Investigating the Inclusive-Performance Tradeoff in Agricultural Cooperatives: Evidence from Nepal*†

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1 Introduction

Rural markets in developing countries are often rife with constraints that limit the production and commercialization of smallholder agricultural producers (Barrett, 2008). In these settings, agricultural cooperatives may contribute to rural development and poverty alleviation by increasing bargaining power, decreasing transaction costs, and helping achieve scale economies in marketing (Markelova & Mwangi, 2010; Staal et al., 1997; Csaki & de Haan, 2003). However, evidence suggests that many farmer organizations struggle to reach their potential, often experiencing weak market performance, heterogeneous benefits or dissolving participation among their members (Bernard & Spielman, 2009; Casaburi & Macchiavello, 2015; Gelo et al., 2020). This has generated a renewed interest among researchers and policymakers in understanding the factors that lead to the success and failure of cooperatives in low-income countries (World Bank, 2008).

One aspect that has received considerable attention is the potential tradeoff between inclusive membership and market performance in agricultural cooperatives (Bernard & Spielman, 2009; World Bank, 2008). This relationship has been highlighted as an unresolved conflict, in which inclusive membership practices appear to damage market performance by increasing internal transaction and coordination costs (Berdegué, 2001; World Bank, 2008). Determining the extent of this tradeoff is essential to understanding the role that cooperatives play in alleivating poverty. However, studies on this topic have largely focused on cooperative membership as the source of inclusion, overlooking the extent to which existing members are included in group activities. This is an important distinction since cooperative members participate to varying degrees (Fischer & Qaim, 2014) and the number of members that are included in a given activity can improve the bargaining position of the cooperative (Aflagah et al., 2019).

In this paper, I expand the definition of inclusive membership to account for two separate sources of inclusion, extensive and intensive, and examine the inclusive-performance tradeoff across each dimension. The former describes the inclusion of a diverse set of households in a cooperative's membership, while the latter describes the extent to which existing members are included cooperative activities. I first analyze the relationship between inclusive membership and market performance across the extensive and intensive dimensions. I then use the Oaxaca (1973)-Blinder (1973) decomposition to determine whether these relationships are best explained by differences in

observable characteristics or differences in the returns to those characteristics.

My population of interest are smallholder goat producers in rural Nepal, all of whom are women and members of agricultural cooperatives. The data used in this study cover 2,856 households across 108 smallholder livestock cooperatives in Nepal. This data set consists of two separate surveys - one with cooperative leaders and another with general members. The separate questionnaires for cooperative members and leaders provides a number of benefits for this study. The cooperative leader survey provides institutional information about each cooperative and its overall performance. The household survey collects detailed information on a sample of members from each cooperative, including their individual performance as a producer. The ability to link member-level data to overall cooperative performance provides the unique ability to go beyond data aggregated at the cooperative-level or case studies of a small number of organizations. In particular, I analyze market performance at the individual-level, shedding light on the link between organizational management and the benefits that individual producers receive from their cooperative.

Prior studies argue that cooperatives with performance oriented membership rules are better able to reduce transaction costs and achieve higher levels of market performance (Berdegué, 2001; Bernard & Spielman, 2009). This has important implications for the role of cooperatives in the development process, as these rules tend to exclude the most vulnerable households from receiving the benefits of cooperative membership (World Bank, 2008). However, the relationship between inclusive membership and market performance is influenced by an important set of factors that has not been sufficiently addressed in the current literature. In particular, cooperatives must decide which existing members should be included in group activities, a decision that directly influences the inclusion of individual members and may indirectly influence the market performance of the cooperative overall. This concept is highlighted by Aflagah et al. (2019), who argue that organizing bulk sales of members' output can be viewed as a critical mass coordination game, in which a larger number of participants can improve the bargaining position of the cooperative by increasing the quantity of marketable output. Importantly, the marginal benefit of including an additional member in group activities is coupled with increasing transaction costs and strategic uncertainty, making coordination more difficult (Aflagah et al., 2019). Therefore the net benefits of including a larger proportion of cooperative members in a given activity are ambiguous and depend on how well the organization is able to manage coordination with larger group sizes.

This study builds on the existing literature by expanding the definition of inclusive membership and providing new evidence on the inclusive-performance tradeoff. While previous studies have demonstrated a tradeoff between extensive inclusion and market performance (Berdegué, 2001; Bernard & Spielman, 2009), I argue that this is only one aspect of inclusiveness. By providing a broader account of inclusive membership, this study provides new insights into the inclusive-performance tradeoff and the role that cooperatives play in alleviating poverty.

My results suggest that extensive inclusion is associated with lower market performance, while intensive inclusion is associated with higher market performance. Specifically, I find that cooperatives that include a larger proportion of non-literate and low asset holding farmers in their membership perform significantly worse than their less inclusive counterparts. I also find that cooperatives that communicate with and award loans to a larger proportion of their members perform better than their less inclusive counterparts. Both results are largely driven by differences in returns to the observable characteristics between the most and least inclusive cooperatives. This suggests that both extensive and intensive inclusion have a meaningful, but opposite, impact on a cooperative's ability to achieve market performance.

2 Background

2.1 Inclusive Agriculture and Producer Cooperatives

Increasing the production and commercialization of smallholder agricultural producers has become a focal point of efforts to alleviate poverty around the world (Barrett, 2008; Fischer & Qaim, 2012). Efforts to link smallholders to markets have taken many forms, including the provision of market information, increased access to credit and extension services, the organization of cooperatives, contract farming and a number of private-sector initiatives (German et al., 2020; Njuki et al., 2011). A common theme throughout these efforts is a tension between the inclusion of the poorest producers and a desire for efficiency and growth. This tension has generated an interest in "inclusive business" practices that focus on ensuring that vulnerable smallholders benefit from their integration into agricultural value chains (German et al., 2020; UNDP, 2013). Despite these efforts, German et al. (2020) argue that there is a trend toward more exclusive agriculture as value chains become increasingly large-scale and complex. Efforts to increase commercialization may lead to elite capture

of benefits, the adoption of new technologies that are inaccessible to the most vulnerable producers and increasing competition that crowds out smallholders (Dorward et al., 2003; Njuki et al., 2011)

Agricultural cooperatives are widely viewed as an important tool for increasing market access among smallholder producers. Through collective action, cooperatives provide the opportunity for smallholders to access markets that may otherwise be inaccessible, pool resources to overcome financial constraints, increase communication flows and collectively negotiate with buyers to receive better prices (Poole & De Frece, 2010). Yet the tension between inclusiveness and performance often pervades these organizations, calling into question the role of cooperatives in alleviating poverty among the most vulnerable producers.

Cooperatives largely operate in rural communities, where they are expected to uphold the values of social inclusion and solidarity (World Bank, 2008). This pressure may undermine the competitive structures that help cooperatives survive in larger value-chains. Cooperatives often have difficulty excluding members that do not meet organizational requirements, leading high-performing members to subsidize low-performers, weakening the incentive to participate (World Bank, 2008). In the case of producer organizations in Chile, Berdegué (2001) demonstrates that the highest performing organizations have strict rules that allocate benefits based on performance and market conditions (World Bank, 2008). The pressure for social inclusion often leads to a diverse cooperative membership, creating managerial challenges. Bachke (2019) argues that a high presence of nonliterate members and low membership fees likely add to the lack of performance by cooperatives in Mozambique. Additionally, the most vulnerable cooperative members often lack representation, further ingraining organizational disparities. Cooperative leaders tend to be older, wealthier farmers who are members of the rural elite (World Bank, 2008). This is demonstrated in the case of Ethiopian cooperatives, where Bernard & Spielman (2009) find that decision-making within cooperatives is often concentrated to management committees that are not inclusive of the poorest members of the cooperative. Similarly, Gelo et al. (2020) show that the benefits of a large-scale intervention intended to increase cooperative performance were largely captured by elite members.

Overall, social inclusion is often intended to ensure that the most vulnerable smallholders have access to productive opportunities. However, these practices may inflate transaction costs and increase the challenges faced by cooperative managers. Bernard & Spielman (2009) summarize

this point by arguing that cooperatives can achieve only two of the following three conditions i) inclusive membership, ii) participatory decision-making and iii) market performance. As noted in the introduction, an important gap exists in this literature. Prior studies largely define 'inclusive membership' to capture the extent to which cooperative policies broadly include producers in their membership. To the extent that prior studies have touched on intensive inclusion (the inclusion of existing members in organizational activities), they have mainly focused on decision-making practices. This paper is intended to introduce the distinction between extensive and intensive inclusion and provide evidence on how each source of inclusion is associated with cooperative performance.

2.2 Livestock Production and Cooperatives in Nepal

In Nepal, where 68 percent of the population depends on agriculture for their livelihood (International Labor Organization, 2016), goats are a common source of income and nutrition. This is particularly true in rural areas, where almost every household owns a least a few goats (Upreti, 2009). In recent years, urbanization and rising incomes have lead to a higher demand for goat meat, but a poorly functioning value chain has left smallholder producers, most of whom are women, unable to benefit (Ashby et al., 2009; Choudhary et al., 2011; Gurung et al., 2015). Smallholders face high transaction costs, weak bargaining power and a lack of communication infrastructure that limit their ability to access and gain from formal output markets (Barrett, 2008). As a result, domestic production has been unable to keep up with rising demand, leading to higher imports from India and Tibet (Heifer International Nepal, 2012).

Many agricultural policy and rural development plans in Nepal have promoted agricultural cooperatives as a means of supporting smallholder producers (Agricultural Development Strategy, 2015). Non-governmental organizations, including Heifer Project International in Nepal (HPIN), have made recent efforts to strengthen the goat value chain by organizing producer cooperatives. HPIN's programs give women livestock and extensive training. Beneficiaries are then organized into self-help groups of around 20-30 female members. Once self-help groups in a given area are sufficiently organized, they are combined into larger producer cooperatives (Janzen et al., 2018).

The majority of goats in Nepal are sold to a local trader or butcher (Heifer International Nepal, 2012). For goats that are marketed outside their original communities, the commercial value chain

links producers, local and regional traders, processors and retailers to consumers who are primarily located in urban markets like the Kathmandu Valley (Heifer International Nepal, 2012). A local trader looking to buy goats from smallholder producers who are not affiliated with a cooperative would likely have to conduct individual negotiations, sometimes making multiple visits per home (Heifer International Nepal, 2012; Staal et al., 1997). After agreeing to terms with producers, the collector would still have to coordinate transportation. Bargaining with many smallholders and managing logistics may inflate transaction costs and dissuade collectors from dealing with smallholders. In contrast, a trader purchasing through a cooperative need only negotiate with a single entity and can leave sales coordination to cooperative managers (Mullally et al., 2020).

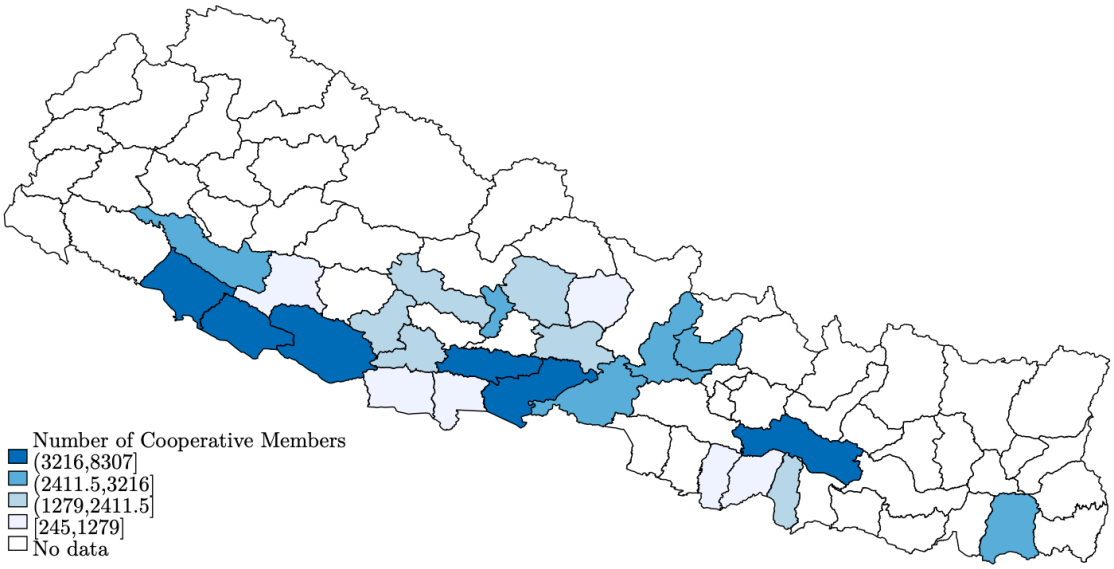
Cooperatives in this setting appear to struggle with coordinating goat sales in a way that is broadly inclusive of members (Mullally et al., 2020). Although officers from 86% cooperatives in the sample stated that their organizations coordinated goat sales, only 35% of households received information about a cooperative sale in the six-months prior to data collection. These cooperatives also appear to largely communicate in person. Among the households that did receive price and sales information, nearly 75% did so through in-person meetings. Distance to meetings points could be a barrier to more frequent interactions, as cooperative members state that it takes approximately 90 minutes to travel to and from cooperative meetings, on average. The difficulties associated with communication emphasize the transaction costs associated with including new members in the cooperative as well as existing members in group activities. This issue may directly affect market performance if cooperatives are failing to broadly share relevant information and include members in organizational activities.

3 Data & Summary Statistics

In this paper I use a cross-sectional dataset covering 2,856 households across 108 female smallholder livestock cooperatives in Nepal. The cooperatives in this sample are spread across four of five development regions in Nepal, specifically the East, Central, West and Mid-Western Development regions. All cooperatives operate in either the low-land Terai or mid-Hills. Figure (1) shows the study area covered in the sample, which includes cooperatives from 24 districts across Nepal. The cooperatives included in the study were selected by HPIN and include all existing livestock

marketing cooperatives the organization helped form prior to 2017.

Figure 1. Study Area



This dataset consists of two separate surveys - one with cooperative leaders and another with general members. I refer to these surveys as the cooperative leader and household survey, respectively. The cooperative leader survey is comprised of interviews from three officers in each cooperative. To obtain a representative sample for the household survey, HPIN and cooperative leaders generated complete cooperative rosters. From these comprehensive lists, a random sample of members from each cooperative was drawn to participate in the household survey. The data were collected from the sample in January 2018 using Android tablets and Open Data Kit.

Table (1) provides summary statistics from the dataset. The average cooperative in this context has 569 members, and a revenue of over $3,800 USD. 93% of cooperatives have an initial membership fee, with an average fee of $2.22 USD. At the last general assembly meeting prior to data collection, an average of 64% of members were in attendance. At the household level, the average cooperative member is 42 years old, roughly 80% of whom are literate. The average household has been a member of their cooperative for 3 years. On average, members have attended more than five self-help group meetings in the 6-months prior to data collection and attended fewer than two cooperative meetings over this period. Members indicate an average round-trip travel time to the cooperative of more than 90 minutes. While nearly 70% of members indicate that they participate in the cooperative's general meeting, fewer than 10% have voted in cooperative elections in the last

2-4 years. Roughly 35% of members were contacted about cooperative organized livestock sales in the 6-months prior to data collection and 38% were contacted about non-sale related cooperative activities.

Table 1. Summary Statistics

Cooperative-Level Variables	N	Mean	sd	Min	Max
Number of members (count)	107.00	568.64	375.77	11.00	2,600.00
Total revenue over last 6-months (USD)	106.00	3,934.92	7,555.17	0.00	65,709.51
Cooperative has an initial membership fee (0/1)	107.00	0.93	0.26	0.00	1.00
Size of initial membership fee (USD)	108.00	2.22	3.86	0.00	35.64
Share of members the attending last general assembly (count)	108.00	0.64	0.27	0.00	1.00
Size of management committee (count)	107.00	10.46	1.78	7.00	15.00
Number of services offered (count)	107.00	8.04	2.57	2.00	17.00
Coordinates goat sales (0/1)	108.00	0.59	0.39	0.00	1.00
Offers loans to members (0/1)	108.00	0.97	0.07	0.55	1.00
Household-Level Variables	**N**	**Mean**	**sd**	**Min**	**Max**
Age (years)	2,856.00	40.40	11.56	20.00	83.00
Literacy (0/1)	2,853.00	0.72	0.45	0.00	1.00
Length of membership (years)	2,856.00	3.04	1.84	0.00	9.00
Round-trip travel time to cooperative meetings (minutes)	2,856.00	91.58	103.41	0.00	420.00
Voted in elections in last 2-years (0/1)	2,856.00	0.09	0.29	0.00	1.00
Contacted about cooperative sales in last 6-months (0/1)	2,856.00	0.35	0.48	0.00	1.00
Contacted about cooperative activities in last 6-months (0/1)	2,856.00	0.38	0.49	0.00	1.00
Primary activity is agriculture (0/1)	2,856.00	0.71	0.45	0.00	1.00
Total number of goats owned (count)	2,856.00	5.76	4.95	0.00	69.00
Sold goats in the last 12-months (0/1)	2,856.00	0.48	0.50	0.00	1.00
Annual number of goats sold (count)	2,856.00	1.12	1.73	0.00	10.00
Annual revenue per goat (USD)	2,856.00	41.91	53.56	0.00	742.50

Notes: Several variables have missing values replaced with zero for analysis. In particular, the number of goats owned, annual number of goats sold and annual revenue per goat sold appear artificially low as they are not conditioned on selling goats.

Table (2) displays the various services that cooperatives offer in this context. The first column indicates the proportion of cooperatives that offer each service, the second column displays the proportion of members that are aware that the service is offered and the last column indicates the proportion of members using each service in the cooperatives that offer them. The most common services offered by the cooperatives in my sample are accepting savings deposits (97%), offering loans to members (91%), providing goat price information (87%) and coordinating goat sales with traders (86%). Among the sample of cooperative members, there is a large disparity in awareness and participation between the various services. While almost all members are aware of and save money through the cooperative, only 14% of members sold at least one goat through the cooperative in the year prior to data collection and a third of members had an outstanding loan from the cooperative at the time of data collection.

Table 2. Cooperative Services

	Share of cooperatives offering service	Share of members aware of service	Share of members using service (where offered)
Accept savings deposits (0/1)	0.97	0.98	0.96
Offer loans (0/1)	0.91	0.97	0.33
Provide goat price information (0/1)	0.87	0.58	.
Coordinate sales of goats to traders (0/1)	0.86	0.60	0.14
Provide assistance with animal husbandry (0/1)	0.79	0.55	0.64
Give dividend payments to owners of cooperative proportions (0/1)	0.66	0.45	0.13
Provide access to veterinary services (0/1)	0.65	0.42	0.87
Provide assistance with business planning (0/1)	0.62	0.38	0.28
Sell or help members access livestock insurance (0/1)	0.41	0.47	0.43
Help members access bank loans	0.37	0.32	0.62
Sell fertilizer (0/1)	0.21	0.20	.
Sell seed (0/1)	0.16	0.19	0.55
Sell consumer goods, such as food (0/1)	0.13	0.13	0.50
Sell animal feed (0/1)	0.11	0.14	0.40
Sell or rent agricultural or livestock tools (0/1)	0.04	0.05	0.27
Sell pesticide (0/1)	0.03	0.07	0.46

Notes: This table displays the proportion of cooperatives offering a given service, the proportion of members who are aware that their cooperative offers this service and the proportion of members who have used each service in the year prior to data collection (among the members whose cooperative offers them). There is no data available on the proportion of members who were assisted by their cooperative in accessing a bank loan or the proportion of members who received goat price information.

Table (3) displays the relationship between members' characteristics and the extent to which they are included in cooperative activities. Columns 1-4 report the results of logit regressions on each of the following binary indicators of inclusion: whether the member currently holds a leadership role in the cooperative, whether the member received information about a cooperative organized goat sale in the last year, whether the member received information about a cooperative organized activity other than a sale in the last year, whether the member voted in cooperative elections in the last 2-4 years and whether the household currently has a loan outstanding from the cooperative.

Table 3. Determinants of inclusion (logit: average marginal effects)

Variables	(1) Leadership role (0/1)	(2) Received sale information (0/1)	(3) Received non-sale information (0/1)	(4) Voted in election (0/1)	(5) Received loan (0/1)
Literacy (0/1)	2.295***	0.473***	0.522***	0.165	0.239**
	(0.397)	(0.104)	(0.100)	(0.169)	(0.107)
Age (years)	-0.002	-0.014***	-0.004	-0.016**	-0.017***
	(0.008)	(0.004)	(0.004)	(0.007)	(0.004)
Number of household members (count)	-0.060*	0.035**	-0.006	-0.022	-0.021
	(0.035)	(0.015)	(0.015)	(0.027)	(0.017)
Total number of goats owned (count)	0.028**	0.061***	0.020**	0.016	0.009
	(0.013)	(0.009)	(0.008)	(0.013)	(0.009)
Length of membership (years)	-0.191***	-0.133***	-0.000	0.197***	0.094***
	(0.047)	(0.024)	(0.022)	(0.033)	(0.023)
Round-trip travel time to cooperative meetings (minutes)	0.001**	-0.002***	-0.002***	-0.002**	-0.002***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)
Number of cooperative members (count)	-0.001***	0.001***	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	2,829	2,829	2,829	2,829	2,829

Notes: Results from a logit regression, reporting the average marginal effects for the sample. Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

These results indicate that cooperatives may be including members to different degrees based on their characteristics. Literate cooperative members are significantly more likely to hold a leadership role, to have received sale and non-sale information from the cooperative and to have an outstanding loan from the cooperative. Interestingly, older members are significantly less likely to be included across three of the five outcomes. Members who own a larger number of goats are significantly more likely to hold a leadership role and receive information regarding cooperative sales and activities. Although those that have been members of the cooperative longer are less likely to be in a leadership role or to receive sale information, they are more likely to have voted in cooperative elections and have a loan outstanding. Additionally, members who live farther away from the cooperative are significantly less likely to be included across four of the five outcomes.

4 Methodology

The goal of this analysis is to separate cooperatives into the most and least inclusive organizations and investigate the differences in market performance between the two groups. A major challenge in any empirical analysis on this topic is accurately defining inclusive membership. Prior studies have focused on membership requirements, the characteristics of members and non-members and participatory decision-making (see the discussion in section 2.1). I attempt to build on this literature by defining two separate sources of inclusion, extensive and intensive, and decomposing the observed

performance gaps between the most and least inclusive cooperatives within each dimension.

Following the discussion in section (2.1), it is clear that both extensive and intensive inclusion take many forms within agricultural cooperatives. Therefore, it is difficult to find any one variable that captures the entire extent to which vulnerable producers are included in a cooperative's membership or the extent to which existing members are included in organizational activities. In an attempt to capture several important dimensions of extensive and intensive inclusion, I create a summary index for each type of inclusive membership. Each index is created from a set of variables that are relevant to extensive and intensive inclusion, respectively. I then split cooperatives into the most and least inclusive groups based on their summary index score and use the Oaxaca (1973)-Blinder (1973) decomposition to analyze the relationship between each source of inclusion and market performance.

4.1 Group Definitions

For the extensive inclusion index, I start by calculating the first principle component score across four variables that describe the extent to which vulnerable producers are included in a cooperative's membership: the proportion of nonliterate members in each cooperative, the proportion of members who own fewer than the sample median number of goats, the coefficient of variation on goats owned per member and the size of the cooperative membership fee.[1] I then split cooperatives at the median value of the principle component score. Cooperatives that have an extensive index score above the median value are placed into the most inclusive group and those at or below the median are placed into the least inclusive group. In addition to the extensive inclusion index, I will report each of the individual components of the index as separate group splits. Therefore, I sort cooperatives along each dimension, calculating the median value of each variable described above and splitting cooperatives above the median value into the most inclusive group and those at or below the median into the least inclusive group (for the size of cooperative membership fee, those above the median value are placed into the least inclusive group and those at or below the median are placed into the most inclusive group). Overall, I will report decomposition results across five separate group splits, the extensive inclusion index as well as a separate group split along each of its components.

[1]The size of the cooperative membership fee is multiplied by -1 before calculating the principle component score. This ensures that a higher membership fee is associated with a lower first principle component score.

I follow the same process for the intensive inclusion index, calculating the first principle component score across four variables that describe the extent to which existing members are included in group activities: the proportion of members receiving information about a cooperative organized goat sale, the proportion of members receiving information about a cooperative organized activity other than a sale, the proportion of members that currently have an outstanding loan from the cooperative and the proportion of members that voted in cooperative elections in the last 2-4 years. I then split cooperatives at the median principle component score and place those above the median into the most inclusive group and those at or below the median into the least inclusive group. As described above, I will also report the results of each component of this index separately.

Each variable included in the extensive and intensive indices is intended to capture an important aspect of inclusive membership. In terms of extensive inclusion, literacy, members' assets and membership fees are all highly relevant sources of inclusion for smallholder producers. Including nonliterate producers or those with very few assets in a cooperative's membership can help increase the production and commercialization of these vulnerable producers (Poole & De Frece, 2010), but likely increases management costs and requires these individuals to be subsidized by more productive members (World Bank, 2008). Similarly, high membership fees may be prohibitive for the most vulnerable households, but can increase revenue and reduce the number of members who are not fully engaged.

For intensive inclusion, the proportion of cooperative members that receive information about group sales and activities, have a cooperative loan outstanding or voted in recent cooperative elections describe crucial aspects of how members are included in an organization's activities. Communicating sale and non-sale information to a larger number of members likely increases participation in a given activity. When a larger number of members participate in cooperative activities, the organization's bargaining power increases by pooling more inputs. Additionally, transaction costs increase as the number of participating members increases, making coordination among larger groups more difficult (Aflagah et al., 2019). The share of cooperative members that currently have a loan outstanding is also a source of inclusion and may affect the cooperative's performance. If cooperatives are only awarding loans to a small number of trustworthy members, the cooperative's investments would be safe, but would prevent many vulnerable members from accessing an important cooperative service. Conversely, lending to a large number of members who are credit

constrained or not creditworthy would be risky for the cooperative. Deciding how to balance the cooperative's lending portfolio is a challenging task for cooperative managers. Finally, the share of members that vote in cooperative elections is an important indicator of how well represented the most vulnerable members are in the organization.

4.2 Outcomes

The outcomes of interest in this study are defined as follows: the revenue received by each member from selling goats through the cooperative, the number of goats sold by each member through the cooperative, the value of outstanding cooperative loans that each member holds and a cooperative benefits index.[2] The cooperative benefits index is an inverse covariance weighted index of the three outcome variables described above, following the apporach outlined in Anderson (2008). Measuring cooperative performance at the individual-level is intended to capture the aspects of performance that most directly benefit cooperative members. As shown in table (2), offering loans and assisting members with goat sales consist of three of the four most common services offered by cooperatives in this context (in addition to accepting savings deposits, a service for which I have limited data). Interestingly, these services appear to be used infrequently, perhaps due to differing levels of extensive and intensive inclusion across cooperatives. Analyzing the relationship between inclusive membership and each of these services seeks to better understand how cooperative organization and management translates to benefits for individual members.

4.3 Decomposing Performance Gaps

The Oaxaca (1973)-Blinder (1973) decomposition allows me to separate the observed average outcomes between the most and least inclusive cooperatives into an explained and an unexplained component. Although decomposition methods typically do not provide causal estimates, this approach closely follows the program evaluation literature, where the 'unexplained' portion of the gap (i.e. returns to characteristics) is analogous to a treatment effect (Fortin et al., 2011).

First, I express the relationship between the outcome for farmer i in cooperative j, Y_{ij}, and a

[2]For cooperative goat revenue and the number of cooperative goats sold, I include only members who sold at least one goat in the year prior to data collection. As listed in table (1), 48% of all members sold at least one goat during this period. Among this subsample, 26% sold at least one goat through the cooperative. Members who sold goats but did not sell through the cooperative have a value of zero for both variables. Therefore, the outcomes for these variables should be viewed as the outcome among goat-selling members.

vector of the determinants of performance, $\mathbf{X}_{ij}$, as

$$Y_{ij} = \beta \mathbf{X}_{ij} + \varepsilon_{ij} \tag{1}$$

where $\mathbf{X}_{ij}$ is a vector of individual and cooperative attributes. Additionally, I include a district dummy to account for location-specific effects and cluster ε_{ij} at the cooperative level. Since the cooperatives in my sample are spread across 24 districts in Nepal, it is possible that goat sales and loans could significantly vary across locations. A number of cooperatives are located in districts that are in close proximity to major urban markets, such as Kathmandu, while others are in remote areas or mountainous terrains. Smallholders who live close to a major urban market may be able to sell a larger quantity of goats due to this close proximity, while smallholders who live in remote or mountainous areas may receive less revenue due to the difficulty of transporting goats in that setting. A similar logic applies to the value of cooperative loans. Members in different locations likely have varying access to and demand for credit, potentially affecting the frequency and amount that they borrow from the cooperative. Therefore, including district fixed effects in my estimation will account for these geographic differences. Additionally, since I am estimating equation (1) at the individual-level, ε_{ij} is likely correlated within cooperatives, requiring clustered standard errors.

Given that the most and least inclusive cooperatives likely differ in their ability to translate members' characteristics into performance, I allow for different values of β for each group. Using group-specific parameters, the difference between average outcomes for the most and least inclusive cooperatives is written as:

$$\overline{Y}_m - \overline{Y}_\ell = \beta_m \overline{\mathbf{X}}_m - \beta_\ell \overline{\mathbf{X}}_\ell \tag{2}$$

where m and ℓ represent the most and least inclusive cooperatives, respectively. Rearranging this equation by adding and subtracting $\beta_\ell \overline{\mathbf{X}}_m$ on both sides gives:

$$\overline{Y}_m - \overline{Y}_\ell \tag{3a}$$

$$= \beta_\ell [\overline{\mathbf{X}}_m - \overline{\mathbf{X}}_\ell] \tag{3b}$$

$$+ \overline{\mathbf{X}}_m [\beta_m - \beta_\ell] \tag{3c}$$

Here, (3b) is the explained component (weighted by the coefficients for producers in the least inclusive cooperatives), which is the difference between the average outcomes that producers in the least inclusive cooperatives receive, given their characteristics, and the expected outcome they would receive if their characteristics matched those of producers in the most inclusive cooperatives. Line (3c) is the unexplained component (weighted by the characteristics of producers in the most inclusive cooperatives), which is the difference between what producers in the most inclusive cooperatives receive and the expected outcome these producers would receive if they had equivalent returns to their characteristics as those in the least inclusive cooperatives. Importantly, this interpretation does not require any assumptions of a causal effect or a model that is linear in parameters. Given that that the regression line runs through $\overline{Y}$ and $\overline{\mathbf{X}}$ by definition, this interpretation holds without onerous assumptions.

5 Results

5.1 Average Performance Gaps

Table (4) displays the average performance gap between the most and least inclusive cooperatives across each summary index (as well as the components of that index) and outcomes described above. The first panel indicates that extensive inclusion is associated with lower market performance across the two goat-selling outcomes. Among cooperatives that score above the median value on the extensive inclusion index, members sell significantly fewer goats through the cooperative and receive less revenue from those sales. The individual components of this index indicate that the proportion of nonliterate members and those who own very few goats are significant sources of extensive inclusion. Among the cooperatives whose proportion of nonliterate members is above the sample median, members receive a significantly lower score on the cooperative benefits index. Similarly, among cooperatives whose proportion of low asset holding members is higher than the median value, members sell fewer goats through the cooperative, receive less revenue from goat sales and score significantly lower on the overall benefits index, on average. Interestingly, there are no significant differences between the most and least inclusive cooperatives when split at the median value of the coefficient of variation on the number of goats owned. This may imply that the overall variation of members' assets is less important than the proportion of members with very few

assets. Similarly, there is no significant performance gap between the groups of cooperatives with the highest and lowest membership fees. This may be due to the fact that the average membership fee is relatively small (see table 1).

The second panel in table (4) indicates that intensive inclusion is associated with higher market performance across three of the four outcomes of interest. Among cooperatives that score above the median value on the intensive inclusion index, members sell more goats through the cooperative, receive more revenue from goat sales and score significantly higher on the overall benefits index. The components of this index suggest that this performance gap is largely driven by the proportion of members that receive sale information and the proportion that have outstanding loans from the cooperative. In cooperatives that communicate sale information to a larger proportion of their members, the average member sells more goats through the cooperative, receives more revenue from goat sales and scores significantly higher on the overall benefits index. In cooperatives where a larger proportion of members have loans outstanding, the average member receives higher benefits across all four outcomes. The proportion of members that receive non-sale information and voted in cooperative elections appear to have little relationship with market performance.

Table 4. Average performance gap between the most and least inclusive cooperatives

Group Definition (split at median)	Cooperative goat revenue (USD)	Cooperative goats sold (count)	Cooperative loan amount (USD)	Cooperative benefits index (st. deviations)
	(N=1,384)	(N=1,384)	(N=1,572)	(N=816)
Extensive Inclusion				
Extensive inclusion index	-41.58***	-0.39***	62.78	-0.16
	(11.52)	(0.11)	(62.04)	(0.11)
Proportion of non-literate members	-9.72	-0.12	-74.29	-0.20**
	(12.89)	(0.12)	(59.32)	(0.10)
Proportion of members below the median number of goats owned	-47.99***	-0.47***	20.68	-0.24**
	(11.03)	(0.11)	(63.26)	(0.10)
Coefficient of variation on members' goats	-1.04	-0.04	39.84	-0.05
	(13.07)	(0.13)	(62.34)	(0.11)
Size of membership fee	4.14	0.01	-50.82	0.00
	(13.15)	(0.13)	(61.71)	(0.11)
Intensive Inclusion				
Intensive inclusion index	33.85***	0.33***	86.22	0.33***
	(11.87)	(0.11)	(54.35)	(0.09)
Proportion of members receiving sale information	63.97***	0.64***	20.95	0.41***
	(12.95)	(0.13)	(71.39)	(0.11)
Proportion of members receiving non-sale information	19.61	0.19	12.86	0.13
	(13.17)	(0.13)	(62.97)	(0.11)
Proportion of members receiving loans	30.02**	0.31**	152.61***	0.30***
	(13.06)	(0.13)	(54.34)	(0.10)
Proportion of members that voted in cooperative elections	11.89	0.06	-26.80	-0.04
	(13.26)	(0.12)	(62.70)	(0.11)

Notes: Results from a simple linear regression of the binary group identifier on the outcome of interest. Clustered standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

5.2 Decomposing Performance Gaps

In this subsection, I decompose the performance gaps described above into the portion that is explained by differences in observable characteristics and the portion that is explained by the returns to those characteristics. Following the approach outlined in section 4.3, I report the separate components of equation (3a)-(3c) across each outcome of interest, showing the results across each inclusion summary index as well as its individual components. See section A.2 of the appendix for the results of the underlying OLS regressions used to generate each set of results, including the full list of covariates.

Figures (2)-(5) display the decomposition results for each outcome of interest. The left sub-figure for each outcome displays results for the extensive inclusion index, while the right sub-figure displays results for the intensive inclusion index. Each figure displays the estimated performance gap between the most and least inclusive cooperatives across each group definition, the portion of that gap that is explained by observable characteristics and the portion of that gap that is explained by the returns to those characteristics.

5.2.1 Revenue From Cooperative Goat Sales

Figure 2. Decomposition results for revenue from cooperative goat sales

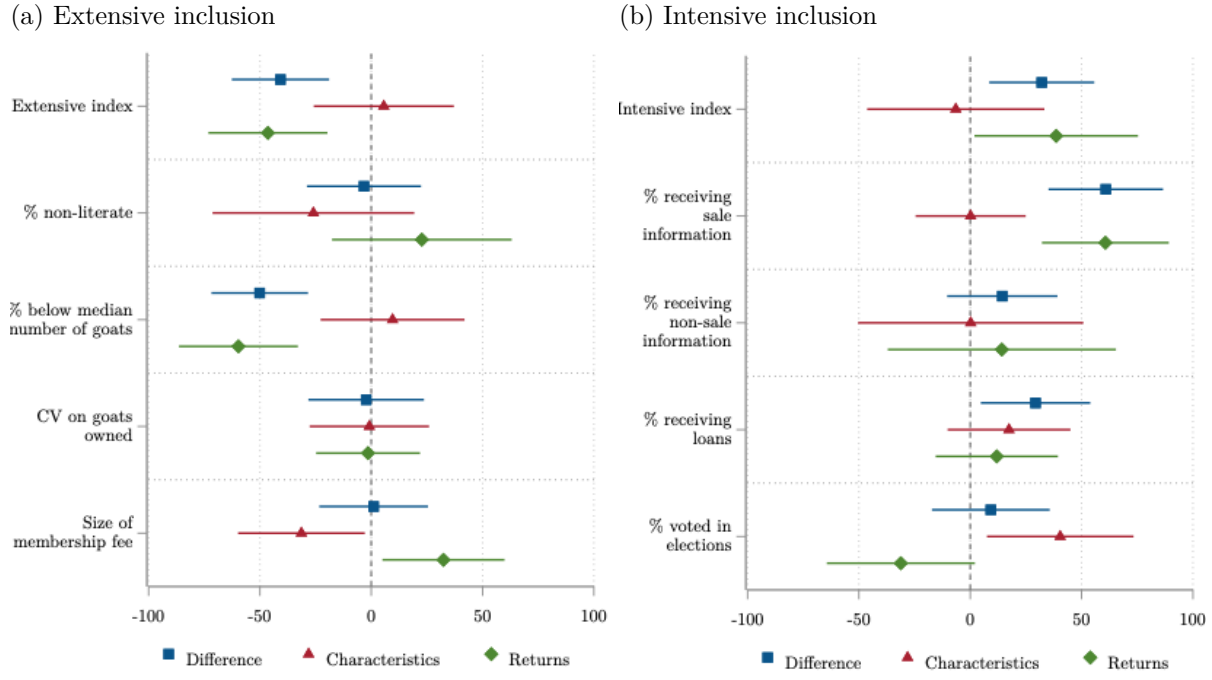


Figure (2) displays the results for the revenue from cooperative goat sales. Figure (2a) indicates that the most extensively inclusive cooperatives perform significantly worse than their less inclusive counterparts. In cooperatives that score above the median value on the extensive inclusion index, members earn $42 less in goat revenue than those in the least inclusive cooperatives. The components of the extensive inclusion index indicate that the share of cooperative members who own very few goats is the most important source of extensive inclusion for this outcome. The decomposition of this performance gap suggests that this result is not explained by differences in observed characteristics between the two groups. The 'explained' portion of the gap indicates how much of this discrepancy can be attributed to differences in observed characteristics between the two groups. In this case, the explained portion of the gap is close to zero, while the unexplained portion of the gap is roughly equal to the overall performance gap. This result implies that the two groups are similar in terms of their observed characteristics, but the least (extensively) inclusive cooperatives appear to be better able to translate their characteristics into performance. This result is largely consistent with the inclusive-performance tradeoff highlighted in previous studies.

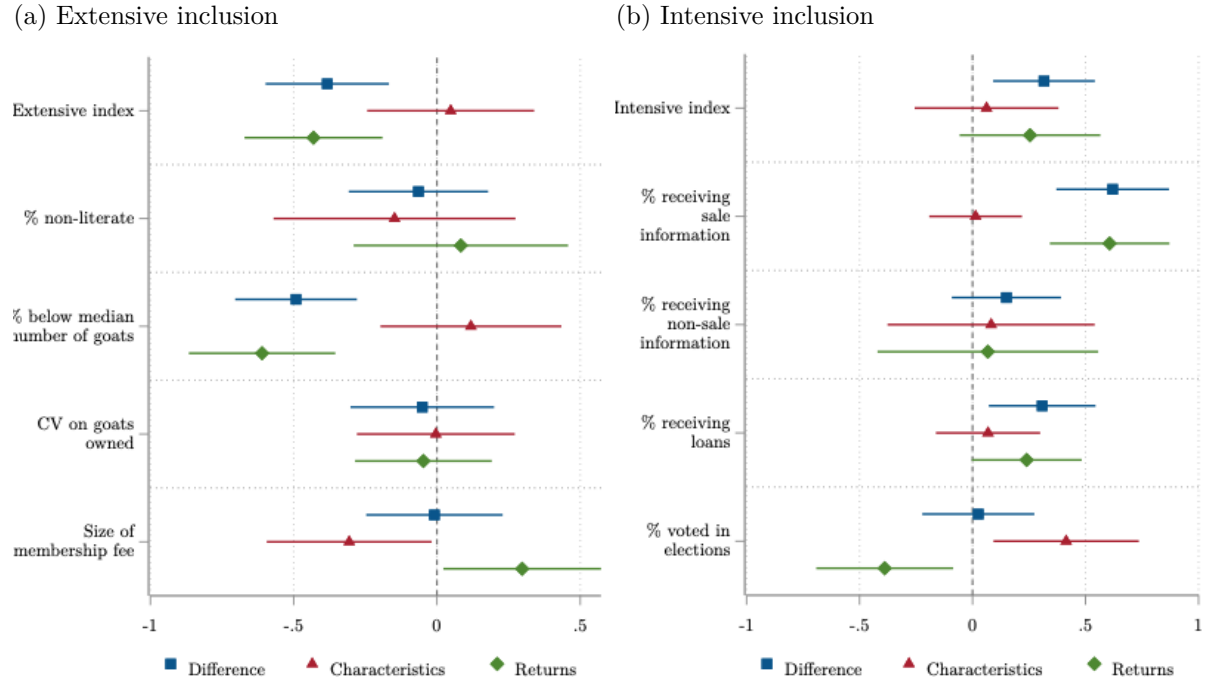
The results displayed in figure (2b) indicate that the most intensively inclusive cooperatives perform significantly better than their less inclusive counterparts. In cooperatives that score above the median value on the intensive inclusion index, members earn $34 more in goat revenue than those in the least inclusive cooperatives. This result is also not explained by differences in observable characteristics, but rather the returns to those characteristics. The individual components of the intensive inclusion index demonstrate that the proportion of members receiving sale information and the share that currently have a loan outstanding are the most important aspects of intensive inclusion for this outcome. Cooperatives that communicate sale information to a larger number of their members perform significantly better, a result that is not explained by differences in observed characteristics. While cooperatives that provide loans to a larger proportion of their members also perform significantly better than their less inclusive counterparts, this result appears to be somewhat equally explained by differences in characteristics and returns. While neither component is statistically significant, both are positive and make up a sizable portion of the overall performance gap.

Finally, the results for the size of the membership fee and the proportion of members who voted in cooperative elections have interesting interpretations. While the overall performance gap is not

significantly different than zero in either case, the components of that make up these gaps are both significant with opposite signs. For the size of the membership fee, the observable characteristics of the most inclusive cooperatives would suggest that they should perform significantly worse than the less inclusive cooperatives. However, these organizations have significantly higher returns to their characteristics. These results indicate that cooperatives with lower membership fees do, in fact, consist of more members with disadvantageous characteristics. However, this effect is offset by high returns relative to those characteristics. Conversely, for the proportion of members that voted in cooperative elections, the observed characteristics of the most inclusive cooperatives would suggest that they should perform significantly better than their less inclusive counterparts, but these organizations have significantly lower returns. This may suggest that the most democratic cooperatives are well positioned to achieve market performance, but are not capitalizing on this opportunity.

5.2.2 Number of Goats Sold Through the Cooperative

Figure 3. Decomposition results for the number of goats sold through the cooperative



The results displayed in figure (3) show a similar pattern for the number of goats sold through the cooperative. Extensive inclusion is associated with fewer goats sold per member, while intensive

inclusion is associated with a higher number of goats sold per member. Among the most extensively inclusive cooperatives, members sell 0.4 fewer goats through the cooperative, on average. This result is also not explained by differences in observable characteristics between the two groups, but rather the returns to those characteristics. The proportion of members who own below the median number of goats also appears to be the main source of extensive inclusion for the number of goats sold. Among cooperatives that score above the median value on the intensive inclusion index, members sell 0.33 more goats through the cooperative, on average. The share of non-literate members and the share that have a cooperative loan outstanding appear to be the main sources of intensive inclusion for this outcome. Similar to figure (2), cooperatives with higher membership fees and in which a larger proportion of members vote in elections have more favorable characteristics but almost equally unfavorable returns to those characteristics.

5.2.3 Value of Outstanding Cooperative Loans

Figure 4. Decomposition results for the cooperative loan amount

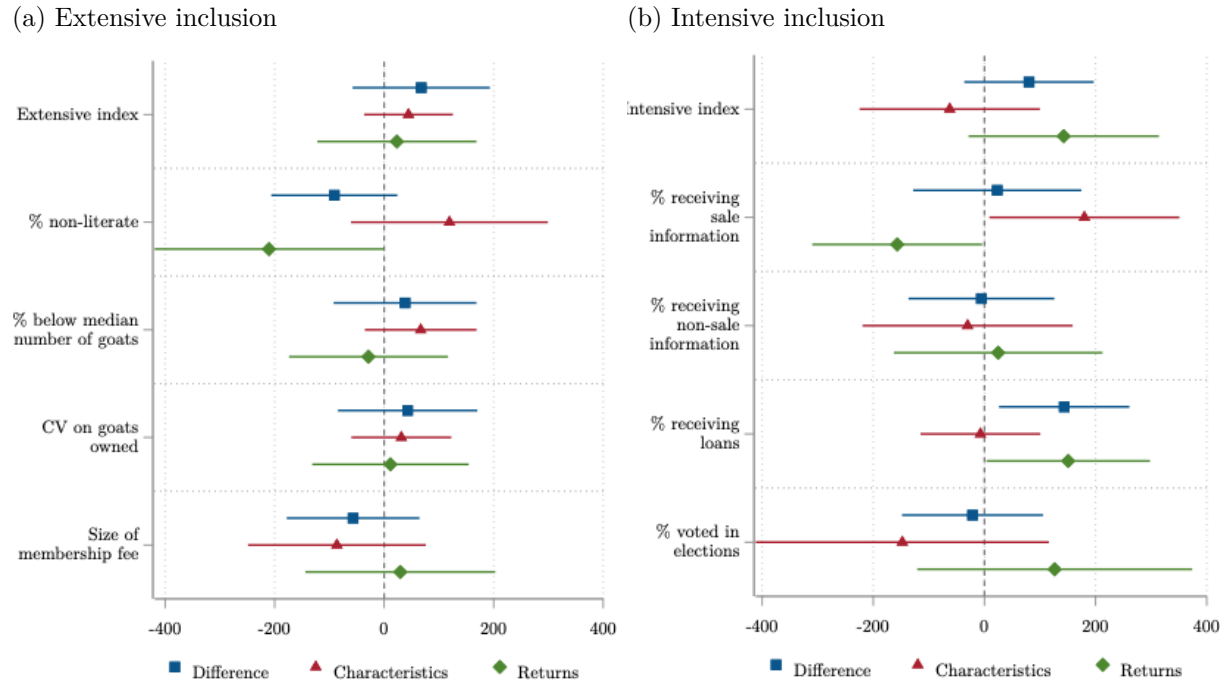
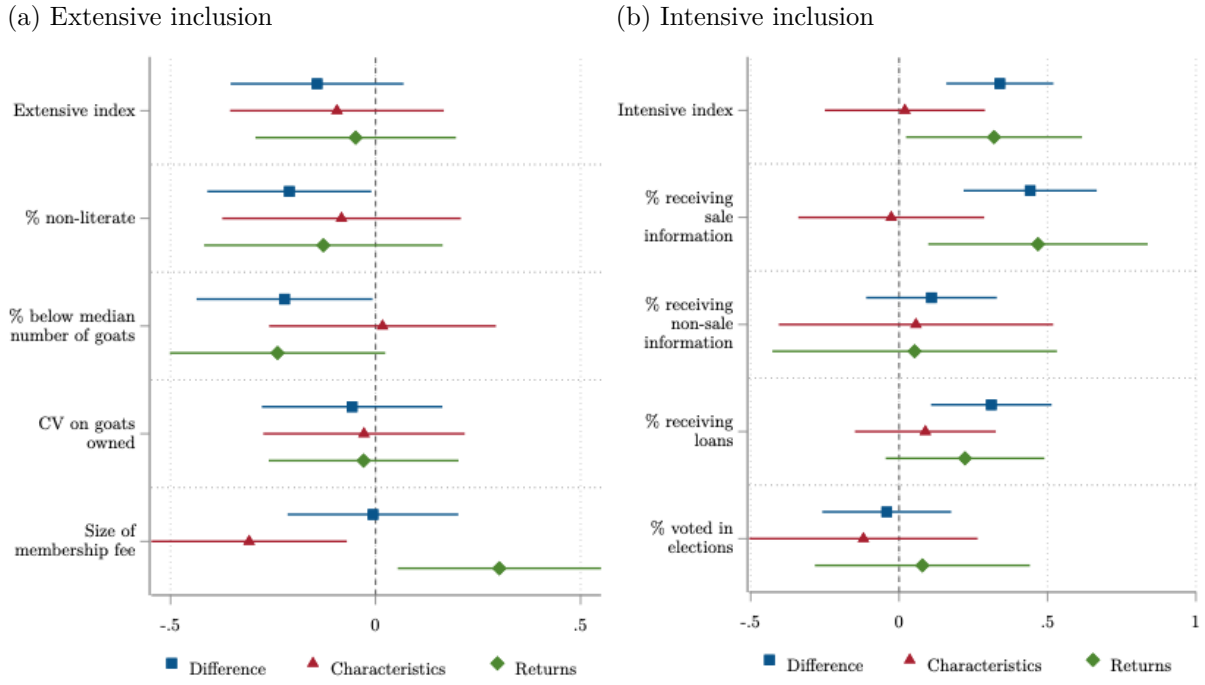


Figure (4) displays the results for the value of outstanding cooperative loans. In figure (4a), none of the performance gaps are significantly different than zero in terms of extensive inclusion. However, cooperatives that include a larger share of nonliterate households in their membership have

significantly lower returns to their characteristics than less inclusive cooperatives. Interestingly, these cooperatives seem to have more favorable characteristics (although the coefficient on characteristics is insignificant), balancing out the effect on the overall performance gap. In figure (4b), there is a similar pattern for cooperatives that provide sale information to a larger proportion of their members. These cooperatives have significantly more favorable characteristics, implying that they should be positioned to provide a larger value of loans to their members. However, these cooperatives receive significantly lower returns than their less inclusive counterparts, erasing most of the overall performance gap. When splitting cooperatives by the proportion of members that have an outstanding cooperative loan, the most inclusive cooperatives perform significantly better than their less inclusive counterparts. This result appears to be almost entirely driven by the returns to individual and institutional characteristics.

5.2.4 Cooperative Benefits Index

Figure 5. Decomposition results for the cooperative benefits index



Finally, figure (5) displays the decomposition results for the cooperative benefits index. Figure (5a) shows that there is not a significant performance gap across the extensive inclusion index. However, members of cooperatives that include a larger proportion of nonliterate members and those that

include a larger share of low asset holding members receive a significantly lower average score on the cooperative benefits index. While the gap for the share of nonliterate members is explained roughly equally by observed characteristics and the returns to those characteristics, the gap for the share of low asset holding members is largely driven by returns. Figure (5b) indicates that the most intensively inclusive cooperatives perform significantly better than their less inclusive counterparts. When splitting cooperatives by the proportion of members that receive sale information as well as the proportion of members who have a cooperative loan outstanding, members of the most inclusive cooperatives receive significantly higher scores on the overall benefits index. Similarly, these results appear to be mostly driven by returns to individual and institutional characteristics.

6 Discussion

My results suggest that extensive inclusion is (weakly) associated with lower market performance while intensive inclusion is (weakly) associated with higher market performance. This study has important limitations that should be taken into account when interpreting these results. The methodology used in this study is based on simple OLS regressions and I do not claim to have a credible identification strategy. The estimates used to decompose cooperative performance gaps likely suffer from ommitted variable bias and therefore should be interpreted as correlations. However, this descriptive analysis provides a useful framework for further investigating the tradeoffs inherent in managing collective action.

With these limitations in mind, my results provide additional evidence of a tradeoff between extensive inclusion and market performance (as highlighted in Berdegué (2001), Bernard & Spielman (2009) and World Bank (2008)), while demonstrating that a limited focus on membership criteria as the main source of inclusion overlooks an important aspect of cooperative management. In expanding the definition of inclusive membership to account for the extent to which existing members are included in group activities, my results indicate that intensive inclusion is associated with higher market performance.

This analysis generates several hypotheses that need further investigation. In terms of extensive inclusion, cooperatives appear to achieve signficantly different levels of market performance based on the proportion of nonliterate and low goat owning households that are currently in their mem-

bership. In this context, there does not appear to be a strong relationship between the coefficient of variation on the number of goats owned per member or the size of the cooperative membership fee. One possible explanation for the relationship between goat ownership and market performance is that the existence of members who own little to no goats may meaningfully increase transaction costs without substantially benefiting the cooperative. Conversely, the variation in members' goat ownership also captures the existence of members that own a large quantity of goats. These members may provide enough benefit to the cooperative to outweigh the additional transaction costs of a number of low goat owning members, balancing out the effect.

In terms of intensive inclusion, cooperatives achieve differing levels of market performance based on the proportion of members that receive sale information and the proportion that have an outstanding loan from the cooperative. The results suggest that market performance likely does not differ based on the proportion of members that receive non-sale information or the proportion that vote in cooperative elections. If there is a causal link between intensive inclusion and market performance, it is not clear which direction this mechanism works. While including a larger number of members in a given group activity can improve cooperative performance by pooling a larger quantity of inputs, the marginal benefit of each additional member included in an activity is also associated with the marginal cost of communicating with and managing a larger group size (Aflagah et al., 2019). It is also possible that this relationship is capturing reverse causality, where the most successful cooperatives have the resources and ability to include a larger number of members in group activities. Further theoretical and empirical research is needed to understand the optimal level of intensive inclusion and its impact on market performance within agricultural cooperatives.

Finally, by decomposing the performance gaps described above, my results demonstrate that the differing levels of performance are largely not explained by observable differences between the most and least inclusive groups. This suggests that inclusive membership (both intensive and extensive) may play an important role in cooperatives' ability to achieve market performance that goes beyond simple differences in members' characteristics or observable institutional structures.

7 Conclusion

In this paper, I expand the definition of inclusive membership in agricultural cooperatives and further investigate the inclusive-performance tradeoff. Prior studies have focused on extensive inclusion (the inclusion of a diverse set of households in a cooperative's membership), while largely overlooking intensive inclusion (the extent to which existing members are included in group activities). The cooperative literature has highlighted the inverse relationship between extensive inclusion and market performance (Berdegué, 2001; Bernard & Spielman, 2009; World Bank, 2008). However, I argue that intensive inclusion is an equally important aspect of cooperative management.

My results suggest that extensive inclusion is associated with lower market performance, while intensive inclusion is associated with higher market performance. First, this study provides evidence of the inclusive-performance tradeoff in a new context: female smallholder livestock cooperatives in Nepal. Second, I provide new evidence that contributes to our understanding of the inherent challenges faced by cooperative management. This paper highlights two opposing relationships that are important to the decision-making process surrounding inclusive cooperative membership. Including a diverse set of households in a cooperative's membership may decrease market performance by increasing transaction costs, but including a large number of existing members in a given activity may improve performance by pooling a larger quantity of inputs.

This study attempts to generate new hypotheses that can be tested with additional theoretical and empirical research. While more rigorous evidence is required to understand the optimal level of inclusion for agricultural cooperatives, this paper highlights key aspects of the relationship between inclusive membership and market performance. These results are crucial for understanding the role that agricultural cooperatives play in rural development and poverty alleviation, especially as governments, donors and researchers continue to explore the potential benefits of producer organizations in developing countries.

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A Appendix

A.1 Decomposition Results

Table A.1. Decomposition results for revenue from cooperative goat sales

Revenue from cooperative goat sales (USD)	Difference	Characteristics	Returns
Extensive Inclusion			
Extensive index	-40.78***	5.64	-46.42***
	(11.14)	(16.05)	(13.64)
Percentage of non-literate members	-3.27	-25.99	22.72
	(13.08)	(23.12)	(20.59)
Percentage of members below the median number of goats owned	-50.10***	9.56	-59.66***
	(11.07)	(16.50)	(13.62)
Coefficient of variation on members' goats	-2.29	-0.85	-1.44
	(13.25)	(13.68)	(11.91)
Size of membership fee	1.07	-31.37**	32.44**
	(12.46)	(14.52)	(13.98)
Intensive Inclusion			
Intensive index	32.09***	-6.50	38.60**
	(11.54)	(14.49)	(13.10)
Percentage of members receiving sale information	60.86***	0.17	60.69***
	(13.12)	(12.62)	(14.53)
Percentage of members receiving non-sale information	14.38	0.21	14.17
	(12.63)	(25.80)	(26.14)
Percentage of members receiving loans	29.31**	17.40	11.91
	(12.54)	(14.07)	(14.00)
Percentage of members who voted in cooperative elections	9.22	40.39**	-31.17*
	(13.49)	(16.79)	(16.97)

Table A.2. Decomposition results for the number of goats sold through the cooperative

Number of goats sold through the cooperative (count)	Difference	Characteristics	Returns
Extensive Inclusion			
Extensive index	-0.38***	0.05	-0.43***
	(0.11)	(0.15)	(0.12)
Percentage of non-literate members	-0.06	-0.15	0.08
	(0.12)	(0.22)	(0.19)
Percentage of members below the median number of goats owned	-0.49***	0.12	-0.61***
	(0.11)	(0.16)	(0.13)
Coefficient of variation on members' goats	-0.05	-0.00	-0.05
	(0.13)	(0.14)	(0.12)
Size of membership fee	-0.01	-0.31**	0.30**
	(0.12)	(0.15)	(0.14)
Intensive Inclusion			
Intensive index	0.32***	0.06	0.25
	(0.11)	(0.12)	(0.12)
Percentage of members receiving sale information	0.62***	0.01	0.61***
	(0.13)	(0.10)	(0.13)
Percentage of members receiving non-sale information	0.15	0.08	0.07
	(0.12)	(0.23)	(0.25)
Percentage of members receiving loans	0.31**	0.07	0.24*
	(0.12)	(0.12)	(0.12)
Percentage of members who voted in cooperative elections	0.03	0.41**	-0.39**
	(0.13)	(0.16)	(0.15)

Table A.3. Decomposition results for the cooperative loan amount

Cooperative loan amount (USD)	Difference	Characteristics	Returns
Extensive Inclusion			
Extensive index	67.68	44.42	23.26
	(63.97)	(41.41)	(74.12)
Percentage of non-literate members	-91.02	119.25	-210.28**
	(58.78)	(91.72)	(106.55)
Percentage of members below the median number of goats owned	38.18	66.79	-28.61
	(66.53)	(52.03)	(74.07)
Coefficient of variation on members' goats	42.89	31.37	11.52
	(64.87)	(46.56)	(72.88)
Size of membership fee	-56.73	-86.24	29.50
	(61.85)	(82.87)	(88.45)
Intensive Inclusion			
Intensive index	80.25	-62.40	142.65
	(55.60)	(51.74)	(65.49)
Percentage of members receiving sale information	23.00	179.93**	-156.93**
	(77.22)	(87.22)	(77.98)
Percentage of members receiving non-sale information	-5.44	-30.24	24.80
	(66.93)	(96.45)	(95.73)
Percentage of members receiving loans	143.59**	-7.19	150.78**
	(59.83)	(54.95)	(75.10)
Percentage of members who voted in cooperative elections	-21.32	-147.74	126.42
	(64.77)	(134.54)	(126.22)

Table A.4. Decomposition results for the cooperative benefits index

Benefits Index	Difference	Characteristics	Returns
Extensive Inclusion			
Extensive index	-0.14	-0.09	-0.05
	(0.11)	(0.13)	(0.12)
Percentage of non-literate members	-0.21**	-0.08	-0.13
	(0.10)	(0.15)	(0.15)
Percentage of members below the median number of goats owned	-0.22**	0.02	-0.24*
	(0.11)	(0.14)	(0.13)
Coefficient of variation on members' goats	-0.06	-0.03	-0.03
	(0.11)	(0.13)	(0.12)
Size of membership fee	-0.01	-0.31**	0.30**
	(0.11)	(0.12)	(0.13)
Intensive Inclusion			
Intensive index	0.34***	0.02	0.32**
	(0.09)	(0.11)	(0.12)
Percentage of members receiving sale information	0.44***	-0.03	0.47**
	(0.11)	(0.16)	(0.19)
Percentage of members receiving non-sale information	0.11	0.06	0.05
	(0.11)	(0.24)	(0.24)
Percentage of members receiving loans	0.31***	0.09	0.22
	(0.10)	(0.12)	(0.14)
Percentage of members who voted in cooperative elections	-0.04	-0.12	0.08
	(0.11)	(0.20)	(0.18)

A.2 OLS Regressions

Table A.5. OLS regressions on revenue from cooperative goat sales (extensive inclusion)

Revenue from cooperative goat sales (USD)	Extensive index		proportion of nonliterate members		proportion below median goat ownership		Coefficient of variation on goats owned		Size of membership fee	
	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age (years)	0.344	0.075	0.291	-0.093	0.905**	-0.102	0.431	0.616	0.915**	-0.168
	(0.337)	(0.526)	(0.525)	(0.473)	(0.397)	(0.591)	(0.497)	(0.604)	(0.410)	(0.641)
Number of household members (count)	-1.176	-0.127	-1.001	-1.478	-1.862*	-1.047	-0.419	-2.165**	-1.150	-1.646
	(0.888)	(2.148)	(1.885)	(1.556)	(1.097)	(1.890)	(2.195)	(1.065)	(1.070)	(2.439)
Total number of goats owned (count)			3.910*	2.822**					3.814***	2.573**
			(2.015)	(1.108)					(1.384)	(1.180)
Primary activity is agriculture (0/1)	-12.978	-12.283	-27.773*	3.549	-11.690	-7.973	-8.340	-1.175	4.025	-32.504*
	(9.835)	(21.644)	(16.481)	(18.828)	(10.916)	(23.157)	(14.109)	(20.795)	(16.200)	(17.344)
Length of membership (years)	1.315	-5.173	1.813	-2.319	0.852	-6.282	-2.415	-1.395	3.826	-1.937
	(2.010)	(3.830)	(3.683)	(2.264)	(1.699)	(3.855)	(2.768)	(3.307)	(3.379)	(2.454)
Cooperative leadership role (0/1)	44.923*	18.365	73.442*	16.793	41.305*	15.973	38.533	19.305	22.451	29.437*
	(25.322)	(23.020)	(42.119)	(18.886)	(23.669)	(25.701)	(24.147)	(23.036)	(29.701)	(16.290)
Round-trip travel time to cooperative meetings (minutes)	-0.039	0.122	0.071	0.059	-0.022	0.097	0.058	0.060	0.073	0.051
	(0.040)	(0.089)	(0.088)	(0.083)	(0.026)	(0.091)	(0.060)	(0.112)	(0.092)	(0.058)
SHG meetings attended in last 6-months (count)	2.502	10.778*	11.835	4.500	2.443	9.822	3.937	7.916	6.526	8.090
	(2.539)	(6.100)	(8.487)	(3.782)	(2.979)	(6.104)	(5.192)	(6.441)	(4.318)	(6.417)
Membership fee (USD)			0.039	-0.033***	-0.005	-0.036***	-0.065	-0.025*		
			(0.032)	(0.012)	(0.020)	(0.012)	(0.049)	(0.015)		
Number of cooperative members (count)	0.009	0.064	0.001	-0.008	0.003	0.048	-0.014	-0.026	0.014	-0.015
	(0.011)	(0.042)	(0.036)	(0.025)	(0.005)	(0.046)	(0.014)	(0.047)	(0.016)	(0.024)
Number of servcies offered (count)	8.368	3.332	16.701***	8.788*	7.074***	5.936	14.171***	6.825	3.750	10.438***
	(6.472)	(4.013)	(4.824)	(4.653)	(2.102)	(4.575)	(4.675)	(4.656)	(4.077)	(3.363)
Total revenue in last 6-months (USD)	0.000	0.003***	-0.002	0.003***	0.000	0.003***	0.009***	0.001	0.002	-0.002
	(0.001)	(0.001)	(0.003)	(0.001)	(0.000)	(0.001)	(0.003)	(0.001)	(0.001)	(0.003)
Cooperative organizes goat sales (0/1)	-5.935	-2.503	-2.897	1.722	-3.464	14.346	-57.284	-6.661	38.051	-25.222
	(30.199)	(20.035)	(34.607)	(22.992)	(19.249)	(22.817)	(34.311)	(28.178)	(26.259)	(26.635)
Cooperative offers loans to members (0/1)	22.212*	-73.913**	22.615	-39.960	22.241**	-48.771	-10.814	-81.405***	-32.931	48.619
	(11.815)	(30.798)	(28.512)	(34.955)	(9.635)	(35.447)	(35.549)	(30.299)	(33.767)	(36.669)
Size of management committee (count)	-2.781	5.571	0.847	7.193	-1.619	1.596	4.172	8.886	-0.415	5.560
	(4.659)	(5.408)	(4.840)	(6.503)	(2.760)	(6.217)	(9.132)	(6.156)	(6.545)	(4.135)
Literacy (0/1)					13.809	8.976	8.219	17.124	20.323	5.879
					(8.355)	(18.628)	(15.552)	(15.943)	(14.471)	(13.434)
Constant	7.251	-61.119	-268.838***	-67.079	-25.442	-60.839	-49.752	-96.100	-121.183	-47.423
	(64.717)	(82.580)	(89.235)	(63.349)	(29.402)	(91.051)	(89.730)	(84.224)	(77.666)	(80.674)
Observations	601	742	481	781	546	714	599	661	712	629
R-squared	0.139	0.168	0.230	0.156	0.141	0.159	0.206	0.168	0.172	0.244
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Variables used to create each group split were not included as controls in regressions on those group splits.

Table A.6. OLS regressions on revenue from cooperative goat sales (intensive inclusion)

Revenue from cooperative goat sales (USD)	Intensive index		proportion receiving sale information		proportion receiving non-sale information		proportion receiving loans		proportion voting in elections	
	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Literacy (0/1)	2.432	23.505**	1.508	15.371	3.166	10.104	11.052	16.594	12.867	12.066
	(15.231)	(11.397)	(19.645)	(13.106)	(17.652)	(12.100)	(16.307)	(12.321)	(17.834)	(12.421)
Age (years)	0.287	0.362	-0.423	0.347	0.795	-0.156	-0.227	0.727*	1.094*	-0.476
	(0.573)	(0.446)	(0.662)	(0.366)	(0.502)	(0.564)	(0.590)	(0.376)	(0.585)	(0.444)
Number of household members (count)	-0.640	-3.041	-0.486	-2.265**	-1.826	-1.812	0.199	-3.131***	-0.719	-2.211*
	(1.705)	(1.839)	(2.200)	(0.989)	(1.447)	(2.407)	(2.063)	(1.080)	(2.425)	(1.194)
Total number of goats owned (count)	3.134***	4.379**	4.466***	2.321	3.292**	3.348**	3.550***	3.295*	2.257*	3.995***
	(1.113)	(2.138)	(1.566)	(1.592)	(1.289)	(1.445)	(1.228)	(1.897)	(1.278)	(1.229)
Primary activity is agriculture (0/1)	-5.843	-21.179	-8.729	-17.863	5.643	-25.262*	-18.999	-5.927	-12.293	-17.053
	(17.308)	(16.527)	(23.002)	(14.309)	(20.994)	(14.948)	(17.681)	(16.858)	(18.314)	(16.194)
Length of membership (years)	-0.555	-3.769	1.969	-3.049	-2.966	0.469	-1.784	-0.998	-0.657	1.340
	(3.036)	(2.763)	(3.534)	(2.521)	(3.897)	(2.649)	(2.756)	(2.619)	(2.877)	(2.063)
Cooperative leadership role (0/1)	18.118	46.657	38.305	38.068	39.844	30.553	25.369	31.902	23.193	24.003
	(21.739)	(32.733)	(24.240)	(31.193)	(24.186)	(25.445)	(25.866)	(20.963)	(22.775)	(24.673)
Round-trip travel time to cooperative meetings (minutes)	0.080	0.019	0.097	0.003	0.066	0.040	0.048	0.058	0.187	-0.057
	(0.086)	(0.070)	(0.118)	(0.063)	(0.092)	(0.069)	(0.054)	(0.116)	(0.133)	(0.053)
SHG meetings attended in last 6-months (count)	4.763	9.191	3.579	7.104	5.276	7.191	5.454	7.756	14.222**	-1.731
	(4.426)	(6.817)	(5.833)	(6.897)	(4.212)	(7.213)	(4.537)	(6.383)	(6.997)	(3.175)
Membership fee (USD)	-0.029**	0.150	-0.045	-0.017*	-0.024*	-0.001	-0.141**	-0.030*	-0.024***	-0.054**
	(0.012)	(0.143)	(0.044)	(0.010)	(0.013)	(0.033)	(0.059)	(0.015)	(0.009)	(0.025)
Number of cooperative members (count)	-0.004	-0.030	-0.082***	0.013	0.017	0.001	0.020	-0.016	-0.010	0.022
	(0.035)	(0.029)	(0.029)	(0.045)	(0.042)	(0.013)	(0.040)	(0.013)	(0.013)	(0.041)
Number of servcies offered (count)	7.527*	7.385	8.623**	5.424	5.228	14.661***	10.286**	8.447	14.168***	19.969***
	(3.919)	(5.843)	(3.639)	(3.702)	(4.572)	(3.202)	(3.872)	(5.823)	(3.305)	(6.306)
Total revenue in last 6-months (USD)	0.001	0.003	0.002*	0.003	0.001	-0.000	0.000	0.003	-0.003	-0.001
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)	(0.004)	(0.004)	(0.001)
Cooperative organizes goat sales (0/1)	28.571				14.149	-15.372	16.407	-30.177	-101.830***	7.858
	(29.772)				(21.032)	(21.762)	(33.085)	(29.998)	(19.498)	(23.709)
Cooperative offers loans to members (0/1)	-14.619		-38.295	45.700	-63.977***	43.475	7.075		-44.124	-28.382
	(31.652)		(27.967)	(33.380)	(23.326)	(34.608)	(31.904)		(42.288)	(43.659)
Size of management committee (count)	3.893	2.033	-2.175	0.941	7.497	1.085	1.116	4.839	-3.590	6.625
	(5.080)	(9.145)	(6.661)	(6.343)	(4.668)	(4.186)	(4.577)	(7.203)	(4.220)	(6.921)
Constant	-23.823	-125.647	33.622	-147.780*	-81.050	-206.579***	20.276	-121.786	20.973	-150.801***
	(93.070)	(124.849)	(88.336)	(86.975)	(68.754)	(71.529)	(87.163)	(88.331)	(95.580)	(52.039)
Observations	791	469	583	514	648	612	654	606	526	734
R-squared	0.158	0.206	0.150	0.147	0.157	0.223	0.193	0.127	0.203	0.237
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.7. OLS regressions on the number of goats sold through the cooperative (extensive inclusion)

Revenue from cooperative goat sales (USD)	Extensive index		proportion of nonliterate members		proportion below median goat ownership		Coefficient of variation on goats owned		Size of membership fee	
	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age (years)	0.002	-0.001	-0.002	-0.001	0.007**	-0.002	0.003	0.004	0.007**	-0.003
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.003)	(0.005)
Number of household members (count)	-0.008	-0.002	-0.004	-0.013	-0.013	-0.008	-0.003	-0.016*	-0.007	-0.013
	(0.009)	(0.015)	(0.014)	(0.014)	(0.011)	(0.014)	(0.018)	(0.009)	(0.008)	(0.020)
Total number of goats owned (count)			0.028*	0.029**					0.041***	0.018**
			(0.015)	(0.011)					(0.015)	(0.009)
Primary activity is agriculture (0/1)	-0.127	-0.068	-0.154	-0.027	-0.097	-0.046	-0.105	0.076	0.034	-0.272**
	(0.084)	(0.146)	(0.105)	(0.149)	(0.093)	(0.158)	(0.104)	(0.147)	(0.114)	(0.129)
Length of membership (years)	0.017	-0.059*	0.043	-0.032	0.010	-0.061*	-0.009	-0.036	0.022	-0.005
	(0.020)	(0.031)	(0.030)	(0.022)	(0.015)	(0.032)	(0.027)	(0.025)	(0.026)	(0.021)
Cooperative leadership role (0/1)	0.254	0.048	0.476*	0.026	0.227	0.014	0.164	0.069	-0.011	0.197
	(0.185)	(0.174)	(0.267)	(0.169)	(0.158)	(0.215)	(0.184)	(0.179)	(0.237)	(0.127)
Round-trip travel time to cooperative meetings (minutes)	-0.000	0.000	0.000	-0.000	-0.000	0.000	0.000	-0.000	-0.000	0.000
	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)
SHG meetings attended in last 6-months (count)	0.021	0.064*	0.072	0.032	0.019	0.058	0.033	0.037	0.032	0.058
	(0.027)	(0.035)	(0.047)	(0.024)	(0.030)	(0.035)	(0.033)	(0.036)	(0.031)	(0.036)
Membership fee (USD)			0.000	-0.000**	-0.000	-0.000**	-0.000	-0.000*		
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
Number of cooperative members (count)	0.000	0.000	0.000	-0.000	-0.000	0.000	0.000	-0.001	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of servcies offered (count)	0.051	0.018	0.144***	0.070	0.073***	0.018	0.085*	0.062	-0.008	0.087***
	(0.075)	(0.037)	(0.051)	(0.050)	(0.020)	(0.043)	(0.049)	(0.046)	(0.041)	(0.029)
Total revenue in last 6-months (USD)	0.000	0.000***	-0.000	0.000***	0.000	0.000***	0.000**	0.000*	0.000**	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cooperative organizes goat sales (0/1)	0.049	0.135	0.080	0.131	-0.030	0.363	-0.183	0.094	0.686***	-0.216
	(0.341)	(0.170)	(0.324)	(0.218)	(0.153)	(0.223)	(0.318)	(0.293)	(0.244)	(0.256)
Cooperative offers loans to members (0/1)	0.215	-0.835**	0.203	-0.365	0.190	-0.547	-0.073	-0.888***	-0.377	0.638
	(0.144)	(0.316)	(0.298)	(0.359)	(0.115)	(0.363)	(0.374)	(0.287)	(0.306)	(0.408)
Size of management committee (count)	-0.045	0.049	-0.000	0.046	0.003	-0.013	-0.025	0.083	-0.019	0.050
	(0.052)	(0.047)	(0.047)	(0.054)	(0.022)	(0.058)	(0.084)	(0.056)	(0.058)	(0.038)
Literacy (0/1)					0.161**	0.092	0.101	0.167	0.206*	0.038
					(0.070)	(0.149)	(0.128)	(0.128)	(0.108)	(0.117)
Constant	0.534	0.084	-2.009**	-0.308	-0.390	0.237	0.127	-0.100	-0.593	-0.265
	(0.733)	(0.637)	(0.792)	(0.563)	(0.295)	(0.732)	(0.883)	(0.591)	(0.639)	(0.636)
Observations	601	742	481	781	546	714	599	661	712	629
R-squared	0.139	0.237	0.284	0.212	0.151	0.216	0.219	0.248	0.236	0.291
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Variables used to create each group split were not included as controls in regressions on those group splits.

Table A.8. OLS regressions on the number of goats sold through the cooperative (intensive inclusion)

Revenue from cooperative goat sales (USD)	Intensive index (most inclusive) (1)	Intensive index (least inclusive) (2)	proportion receiving sale information (most inclusive) (3)	proportion receiving sale information (least inclusive) (4)	proportion receiving non-sale information (most inclusive) (5)	proportion receiving non-sale information (least inclusive) (6)	proportion receiving loans (most inclusive) (7)	proportion receiving loans (least inclusive) (8)	proportion voting in elections (most inclusive) (9)	proportion voting in elections (least inclusive) (10)
Literacy (0/1)	0.061	0.198*	0.031	0.155	0.079	0.089	0.093	0.178*	0.059	0.142
	(0.121)	(0.099)	(0.174)	(0.095)	(0.132)	(0.108)	(0.134)	(0.090)	(0.140)	(0.101)
Age (years)	0.003	-0.002	-0.002	-0.001	0.008*	-0.004	-0.001	0.004	0.007	-0.004
	(0.005)	(0.003)	(0.006)	(0.002)	(0.004)	(0.004)	(0.005)	(0.003)	(0.005)	(0.003)
Number of household members (count)	-0.008	-0.013	-0.009	-0.010	-0.016	-0.014	-0.002	-0.019**	-0.006	-0.014
	(0.013)	(0.015)	(0.017)	(0.009)	(0.013)	(0.018)	(0.017)	(0.008)	(0.019)	(0.011)
Total number of goats owned (count)	0.033***	0.032*	0.046***	0.015	0.038**	0.023**	0.037***	0.024	0.017*	0.043***
	(0.012)	(0.017)	(0.016)	(0.011)	(0.014)	(0.011)	(0.013)	(0.015)	(0.009)	(0.014)
Primary activity is agriculture (0/1)	-0.093	-0.079	-0.108	-0.069	0.006	-0.159	-0.197	0.012	-0.144	-0.077
	(0.134)	(0.083)	(0.178)	(0.072)	(0.161)	(0.103)	(0.138)	(0.111)	(0.142)	(0.106)
Length of membership (years)	-0.011	-0.017	0.010	-0.012	-0.041	0.022	-0.011	-0.020	-0.015	0.023
	(0.026)	(0.021)	(0.032)	(0.019)	(0.028)	(0.023)	(0.028)	(0.020)	(0.024)	(0.020)
Cooperative leadership role (0/1)	0.046	0.215	0.236	0.184	0.189	0.179	0.036	0.243*	0.145	0.001
	(0.196)	(0.190)	(0.201)	(0.184)	(0.189)	(0.168)	(0.217)	(0.133)	(0.164)	(0.203)
Round-trip travel time to cooperative meetings (minutes)	-0.000	0.000	-0.000	-0.000	-0.000	0.000	0.000	-0.000	0.001	-0.001*
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)
SHG meetings attended in last 6-months (count)	0.033	0.052	0.006	0.045	0.029	0.037	0.047	0.038	0.067*	-0.004
	(0.030)	(0.040)	(0.037)	(0.039)	(0.025)	(0.042)	(0.030)	(0.036)	(0.039)	(0.027)
Membership fee (USD)	-0.000**	0.001	-0.000	-0.000**	-0.000*	-0.000	-0.001**	-0.000*	-0.000**	-0.000*
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Number of cooperative members (count)	-0.000	-0.000	-0.001**	0.000	-0.000	-0.000	0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of servcies offered (count)	0.047	0.123**	0.045	0.074**	0.034	0.136***	0.070*	0.058	0.098***	0.203***
	(0.039)	(0.052)	(0.036)	(0.032)	(0.046)	(0.034)	(0.035)	(0.057)	(0.029)	(0.061)
Total revenue in last 6-months (USD)	0.000	0.000	0.000**	0.000	0.000	-0.000	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cooperative organizes goat sales (0/1)	0.441				0.349*	-0.107	0.336	-0.092	-0.767***	0.193
	(0.307)				(0.199)	(0.190)	(0.331)	(0.259)	(0.253)	(0.230)
Cooperative offers loans to members (0/1)	-0.176		-0.369	0.499**	-0.717***	0.530	0.017		-0.334	-0.347
	(0.326)		(0.290)	(0.226)	(0.223)	(0.381)	(0.332)		(0.368)	(0.430)
Size of management committee (count)	0.026	-0.009	-0.024	-0.012	0.066	0.013	0.016	0.043	-0.017	0.039
	(0.050)	(0.077)	(0.064)	(0.056)	(0.041)	(0.036)	(0.045)	(0.060)	(0.037)	(0.068)
Constant	0.225	-1.010	0.900	-1.214*	-0.435	-1.779***	0.384	-0.699	0.857	-1.406***
	(0.870)	(0.960)	(0.718)	(0.608)	(0.544)	(0.590)	(0.832)	(0.720)	(0.712)	(0.451)
Observations	791	469	583	514	648	612	654	606	526	734
R-squared	0.209	0.220	0.184	0.168	0.225	0.271	0.243	0.150	0.205	0.305
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.9. OLS regressions on the cooperative loan amount (extensive inclusion)

Revenue from cooperative goat sales (USD)	Extensive index		proportion of nonliterate members		proportion below median goat ownership		Coefficient of variation on goats owned		Size of membership fee	
	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)	(most inclusive)	(least inclusive)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age (years)	-1.380	-0.045	-2.566	-0.075	-0.767	-0.954	-3.554*	0.942	-1.076	0.723
	(1.924)	(2.159)	(1.693)	(2.227)	(1.852)	(2.307)	(1.979)	(2.203)	(2.226)	(2.053)
Number of household members (count)	-7.705	20.892	-2.351	25.179	-5.267	19.746	-8.195	24.936	28.705*	-10.578
	(8.694)	(17.825)	(8.994)	(18.204)	(9.546)	(18.827)	(9.148)	(17.172)	(16.387)	(8.462)
Total number of goats owned (count)			-5.995	-3.414					-2.899	-4.983
			(5.713)	(3.515)					(4.299)	(4.173)
Primary activity is agriculture (0/1)	-94.298	-76.958	-14.282	-242.208*	-142.623	-114.956	-250.771*	-9.965	17.482	-189.308
	(125.776)	(71.846)	(70.635)	(136.553)	(123.606)	(87.818)	(129.293)	(66.311)	(82.923)	(113.351)
Length of membership (years)	26.625	5.014	47.735*	-16.815	-0.223	22.717	19.069	-0.896	43.181**	-12.270
	(28.029)	(12.535)	(25.202)	(16.224)	(21.501)	(13.880)	(23.880)	(17.252)	(16.209)	(19.022)
Cooperative leadership role (0/1)	5.818	57.500	24.292	24.921	52.550	8.476	128.752**	-48.679	-99.020	163.780*
	(58.730)	(107.114)	(132.690)	(93.633)	(89.191)	(114.445)	(61.736)	(124.869)	(88.966)	(94.219)
Round-trip travel time to cooperative meetings (minutes)	-0.149	-1.098***	0.036	-1.403***	-0.555	-0.895**	-0.908**	-0.668*	-0.560	-0.706*
	(0.430)	(0.380)	(0.270)	(0.394)	(0.399)	(0.358)	(0.392)	(0.379)	(0.347)	(0.353)
SHG meetings attended in last 6-months (count)	14.428	7.515	12.932	-1.309	4.517	11.566	-20.734	26.432	0.177	21.296*
	(25.291)	(12.762)	(21.509)	(20.315)	(26.087)	(12.850)	(25.466)	(16.612)	(18.134)	(12.471)
Membership fee (USD)			-0.187**	-0.109**	-0.117	-0.050	-0.833	-0.062		
			(0.080)	(0.054)	(0.146)	(0.032)	(0.690)	(0.041)		
Number of cooperative members (count)	-0.008	-0.125	-0.185	-0.155	0.064	-0.116	-0.010	-0.289	0.013	0.024
	(0.083)	(0.128)	(0.111)	(0.122)	(0.095)	(0.115)	(0.124)	(0.186)	(0.038)	(0.177)
Number of servcies offered (count)	-11.954	-1.110	-25.043	-2.383	-5.046	-4.707	-5.542	-3.664	-30.230	-11.427
	(25.651)	(10.934)	(16.287)	(18.839)	(20.637)	(13.342)	(21.007)	(14.221)	(21.820)	(13.378)
Total revenue in last 6-months (USD)	-0.002	0.004*	0.023**	0.003	-0.001	0.004	0.015	0.003	0.002	-0.005
	(0.006)	(0.002)	(0.009)	(0.003)	(0.003)	(0.003)	(0.014)	(0.003)	(0.003)	(0.024)
Cooperative organizes goat sales (0/1)	27.782	64.292	222.318	178.074	16.771	18.700	150.499	129.252	301.414*	141.220
	(153.794)	(87.478)	(144.272)	(109.057)	(124.413)	(95.702)	(304.663)	(102.145)	(155.435)	(110.743)
Cooperative offers loans to members (0/1)	107.432	-156.405	166.355*	33.026	369.755*	-29.443	394.527**	-168.946	19.171	347.918*
	(161.973)	(254.619)	(93.040)	(188.173)	(201.552)	(196.124)	(169.693)	(336.748)	(148.672)	(191.213)
Size of management committee (count)	-30.560	-6.926	-77.844***	-19.852	-10.488	-37.538*	-22.907	-11.188	-18.219	-24.128
	(37.071)	(16.391)	(24.086)	(23.754)	(25.946)	(21.545)	(33.623)	(24.566)	(20.979)	(22.170)
Literacy (0/1)					-0.688	-5.766	-70.178	63.948	31.301	-32.726
					(65.674)	(99.377)	(83.282)	(60.408)	(67.764)	(81.947)
Constant	709.373*	283.710	701.024**	186.475	435.441	470.754	282.871	213.006	-1.096	636.863*
	(383.300)	(294.052)	(329.182)	(278.450)	(356.187)	(341.883)	(483.029)	(451.255)	(328.984)	(322.145)
Observations	741	781	618	815	694	737	706	725	779	741
R-squared	0.101	0.088	0.093	0.097	0.116	0.085	0.098	0.103	0.177	0.065
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Variables used to create each group split were not included as controls in regressions on those group splits.

Table A.10. OLS regressions on the cooperative loan amount (intensive inclusion)

Revenue from cooperative goat sales (USD)	Intensive index (most inclusive) (1)	Intensive index (least inclusive) (2)	proportion receiving sale information (most inclusive) (3)	proportion receiving sale information (least inclusive) (4)	proportion receiving non-sale information (most inclusive) (5)	proportion receiving non-sale information (least inclusive) (6)	proportion receiving loans (most inclusive) (7)	proportion receiving loans (least inclusive) (8)	proportion voting in elections (most inclusive) (9)	proportion voting in elections (least inclusive) (10)
Literacy (0/1)	41.335	-50.698	62.646	-58.186	92.892	-47.277	22.349	-7.911	62.905	-86.352
	(64.815)	(109.195)	(80.720)	(102.246)	(79.056)	(81.891)	(64.904)	(98.388)	(68.081)	(86.077)
Age (years)	0.187	-3.444	0.434	-1.730	-1.213	-0.316	-1.521	-0.442	-0.332	-3.272
	(1.740)	(2.978)	(2.215)	(2.467)	(2.025)	(2.182)	(2.021)	(2.520)	(1.605)	(2.531)
Number of household members (count)	17.187	-2.219	19.357	1.460	19.397	-3.599	10.819	2.882	-0.563	22.452
	(14.760)	(16.359)	(17.883)	(15.861)	(15.970)	(11.030)	(15.884)	(12.836)	(6.402)	(21.147)
Total number of goats owned (count)	-3.401	-10.038	-3.278	-9.775	-4.102	-4.771	-2.412	-5.001	-3.113	-5.567
	(3.531)	(7.261)	(3.756)	(6.347)	(2.798)	(6.127)	(3.008)	(8.615)	(5.011)	(4.475)
Primary activity is agriculture (0/1)	-158.699	-81.428	-170.771	-109.657	-191.792	-77.565	-234.275*	-55.891	-174.174	-19.403
	(106.120)	(104.669)	(144.167)	(85.792)	(126.445)	(79.134)	(123.143)	(85.596)	(113.318)	(84.835)
Length of membership (years)	2.854	15.620	1.201	18.452	10.541	17.135	-27.216	33.790*	-16.631	38.711*
	(17.748)	(26.581)	(24.286)	(17.748)	(19.357)	(16.763)	(20.528)	(17.040)	(18.319)	(20.552)
Cooperative leadership role (0/1)	28.608	148.000	-12.198	55.550	53.948	38.843	12.922	117.794	35.753	127.722
	(84.160)	(163.673)	(79.017)	(151.579)	(98.289)	(92.045)	(92.679)	(125.006)	(63.344)	(106.096)
Round-trip travel time to cooperative meetings (minutes)	-0.926**	-0.410	-0.753*	-0.675	-0.814**	-0.450	-1.159***	-0.179	-0.458	-0.972**
	(0.359)	(0.438)	(0.418)	(0.426)	(0.327)	(0.404)	(0.394)	(0.320)	(0.355)	(0.416)
SHG meetings attended in last 6-months (count)	7.651	5.144	26.716	-9.368	16.536	-7.146	-4.316	22.018	35.021**	-12.623
	(19.120)	(26.476)	(16.955)	(27.057)	(17.682)	(22.938)	(19.520)	(18.685)	(16.024)	(21.433)
Membership fee (USD)	-0.113	0.634	-0.146	-0.010	-0.015	-0.188*	-1.081*	-0.024	-0.072***	-0.567**
	(0.068)	(0.409)	(0.138)	(0.036)	(0.045)	(0.102)	(0.540)	(0.047)	(0.025)	(0.261)
Number of cooperative members (count)	-0.184	0.012	-0.139	0.197	-0.016	-0.111**	-0.323*	-0.012	0.133	-0.124
	(0.199)	(0.141)	(0.229)	(0.138)	(0.179)	(0.046)	(0.165)	(0.055)	(0.121)	(0.201)
Number of servcies offered (count)	-1.437	-34.626**	-5.962	-22.783**	-43.301	-16.007	-8.069	-1.943	-9.973	-23.994
	(17.286)	(17.089)	(19.955)	(9.604)	(32.308)	(13.396)	(28.805)	(19.427)	(12.193)	(29.114)
Total revenue in last 6-months (USD)	0.001	0.006	0.002	0.005	0.002	0.023**	-0.001	0.005	0.032	0.004
	(0.002)	(0.013)	(0.006)	(0.011)	(0.003)	(0.009)	(0.003)	(0.015)	(0.021)	(0.004)
Cooperative organizes goat sales (0/1)	192.121				256.548	-38.784	210.541	66.047	204.048	411.307**
	(115.859)				(157.476)	(122.972)	(162.863)	(123.564)	(154.252)	(181.775)
Cooperative offers loans to members (0/1)	141.056		95.684	267.554*	30.428	343.236**	351.976*		610.212***	267.923
	(177.489)		(181.169)	(147.818)	(197.682)	(167.252)	(195.655)		(143.041)	(198.452)
Size of management committee (count)	-19.444	-96.228***	-0.672	-92.918***	23.051	-72.600***	-28.428	-41.141	-12.787	-100.276**
	(21.751)	(33.696)	(28.537)	(25.371)	(23.400)	(18.605)	(26.018)	(36.800)	(23.293)	(48.341)
Cooperative organizes goat sales (0/1) = o,		-	-	-						
Cooperative offers loans to members (0/1) = o,		-						-		
Constant	647.461**	1,375.281**	-96.237	1,474.160***	-215.254	829.533**	1,317.009***	255.714	-331.895	872.039*
	(314.374)	(587.425)	(371.678)	(439.362)	(278.470)	(387.790)	(422.321)	(500.765)	(306.739)	(478.494)
Observations	936	495	686	578	717	714	797	634	675	756
R-squared	0.067	0.079	0.041	0.160	0.056	0.162	0.098	0.066	0.060	0.120
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.11. OLS regressions on the cooperative benefits index (extensive inclusion)

Revenue from cooperative goat sales (USD)	Extensive index (most inclusive) (1)	Extensive index (least inclusive) (2)	proportion of nonliterate members (most inclusive) (3)	proportion of nonliterate members (least inclusive) (4)	proportion below median goat ownership (most inclusive) (5)	proportion below median goat ownership (least inclusive) (6)	Coefficient of variation on goats owned (most inclusive) (7)	Coefficient of variation on goats owned (least inclusive) (8)	Size of membership fee (most inclusive) (9)	Size of membership fee (least inclusive) (10)
Age (years)	0.005	0.002	0.002	0.001	0.005	0.003	-0.004	0.011**	0.008	0.006
	(0.004)	(0.004)	(0.003)	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)
Number of household members (count)	0.009	0.015	0.010	0.009	0.001	0.020	-0.007	0.027	0.035	-0.018
	(0.013)	(0.036)	(0.014)	(0.039)	(0.017)	(0.030)	(0.010)	(0.039)	(0.031)	(0.013)
Total number of goats owned (count)			0.005	0.009					0.007	0.003
			(0.011)	(0.007)					(0.010)	(0.004)
Primary activity is agriculture (0/1)	-0.192	0.052	-0.097	-0.098	-0.216	0.046	-0.264*	0.132	0.088	-0.151
	(0.131)	(0.224)	(0.128)	(0.241)	(0.140)	(0.247)	(0.150)	(0.201)	(0.217)	(0.133)
Length of membership (years)	0.034	0.051	0.114***	-0.005	0.006	0.074	0.014	0.054	0.110**	0.013
	(0.035)	(0.045)	(0.028)	(0.035)	(0.034)	(0.044)	(0.039)	(0.049)	(0.041)	(0.032)
Cooperative leadership role (0/1)	0.282	0.318	0.512	0.208	0.457*	0.083	0.412**	0.218	-0.116	0.744***
	(0.241)	(0.237)	(0.379)	(0.226)	(0.238)	(0.291)	(0.197)	(0.288)	(0.216)	(0.240)
Round-trip travel time to cooperative meetings (minutes)	-0.000	-0.001	-0.001	-0.000	-0.001	-0.000	-0.001	-0.000	-0.000	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.001)	(0.000)
SHG meetings attended in last 6-months (count)	0.091*	0.039	0.038	0.064	0.082	0.043	0.015	0.081	0.066	0.040
	(0.052)	(0.041)	(0.045)	(0.046)	(0.064)	(0.043)	(0.044)	(0.052)	(0.043)	(0.032)
Membership fee (USD)			-0.000	-0.000**	-0.000	-0.000**	-0.001**	-0.000*		
			(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)		
Number of cooperative members (count)	0.000	-0.000	0.000	-0.000*	0.000**	0.000	0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Number of servcies offered (count)	0.027	0.043	0.076	0.072	0.029	0.036	0.007	0.061*	-0.033	0.058***
	(0.059)	(0.031)	(0.046)	(0.045)	(0.035)	(0.035)	(0.035)	(0.032)	(0.043)	(0.020)
Total revenue in last 6-months (USD)	-0.000	0.000**	-0.000	0.000**	-0.000	0.000**	0.000**	0.000	0.000**	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cooperative organizes goat sales (0/1)	-0.053	-0.045	0.003	0.014	-0.023	0.086	0.685*	0.004	0.749**	-0.234
	(0.293)	(0.287)	(0.229)	(0.276)	(0.173)	(0.308)	(0.375)	(0.288)	(0.315)	(0.196)
Cooperative offers loans to members (0/1)	0.095	-0.786*	0.299	-0.162	0.541**	-0.498	0.418	-0.701	-0.167	0.669*
	(0.251)	(0.460)	(0.257)	(0.391)	(0.217)	(0.425)	(0.334)	(0.539)	(0.331)	(0.339)
Size of management committee (count)	-0.014	0.072*	-0.008	0.000	-0.020	0.019	-0.070**	0.114**	-0.067	0.021
	(0.044)	(0.040)	(0.037)	(0.049)	(0.031)	(0.048)	(0.034)	(0.056)	(0.071)	(0.023)
Literacy (0/1)					-0.127	0.398***	-0.021	0.341**	0.286**	0.113
					(0.091)	(0.140)	(0.117)	(0.140)	(0.130)	(0.119)
Constant	-0.278	-0.559	-1.771**	-0.622	-0.195	-1.044	-0.175	-2.089**	-1.057	-0.353
	(0.615)	(0.665)	(0.689)	(0.542)	(0.379)	(0.666)	(0.562)	(0.877)	(0.645)	(0.449)
Observations	361	426	286	460	327	417	361	383	413	372
R-squared	0.192	0.204	0.245	0.131	0.239	0.189	0.215	0.225	0.204	0.291
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Variables used to create each group split were not included as controls in regressions on those group splits.

Table A.12. OLS regressions on the cooperative benefits index (intensive inclusion)

Revenue from cooperative goat sales (USD)	Intensive index (most inclusive) (1)	Intensive index (least inclusive) (2)	proportion receiving sale information (most inclusive) (3)	proportion receiving sale information (least inclusive) (4)	proportion receiving non-sale information (most inclusive) (5)	proportion receiving non-sale information (least inclusive) (6)	proportion receiving loans (most inclusive) (7)	proportion receiving loans (least inclusive) (8)	proportion voting in elections (most inclusive) (9)	proportion voting in elections (least inclusive) (10)
Literacy (0/1)	0.267*	0.051	0.200	0.080	0.493***	-0.020	0.199	0.266*	0.203	0.080
	(0.139)	(0.102)	(0.176)	(0.103)	(0.154)	(0.088)	(0.129)	(0.138)	(0.150)	(0.105)
Age (years)	0.005	-0.003	0.001	0.003	0.008	0.003	-0.000	0.010**	0.009*	-0.006
	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.003)	(0.005)	(0.004)	(0.005)	(0.004)
Number of household members (count)	0.013	0.006	0.021	0.004	0.026	-0.017	0.010	0.005	-0.005	0.031
	(0.026)	(0.019)	(0.031)	(0.021)	(0.031)	(0.017)	(0.028)	(0.015)	(0.012)	(0.039)
Total number of goats owned (count)	0.005	0.017	0.007	0.002	0.008	0.006	0.010*	0.015	-0.003	0.015*
	(0.006)	(0.012)	(0.007)	(0.005)	(0.007)	(0.007)	(0.005)	(0.019)	(0.009)	(0.008)
Primary activity is agriculture (0/1)	-0.054	-0.098	-0.034	-0.140	0.007	-0.122	-0.245*	0.071	0.053	-0.202
	(0.200)	(0.139)	(0.269)	(0.122)	(0.262)	(0.118)	(0.141)	(0.204)	(0.205)	(0.171)
Length of membership (years)	0.028	0.067*	0.076	0.080**	0.027	0.078***	-0.045	0.123***	0.023	0.079**
	(0.037)	(0.035)	(0.061)	(0.030)	(0.046)	(0.023)	(0.036)	(0.034)	(0.042)	(0.034)
Cooperative leadership role (0/1)	0.174	0.660*	0.233	0.447	0.279	0.388	0.174	0.447	0.330	0.280
	(0.235)	(0.366)	(0.249)	(0.367)	(0.273)	(0.258)	(0.264)	(0.305)	(0.218)	(0.261)
Round-trip travel time to cooperative meetings (minutes)	-0.000	-0.001	-0.000	-0.001**	-0.000	-0.001**	-0.001	0.000	0.001	-0.001*
	(0.001)	(0.000)	(0.002)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.001)
SHG meetings attended in last 6-months (count)	0.073	0.029	0.054	0.038	0.064	0.021	0.041	0.071	0.122	-0.003
	(0.050)	(0.037)	(0.071)	(0.036)	(0.051)	(0.036)	(0.039)	(0.045)	(0.082)	(0.032)
Membership fee (USD)	-0.000*	0.001	-0.000	0.000	-0.000	-0.000	-0.002***	-0.000	-0.000***	-0.001**
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Number of cooperative members (count)	-0.000	0.001	-0.001*	0.001**	-0.000	0.000	-0.000*	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of servcies offered (count)	0.047	-0.007	0.027	0.005	0.015	0.097**	0.033	0.077	0.097***	0.064
	(0.034)	(0.054)	(0.037)	(0.037)	(0.049)	(0.037)	(0.042)	(0.054)	(0.036)	(0.062)
Total revenue in last 6-months (USD)	0.000	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cooperative organizes goat sales (0/1)	0.227				0.256	-0.133	0.296	-0.191	-0.742***	0.662**
	(0.337)				(0.284)	(0.137)	(0.335)	(0.202)	(0.189)	(0.311)
Cooperative offers loans to members (0/1)	-0.038		-0.135	0.449	-0.419	0.598*	0.185		0.428	0.186
	(0.351)		(0.342)	(0.336)	(0.358)	(0.350)	(0.350)		(0.293)	(0.410)
Size of management committee (count)	0.020	-0.074	0.011	-0.064	0.056	0.001	0.021	0.049	0.003	-0.084
	(0.045)	(0.059)	(0.059)	(0.046)	(0.043)	(0.022)	(0.036)	(0.058)	(0.040)	(0.078)
Constant	-0.356	-0.081	-0.557	-0.525	-1.639***	-1.760***	0.860	-2.198***	-1.504	-0.536
	(0.739)	(0.834)	(0.799)	(0.670)	(0.580)	(0.534)	(0.544)	(0.628)	(0.914)	(0.560)
Observations	478	266	345	302	389	355	418	326	314	430
R-squared	0.135	0.174	0.119	0.256	0.135	0.305	0.198	0.172	0.199	0.216
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1