974, the end of the imperial era, only 149 cooperatives existed in the entire country, including 94 multipurpose, 19 savings and credit, 19 consumer, and 17 handicraft cooperatives (Lelisa 2000, cited in Lemma 2008). The military (Derg) regime that ruled Ethiopia from 1974 to 1991 introduced a new type of cooperative, based on more Marxist principles aimed at ending capitalist exploitation of the peasantry (Rahmato 1990; Kodama 2007). During this period, the government established a massive network of cooperatives to organize peasants, manage production and purchasing, and sell inputs and consumer goods to members. At its height, the network included more than 7,700 primary (that is, community-level) cooperatives and 4.8 million members (Table 2.2).

There were two main types of farmers' cooperative during the Derg: service cooperatives and producer cooperatives. The former were charged with managing input supply, credit, output purchasing, milling services, and the sale of consumer goods for smallholders. The latter were collective production units that were ultimately found to be one-third less productive than individual farms (Rahmato 1994b; Kodama 2007). Both types of cooperatives played a central role, alongside the *kebele* administration, in levying and collecting taxes from smallholders, extending state control to the

Table 2.2 Rural organizations during Ethiopia's Derg regime, 1988–89

Type of organization	Number	Number of household members (million)	Number of *kebeles* covered
Peasant associations	20,455	5.7	n.a.
Producer cooperatives	3,732	0.3	n.a.
Service cooperatives	4,052	4.5	17,785

Sources: Adapted from Rahmato (1994a); Kodama (2007).
Note: n.a. means not available. A *kebele* is a peasant association, the smallest administrative unit in Ethiopia.

local level, and promoting a socialist ideology. Farmers came to view these cooperatives—as well as their state-appointed leaders—as synonymous with government oppression. It was not until 1989 that some degree of liberalization was introduced, though it proved to be too little and too late, as the Derg was overthrown by 1991.

Policies Supporting a New Generation of Cooperatives

Since 1994, the GoE has made efforts to promote a generation of cooperatives that differ from their predecessors. The new type of cooperative should be (1) based on "peasants' free will to organize"; (2) able to fully participate in the free market; and (3) free of government intervention in their internal affairs (Proclamation 85/1994, published in FDRE [1994], 1). Legal reforms in 1998 and 2004 were introduced to reinforce these principles and strengthen membership incentives by improving members' rights in the areas of ownership, voting, share transfers, and risk management (Proclamations 147/1998 and 402/2004, published in FDRE [1998] and FDRE [2004], respectively; Rahmato 2002). The reforms are meant to ensure that cooperatives are governed in accordance with standard bylaws that provide for regular election of chairpersons and management committees and for voting based on the principle of one member, one vote. In the broadest terms, these reforms are designed to create a new generation of cooperatives in Ethiopia that are voluntary, inclusive, and accountable, in stark contrast to the cooperatives formed under Ethiopia's previous regime.

The GoE's various poverty-reduction strategy papers also reflect its support for cooperatives. For example, *Ethiopia's Sustainable Development and Poverty Reduction Program* (FDRE 2002, 43) includes cooperatives as one of its main goals for agricultural development: "to organize, strengthen and diversify autonomous cooperatives to provide better marketing services and serve as a bridge between small farmers (peasants) and the non-peasant private sector." Cooperatives are also expected to

> render vital services other than those related to agricultural marketing, including the following: (i) Expanding financial services in rural areas; (ii) Purchase of agricultural machinery, equipment and implements, and lease them to farmers; (iii) Setting up of small agro-processing industries where processed agricultural products with greater value added could be produced and (iv) Establishing various social institutions to provide different kinds of social services. (FDRE 2002, 59)

This thrust continues in the current poverty-reduction strategy, which explicitly emphasizes the need to support producer cooperatives as a means of strengthening and empowering smallholders' market participation in the liberalized market environment (FDRE 2005).

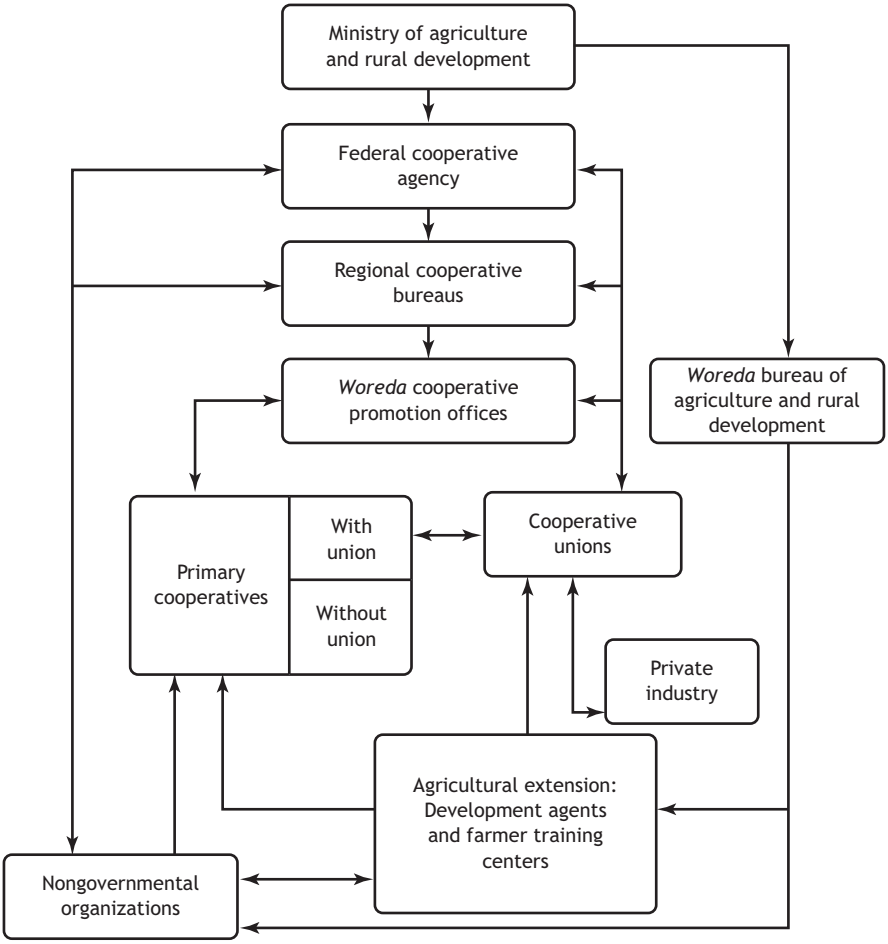
Running parallel to this state-led promotion of cooperatives is the effort by civil society to encourage farmer organizations at the grassroots level. Different types of these community-based organizations (CBOs) exist throughout Ethiopia, ranging from savings and credit associations that provide rural microfinance services to groups that organize the marketing of such crops as honey and organic coffee. A motivating force behind the growth of CBOs is the extensive community of NGOs in Ethiopia. NGOs are important actors in Ethiopia: although their activities were generally limited to famine relief in the 1970s and 1980s, many are now working on issues related to sustainable agriculture and rural development. As of 2000, some 368 NGOs operated in Ethiopia, of which one-third were international organizations (Rahmato 2002).

Administrative Structures to Promote Cooperatives

In 2002, the GoE established the Federal Cooperatives Commission (now the Federal Cooperatives Agency, or FCA) with a broad mandate: to oversee the appropriate implementation of cooperative legislation, to design policies and legal procedures consistent with international conventions on cooperatives, and to ensure the coherence of cooperative policy with other relevant sectors (land, labor and employment, customs and taxation, and financial regulations) (Lemma 2008). The FCA guides cooperative promotion efforts throughout the country, working through regional state Bureaus of Cooperative Promotion (BoCPs), whose mandate extends down to the *woreda* and *kebele* levels.[2] Cooperative promotion efforts at the *woreda* level are man-

[2] This allocation of responsibilities reflects Ethiopia's wider process of political, fiscal, and administrative decentralization, introduced following the downfall of the Derg in 1991 and codified in the 1994 Constitution. The process led to a novel reallocation of powers to the country's nine regions and the urban administrations of Addis Ababa and Dire Dawa. Today each region and administration enjoys wide executive and legislative powers and is financed through a combination of transfers from the federal level and regional tax revenues.

Figure 2.1 Actors and relationships in cooperative promotion and development, Ethiopia, 2007



Source: Authors.

aged through *woreda* offices of the BoCPs—typically, an office housed in the *woreda* offices of the Bureaus of Agriculture and Rural Development (BoARDs). Promotion efforts at the *kebele* level are conducted through direct interactions with local community leaders and farmers themselves. These efforts are often supported by the BoARDs' development agents (as extension agents are known in Ethiopia), working individually or through farmer training centers. (These centers, introduced over the past several years, are meant to serve

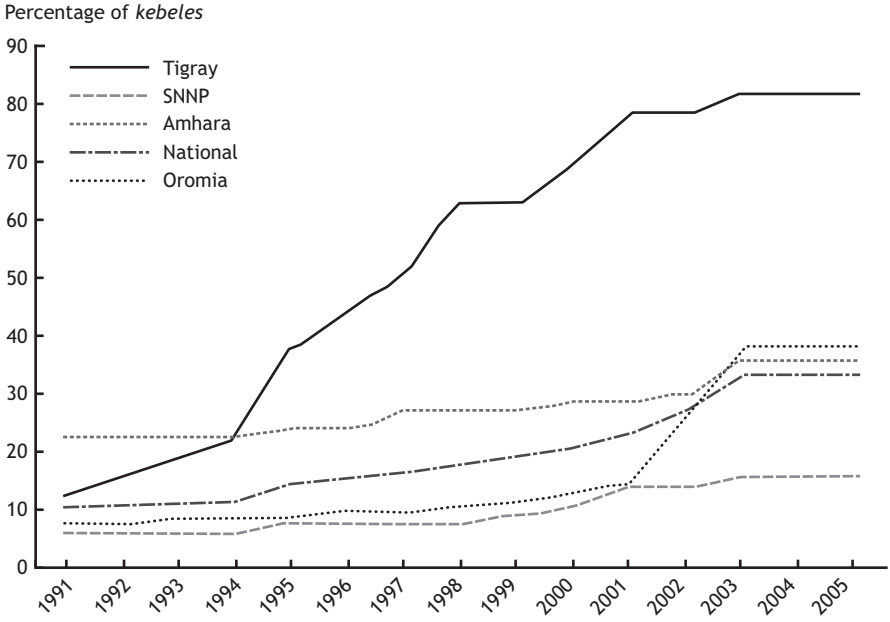
as focal points for training and extension activities.) Given the integrated nature of their work, BoCPs and BoARDs maintain close working relationships that are supported by formal accountability systems at both the *woreda* and regional levels (Spielman et al. 2010).

Increasingly, cooperatives are organized as part of larger cooperative unions, which are umbrella organizations that provide input supply and marketing services to their member cooperatives. These cooperative unions are playing an increasingly central role in importing and packaging chemical fertilizer and other inputs and in distributing inputs to cooperatives throughout the country (Byerlee et al. 2007). Figure 2.1 summarizes the interaction of the various bodies involved in cooperative promotion in Ethiopia.

The Prevalence of Cooperatives in Ethiopia

The new policy regime and administrative structure have substantially promoted the growth of cooperatives over the past 10–15 years. Figure 2.2 shows how the number of *kebeles* with at least one cooperative grew from only 10 percent in 1991 to nearly 35 percent in 2005. Much of this growth trend

Figure 2.2 *Kebeles* **with at least one cooperative, 1991-2005**



Source: Authors' calculations based on data from ESCS (2005).

Table 2.3 Number of registered primary cooperatives and members by region, Ethiopia, 2007

Region	Number of primary cooperatives	Members			Total capital (birr)
		Male	Female	Total	
Amhara	4,223	1,637,069	258,996	1,896,065	165,040,320
Oromia	2,957	658,763	58,284	717,047	104,763,293
SNNP	5,512	892,788	126,076	1,018,864	201,079,907
Benshangul	1,32	6,675	1,742	8,417	4,058,904
Harrari	216	5,288	2,258	7,546	11,424,448
Gambella	81	1,144	2,553	3,697	946,443
Afar	202	4,971	3,649	8,620	6,115,598
Tigray	1,335	356,868	282,425	639,293	42,334,481
Addis Ababa	7,262	n.a.	n.a.	338,321	60,426,253
Dire Dawa	7,15	10,685	5,672	163,57	8,093,956
Somali	449	7,776	6,939	147,15	8,335,264
Total	23,084	3,582,027	748,594	4,668,942	612,618,867

Source: Adapted from Meherka (2008).
Notes: n.a. means not available; SNNP means Southern Nations, Nationalities, and Peoples regional state.

Table 2.4 Household participation in cooperatives among smallholder farmers in Ethiopia

Region	Smallholders participating in a cooperative		Smallholders with a cooperative in their *kebele*		Smallholders participating when they have a cooperative in their *kebele*	
	Percentage of households	Difference[a]	Percentage of households	Difference[a]	Percentage of households	Difference[a]
Ethiopia	9.14	—	39.59	—	16.87	—
Tigray	20.40	0.0057	87.99	0.0000	20.93	0.3511
Amhara	14.48	0.0630	46.34	0.0000	24.29	0.1362
Oromia	7.35	0.3026	42.54	0.0046	12.18	0.1446
SNNP	3.69	0.0000	18.49	0.0000	8.96	0.0391

Source: Authors' calculations based on data from ESCS (2005).
Notes: — means not applicable; SNNP means Southern Nations, Nationalities, and Peoples regional state. A *kebele* is a peasant association, the smallest administrative unit in Ethiopia.
[a]Test of difference from national average: probability > *F*.

is explained by the expansion of cooperatives in Tigray, where cooperative prevalence grew from 12 to 83 percent during 1991–2005. As of 2007, there were more than 23,000 primary cooperatives in Ethiopia, with membership totaling more than 4.6 million (Table 2.3). These figures, however, include urban as well as rural cooperatives.

In Table 2.4, we use data from the ESCS (2005) survey to investigate the actual prevalence of agricultural cooperatives in rural areas; we show the percentage of households participating in at least one cooperative involved in agriculture. As indicated in column 1, only 9 percent of all farm households report participating in a cooperative at a national level. We also note significant differences in membership rates across regions: 20 percent of the smallholders in Tigray region participate in cooperatives, whereas less than 4 percent of people in the SNNP region participate. Part of this variation is driven by differences in the level of access to cooperatives. Thus, as reported in column 3 of the table, 88 percent of smallholders in Tigray have at least one cooperative in their *kebele,* compared to less than 20 percent in SNNP. However, even when there is an organization in their *kebele,* smallholders in SNNP are still less likely to participate in cooperatives: only 9 percent participate—below the national average of 17 percent (column 5 in the table).

Descriptions of Agricultural Cooperatives in Ethiopia: Data and Narratives

Boxes 2.1 and 2.2 describe two agriculture marketing cooperatives encountered during fieldwork. They are characteristic of the diversity and heterogeneity found among cooperatives in Ethiopia and help to illustrate some of the issues being raised in this study. Table 2.5 shows that Ethiopian cooperatives are engaged in a vast array of activities. Multipurpose and savings and credit cooperatives are the most prevalent, followed by housing and small/medium enterprise cooperatives. (Note, however, that these figures include both rural and urban cooperatives; the vast majority of housing and small/medium enterprise cooperatives are urban.) From these figures, one can estimate that about one-third to half of the cooperatives in the country are directly involved with agriculture.

Focusing on those cooperatives with an agricultural emphasis, we use the ECS (2006) data to provide average characteristics of grain-marketing cooperatives in the four main regions of the country (Table 2.6). These organizations are rather large, with average membership close to 1,000 (ranging from 21 to 3,664 members). Land cultivated per member averages 1.75 hectares, a figure that is consistent with the notion that cooperative members are largely smallholders, although not necessarily the smallest, as the average

Box 2.1 Amecha Area Multipurpose Cooperative

The Amecha Area Multipurpose Cooperative is located 17 kilometers from Wolenchiti, the capital of the food-insecure *woreda* of Boset. Founded in 1980 under the Derg regime, its activities were then limited to collecting farmers' produce for the Agricultural Marketing Corporation of the government at below-market prices. The organization was therefore considered exploitative of farmers and was dismantled with the fall of the regime in 1991.

The Cooperative was re-established in 1995 with the objective of providing members with output marketing services as well as enhanced access to agricultural inputs and credit. This time, however, the organization was meant to be free of any external control and to be governed democratically in accordance with the interests of the members. At present, the Cooperative's contacts with the administration are limited to management training, market information, and audit services provided by the *Woreda* Cooperative Office. In return, the Cooperative is obligated to present its audited financial report annually to the Zonal Cooperative Office.

At the time of the Cooperative's re-establishment, it was also made clear that membership should be voluntary, in contrast with forced participation under the previous regime. As of today, membership is open to anyone, provided they accept and respect the Cooperative's bylaws, understand and accept its objectives, and pay 67 birr (1 birr as a registration fee and 66 birr as the price of a share). The Cooperative today counts 984 members, mostly elderly people. Younger individuals typically do not control land and are thus less interested in the services offered; moreover, the organization is often still perceived as a government entity similar to the cooperatives under the Derg regime rather than a farmer-owned organization.

Currently, the Cooperative is only involved in input supply and crop purchase. It receives agricultural inputs (fertilizer and credit) from the Lume-Adama-Boset Union and sells to members and nonmembers (but only members may purchase on credit). In marketing members' output, the Cooperative gives priority to the Union, provided the prices offered are competitive with the nearby markets of Nazareth and Wolenchiti. Nonmembers may also sell their products through the Cooperative, but they do not benefit from the proceeds of the organization. (Dividends have been distributed twice to members since the re-establishment.)

The main constraint faced by the Cooperative is the dearth of appropriate financial resources. Because of the lack of appropriate storage and transportation, the organization is forced to sell outputs in May instead of waiting for higher prices in September. Although there are several potential partners operating in the *woreda* (such as the Rural Financial Intermediation Program and World Vision, an international NGO), the Cooperative has not yet been able to secure credit to invest in needed equipment.

Source: Key informant interviews conducted by the authors as part of ECS (2006).

Box 2.2 Awara Cooperative

The Awara Cooperative is located 8 kilometers from Aje, capital of the remote *woreda* of Siraro. The organization was created in February 2005 to help farmers get timely access to seeds and fertilizers. The organization significantly benefited from initial help from the *woreda* office of the regional BoCP, which gave members training on the importance of cooperatives in helping smallholders. Immediately after its establishment, the Cooperative received 127 quintals of fertilizer on credit from the *woreda* office of the BoARD.

The organization also aims to provide marketing services to its members, buying from them at higher-than-market prices after the harvest and selling on the market when prices are more favorable. Safe storage is ensured through renting appropriate local warehouse facilities (1,000 birr per year for 214 quintals of maize). Price information is collected on the nearby markets of Shashemene and Aje through an informal network of individual traders who are known to the members. In 2005 the Cooperative purchased maize from its members at 105 birr per quintal at a time when the market price was 100 birr per quintal.

Members are not forced to supply all their produce to the Cooperative; in the future, however, dividends will be paid according to the volume of grain supplied. To date, nonmembers have not been permitted to sell their produce to the Cooperative; this should change once the organization's financial capacity is stronger.

Membership in the Cooperative is open to anyone, provided he or she is free of debt and can reliably repay a loan. Initially the registra-

tion fee was 25 birr and a share cost 100 birr. Today new members must also contribute a quintal of maize to strengthen the financial capacity of the Cooperative. There are now 130 members in all. Reasons for not joining the organization include the high level of entrance fees, the mistaken identification of the Cooperative with previous Derg organizations, and suspicions of corruption in the Cooperative management.

The *woreda* office of the BoCP offers continuous support to the Awara Cooperative, as does the Negele-Shashemene-Siraro Cooperative Union, which monitors and controls the Cooperative and, in particular, its management procedures. The main bottleneck to the organization's development is its lack of access to credit; a request was filed with the *woreda* office of the BoCP, but the loan was refused. Other constraints include the lack of information and marketing links in potentially lucrative markets, such as Addis Ababa.

One-quarter of the profit of the Cooperative is retained to fund its further development. Plans include providing greater quantities of improved seeds and fertilizers to members, opening shops in the town of Aje, developing marketing links to larger markets, providing oxen for those who lack one, and purchasing grain from the market to sell when prices rise.

Source: Key informant interviews conducted by the authors as part of ECS (2006).

Table 2.5 Types of cooperatives in Ethiopia, 2007

	Type of cooperative									
Region	Multipurpose	Irrigation	SACCO	Housing	SME	Consumer	Dairy	Livestock marketing	Other	Total
Amhara	1,712	188	543	1,060	n.a.	14	45	n.a.	661	4,223
SNNP	1,025	n.a.	869	119	n.a.	52	59	n.a.	3,388	5,512
Oromia	1,468	77	515	n.a.	12	59	2	293	531	2,957
Tigraye	580	225	232	32	n.a.	13	100	n.a.	153	1,335
Benshangul	55	n.a.	70	1	n.a.	1	n.a.	n.a.	5	132
Dire Dawa	71	5	79	248	n.a.	42	13	n.a.	257	715
Harari	12	1	13	93	n.a.	2	13	n.a.	82	216
Gambella	14	n.a.	27	n.a.	9	9	n.a.	7	15	81
Somali	230	n.a.	20	16	37	12	10	68	56	449
Afar	104	34	15	n.a.	n.a.	n.a.	14	n.a.	35	202
Addis Ababa	n.a.	n.a.	2,852	2,323	2,053	34	n.a.	n.a.	n.a.	7,262
Total	5,271	530	5,235	3,892	2,111	238	256	368	5,183	23,084

Source: Adapted from Meherka (2008).

Notes: n.a. means not available; SACCO means savings and credit cooperative; SME means small/medium enterprise; SNNP means Southern Nations, Nationalities, and Peoples regional state.

Table 2.6 Grain-marketing cooperatives in Ethiopia, descriptive statistics

Cooperative characteristic	Unit/Description	Mean	25th percentile value	75th percentile value
Membership	Number of members in 2005	942.23	335	1,290
Aggregated product	Total hectares cultivated by members	1,541.45	397.50	2,207.50
Holdings per member	Hectare	1.75	0.85	2.43
Age of cooperative	Year	8.18	3.00	14.00
Partner at origin	1 = received external help at creation	59.30%	0	1
Financial help at origin	1 = received financial help at creation	20.34%	0	0

Source: Authors' calculations based on data from ECS (2006).
Note: Characteristics based on a sample of 172 cooperatives surveyed in 2006.

landholding in Ethiopia is 0.8 hectares. Most of the cooperatives were created or re-established (following the downfall of the Derg in 1991) within the past 10 years. About 59 percent of the cooperatives surveyed stated that they had received significant help from external partners at the time of their (re)establishment; in 80 percent of these cases, this help came from the government. About 20 percent of the cooperatives surveyed stated that they had received significant financial help at the time of their (re)establishment, also primarily from the government. And about 74 percent of these marketing cooperatives were also engaged in providing social services to their members.

CHAPTER 3

Impact of Cooperatives on Members' Commercialization

Can cooperatives secure greater benefits of commercialization for smallholder farmers? We use household-level data from the ESCS (2005) to compare the actual extent of commercialization of cooperative members against their likely level had they not participated in such an organization. Care is taken to minimize biases caused by the nonrandom location of cooperatives and the nonrandom selection of members, as described in detail below.

Identification Strategy

Our empirical strategy aims to overcome three potential sources of biases. First, participants may significantly differ from nonparticipants in community- and household-level observable characteristics that may have a direct effect on commercialization (such as geographic remoteness, or a household's physical and human capital stock). As a result, the observed differences between members and nonmembers may, either totally or partially, reflect initial differences between them rather than the effects of cooperative membership.

Second, such selection bias may also result from unobservable community or household characteristics. At the community level, for instance, it may be that the existence of a cooperative is in part driven by particularly dynamic local leaders. At the member level, a household's risk preference, its entrepreneurial spirit, or its relationship with other cooperative members may significantly influence behavior.

Such biases are most often accounted for using an instrumental variables approach. However, instrumental variable methods are of limited help in the presence of a third source of bias: local general equilibrium effects, as would occur (for example) if the presence of a cooperative (the *treatment*) significantly affects the relevant outcome even for nonmembers (the *nontreated*), through externalities or spillover effects.

This third source of bias can arise from the likely externalities exerted by cooperatives on the commercialization capacities and choices of nonmembers. For instance, cooperatives may significantly affect the price offered by local traders to cooperative nonmembers. This effect is likely to be enhanced if nonmembers have the option of using cooperatives as an outlet for their output.

To minimize these biases, we employ propensity score matching techniques, extensively used in the recent literature on economic impact evaluation (Jalan and Ravallion 2003a). Relevant applications of these techniques include impact assessments of farmers' field schools (Gotland et al. 2004), community-driven development (Rao and Ibanez 2003), pipe water (Jalan and Ravallion 2003b), and road rehabilitation (Van de Walle and Cratty 2002). Specifically, our approach involves a two-step matching estimator. First, *kebeles* with cooperatives are matched to similar *kebeles* without cooperatives, on the basis of marketing-relevant characteristics, such as remoteness, agricultural potential, and population density. In a second step, we match cooperative members to similar households living in *kebeles* without cooperatives. The matching is based on a unique variable, the *propensity score,* defined as the probability that a given household would participate in a cooperative, given a set of observable characteristics.[1]

Overall, controlling for the households' observable characteristics minimizes the incidence of the first bias described above. Furthermore, because our strategy compares cooperative members to similar households located in other *kebeles,* it is also likely that the third bias is also limited. We are therefore left with the second source of bias, namely, the effect of nonobservable characteristics influencing both the presence of cooperatives in particular *kebeles* and households' decisions to participate.

In Ethiopia, however, most cooperatives were initiated under the influence of an external partner (see Table 2.6). According to data from the ECS (2006), 63 percent of the agricultural marketing cooperatives were created by government institutions, 11 percent by a donor agency or NGO, and only 26 percent by members themselves. Dropping from our sample those *kebeles* in which cooperatives were member-created, we assume that the establishment of cooperatives is exogenous to communities' unobservable characteristics as well as to that of their members. Indeed, it became clear from several discussions with *woreda*-level cooperative promotion officers that encouragement for the creation of cooperatives mostly follows a top-down approach.

[1] Rosenbaum and Rubin (1983) show that households with similar propensity scores also have similar distributions of covariates.

In other words, *kebeles* with cooperatives created by government institutions do not self-select but instead are externally selected by the cooperative promotion agents. It was also clear from discussions with the agents from the FCA that no clear directions were given to *woreda*-level offices as to how to select *kebeles* to be targeted first. Overall, controlling for relevant observable characteristics appears sufficient to ensure comparability of *kebeles* with and *kebeles* without cooperatives.

Furthermore, because in this sample the existence of a cooperative is assumed independent of its members' characteristics, there is no a priori reason to believe that the distribution of household-level unobservable characteristics systematically differs across *kebeles* that share similar observable characteristics. It follows that differences in unobservable characteristics between cooperative members and households with similar propensity scores (but living in *kebeles* without cooperatives) may be considered here as random and will not bias the estimator.[2]

Finally, to further ensure the validity of such an approach, one must verify that treatment and comparison households are operating in the same markets (Heckman, Ichimura, and Todd 1998). In the present case, however, this requirement has to be tempered by the need to minimize spillover effects within markets, from *kebeles* with cooperatives to those without. We address this double requirement with three arguments:

1. Our matching procedure ensures that sample *kebeles* are sufficiently similar by taking into account important determinants of price, such as remoteness, agro-ecological potential, and population density.
2. Cooperatives may generate spillover effects that are particularly strong at the local market level; by ensuring that treatment and comparison *kebeles* are linked to different local markets, we ensure that the likelihood of spillover effects is minimized.
3. An extensive literature has shown the important increase in grain-market integration in Ethiopia (Dercon 1995; Jayne, Negassa, and Myers 1998; Negassa 1998; World Bank 2006; Negassa and Myers 2007)—and in particular in the three regions considered in our final sample (Rashid, Gabre-Madhin, and Getnet 2007). Grain-market integration ensures that treatment and comparison *kebeles* are indeed exposed to similar market conditions. In any case, the operation of cooperatives is unlikely to significantly affect regional prices: as of 2005, less than 10 percent of agricultural output marketed in the country passed through cooperatives (FCA 2005).

[2] The greater the number of *kebeles* considered, the more likely this assumption will hold.

Matching

Matching *Kebeles*

Among the 293 *kebeles* in the sample, 94 had at least one cooperative at the time of the survey. However, not all of them satisfy the identification assumption that the present spatial distribution of cooperatives is exogenous. Specifically, this assumption may not hold for *kebeles* with member-created cooperatives; such *kebeles* were therefore removed from our sample. In addition, in some *kebeles* without cooperatives, it was reported that households had access to one in a nearby *kebele.* To further add to the robustness of our estimates, these *kebeles* were also removed from the sample. The remaining sample consists of 68 treatment *kebeles,* where at least one cooperative can be found, and 134 comparison *kebeles* where no cooperatives exist.

The next step is to ensure that the treatment *kebeles* are sufficiently similar to the comparison ones. To do so, we apply the notion of development domains, as adapted to Ethiopia by Chamberlin, Pender, and Yu (2006). *Development domains* are defined as geographic locations sharing broadly similar rural development constraints and opportunities. The classification is based on four characteristics that best capture livelihood heterogeneity among smallholders in Ethiopia: altitude, population density, distance to the closest market, and moisture reliability. Their aggregation is based on thresholds specifically established to maximize the predictive power of the domains.[3]

In our sample, *kebeles* can be classified into 22 different domains. To test the validity of these domains as predictors for the existence of externally created cooperatives, we use a probit estimation, where the dependent variable is the existence or absence of a cooperative and the independent variables are dummy variables for each of the domains. Overall, this test performs relatively well: domains successfully predict 70 percent of the incidence of cooperatives.

Next, according to our matching procedure, we need to ensure that a sufficient number of treatment and comparison *kebeles* exist in each domain. The distribution is reported in Table 3.1, showing that five domains (1, 2, 5, 12, and 15) capture more than 70 percent of the *kebeles* with at least one externally created cooperative, while the remaining 30 percent are dispersed among 12 of the remaining 17 domains. It appears that each of the five predominant domains includes enough comparison *kebeles* to perform the analysis. Finally, although selective, these five domains are quite heterogeneous:

[3] Whereas Chamberlin, Pender, and Yu (2006) conduct the necessary computation at the *woreda* level, the present analysis is based on the analogous computation at the *kebele* level.

Table 3.1 Treatment and comparison *kebeles,* by development domains

Domain number	Domain	Percentage of comparison *kebeles*	Percentage of treatment *kebeles*
1	Highland, moisture reliable, high market access, high population density	8.21	13.24
2	Highland, moisture reliable, high market access, medium population density	23.13	20.59
3	Highland, moisture reliable, high market access, low population density	2.24	4.41
4	Highland, moisture reliable, low market access, high population density	4.48	0.00
5	Highland, moisture reliable, low market access, medium population density	19.40	10.29
6	Highland, moisture reliable, low market access, low population density	2.99	0.00
7	Lowland, moisture reliable, high market access, medium population density	3.73	1.47
8	Lowland, moisture reliable, high market access, low population density	0.75	0.00
9	Lowland, moisture reliable, low market access, medium population density	1.49	2.94
10	Lowland, moisture reliable, low market access, low population density	5.22	0.00
11	Highland, drought prone, high market access, high population density	1.49	1.47
12	Highland, drought prone, high market access, medium population density	2.99	13.24
13	Highland, drought prone, high market access, low population density	1.49	1.47
14	Highland, drought prone, low market access, high population density	1.49	1.47
15	Highland, drought prone, low market access, medium population density	2.99	14.71
16	Highland, drought prone, low market access, low population density	2.24	2.94
17	Lowland, drought prone, high market access, high population density	1.49	0.00
18	Lowland, drought prone, high market access, medium population density	0.75	2.94
19	Lowland, drought prone, high market access, low population density	2.99	1.47
20	Lowland, drought prone, low market access, medium population density	2.24	2.94
21	Lowland, drought prone, low market access, low population density	5.22	2.94
22	Lowland, pastoralist, high market access, low population density	2.99	1.47
	Total	100.00	100.00

Source: Authors' calculations based on data from ESCS (2005).

Notes: A *kebele* is a peasant association, the smallest administrative unit in Ethiopia. The data for comparison *kebeles* are based on 134 observations; the data for treatment *kebeles* are based on 68 observations.

some domains are highland moisture-reliable domains (1, 2, and 5), whereas the others are highland, drought-prone domains (12 and 15); some have high market access (1 and 2), whereas the others are more remote (5 and 12); most have medium population densities (2, 5, 12, and 15), but one is more densely populated (1). Accordingly, we further refine our sample by focusing on treatment and comparison *kebeles* falling within these five development domains.

To further check the sample's validity, we present in Table 3.2 the distribution of treatment and comparison *kebeles* across the administrative regions of Ethiopia. Indeed, as described in Chapter 2, regional cooperative offices can play an important role in the promotion and organization of cooperatives through directives passed down to *woreda* cooperative offices. Consequently, there are important differences at the regional level that need to be accounted for. As shown in Table 3.2, only three regions—Amhara, Oromia, and SNNP—exhibit a relatively balanced subsample between treatment and comparison *kebeles.* In contrast, the Tigray subsample contains only one *kebele* without a cooperative in 2005, and the subsamples in Beneshangul-Gumuz and Harari have a total membership of one *kebele* each. Hence, it may be necessary to further limit the sample to include only the Amhara, Oromia, and SNNP regions to ensure better comparability of treatment and comparison observations.

Table 3.3 reports a series of balancing tests for both samples—one that includes all regions and one that excludes Tigray, Beneshangul-Gumuz, and Harari—to ascertain the significance of these comparability concerns. Results indicate that the sample containing all regions performs poorly: a significant difference between treatment and comparison *kebeles* is found in 5 of the 13 tests performed. By comparison, the sample restricted to Amhara, Oromia, and SNNP performs better: the *kebeles* are on average similar in all dimensions covered by these tests. We thus reject the suitability of the full sample and restrict ourselves to the subsample consisting of three regions that includes 35 treatment and 73 comparison *kebeles.*

Table 3.2 Number of treatment and comparison *kebeles,* by region

Kebele category	Tigray	Amhara	Oromia	Beneshangul-Gumuz	SNNP	Harari	Total
Comparison	1	18	33	1	22	1	76
Treatment	14	9	20	0	6	0	49

Source: Authors' calculations based on data from ESCS (2005).
Notes: SNNP means Southern Nations, Nationalities, and Peoples regional state. A *kebele* is a peasant association, the smallest administrative unit in Ethiopia.

Table 3.3 Balancing tests: treatment and comparison *kebeles*

Test characteristic	Sample with all regions			Sample with Amhara, Oromia, and SNNP only		
	Comparison *kebeles*	Treatment *kebeles*	Difference $p > t$	Comparison *kebeles*	Treatment *kebeles*	Difference $p > t$
Population	4,548.29	5,359.72	0.0966	4,526.18	4,622.91	0.8550
Female-headed households (%)	14.01	21.52	0.0116	13.98	18.60	0.1607
Orthodox households (%)	45.97	57.77	0.1725	45.08	43.06	0.8298
Muslim households (%)	38.09	26.21	0.2208	37.44	33.70	0.7306
Amharic-speaking households (%)	50.95	48.15	0.7010	52.90	61.28	0.2875
Existence of commercial bank	9.21	12.24	0.5910	9.58	17.14	0.2630
Existence of microfinance institution	21.05	46.93	0.0021	19.17	31.42	0.1607
Importance of traditional institutions[a]	46.64	46.16	0.9193	46.50	50.91	0.4053
Number of development (extension) agents	1.83	2.52	0.0023	1.84	2.05	0.3444
Productive Safety Net *woredas*[b] (%)	27.63	38.77	0.1952	26.02	28.57	0.7825
Existence of primary school	86.84	91.83	0.3914	86.30	88.57	0.7452
Direct access to seasonal/dry road	55.26	69.38	0.1161	56.16	60.00	0.7019
Access to safe water	44.73	67.34	0.0131	45.20	57.14	0.2495
Number of observations	76	49	—	73	35	—

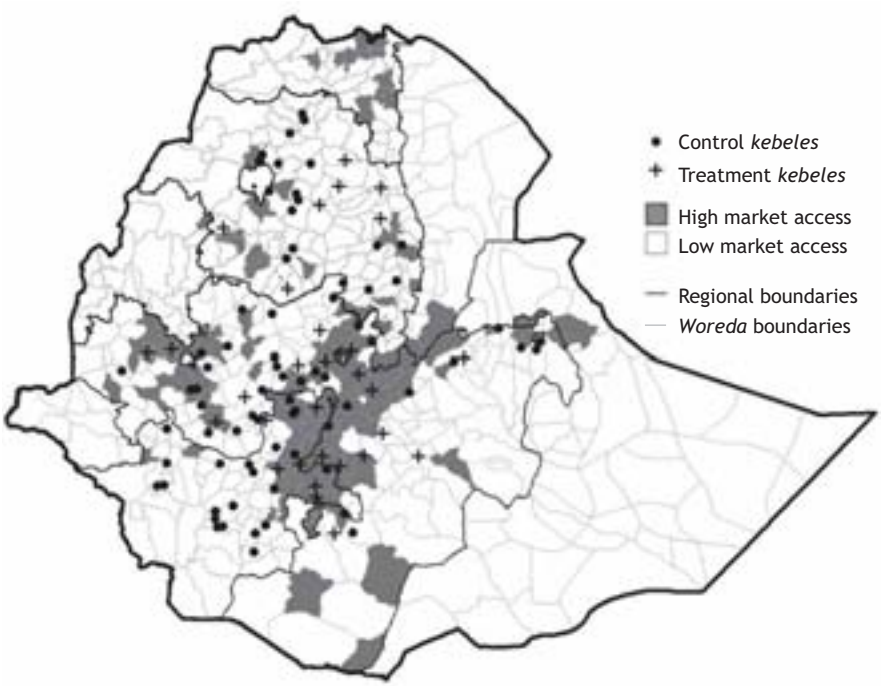
Source: Authors' calculations based on data from ESCS (2005).

Notes: — means not applicable. A *kebele* is a peasant association, the smallest administrative unit in Ethiopia. A *woreda,* or district, is the second smallest.

[a]Value defined as the percentage of conflicts resolved through the Shimagile (council of elders) as opposed to local courts.

[b]The Productive Safety Net Program is intended to provide food or cash through public work and, to a lesser extent, direct support to 8.3 million chronically food-insecure individuals in 268 *woredas.*

Figure 3.1 Geographic location of treatment and comparison *kebeles*



One last validity check is undertaken to ensure that treatment and comparison *kebeles* correspond to sufficiently close locations. Figure 3.1 shows the geographic location of each *kebele* in our subsample against a shaded background that indicates the level of market access based on the development domain calculations. We find that (1) treatment and comparison groups are geographically mixed, thereby ensuring that the impact of cooperatives will not be driven by area-specific characteristics; and (2) the distribution of treatment and comparison *kebeles* by level of market access is also fairly balanced.

Matching Households

As a result of the sample reduction, the subsample now contains 2,532 households, including 1,702 in comparison *kebeles* and 830 in treatment *kebeles;* 150 are cooperative members (Table 3.4). Propensity scores are used to match the 150 household members in the treatment *kebeles*—the treated households—to those households among the 1,702 in the comparison *kebeles* that most resemble them. For this purpose, we first estimate each household's propensity score (its likelihood of joining a cooperative in the treatment *kebeles*) using a flexible probit model where the dependent variable

Table 3.4 Distribution of households across treatment and comparison *kebeles*

Household type	Comparison *kebeles*	Treatment *kebeles*	Total
Cooperative nonmembers	1,702	680	2,382
Cooperative members	0	150	150
Total	1,702	830	2,532

Source: Authors' calculations based on data from ESCS (2005).
Note: A *kebele* is a peasant association, the smallest administrative unit in Ethiopia.

is the household's membership status. Domain dummies are used to ensure matching within the domains. Household characteristics include measures of the household's assets (such as education level, radio ownership, nonfarm income, landholding, and livestock) that are introduced linearly as well as quadratically to augment the model's predictive power. Finally, a set of dummy variables is included to account for the household's cultivation of particular cereal crops.[4]

We must also consider that a household's production of a particular cereal may be in response to participation in the cooperative. The estimated impact would then be downward biased, as it might not take into account a household's switch into production of higher profit crops. However, the focus of the present monograph is the cooperatives' impact on smallholders' marketing behavior. As such, one wants to compare marketing behavior of households engaged in similar production, regardless of whether this was driven by the cooperative. In addition, the production of particular cereals is largely driven by soil and weather conditions in Ethiopia: teff is mainly cultivated in highland areas north of Addis Ababa, maize in the lowlands south of Addis Ababa, sorghum in the northwest and east, and barley along a north-south meridian in the middle of the country (CSA, EDRI, and IFPRI 2006).

The probit estimation is better identified when undertaken on treatment *kebeles* only, where the choice to join a cooperative exists (see Gotland et al. 2004 for a discussion). We report estimates of the coefficients in Table 3.5. We also report the associated *p*-values, although the purpose here is not to identify particular relationships but rather to maximize the predictive power of the model. Such an approach relies on out-of-sample prediction to generate a propensity score for the comparison households, however. To assess

[4] All households in this sample are involved in cereal production.

Table 3.5 Probit estimations of determinants of participation in cooperatives

	Sample 1: members and nonmembers from *kebeles* with cooperatives		Sample 2: members and nonmembers from *kebeles* with and without cooperatives	
Determinant	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**
Age of household head	0.009	0.028	0.009	0.003
Gender of household head	–0.579	0.002	–0.311	0.038
Household head is literate	–0.003	0.978	0.066	0.539
Household size	0.082	0.513	0.142	0.129
(Household size)^2	–0.006	0.562	–0.010	0.161
Radio ownership	0.005	0.970	0.064	0.549
Household receives nonfarm income	–0.166	0.190	–0.216	0.027
Number of hectares held	0.551	0.000	0.380	0.000
(Number of hectares held)^2	–0.053	0.025	–0.033	0.038
Number of oxen owned	0.061	0.656	0.128	0.161
(Number of oxen owned)^2	–0.001	0.978	–0.007	0.616
Number of cattle owned	0.022	0.632	–0.017	0.630
(Number of cattle owned)^2	–0.002	0.425	0.001	0.877
Number of small ruminants owned	0.051	0.051	0.036	0.072
(Number of small ruminants owned)^2	–0.001	0.498	–0.001	0.455
Number of poultry owned	0.029	0.378	0.026	0.310
(Number of poultry owned)^2	–0.001	0.367	–0.001	0.627
Produces teff	0.134	0.326	0.245	0.020
Produces wheat	0.060	0.703	0.055	0.607
Produces maize	–0.333	0.028	–0.251	0.026
Produces barley	–0.629	0.000	–0.699	0.000
Produces sorghum	–0.159	0.264	–0.315	0.003
Produces oats	–0.403	0.389	–0.204	0.579
Produces millet	–0.524	0.033	–0.319	0.111
Development domain dummies (5–1)[a]	Yes	—	Yes	—
Constant	–2.658	0.000	–1.906	0.000
Number of observations		830		2,532
Pseudo R^2		0.2444		0.2130
Correct prediction rate (%)	84.45		94.43	
Correct prediction rate among participants (%)	32.66		7.33	

Source: Authors' calculations based on data from ESCS (2005).

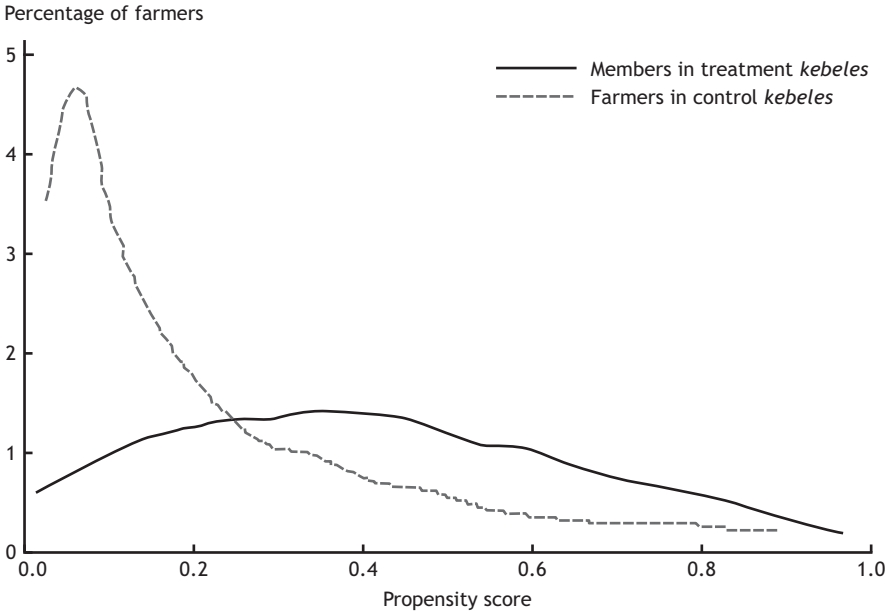
Notes: — means not applicable. A *kebele* is a peasant association, the smallest administrative unit in Ethiopia.

[a](5–1) denotes the five development domains that capture the majority of cooperatives.

the importance of associated concerns, we also report estimates from the same model applied to the entire sample. Overall, parameter estimates and their statistical significance are similar, except for variables linked to non-farm income and type of cereals production, which may well be influenced by *kebele*-level characteristics. We find, however, that estimates based on the restricted sample are better able to predict the rare event (membership in cooperatives) than those based on the full sample. We therefore use the restricted sample to generate propensity scores for households living in comparison *kebeles,* determining which ones would probably participate, given access to a cooperative.

The distribution of propensity scores among the treatment and comparison groups are reported in Figure 3.2. As is clear from the figure, the distributions appear quite different, so that matching techniques will be necessary to ensure the robustness of our estimates. Several techniques can be used. Here we focus on two broadly used methods: (1) nonparametric kernel regression matching proposed by Heckman, Ichimura, and Todd (1998); and (2) five-nearest-neighbors matching. In the first case, each treated household is

Figure 3.2 Propensity-score distribution among treatment and comparison observations



Source: Authors' calculations based on data from ESCS (2005).

Table 3.6 Balancing tests of matched samples

	Unmatched samples			Kernel-based matching			Five-nearest-neighbors matching		
	Treatment *kebeles*	**Comparison** *kebeles*	**Difference** ***p*-value**[a]	**Treatment** *kebeles*	**Comparison** *kebeles*	**Difference** ***p*-value**[a]	**Treatment** *kebeles*	**Comparison** *kebeles*	**Difference** ***p*-value**[a]
Age of household head (years)	47.79	42.82	0.000*	47.60	47.79	0.915	47.60	48.55	0.608
Gender of household head[b]	1.10	1.17	0.015*	1.10	1.06	0.336	1.10	1.05	0.185
Household head literate[c]	39.59	30.69	0.025*	40.00	36.43	0.541	40.00	32.71	0.207
Household size	6.04	5.19	0.000*	5.92	5.84	0.768	5.92	5.74	0.513
Radio ownership[c]	1.40	1.21	0.000*	1.37	1.31	0.343	1.37	1.32	0.368
Nonfarm income[c]	1.48	1.53	0.262	1.48	1.49	0.920	1.48	1.49	0.868
Land owned (hectares)	2.10	1.34	0.000*	1.95	2.07	0.449	1.95	2.06	0.475
Oxen (number)	1.63	0.90	0.000*	1.47	1.38	0.553	1.47	1.38	0.583
Cattle (number)	5.16	3.50	0.000*	4.80	4.55	0.593	4.80	4.54	0.587
Ruminants (number)	3.42	2.44	0.003*	2.84	3.73	0.089*	2.84	3.70	0.075*
Poultry (number)	3.66	2.11	0.000*	3.60	3.39	0.688	3.60	3.41	0.715
Cereal production (kg)	1,148.9	650.94	0.000*	1,073.0	896.39	0.135	1,073.0	897.6	0.115

Source: Authors' calculations based on data from ESCS (2005).

Notes: * indicates differences significant at the 10 percent or lower level. A *kebele* is a peasant association, the smallest administrative unit in Ethiopia.

[a]Significance test results (using *p*-values) of the difference between the treatment and comparison sample values.

[b]1 = male; 2 = female.

[c]1 = yes; 2 = no.

matched with the entire sample of comparisons. However, each comparison observation enters the estimate with a weight inversely proportional to its distance to the treatment one, based on the propensity score distribution. In the second method, each treatment observation is matched with the average value of its five nearest comparison neighbors, again based on the propensity score distribution. To ensure maximum comparability of the treatment and comparison groups, the sample is restricted to the *common support region,* defined as the interval of propensity score values where both treatment and comparison observations can be found.

A straightforward way to test the validity of the matching procedure is to compare an average household's characteristics in the treatment sample to the corresponding characteristics of the comparison group generated. Accordingly, the absence of significant differences between the treatment and comparison groups is indicative of a valid matching. We thus undertake a series of statistical tests for differences in household characteristics on three different samples: (1) cooperative members in treatment *kebeles* compared to all households in the comparison *kebeles* (an unmatched sample); (2) cooperative members in treatment *kebeles* compared to the subset of households satisfying the common support restriction in the comparison *kebeles,* with kernel-based matching; and (3) cooperative members in treatment *kebeles* compared to the subset of households satisfying the common support restriction in the comparison *kebeles,* selected through the five-nearest-neighbors matching method.

As shown in Table 3.6, the unmatched sample fails to satisfy the balancing properties: households in treatment *kebeles* are on average significantly different from the households in the comparison *kebeles* in all but one of the aspects considered. By comparison, only one such significant difference is observed in the matched samples, that is, the number of ruminants owned by the household. Overall, these results suggest that the two matched samples suit our comparability requirements, whereas the nonmatched sample does not.

Average Impact

Indicators of Impact

We assess the impact of cooperatives on smallholders' commercialization using two related indicators. The first one captures the extent to which cooperatives provide smallholders with better market conditions in the form of higher output prices. The second one measures smallholders' actual marketing response to cooperative membership, as reflected in the percentage of output being commercialized.

The impact of cooperatives on output prices is intended to capture whether cooperatives effectively enable their members to obtain a higher price for their output. This indicator is fundamental, because policies promoting cooperatives often highlight, as a rationale, the possibility that such organizations can help smallholders obtain higher prices for their output through reduced transaction costs, increased bargaining power vis-à-vis traders, or the ability to reach more attractive markets. The price indicator that we use is an acreage-share weighted sum, over all types of cereal sold, of the difference between the price received by the member household and the corresponding average price in the sample:

$$PD_i = \sum_j l_{ij} \times \left(\frac{p_{ij} - \bar{p}_j}{\bar{p}_j} \times 100 \right),$$

where PD_i is the price indicator for household i, l_{ij} is the proportion of land that is allocated to cereal j by household i in 2005, p_{ij} is the unit price received by household i for crop j, and $\bar{p}_j$ is the average unit price of crop j received by the sample households.[5]

The second indicator aims to capture whether smallholders' participation in marketing cooperatives leads to more market-oriented behavior. We use the share of the cereal output that was sold by a household in 2005, denoted PS, and defined as:

$$PS_i = \sum_j \frac{S_{ij}}{Q_{ij}},$$

where Q_{ij} is the quantity of crop j that was produced by household i and S_{ij} is the quantity of crop j that was sold by household i, both in 2005. If cooperatives are able to enhance market participation, then their impact on this indicator will be positive.

Estimators

Because the impact estimates may be sensitive to the estimator chosen, we use two separate classes of estimators to assess the robustness of our results. In the first one, we simply compute the difference in outcome between treatment and comparison households that are matched according to the

[5] The aggregation process across crops is meant to capture the effects of the household's crop production profile.

two procedures described above. Because analytical standard errors are not computable for the kernel density matching method, we use 100 bootstrap replications stratified at the development domain level to compute robust estimates of them. The second estimator is based on ordinary least squares and tobit estimations, including several control variables. To further ensure comparability of the treatment and comparison groups, we restrict the sample to the common support region of the five-nearest-neighbors matching, as described above.

Results: Average Impact of Cooperatives on Their Members

Panel A of Table 3.7 gives the nonparametric estimates of the *average treatment effect on the treated*—that is, the mean impact that cooperative membership has had on members' output commercialization and price. Starting with the price difference indicator, we find that, on average, cooperative members receive between 7.2 and 8.9 percent higher prices for their cereal products than did their nonmember counterparts. This effect is statistically significant and robust across both matching techniques; it is consistent with the idea that cooperatives may increase the returns to commercialization for smallholder farmers. Regarding the share of production sold, however, we find that cooperative membership does not have an impact significantly different from zero.

The implication of these results appears surprising: despite a higher average price received for their outputs, cooperative members apparently do not tend to supply more of their output to the market. Two types of biases may be at play, however. First, the obtained estimates may be influenced by the estimation procedures adopted and the indicators used. Second, given the reduction in the size of the sample, the estimates obtained may lack representativeness of the general situation in Ethiopia. To account for these sources of bias, we present in panels B and C of Table 3.7 a series of robustness and representativeness checks.

For instance, one may argue that the use of the sample average as the reference point in the price indicator is problematic. Although our estimations control for important determinants of output prices via the development domains, it could still be the case that, if cooperatives are located in areas with higher prices to start with, a higher price for cooperative members may wrongly be attributed to the presence of cooperatives instead of to local conditions. To avoid such biases, using zonal or regional level aggregates as the reference point instead of the entire sample might be recommended. In this case, however, the relatively small size of our sample at the zonal level as well as in some regions would provide us with imprecise estimates

Table 3.7 Effect of cooperatives on members' cereals commercialization

	Kernel-based matching		Five-nearest-neighbors matching		
	ATT	Standard error	ATT	Standard error	Number of observations
Measure					
A. Two-step matching, final sample					
Price difference (%)	7.249	3.229**	8.901	4.361**	862
Production sold (%)	–0.122	1.862	–1.116	2.202	1,817
B. Checks of robustness					
B-1. Two-step matching, final sample limited to Oromia region only					
Price difference (%)	8.545	3.952**	7.141	6.373	454
Production sold (%)	–2.881	3.671	–2.914	3.141	787
B-2. Two-step matching, final sample excluding *kebeles* with NGO-created cooperatives					
Price difference (%)	5.567	3.674	6.196	4.366	861
Production sold (%)	0.761	1.876	–1.402	2.442	1,805
B-3. Two-step matching, final sample, with propensity scores estimated on whole sample					
Price difference (%)	7.206	3.229**	7.562	3.771**	862
Production sold (%)	–1.180	1.964	–3.224	2.550	1,817
C. Checks of representativeness					
C-1. Two-step matching, sample with all regions					
Price difference (%)	11.451	2.060***	10.607	2.765***	1,449
Production sold (%)	–1.174	1.147	–0.944	1.340	2,993
C-2. Two-step matching, sample with member-created cooperatives					
Price difference (%)	9.294	1.831***	8.626	2.327***	1,471
Production sold (%)	0.005	1.07	–0.084	1.325	2,972
C-3. Two-step matching, sample with all regions and member-created cooperatives					
Price difference (%)	13.120	1.923***	12.118	2.206***	1,504
Production sold (%)	–1.380	0.923	–1.295	1.093	3,105
C-4. One-step matching, final sample within treatment *kebeles* only					
Price difference (%)	7.606	3.980*	7.259	3.571**	368
Production sold (%)	–1.083	1.811	–1.410	2.135	822

Source: Authors' calculations based on data from ESCS (2005).

Notes: Stratified bootstrap with 100 replications is used to estimate the standard errors. Numbers are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively. ATT means average treatment effect on the treated; NGO means non-governmental organization. A *kebele* is a peasant association, the smallest administrative unit in Ethiopia.

of the mean price, which in turn may severely affect the precision of our estimates. To test the importance of such potential bias, we compute the average treatment effects when only the Oromia region is considered in the analysis. (As shown in Table 3.2, Oromia is the only region where a sufficiently large sample of treatment and comparison *kebeles* exist.) Results reported in panel B-1, although less precise, are qualitatively similar to those of panel A.

Second, we investigate whether the inclusion of NGO-created cooperatives in the final sample may affect the results. Indeed, if NGOs deliberately choose the *kebeles* in which they intervene based on criteria linked to the likely performance of the organizations they help set up, results may be artificially high. In panel B-2, we present estimates from a sample excluding *kebeles* where NGO-created cooperatives exist. The estimates are reduced in their magnitude and precision, although the main features remain.

Third, we check whether our use of the sample of *kebeles* with cooperatives only, to derive the propensity score estimates, may have affected the results. Results are reported in panel B-3; they do not show any meaningful differences from those of panel A.

Next we investigate how the estimates may be affected by more representative but arguably more biased samples. A first concern may come from our limitation to cereal crop cooperatives, when evidence suggests that cooperatives are often more efficient when operating with high-value products, such as coffee. As discussed in Chapters 1 and 2, cereals do, however, constitute the most important crops for smallholders' livelihood in many Sub-Saharan African countries, particularly in Ethiopia.

Further, in panel C-1, we use a sample containing all regions, including Tigray, Beneshangul-Gumuz, and Harari. Again, the results do not clearly differ from those of panel A, although the impact of cooperatives on output prices seems greater in magnitude than for the fully restricted sample. The same conclusions are drawn from panels C-2 and C-3, where the sample includes all *kebeles* with member-created cooperatives, first restricted to only three regions (Amhara, Oromia, and SNNP) and then extended to cover all regions. Finally, in panel C-4, results are based on the sample of panel A but are further restricted to only *kebeles* where an externally created cooperative exists. The comparison is then done between cooperative members and nonmembers living in the same *kebeles.* Again, the results do not change in nature.

Another robustness check uses parametric estimations that control for several household- and community-level characteristics (Table 3.8). Because participation in a cooperative may directly affect the production levels of

members, we use the number of hectares of farm land "owned" by the household as a proxy for its actual level of production. Given the land ownership regime in Ethiopia, this variable is considered as exogenous, at least in the short or medium term.[6] Other variables in the estimation include the household head's reading ability, household size, and the set of *kebele*-level control variables used in the definition of the development domains. The sample is the same as that used in the estimates reported in panel A of Table 3.7, except that a few observations with missing data were dropped. Estimators used are the ordinary least squares and tobit specifications described above.

Coefficients in the upper part of Table 3.8 indicate that households living close to markets sell more of their production and at higher prices, whereas the opposite is true for households living in areas with higher population densities. Favorable agroclimatic conditions (that is, areas that produce surpluses) tend to have depressing effects on prices. From among the household-level characteristics, the amount of land owned positively affects the share of production that is commercialized by a household, and the education of the household head has a clear and significant effect on the price he or she is able to obtain for a unit of output. In the middle part of the table, we report the coefficients on a membership dummy ("Treatment ×"). Cooperative membership does have a significant positive impact on output price, similar in magnitude to the results presented in Table 3.7. In contrast, the effect on the share of production sold cannot be distinguished from zero, further supporting the conclusions of the previous table.

Overall, the robustness and representativeness checks support the general conclusion that, although cooperatives may provide significantly higher prices to their members, the average impact on fraction of output marketed is not statistically different from zero. However, these estimates capture average outcomes and do not capture potentially important heterogeneities across farmers' responses to their participation in cooperatives.

Heterogeneous Impact

There is no reason to believe a priori that membership in a cooperative implies homogenous responses for different categories of farmers. To see this, we plot in Figure 3.3 the distribution of the impact that cooperatives have on

[6] Land in Ethiopia is the property of the state and cannot be owned by individual farmers. Nevertheless, land is allocated to households on a usufructuary basis for an undetermined period. Although land cannot be sold, it can be rented out and eventually passed on to heirs. The variable we use here as "landholding" is the amount of land allocated by the state to the household. For a detailed description of the Ethiopian land-tenure system, see Gebreselassie (2006).

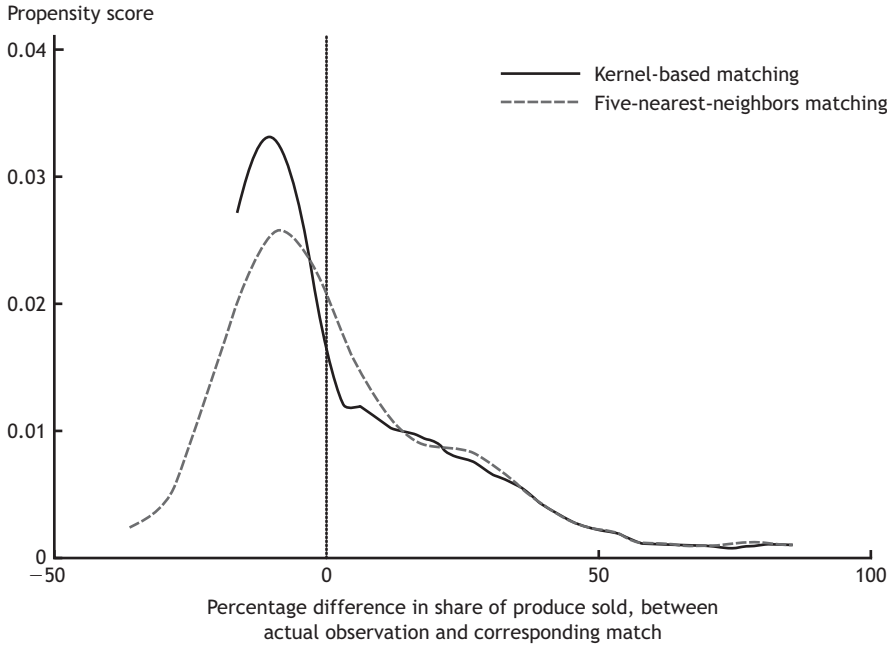
Table 3.8 Heterogeneous effects of membership on commercialization

	Price difference		Percentage of production sold			
	Ordinary least squares model		Tobit model			
	(1)	(2)	(3)		(4)	
Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Marginal effect**	**Coefficient**	**Marginal effect**
Land owned (hectares)	0.331	0.010	4.112	1.947	3.655	1.732
	(0.835)	(0.878)	(0.675)***		(0.708)***	
Household head is literate	3.778	4.241	3.789	1.829	3.904	1.887
	(2.176)*	(2.279)***	(1.767)**		(1.847)*	
Household size	0.014	0.153	–1.005	–0.476	–0.927	–0.439
	(0.501)	(0.520)	(0.382)***		(0.394)**	
Market access	7.429	7.149	4.217	1.968	4.058	1.897
	(2.305)***	(2.314)***	(1.799)***		(1.797)***	
Population density	–5.408	–5.297	–6.690	–2.962	–6.303	–2.803
	(3.398)	(3.404)	(2.555)**		(2.556)**	
Agricultural potential	–22.235	–22.679	11.788	4.872	11.336	4.713
	(4.113)***	(4.139)***	(2.985)***		(2.990)***	
Treatment	10.007	14.007	0.731	0.349	–2.455	–1.130
	(3.838)***	(11.687)	(3.089)		(9.360)	
Treatment × . . .						
Land owned (hectares)		3.272		4.830	2.289	
		(2.933)		(2.314)***		
Household head is literate		–3.344		0.416	0.198	
		(8.054)		(6.358)		
Household size		–1.763		–1.153	–0.546	
		(1.959)		(1.534)		
Constant	8.340	8.540	–16.094		–15.389	
	(4.916)*	(5.000)*	(3.669)***		(3.723)***	
Number of observations	856	856	1,808		1,808	

Source: Authors' calculations based on ESCS (2005).

Notes: Robust standard errors are listed in parentheses. A total of 931 observations were censored at percentage sold equals zero. Samples are limited to common support for each estimation. Coefficients are significant at the * 1 percent, ** 5 percent, and *** 10 percent levels, respectively.

Figure 3.3 Distribution of cooperative membership impact across households, kernel-density estimates



Source: Authors' calculations based on data from ESCS (2005).

members' percentage of production sold.[7] The figure displays marked heterogeneity in member response to participation in cooperatives. Although for some cooperative members, the share of production sold is almost double that of their nonmember counterparts, for many other members, this level is significantly lower than that for their estimated counterparts—possibly despite higher prices within the cooperative.

We further investigate this heterogeneity by interacting the treatment dummy ("Treatment ×") with household-level variables, in columns (2) and (4) of Table 3.8. In column (2), none of the obtained coefficients on the interacted terms differs significantly from zero, indicating that no obvious heterogeneity exists between cooperative members regarding the impact on output price received. In column (4), however, we find that the effect of membership on the percentage of production sold increases significantly

[7] Letting PS measure the household's share of production sold and $\overline{PS}$ the share of production sold by its generated counterfactual, the curves graphed in Figure 3.3 represent the distribution of the difference ($PS - \overline{PS}$), expressed as a percentage of $\overline{PS}$, across households.

with the size of the landholding, indicating that the larger a household's landholding—standing in for potential production—the more responsive it will be to the price incentive secured by the cooperative. With an average impact of null, these results suggest that smaller farmers tend to be the ones substituting out of the market in response to the price increases.

Given the staple nature of the crops considered, this phenomenon may be explained by the potentially counteracting effects of the price increase on the household's production and consumption choices. Although a price increase will probably lead to a positive (or zero) production response, its effect on consumption is more ambiguous. As a consequence, the impact on marketed output is uncertain. This ambiguity may be the case particularly for poorer households with lower capabilities of supply response and greater (positive) income elasticity of cereals consumption.[8] Further research is needed, however, to elicit this hypothesis.

Conclusion

In Chapter 1 we hypothesized that collective action mechanisms can help smallholders overcome marketing constraints. The results presented here offer a somewhat contrasting picture. Although cooperatives can effectively secure higher prices for their members' output, this ability does not necessarily lead to an increase in the quantity of output commercialized by their members, suggesting (as indicated elsewhere in the literature) that price incentives may not be sufficient to ensure greater market participation by the poorest farmers.

[8] Evidence has been uncovered suggesting that preference for food self-sufficiency falls with increasing income and/or wealth in Ethiopia (Taffesse, Bernard, and Yu 2007).

CHAPTER 4

Cooperatives for Whom?

This chapter investigates the extent to which RPOs constitute an effective means for reaching the rural poor. We explore the second issue presented in Chapter 1: do poorer households participate in Ethiopian cooperatives, and if not, do they nonetheless benefit indirectly from some of the cooperative's activities?

Determinants of Household Participation

Only 17 percent of farm households with access to a cooperative in their *kebele* participated in it. Several reasons may explain this low level of participation. Under the previous regime, cooperatives were used to extend strong government control to the local level and to promote socialist ideology through compulsory participation. Field observations suggest that a long process of trust recovery is required for present-day cooperatives to overcome persisting suspicion and wariness on the part of potential members.

Other reasons may be linked to a household's economic incentive or the cooperative's exclusive membership. Table 4.1 shows responses to the question (asked of nonmember households in *kebeles* that have a cooperative): "Why did you decide not to join the cooperative?" For 59 percent of the respondents, the benefit of participation did not seem worth the effort or fee required. Another 39 percent would have participated had they been accepted. We analyze these two mechanisms below.

Household-Level Self-Exclusion

Small- and large-scale farmers tend not to participate in these organizations, resulting in what might be referred to as a "middle class" participation effect. As discussed in Chapter 1, this pattern of self-exclusion can be linked to a nonlinear (inverted U-shaped) relationship between the level of a household's production and the benefit it may derive from participating in such organizations. Using the subset of *kebeles* with at least one cooperative,

Table 4.1 Reasons not to join the cooperative

Reason	Percent
Does not think he or she would benefit from the cooperative as it is; fees are too high compared to benefits	58.92
Does not meet the requirement for membership; was not accepted or could not pursue membership	38.86
Other	2.22

Source: Authors' calculations based on data from ESCS (2005).

we test for the existence of such a relationship using the ESCS (2005) survey. The analysis relies on logit estimates of the probability of membership, using a variety of household characteristics.

In particular, we use landholding as a proxy for a farmer's production level, as there is clearly a significant relationship between landholding and production. In addition, the relationship between landholding and cooperative membership in Ethiopia is probably immune to the problem of reverse causality that would be likely to arise between participation in a cooperative and level of wealth.[1]

However, such asset measures as number of oxen owned and house value (Table 4.2) may in part be determined by the household's participation in the cooperative, insofar as participation makes the household wealthier and thus able to purchase more oxen and upgrade its housing. We nevertheless introduce them to assess the robustness of the results obtained in the first specification. Other household characteristics include the age and reading capacities of the household head, as well as a set of regional and ethnicity dummies.

Overall, education and landholding seem to be the dominant variables explaining household participation in cooperatives. Thus the probability that a household participates in a cooperative is increased by 5–8 percent if the household head is literate.[2] Participation also increases by 6–9 percent for each additional hectare of land. However, the marginal effect of landholding

[1] See Chapter 3 for a discussion of the exogeneity of land allocation in Ethiopia.

[2] Overall, the literacy rate approaches 27 percent for nonmembers and 40 percent for members. If one considers that literacy is somewhat predetermined with regard to participation, and that the effect is not driven by other household (unobservable) characteristics, then education and literacy programs may constitute a powerful tool to promote participation in cooperatives. Testing these assumptions would require a more sophisticated estimation of the participation equation, beyond the scope of this chapter.

Table 4.2 Determinants of households' participation in cooperatives

Dependent variable: household participates in at least one cooperative	Mean[b]	Marginal effect at mean of independent variable[a] (1)	(2)	(3)	(4)
Household size	5.13	0.016	0.008	0.010	0.011
	(2.23)	(0.003)***	(0.003)***	(0.03)***	(0.003)***
Age of household head (years)	44.31	0.001	0.001	0.001	0.001
	(15.28)	(0.000)***	(0.000)***	(0.001)	(0.000)
Gender of household head	0/1	–0.047	–0.049	–0.040	–0.039
		(0.018)***	(0.018)***	(0.016)**	(0.015)**
Household head is literate	0/1	0.080	0.064	0.054	0.058
		(0.017)***	(0.017)***	(0.015)***	(0.015)***
Land owned (hectares)	1.24	0.092	0.089	0.065	0.059
	(0.95)	(0.022)***	(0.023)***	(0.021)***	(0.020)**
$(\text{Land owned})^2$		–0.011	–0.012	–0.007	–0.007
		(0.005)**	(0.005)**	(0.004)	(0.005)
Number of oxen	0.88		0.022	0.018	0.017
	(1.12)		(0.008)***	(0.007)**	(0.007)**
$(\text{Number of oxen})^2$			–0.001	–0.001	–0.001
			(0.001)	(0.001)	(0.001)
House value (birr)	835.20		0.559×10^{-5}	0.445×10^{-5}	0.463×10^{-5}
	(1,486.86)		$(0.1 \times 10^{-5})^{***}$	$(0.1 \times 10^{-5})^{***}$	$(0.1 \times 10^{-5})^{***}$
$(\text{House value})^2$			-0.465×10^{-8}	-0.340×10^{-8}	-0.347×10^{-8}
			$(0.000)^{***}$	$(0.000)^{***}$	$(0.000)^{***}$
Ethnicity dummies				Yes	Yes
Regional fixed effects					Yes
Number of observations		2,674	2,541	2,486	2,486

Source: Authors' calculations based on data from ESCS (2005).

Notes: Marginal effects are reported at the mean of the independent variable after logit estimations. Coefficients are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively. The values for "Gender of household head" and "Household head is literate" denote the range of possible responses, with 0 equal to male, 1 equal to female for the gender variable, and 0 equal to yes and 1 equal to no for the literacy variable.

[a]Standard errors are listed in parentheses.

[b]Standard deviations are listed in parentheses.

decreases with the amount of land: very large farm households (holding more than 14 hectares) are less likely to participate.[3]

Cooperative Exclusiveness

The overall low participation in cooperatives may also be driven by their reluctance to include all potential members. As discussed earlier, inclusive membership implies two potentially opposing effects: (1) economies of scale in marketing surpluses and procuring inputs and (2) the offsetting increases in coordination costs that result from an increase in the number of members. Coordination costs may be particularly significant if increased membership is directly correlated with growing heterogeneity and divergent interests among members concerning the cooperative's operations.

In Table 4.3, we report on cooperative-level indicators of inclusiveness. We find that, although most cooperatives declare that their membership is open to all individuals, all of them condition membership on the fulfillment of particular criteria. For instance, 87 percent of the organizations only accept members living in the same *kebele,* a criterion that may be intended as a way of reducing monitoring costs among members. Surprisingly, asset ownership is not often cited as a primary criterion. But as these cooperatives are all mainly linked to agriculture, and most households control at least some land, an asset criterion would not be a discriminant in most cases. A more constraining criterion may be that all members must buy a share of the cooperative, which costs on average 45 birr (US$4.95) but can reach 1,000 birr (US$110.00).[4]

We investigate the potential effect of these membership criteria on actual membership structure in Table 4.4.[5] Column (1) shows a positive relationship between both the *kebele* and the age criteria and the total number of members in the organization (expressed in log values). However, an opposite effect is found with respect to the financial criterion. In column (2) we replace the financial criterion with the actual price of the cooperative share. Results are clearly robust, indicating that an increase of 1 birr (US$0.11) in the price of a cooperative share is typically associated with a 0.4 percent decrease in the size of the organization. Columns (3) and (4) report similar

[3] Such "middle-class effects" are often observed in the collective action literature. See, for example, Weinberger and Juttin (2001).

[4] Data limitations prevent us from relating cooperative membership fees (cooperative-level dataset) to the household decision to join the organization (household-level dataset).

[5] Note that the reported coefficients are likely subject to various endogeneity biases and should only be interpreted as correlates.

Table 4.3 Cooperative-level indicators of inclusiveness

Indicator	Unit	Mean	Standard deviation
Can anybody join the cooperative?	Percentage yes	73.26	
Are there any criteria to join the cooperative?	Percentage yes	100.00	
Buy cooperative share and pay annual fee	Percentage yes	56.97	
Live in the same *kebele*	Percentage yes	87.20	
Minimum and/or maximum age requirement	Percentage yes	65.69	
Ownership of specific asset	Percentage yes	7.55	
Price of cooperative share	Birr	45.24	96.39
Annual fee	Birr	5.56	9.62
Has anybody ever been refused membership in the cooperative?	Percentage yes	8.77	
Percentage of women in the cooperative	Percentage of members	13.15	13.36

Source: Authors' calculations based on data from ECS (2006).
Note: A *kebele* is a peasant association, the smallest administrative unit in Ethiopia.

Table 4.4 Membership criteria and actual membership

	Total membership (log)		Heterogeneity (coefficient of variation for landholding)	
Dependent variable	**(1)**	**(2)**	**(3)**	**(4)**
Kebele criteria	0.477	0.287	0.018	0.027
	(0.256)*	(0.242)	(0.066)	(0.071)
Age criteria	0.336	0.379	–0.043	–0.002
	(0.200)*	(0.175)**	(0.052)	(0.051)
Asset criteria	–0.305	–0.422	–0.032	–0.016
	(0.345)	(0.317)	(0.089)	(0.093)
Financial criteria	–0.482		–0.095	
	(0.176)***		(0.045)**	
Share price		–0.004		0.0002
		(0.001)***		(0.0002)
Constant	6.040	6.136	0.462	0.364
	(0.314)***	(0.263)***	(0.081)***	(0.077)***
Number of observations	171	169	171	169

Source: Data are from ECS (2006).
Notes: A *kebele* is a peasant association, the smallest administrative unit in Ethiopia. Least square coefficients are reported. Standard errors are listed in parentheses. Coefficients are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

estimates, this time using the landholding heterogeneity—measured as the coefficient of variation of members' landholdings—as the dependent variable. Although we do not find a clear negative effect of personal membership criteria (location, age, or assets), financial criteria appear to be a statistically significant factor in membership.

By and large, these results do support the hypothesis that cooperative membership is driven partly by household self-selection and partly by cooperative exclusion policies. We find interesting that the exclusion of community members is not clearly stated as a policy but rather is implemented through potentially disqualifying financial criteria. This tacit approach may be related to the organization's need to gain social acceptance and establish its legitimacy as well as to reduce the potential for intracommunity disharmony and jealousy—a phenomenon also observed in RPO studies in West Africa (for example, Bernard et al. 2008). The desire for such social acceptance may also explain the range of activities undertaken by the organization.

Public Goods and Services, and Spillover Effects

An organization's inclusiveness may be defined more broadly than simply in terms of its membership. It may also be measured by whether an RPO's benefits extend beyond its membership base. For instance, ECS (2006) data reveal that 90 percent of nonmembers living in a *kebele* where a cooperative exists declared that they benefit "somehow" from the presence of the organization. This level is all the more important considering that only 24 percent of these organizations reported being engaged in any type of provision of public goods for the community.

As shown in Table 4.5, an average marketing cooperative in Ethiopia reports being simultaneously engaged in more than four separate activities.[6] Some of these are clearly complementary to marketing, shown in the upper part of the table. For instance, 84 percent of these organizations are also engaged in input provision, and 54 percent aim to provide credit to their members. Other activities are more remote from the marketing objective of the organization; these appear in the lower part of the table. Overall, 74 percent of the marketing organizations are also involved in nonmarketing-related activities, ranging from consumption services to HIV prevention.

[6] This figure does not imply that the cooperative is effectively providing this service, but rather that the service is part of its declared objectives. For instance, as discussed in the next chapter, a large proportion of the cooperatives that declare being engaged in output marketing had not actually provided such service to their members for at least 2 years.

Table 4.5 Activities undertaken by agricultural marketing cooperatives

Type of activity	Definition and unit	Mean	25th percentile	75th percentile
All activities	Total number, including marketing	4.63	3	6
Marketing-related activities				
Number of marketing-related activities	Total number, including marketing	3.51	3	4
Input provision	1 = provides this service (%)	83.72	1	1
Credit	1 = provides this service (%)	54.06	0	1
Extension	1 = provides this service (%)	23.25	0	0
Price information	1 = provides this service (%)	70.93	0	1
Processing	1 = provides this service (%)	19.18	0	0
Nonmarketing activities				
Engages in nonmarketing activities	1 = at least one (%)	74.41	0	1
Number of nonmarketing activities	Total number	1.12	0	2
Consumption services	1 = provides this service (%)	62.20	0	1
Literacy training	1 = provides this service (%)	11.62	0	0
HIV prevention training	1 = provides this service (%)	23.25	0	0
Public infrastructure	1 = provides this service (%)	15.11	0	0

Source: Authors' calculations based on data from ECS (2006).
Note: Types of activity based on a sample of 172 cooperatives surveyed in 2006.

Thus the extent to which nonmembers benefit from a cooperative depends on the cooperative's portfolio of activities. Three categories of activities can be identified: activities directly beneficial to nonmembers, activities neutral to nonmembers, and those indirectly beneficial to nonmembers (Table 4.6).

Activities Directly Beneficial to Nonmembers

These are activities that allow the cooperative to benefit from scale economies. With regard to product aggregation, for instance, these activities may include the supply of production inputs (such as fertilizer) or the sale of surplus cereal output. Often the only difference in benefits accruing to members versus nonmembers is limited to the distribution to members of profits or dividends that are generated from these services. For example, a study by Tendler (1983) finds that among cooperatives in Bolivia, nonmembers benefited, because RPOs tended to extend their services to nonmembers to establish larger economies of scale.

Table 4.6 Who benefits from cooperative activities?

Indicator	Mean (% yes)
Do you feel that you benefit from the cooperative even though you are not a member?[a]	89.59
Activities directly beneficial to nonmembers	
Has the cooperative provided fertilizers to its members in 2005?	74.27
Has it also provided fertilizers to nonmembers in 2005?	71.65
Has the cooperative provided pesticides to its members in 2005?	14.04
Has it also provided pesticides to nonmembers in 2005?	58.33
Has the cooperative provided seeds to its members in 2005?	53.22
Has it also provided seeds to nonmembers in 2005?	57.14
Activities neutral to nonmembers	
Does the cooperative provide training to its members?	10.00
Can nonmembers access this training?	50.00
Does the cooperative formally share price information with its members?	80.00
Can nonmembers formally access the information?	30.00
Does the cooperative informally share price information with its members?	68.96
Can nonmembers informally access the information?	75.86
Activities not beneficial to nonmembers	
Has the cooperative ever given credit in cash to its members?	60.00
Do nonmembers have access?	10.71
Other activities	
Has the cooperative bought agricultural output from its members in 2005?	23.39
Has it also bought agricultural output from nonmembers in 2005?	2.50

Source: Authors' calculations based on data from ESCS (2005) and ECS (2006).
[a]From household-level interviews of nonmembers.

Activities Neutral to Nonmembers

These activities may cover services for which nonmember participation entails only a low marginal cost to the organization. They include the provision of technical training in production techniques or information sharing on commodity prices, for which an additional nonmember participating in the training or sharing incurs little in the way of incremental costs. For example, a study by Bernard, de Janvry, and Sadoulet (2010) finds that among cooperatives in Burkina Faso, there is a tendency to provide services to nonmembers as a way of assuring acceptance of the cooperative in its village communities.

Activities Indirectly Beneficial to Nonmembers

Nonmembers may also benefit from unintended consequences of cooperative activities. For example, if an RPO successfully bargains for higher prices for its members' output, local commodity prices that are offered to nonmembers may also increase as a result.[7] Similarly, if an RPO contributes to public goods that serve their members and are nonexcludable to nonmembers (such as the construction of local roads, schools, or health centers), then nonmembers are indirect beneficiaries of the RPO's contributions. In both cases, nonmembers may enjoy indirect benefits from the mere existence of the cooperative—a benefit they cannot be prevented from enjoying.

We investigate the relevance of this classification in Table 4.6. Both the activities undertaken by the organizations and the extent to which nonmembers may benefit are given in the table. As expected, when activities are unambiguously associated with economies of scale, the corresponding service is often open to nonmembers. Such is the case for input provision services by cooperatives: nonmembers have access in the majority of cases. We also find that nonmembers tend to benefit from activities neutral to nonmembers, such as training (for instance, HIV/AIDS awareness and prevention) or the dissemination of price information. Regarding the latter benefit, it is interesting to note that, even if the cooperative is not willing to provide such services to nonmembers, it is likely that outsiders would access it anyway, given the nonexcludable and nonrivalrous nature of information. Although only 27 percent of the cooperatives share price information formally beyond their membership, in 56 percent of the cases, outsiders can access it informally—through friends and family networks, for instance. Similarly, although robust empirical estimates are lacking, it is often reported that the simple presence of a

[7] This effect may be particularly important in the case of input provision, where markets are often characterized by monopolistic competition. In these cases, RPOs tend to provide their members with inputs at cost, thereby exerting a downward pressure on the prices that other input suppliers can ask.

cooperative involved in marketing significantly affects the price local traders offer to nonmembers.

Table 4.6 also shows the more restricted benefits in activities not beneficial to nonmembers—for example, the allocation of credit, typically in short supply in rural Ethiopia. In 72 percent of the cases where a cooperative gave credit to its members, it was unable to satisfy all its members' demands. Accordingly, nonmembers access credit from the cooperative in less than 20 percent of all cases.

Finally, we report statistics on the purchase of outputs as an unclassified activity. Indeed, although there are clearly potential economies of scale in output marketing, there are also several risks involved. In many cases, cooperatives only broker a relationship between buyers (typically, local traders and cooperative unions) and sellers as a means of minimizing the risk of holding unsold output. When a cooperative actually buys smallholders' surplus output, it often restricts this service to members who share the risk of unsold output (for instance, through a lower share of the profits generated from the collective marketing margins). Thus Table 4.6 shows that in only 2.5 percent of cases does a cooperative buy output from both its members and from nonmembers.

Overall, the extent to which cooperatives benefit nonmembers depends on their willingness to engage in activities that are friendly or neutral to outsiders. In many cases, it is likely that poorer households will benefit less, because the gains are likely to be positively linked to the level of production (for instance, access to fertilizer at better prices will be more beneficial to an individual with larger fertilizer needs, that is, someone with a larger farm or landholding). In other cases, where no complementary asset determines the level of benefits—such as training on HIV/AIDS awareness and prevention—poorer nonmembers may benefit just as much as their richer counterparts.

Conclusion

In conclusion, the findings presented here are broadly consistent with Issue 2 of Chapter 1: they suggest that the poorest of the poor tend to face considerable constraints on membership in marketing cooperatives. However, poorer nonmember households still benefit from positive spillovers generated by some types of cooperative activities, although these benefits are often limited in comparison to those accruing to members. Finally, it is important to note that data availability limited the nature and depth of the analysis. The geographic spread and role of cooperatives in Ethiopia are also changing. Both considerations indicate the need for further data collection and analysis.

CHAPTER 5

Commercialization Performance of Cooperatives

This chapter investigates the actual marketing performance of cooperatives. We analyze the extent to which activity portfolio and membership structure can account for the overall limited number of commercially active organizations. We then examine how governance structure can be adapted to mitigate these effects.

Marketing Performance of Ethiopian Cooperatives

Although the cooperative movement in Ethiopia has chalked up successes in traditional export sectors, such as coffee (see Gabre-Madhin et al. 2003; Kodama 2007), its successes in the food staple sector are far fewer. During 2003–07, cooperatives marketed 282,000 metric tons of grain, less than 1 percent of total grain production in the country (Meherka 2008). In contrast, cooperatives marketed 357,000 metric tons of fertilizer, or 67 percent of all fertilizer imports and 85 percent of domestic fertilizer distribution (Meherka 2008).

Similar conclusions can be reached using the ECS (2006) data. As shown in Table 5.1, only 59 percent of the cooperatives that claimed to be engaged in marketing members' output actually performed this activity during the 12 months prior to the survey. For those cooperatives that did market output, the average value sold per member was 1,116 birr (about US$122.76), although for 75 percent of them, the value was below 200 birr (about US$22.00).[1]

We might hypothesize that this pattern reflects the organizations' incapacities to effectively market their members' products. However, the results presented in the previous chapter indicate that cooperatives that provide marketing services are relatively well organized to do so. As shown in Table 5.1, these organizations tend to specialize in one or two products, storing

[1] This measure was often not recorded in the cooperative registries; it was therefore collected from estimates by the *woreda*-level cooperative office, resulting in potentially large biases. For this reason, the following estimations are restricted to the binary performance indicator: "The cooperative has provided marketing services to its members over the past 12 months."

Table 5.1 Marketing performance of Ethiopian cooperatives

Indicator	Description and unit	Mean	25th percentile	75th percentile
Sold members product over past 12 months	1 = yes (%)	58.72	0	1
Value sold last year	Birr	256,408	22,800	150,294
Value sold last year, per member	Birr	1,116.30	30.39	188.88
Number of product commercialized	Number	1.55	1	2
Stored product before selling?	1 = yes (%)	95.58	1	1
Number of days of storage	Number	105.03	30	150
Collect price info before selling?	1 = yes (%)	85.29	1	1
On how many markets?	Number	2.25	1	3
Farthest market on which information is collected	Kilometers	99.6	5.5	69.25
Knows price in Addis Ababa, Ethiopia, today?	1 = yes (%)	37.27	0	1
Knows price in nearest *woreda* market today?	1 = yes (%)	63.31	0	1
Used intermediary for transaction?	1 = yes (%)	4.14	0	0
Cooperative transported product for transaction?	1 = yes (%)	21.32	0	0

Source: Authors' calculations based on data from ECS (2006).
Note: *Woredas,* or districts, are one of the smallest administrative units in Ethiopia.

them for more than 3 months (on average) to secure higher prices. Price information is generally collected on one to three markets, including markets that are fairly distant from the location of the cooperative. No intermediary is used for transactions, which may contribute to the improved prices obtained by cooperatives for their members. We examined the knowledge of actual price levels for the Addis Ababa market and found it somewhat limited.[2] This ignorance may be due, however, to the timing of our survey—about 5 months before harvest.[3] Overall, lack of marketing capacity does not seem to explain the finding that more than 40 percent of cooperatives officially engaged in output marketing did not sell *any* of their members' output over the past 2 years.

Another hypothesis is that members may be unwilling to sell their products through the organization. Although 82 percent of cooperative members said they were satisfied with their participation in the organization, only 40

[2] Addis Ababa is by far the largest grain market in the country and is often considered to lead price evolution in other regional markets (Gabre-Madhin 2001).
[3] The survey attempted to collect accounts of cooperative financial performance. Cooperative-level data were, however, scarce and often of low reliability. Audits by *woreda* cooperative offices of primary cooperatives were also collected but proved insufficient in number and often concerned only the best-performing organizations.

percent indicated that the main benefits they gain from cooperatives relate to the commercialization of their output. According to data from ESCS (2005), 60 percent do not feel obligated to sell their product through the cooperative, and of this group 71 percent sold none of their past season production to the cooperatives and only 14 percent sold all of it to these organizations. A possible conclusion is that the marketing functions of the cooperatives are not the primary attraction for their members. Note that cooperatives are also involved in other types of activities: 74 percent were engaged in activities with no apparent direct link to marketing.

Cooperative Activities, Membership, and Marketing Performance

In Table 5.2 we report the results of a series of tests of difference related to the activities undertaken by cooperatives and their marketing performance. The first three columns of the table relate characteristics of the cooperative to its portfolio of activities—economic only versus mixed economic and social. Cooperatives with mixed portfolios have a significantly larger number of members but a lower average landholding than specialized organizations have. Thus multiple activities tend to attract more members but with less individual potential for product aggregation. Multipurpose cooperatives are, on average, older than their specialized counterparts.

The last three columns of Table 5.2 show the results of similar tests of differences, this time between cooperatives that provided marketing services to their members over the 12 months prior to the survey and those that did not. Although there are no significant differences in terms of membership, average landholding is greater for cooperatives providing marketing services.

We further investigated whether large portfolios of activities may in part explain the apparently low marketing performance of cooperatives. Indeed, several studies have argued that by broadening their portfolio of activities, cooperatives often jeopardize their capacity to fulfill their initial purposes, especially when these activities are more diverse (Lele 1981; Collion and Rondot 2001). There have been two main explanations for this phenomenon. First, for a given size of organization, engaging in new activities increases management difficulties, which may negatively affect the quality of the service initially provided (Stringfellow et al. 1997). Second, for cooperatives specialized in a given activity, an increase in the heterogeneity of membership can lead to increased coordination costs, offsetting the benefits linked to economies of scale (Stockbridge, Dorward, and Kydd 2003). The analysis here focuses on the impact on coordination costs rather than on general management problems.

The rationale is as follows. By providing extra services, marketing cooperatives may become attractive to households that are otherwise uninterested

Table 5.2 Characteristics and marketing performance of sampled cooperatives

	Activities			Has provided marketing services to members over the past 12 months?		
Characteristic	**Economic only**	**Mixed economic and social**	**Difference *p*-value**	**No**	**Yes**	**Difference *p*-value**
Aggregated product[a] (hectares)	1,079.92	1,700.10	0.0458*	872.31	1,720.68	0.0142**
Number of members	574.56	1,069.61	0.0002***	812.56	970.64	0.3002
Average land cultivated per member (hectares)	2.0	51.65	0.0240**	1.20	1.90	0.0004***
Age of cooperative (years)	5.77	9.01	0.0001***	7.27	8.25	0.5644
Partner at origin of cooperative (%)	61.36	58.59	0.7487	27.27	67.64	0.0000***
Financial help at origin of cooperative (%)	29.54	17.18	0.0798	9.09	23.52	0.0000***

Source: Authors' calculations based on data from ECS (2006).
Note: Differences are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.
[a]Denotes the cooperative's potential aggregated product as measured by the total land available among cooperative members.

in its marketing activities. Additional members will increase the coordination costs (through an increase in size) without contributing to increased commercialization benefits (through added output to be marketed). As a consequence, some households that are uninterested in the additional service and only marginally interested in the commercialization services will revise their cost–benefit comparisons and leave the organization, further lowering commercialization benefits for the remaining members. This in turn may prompt additional departures from the cooperative. In the extreme case, the marketing cooperative will end up providing only noncommercialization services to its members. Only if there is substantial overlap between the two groups of members (those interested in commercialization and those attracted by the additional services)—in other words, if many households are likely to be interested in both services—can these supplementary activities reinforce the organization by providing more than one service at essentially constant costs. We test these relationships below.

Activities and Membership

Table 5.3 reports estimates of the correlation between various social activities and the size of cooperatives (columns (1) and (2)), and with the potential aggregated product as measured by the total land available among cooperative members.[4] Presumably, the introduction of these activities should lead to an increase in membership. However, if poorer households may be more interested in such social services, it follows that the overall product aggregation should only slightly increase as a result of the introduction of these activities.

In columns (1) and (3) we test for the effective significant influence of these activities on the size and product aggregation of the organization. The results indicate that consumption-related services as well as literacy training exert a strong positive influence on the size of the organization. The effect is somewhat weaker for product aggregation. Columns (2) and (4) assess the robustness of these results by adding a series of additional explanatory variables. In particular, we use the initial size of the organization as a proxy measure for members mostly interested in the marketing services of the organization. (Thus we assume that social activities were added later to the cooperatives, which is the case for nearly all of them.) The results on social activities are robust across all estimations as well as the coefficients obtained on the initial membership variable. In contrast, the effect of social activities on product aggregation vanishes once the impact of initial product

[4] See Chapter 3 for a discussion of the exogeneity of land allocation in Ethiopia.

Table 5.3 Social activities and size of cooperative

	Log n[a]		Log Q[b]	
Characteristic	**(1)**	**(2)**	**(3)**	**(4)**
Consumption[c]	0.908	0.407	0.560	0.046
	(0.210)***	(0.133)***	(0.242)**	(0.174)
Literacy[c]	0.759	0.273	0.537	0.118
	(0.282)***	(0.163)*	(0.307)*	(0.183)
HIV prevention[c]	–0.316	0.055	–0.257	0.211
	(0.254)	(0.110)	(0.309)	(0.141)
Public infrastructure[c]	–0.100	–0.277	0.210	0.048
	(0.275)	(0.233)	(0.338)	(0.277)
Log (initial number of members)		0.511		0.535
		(0.085)***		(0.096)***
Age		0.040		0.054
		(0.017)**		(0.022)**
Partner at origin		0.204		0.446
		(0.122)*		(0.185)**
Financial help at origin		–0.384		–0.226
		(0.172)**		(0.234)
Controls for market access		Yes		Yes
Controls for population density		Yes		Yes
Constant	5.821	2.453	6.333	2.759
	(0.217)***	(0.477)***	(0.236)***	(0.725)***
Number of observations	171	158	171	158
R^2	0.19	0.71	0.07	0.46
F-test on significance	0.0004***	0.000***	0.0716	0.0000***

Source: Authors' calculations based on data from ECS (2006).
Notes: Robust standard errors are computed with clustering at the *woreda* level. Standard errors are listed in parentheses. A *woreda,* or district, is one of the smallest administrative units in Ethiopia. Numbers are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.
[a]Denotes the log value of the cooperative's membership size.
[b]Denotes the log value of the cooperative's potential aggregate product.
[c]F-test data given at end of table pertain to this characteristic.

aggregation is accounted for. In all estimations, partial F-tests indicate the joint significance of the variables to be used as instruments later.

Membership and Performance

Table 5.4 further tests the above theory by relating the marketing performance of a cooperative to its membership and aggregated product. Results from ordinary least squares estimates are shown in the table, with the basic model reported in column (1) and the more controlled one in column (2).[5] The

[5] The basic model is the simplest estimation containing the fewest number of variables and employing ordinary least squares.

Table 5.4 Marketing performance of cooperatives

	Ordinary least squares		Two-stage least squares	
Variable	**(1)**	**(2)**	**(3)**	**(4)**
Log (number of members)	–0.143	–0.124	–0.589	–0.520
	(0.073)**	(0.061)*	(0.206)***	(0.195)***
Log (aggregated product)	0.164	0.132	0.637	0.540
	(0.059)***	(0.056)**	(0.221)***	(0.205)***
Age of cooperative (years)		0.002		–0.001
		(0.009)		(0.010)
Partner at origin		0.202		0.112
		(0.064)***		(0.094)
Financial help at origin		0.069		–0.032
		(0.088)		(0.111)
Controls for market access		Yes		Yes
Controls for population density		Yes		Yes
Number of observations	168	162	162	156
R-squared	0.07*	0.19***		0.17
Sargan test, *p*-value			0.8417	0.7868
Basmann test, *p*-value			0.8481	0.8049

Source: Authors' calculations based on data from ECS (2006).
Note: Numbers are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

results are rather clear: for a given level of potential volume traded, a 1 percent increase in the size of the organization typically leads to a decrease of 14 percent in the chance that it provides marketing services to its members. Furthermore, a 1 percent increase in the level of overall potential volume-traded aggregation leads to a 16 percent greater chance that the organization has performed marketing activities during the past 12 months. These effects are robust with the introduction, in the more controlled model (column (2)), of *woreda*-level characteristics controlling for the market opportunities faced by the cooperative, as well as the organization's age, external partners, and financial support.[6] These last characteristics may well influence membership and be decisive in terms of marketing performance. The results are now slightly lower than initially, but remain with the expected sign and are statistically different from zero.

Overall we find a rather clear correlation between a cooperative's portfolio of activities, its type of membership, and its marketing performance.

[6] We use the cooperative's partners and financial help at inception to avoid two-way relationships with the organization's performance.

These correlations face significant potential endogeneity problems, however, as the marketing performance of the cooperative may itself influence both the number and type of members. For instance, an organization that performs well may attract more members than does a weakly performing one.[7] As a result, the estimates of membership on performance are likely to understate the magnitude of the (negative) relationship. Similar arguments may apply to aggregated product, although the sign would then be undetermined. Such biases can be overcome using an external source of variation in both membership and aggregated product.

To overcome this potential bias, we use the above theory to justify the use of social activities as instruments for the size of the cooperative. To be valid, however, these instruments must respect the following three criteria:

1. a cooperative's engagement in such activities was not driven by its marketing performance;
2. there are no other unaccounted-for factors that may have driven both a cooperative's marketing performance and its portfolio of activities; and
3. the effect of these social activities on marketing performance is uniquely driven by their effects on membership.

The strong governmental and external partners' support for social activities in cooperatives tend to support criterion 1. For instance, the Federal Cooperative Commission requires that all registered cooperatives allocate between 1 and 5 percent of their earnings to a social fund that finances such activities as HIV/AIDS awareness and prevention training. Further, controlling for a cooperative's external partner may address concerns regarding criterion 2. However, criterion 3 cannot be directly tested unless other sets of instruments are also available. As described below, we use a cooperative's original number of members as an extra instrument to perform such tests.

These results are presented in columns (3) and (4) in Table 5.4, where we report two-stage least square estimates of a linear probability model of marketing performance. The results suggest that the relationships identified in the left part of the table hold, once one accounts for potential sources of endogeneity. In addition, the numbers tend to be higher in magnitude, supporting the idea of a reverse causality. Overall, the results suggest that a 1 percent increase in the size of the organization may lead to a 0.3 percent decrease in the probability that it provides marketing services to its members. Finally, we use Sargan's (1958) and Basmann's (1960) overidentification

[7] However, most of the organizations (75 percent) have increased their memberships since their creation.

tests to verify that social activities are in effect not directly correlated with marketing performance. Accordingly, we cannot reject the exogeneity of our instruments at any reasonable confidence level.

Overall, these results tend to support the claim that a wide scope of activities may significantly affect membership structure. This structure may in turn impinge on the organization's capacity to effectively provide marketing services to its members. Governance structure may help mitigate these effects, as we explore in the next section.

Governance Structure

Under the Federal Cooperative Agency's guidance, efforts to promote cooperatives in Ethiopia are designed to follow the principles set down by the International Cooperative Alliance and are meant to replicate global best practices. Use of such guidelines introduces a certain degree of standardization in the design of cooperative governance, management, and membership. The reforms are meant to ensure that cooperatives are governed in accordance with standard bylaws that provide for the regular election of chairpersons and management committees, and voting based on the principle of one member–one vote. For example, to receive a registration certificate from the regional BoCP, a cooperative must demonstrate that it has at least 10 members, is owned by its membership, and has put in place certain bylaws that govern the election of leaders, management of cooperative affairs, and so on. Thus, for example, ECS (2006) data show that in 99 percent of cases, all members are authorized to vote in their cooperative's election for chairman, and in 97 percent of cases, the vote is organized on a one-member–one-vote basis. However, anecdotal evidence suggests that beyond elections, members are sometimes left with little influence on the direction taken by the cooperative.

These divergences may be related to the possible existence of trade-offs between the various dimensions of inclusiveness, on the one hand, and the organization's performance, on the other. For instance, a cooperative may choose to explicitly or implicitly exclude new members to maintain cohesiveness among its existing members, minimize transaction costs that result from participatory decisionmaking, and ensure effective performance. Alternatively, cooperatives may choose to cast their membership more widely and allow both the size and the interests of the membership to expand. Increased size and diversified interests may lead to an expansion of the cooperative's portfolio of activities, and may incur higher transaction costs for the cooperative's participatory decisionmaking processes.

We empirically investigate the decisionmaking process in Ethiopian cooperatives through participation indicators, based on a series of questions meant

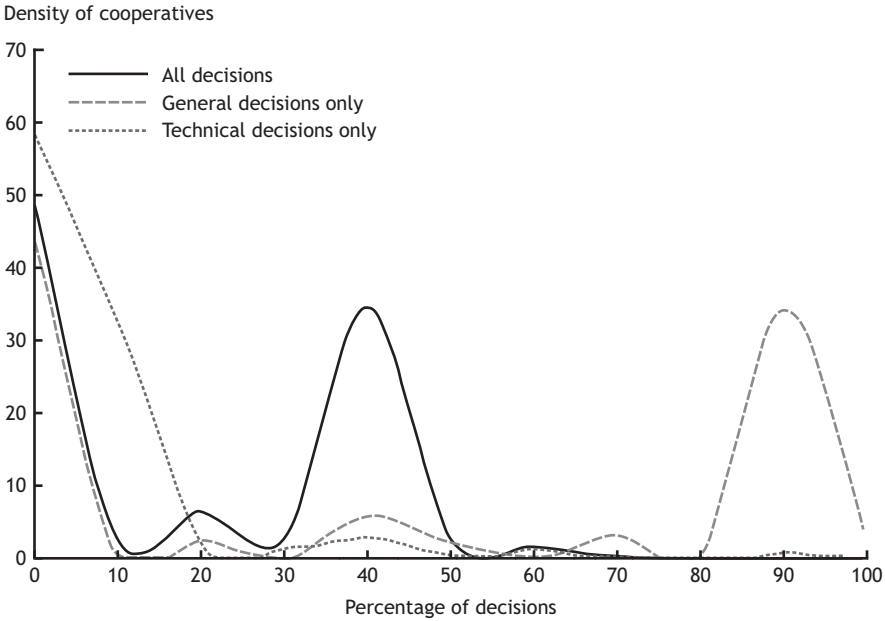
to identify who the decisionmakers are for a series of commonly taken decisions on

1. the inclusion of new members,
2. the expulsion of existing members,
3. the start of a new activity in the cooperative,
4. the collaboration with a new partner,
5. the amount of dividends to be distributed,
6. the investment in new materials or infrastructure,
7. the amount of output to buy,
8. the amount of output to sell,
9. the amount of output to store,
10. the amount of input to buy,
11. the amount of input to sell,
12. the time to sell,
13. the price given to members for their outputs,
14. the person or organization to buy input from,
15. the person or organization to sell output to, and
16. the market on which to sell.

For each decision, we recorded whether all members participated in the decision process (for example, through a vote in the general assembly) or the decision was left to a restricted number of individuals (such as the management committee or the president). We then computed participation indicators as the percentage of decisions that were open to all members. Three indicators are specifically considered: a general indicator taking all decisions into account, an indicator limited to general organizational decisions (decisions 1–6 above), and an indicator limited to technical decisions (decisions 7–16).

Our results show that on average 19 percent of all decisions are open to all members. For general organizational decisions, the average reaches 38 percent, compared to only 8 percent for technical decisions. The low level of participation in technical decisions is to be expected. More surprising, however, is the low level of participation in general decisions. More information can be drawn from the distributions of these variables, as shown in Figure 5.1. Clearly, in the vast majority of cooperatives, most—if not all—technical decisions are taken by the management committee. In contrast, the distribution of the indicator for general decisions is clearly bimodal: some cooperatives are more or less fully participatory, whereas others are almost fully nonparticipatory. We classify the former as *high-participation* and the latter as *low-participation* organizations.

Figure 5.1 Participatory decisionmaking



Source: Authors' calculations based on data from ESCS (2005).
Note: Density distribution of cooperatives is calculated according to the percentage of decisions taken by the general assembly.

Trade-Offs?

We now investigate the relationship among membership, governance, and performance. The results are reported in Table 5.5. The results do not account for likely endogeneity biases and should therefore be interpreted only as correlations. Nevertheless, they are useful in pinpointing eventual trade-offs relevant for future, and more robust, analysis.

In column (4), we also introduce proxies for the quality of cooperative management with two additional variables: share of committee members who can read and the maximum level of education among committee members. The estimated parameters for these proxies are not significant, but the parameters estimated for our original set of variables remain robust. Overall, these results clearly show some trade-off between two objectives: (1) the extent to which a cooperative can open its membership (and allow more heterogeneity) or give voice to its members through participatory decisionmaking and (2) the extent to which it can maintain a minimum performance level in its economic activities.

Table 5.5 Membership, governance, and performance (ordinary least squares)

	Cooperative has sold members' output in 2005 (0/1)			
Dependent variable	**(1)**	**(2)**	**(3)**	**(4)**
Total landholding in the cooperative (log)	0.144	0.142	0.144	0.138
	(0.049)***	(0.050)***	(0.049)***	(0.051)***
Total membership (log)	–0.139	–0.138	–0.141	–0.134
	(0.058)**	(0.058)**	(0.062)**	(0.065)**
Heterogeneity (coefficient of variation for landholding)	0.193	0.196	0.390	0.390
	(0.112)*	(0.112)*	(0.145)**	(0.151)**
High participation (0/1)		–0.047	0.055	0.048
		(0.068)	(0.347)	(0.360)
High participation × Total membership			0.030	0.030
			(0.052)	(0.054)
High participation × Heterogeneity			–0.497	–0.484
			(0.217)**	(0.227)**
Percentage of committee members who can read				–0.092
				(0.225)
Maximum education level in committee				0.021
				(0.057)
Age	Yes	Yes	Yes	Yes
Market access is high (0/1)	Yes	Yes	Yes	Yes
Population density	Yes	Yes	Yes	Yes
Number of observations	162	162	162	161

Source: Authors' calculations based on data from ECS (2006).
Note: Numbers are significant at the * 10 percent, ** 5 percent, and *** 1 percent levels, respectively.

Conclusion

As noted while exploring Issue 3 in Chapter 1, a large portfolio of activities may jeopardize a cooperative's capacity to provide marketing services to its members. Results presented here tend to support this conjecture, via the effect of an organization's scope of activities on its membership structure. We found, however, that this effect may—in part—be counteracted by appropriate decisionmaking structures.

CHAPTER 6

Conclusions

Over the past few years, policymakers, international donors, and development practitioners have shown a renewed interest in RPOs as a means to attain several goals: connecting smallholders to markets, alleviating rural poverty, and promoting agricultural development and economywide growth. This interest has re-emerged, despite the rather troubled history of RPOs in the region from the postcolonial era of the 1960s through the structural adjustment programs of the 1980s.

With the recent emergence of a new type of RPO—one that is more responsive to the priorities of the community it serves, more independent of state control, and more oriented to the provision of market-related services—there is hope that collective action organizations can play a larger and more supportive role in smallholder commercialization than they currently do. However, in spite of success stories accumulating around RPOs engaged in high-value crop marketing, there is scarce evidence to suggest that RPOs are playing the same role with respect to the marketing of cereals. And it is precisely these cereals that are the key to large-scale poverty reduction, agricultural development, and economywide growth in Sub-Saharan Africa.

This study provides new insights into the question of what RPOs can and cannot do to support smallholder cereal producers in Sub-Saharan Africa. The study identifies the conditions under which RPOs engaged in cereal marketing are successfully promoting smallholder commercialization and examines how the benefits of this commercialization process are distributed.

Specifically, this study investigates three broad issues. First, what role does collective action play in helping smallholders overcome marketing constraints? Second, to what extent do poorer households tend to participate in RPOs? Third, what are the principal constraints on an RPO's marketing performance? Our findings suggest the following.

First and foremost, collective action can indeed be an effective means to provide marketing services to farmers facing prohibitive transaction costs. In fact, cooperatives deliver, on average, a 7 percent price premium for their members' output, relative to what these farmers would have received had

they decided to market their output individually. Cooperatives are able to do this by collecting price information on several markets before choosing which market to sell in, storing members' surpluses as a hedge against low postharvest prices, and eschewing the use of market intermediaries.

Second, the downside to this premium is that the smallest farmers tend to market only the quantity necessary to meet their basic needs; and, because of the premium offered by the cooperative, this amount is less than the total quantity they would otherwise market individually. As a result, the actual quantity of grain coming to market from this cohort of farmers is less than it would be without the cooperative's services. In a country where the supply of grain regularly falls short of demand, this issue is of strategic importance.

Third, smaller farmers tend to self-exclude from participating in cooperatives, as their returns from membership are less than the costs of membership. This tendency may be partly attributable to membership fees that exceed the gains accruing from the price premium generated from collective marketing of smallholder surpluses.

Fourth, some degree of exclusion is necessary for cooperatives to maintain a certain degree of homogeneity in the cooperative's membership—that is, homogeneity in members' interests or levels of commitment. This necessity has implications for those who view cooperatives as a means of mobilizing entire rural communities or want to leverage cooperatives for the expression of the community voice.

Fifth—and in spite of the practice of exclusion—there is evidence to suggest that for some services, excluded poorer farmers may still benefit from the presence of cooperatives. For example, cooperatives may exert upward pressure on output prices among local traders or provide public goods from which no individual can be excluded. However, these spillover benefits for nonmembers tend to be small compared to the total benefits accruing to members.

Sixth, the evidence suggests that grain-marketing cooperatives in Ethiopia are engaged in a wide range of nonmarketing activities. A striking feature of these organizations is their involvement in such activities as HIV/AIDS prevention and awareness and literacy training. Such social activities are often promoted by external partners—both state and nonstate actors—because they view cooperatives as an efficient way of reaching the rural poor. However, the evidence suggests that inclusion of such nonmarketing activities may significantly affect membership structure, thus reducing the cooperative's capacity to provide marketing services to its members.

Seventh, the evidence also suggests that different types of cooperative governance can similarly affect the cooperative's capacity to provide marketing services to its members. This finding illustrates the difficulties that RPOs face in balancing social inclusion and participatory decisionmaking on the one

hand against more professional, business-oriented management practices on the other. Thus the burgeoning interest in farmer cooperatives in Ethiopia is not amenable to the one-size-fits-all strategy that is rapidly evolving.

Critics may argue that these findings are specific to grain-marketing cooperatives in Ethiopia and are an exception to the general trend found in the rest of Sub-Saharan Africa. In response, we would suggest that the Ethiopian experience provides more of a model than critics might recognize. Apart from the historical similarities with other Sub-Saharan African countries—the imposition of state control over grain marketing and the manipulation of cooperatives for political ends—Ethiopia's more recent experience suggests that large-scale investment in promoting smallholder cooperatives and commercialization is not without significant challenges.

Nevertheless, provided that these challenges are acknowledged and accounted for in the design of policies and choices for investment, there is great potential for RPOs to play a central role in smallholder commercialization. With this in mind, we offer the following recommendations based on the findings of this study.

1. Cooperatives are not a silver bullet for removing the constraints to smallholder commercialization. Cooperatives are beset by unique—and often intractable—challenges relating to their agenda, structure, membership, management, and governance.
2. Cooperatives are not necessarily an efficient means of targeting the poorest of the poor. Alternative and complementary support mechanisms must be used to protect more vulnerable social groups and, over time, increase their capacity to participate effectively in cooperatives.
3. Cooperatives must be free to choose their own agendas and to develop the management and governance systems that are most appropriate to their agendas. Although external actors, such as public agencies and NGOs, may have a role to play in building cooperative members' capacity to govern and manage their own organization, they can do irreparable harm to the organization's future capacity to serve its members by imposing their own agenda. This issue is particularly important with respect to the imposition of nonmarketing activities on cooperatives that are formed for and dedicated to commercialization.

Although more theoretical and empirical work is needed to fully understand the inherent challenges and trade-offs in smallholder organization, there are lessons to be learned here for other initiatives promoting RPOs in Sub-Saharan Africa. Sovereign governments, international donors, and development practitioners have moved to reinstate RPOs squarely on the global development agenda. As these actors move forward with investments based on a limited

number of success stories, there is a need for more robust empirical evidence of what RPOs can and cannot achieve. At present, there is little empirical data to suggest that due consideration has been given to the trade-offs inherent in grain-marketing cooperatives—a class of RPOs that is highly relevant to many small-scale, resource-poor farmers in the region. There remains a sizable knowledge gap with respect to grain-marketing cooperatives and the trade-offs inherent in their design, promotion, and impact.

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Rural producer organizations (RPOs), such as farmers' organizations or rural cooperatives, offer a means for smallholder farmers in developing countries to sell their crops commercially. RPOs hold particular promise for Sub-Saharan Africa, where small-scale farming is the primary livelihood but commercialization of foodcrops is very limited. Using the experience of smallholders in Ethiopia as a case study, this research monograph identifies the benefits of RPOs for small farmers, as well as the conditions under which such organizations most successfully promote smallholder commercialization. The evidence from Ethiopia indicates that RPOs do increase farmers' profits from crop sales, but that the beneficiaries do not tend to be the poorest smallholders. Moreover, an RPO's marketing effectiveness is precarious: it can easily diminish if the number or diversity of its members increases or if it provides more nonmarketing services. The authors conclude that RPOs have a role to play in the agricultural development of Sub-Saharan Africa, but that role should be complemented by other programs that directly target the poorest farmers. Further, the effectiveness of RPOs should be preserved by allowing them to follow their own agendas rather than being encouraged to take on nonmarketing activities. The assessment of RPOs presented in this monograph should be a valuable resource for policymakers and researchers concerned with economic development and poverty reduction in Sub-Saharan Africa.

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