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EXPERIMENTS WITH FIRMS IN DEVELOPING COUNTRIES

Loyalty, Exit, and Enforcement: Evidence from a Kenya Dairy Cooperative[†]

By LORENZO CASABURI AND ROCCO MACCHIAVELLO*

Organizations of all kinds depend on members' loyalty for their success, particularly when inevitable lapses drift the organization away from its production frontier. Hirschman (1970) famously argued that "loyalty" makes "exit" less likely and potentially gives more scope to "voice." In limiting exit, loyalty becomes particularly important when it appears most irrational, i.e., when alternative are readily available.

Loyalty, therefore, is of paramount importance in the context of agricultural value chains, particularly so in developing countries: frequent shocks thwart organizations' attempts to build and sustain relationships with farmers; readily available side-selling opportunities in informal markets enhance exit options; low levels of education and mistrust lessen members' faith in their ability to exercise voice in their organizations. These problems commonly surface in analysis of institutional arrangements as diverse as network-based exchanges (see, e.g., Fafchamps 2004); putting-out systems (e.g., Kranton and Swamy 2008), contract farming (e.g., Little and Watts 1994), and farmers' cooperatives (e.g., Putterman 1989). To prevent inefficient "exit," organizations try to impose institutional restrictions to exit, e.g., statutory regulations ("by-laws") on members' obligations. Yet, at

least since Ostrom (1990) it has been known that a significant obstacle to the viability of cooperative institutional forms has been the unwillingness to enforce graduated sanctions against defecting members. How can loyalty be (re-) built? And why is it difficult to enforce graduated sanctions?

I. Setup

We explore these questions in the context of a dairy cooperative (co-op) in Kenya.¹ Like many others, the cooperative, one of the oldest in the country, has found itself facing increased competition for milk supply. Milk is produced by farmers twice a day: in the morning and in the afternoon. Administrative records from the co-op reveal that many members sell part of their milk to local traders; while they sell regularly to the cooperative in the morning, they sell none of their afternoon production. Yet, selling to local traders is a violation of co-op's by-laws: farmers are supposed to sell all their produce in excess of household consumption to the co-op.²

Following a deteriorating financial performance, the management of the co-op has set out to explore ways of increasing milk deliveries and re-enhancing members' loyalty. In February 2014 the issue of afternoon milk deliveries was discussed at the general members' assembly (henceforth, *assembly*). At the meeting, the by-laws provision according to which all milk

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¹These issues are particularly poignant among cooperatives: exit by a member imposes externalities on others, exposing the cooperative to "runs" and premature collapse (see Rey and Tirole 2000).

²Many traders are also illegal and operate without required license, posing a potentially serious hazard to consumers.

in excess of domestic consumption must be sold to the co-op was vigorously restated and the management announced that “graduated sanctions” as specified in the by-laws would be implemented. Those include financial penalties, refusal to purchase milk, and expulsion from the co-op. Following the meeting, a letter was also sent, mostly to members who did not deliver milk in the afternoon during the previous months. At that time, the co-op had 1,754 active members, among which 1,080 that did not deliver any milk during the previous month (henceforth, *target members*). In total, 529 members attended the assembly. Among the target members, 742 received the letter and 361 attended the assembly (263 did both).

II. Results

We explore how deliveries to the co-op changed after the assembly and the letter using detailed milk delivery data to the co-op and an original survey of noncompliant farmers conducted *after* the assembly and the letter.

We implement a difference-in-differences (DID) specification that includes both day and farmer fixed effects and examine different margins of response. We focus on how members responded to the announcement that the co-op would implement penalties. We find three main results: (i) the announcement induced some members to increase deliveries; (ii) it also led other members to stop delivering milk (“exit”); (iii) the two components of the treatment—the assembly and the letter—are substitutes.

A. Positive Effects

We begin by considering an intention-to-treat (ITT) specification in which the focus is on target members (i.e., those not supplying milk in the afternoon session during January 2014), irrespective of whether they received the letter and/or attended the assembly. The announcement generated a positive response among some of those target members. Figure 1 presents evidence of this. The dark dots display the share of members delivering in the afternoon among the target members. Over the weeks immediately after the meeting, about 20 percent of these members start selling to the co-op. The light dots show the share of members selling in the afternoon among the remaining active

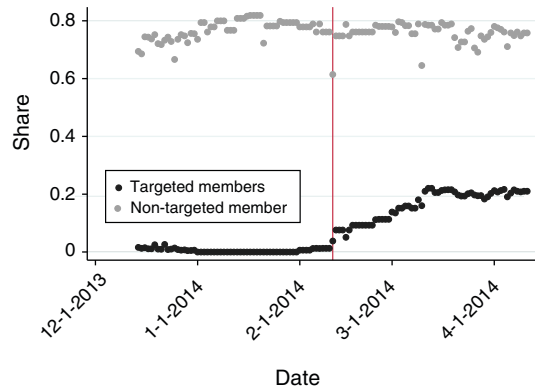


FIGURE 1. SHARE OF MEMBERS DELIVERING MILK IN THE AFTERNOON

Notes: The dark scatter shows the daily share of “targeted” members delivering milk to the co-op in the afternoon. The light scatter shows the share of “nontargeted” members delivering milk to the co-op in the afternoon. Targeted members are those who did not deliver milk in the afternoon in January 2014. The vertical line is placed at the general assembly date (February 11, 2014).

members, i.e., those who sold at least once in the afternoon in January 2014. This likelihood is constant over the sample period. The differential response persists for several months after the announcement.³

Table 1 presents the DID specification. Column 1 focuses on daily deliveries and shows that average afternoon deliveries go up by 0.333 liters in the target group. Column 2 aggregates the data in four 30-day periods (two before the announcement and two afterwards). It shows that the likelihood that the farmer sells to the co-op at least 15 days in the period goes up by 17.1 percentage points among the target group after the announcement.

B. Exit versus Gaming

The results confirm that the announcement did induce some target members to sell to the co-op in both daily sessions. Column 3 in Table 1, however, shows a reduction in morning deliveries for targeted farmers, relative to nontargeted ones, albeit nonsignificant at conventional levels. By

³The timing of the response rules out mean-reversion as an explanation for the delivery pattern.

TABLE 1—DIFFERENCE-IN-DIFFERENCES ON CO-OP MEMBER DELIVERY OUTCOMES

	Kg PM (1)	>15 days PM (2)	Kg AM (3)	No AM (4)	Only PM (5)	>15 days only PM (6)	No delivery (7)	>15 days no delivery (8)
Post × Target	0.333* (0.132)	0.171*** (0.017)	-0.339 (0.207)	0.078*** (0.013)	0.014*** (0.004)	0.016*** (0.005)	0.065*** (0.013)	0.050*** (0.013)
Dependent variable mean	2.440	0.356	7.505	0.167	0.016	0.010	0.151	0.121
Sample	Daily	Monthly	Daily	Daily	Daily	Monthly	Daily	Monthly
Observations	208,726	7,016	208,726	208,726	208,726	7,016	208,726	7,016

Notes: The table reports the coefficient β from the following regression equation: $y_{it} = \theta_i + \theta_t + \beta Post_t \times Target_i + \varepsilon_{it}$, where y_{it} is the outcome variable for farmer i in period t . The row *Sample* describes the frequency of the observations for each outcome variable (daily or monthly). A description of each outcome variable is provided in the text. The indicator *Post* equals 1 if the observation refers to a period (day, month) after the cooperative general assembly (February 11, 2014). The indicator *Target* equals one if the co-op member did not deliver any milk in the afternoon in January 2014 and was thus targeted by the announcement at the meeting. Standard errors are clustered at the co-op member level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

combining the point estimates in column 1 and 3, the announcement generated a small increase in daily deliveries (AM + PM) among the target members, nonsignificant at conventional levels. Column 4 provides evidence of a large and significant decline on the extensive margin: the likelihood of not delivering milk in the morning goes up by 7.8 percentage points, from a baseline mean of 16.7.

This change may be driven by two different responses: “gaming” and “exit.” In the former, some members switch from delivering in the morning to delivering in the afternoon to avoid the penalties. In the latter, members stop delivering altogether, de facto leaving the organization. Column 5 suggests only moderate gaming: the likelihood that the target members deliver milk to the co-op only in the afternoon goes up differentially by 1.4 percentage points relative to the nontarget members in the post period. The analysis when aggregating deliveries at the monthly level confirms this pattern (column 6). We find stronger evidence of “exit.” Column 7 shows that, following the announcement, the likelihood of no-delivery in any given day increases by 6.5 percentage points for target members (relative to nontarget ones). In other words, “exit” explains 83 percent of the decline in morning deliveries reported in column 4. The analysis of aggregate deliveries at the monthly level confirms these results: column 8 shows that the announcement increases significantly the share of target members who deliver milk to the co-op less than

15 days per month. This negative exit effect is permanent.

To summarize, the announcement of graduated sanctions against members not delivering in the afternoon had heterogeneous effects: some members positively responded, increasing deliveries; others “exited” and reduced their morning deliveries.

C. Engagement

To better understand this heterogeneity, we explore differential effects within the group of targeted members. We are interested in understanding if the effect is larger for more engaged members (as implied by Hirschman’s argument) and whether the letter reinforces or dilutes the effects of members’ engagement. The announcement that sanctions would be enforced was delivered through (i) the assembly and, (ii) the letter. Here, we look at the impact and interaction of these two strategies. As caveats to a causal interpretation of the results, note that (i) the choice to attend the meeting may be correlated with other member-level unobservables and (ii) criteria the co-op used to select the letter recipients are not fully transparent.

We restrict the sample to target members and use a DID with farmer and day fixed effects as above. We split the target members into four groups and focus on afternoon deliveries. Relative to those who did not attend the assembly and did not receive the letter, we find

that: (i) those who attended the assembly and did not receive the letter increase deliveries by 0.64 kilograms (kg) (standard error = 0.21, p -value = 0.002) from a baseline mean of 0.034; (ii) those who received the letter and did not attend the assembly increase afternoon deliveries by 0.23 kg (standard error = 0.097, p -value = 0.019); (iii) those who both attended and received the letter increased delivery by 0.29 kg (standard error = 0.105, p -value = 0.005). In sum, the evidence confirms Hirschman's logic that the effect of the announcement was stronger on more engaged farmers, i.e., those who attended the assembly. Moreover, there is some evidence that the letter dilutes the effect among engaged farmers. Following a recent literature on pro-social behavior, we conjecture the letter crowded out the intrinsic motivation of more engaged members (see, e.g., Bénabou and Tirole 2006). The threat of sanctions is, nevertheless effective on less engaged farmers.

III. Why Is It Difficult to Enforce Threats?

It turns out that the cooperative never enforced the threatened sanctions on nondelivering members. As famously illustrated by Ostrom (1990), our cooperative is far from being unique in this respect. Why is it so difficult to enforce threats, even when they are written in formal by-laws?

Some suggestive evidence comes from a survey we conducted among farmers a few months after the assembly and the letters were sent. We focus on farmers that were still not complying with the by-laws. We argue that a key challenge in enforcing threats comes from heterogeneous beliefs among members on the legitimacy of those threats. This evidence echoes recent work on the importance of *clarity* in managing and sustaining relational contracts (see Gibbons and Henderson 2013).

Among those farmers who did not respond to the threat of sanctions, we asked, "Do you think the co-op should take actions against members that hawk milk?" We find that 64 percent of respondents say that co-op should *not* punish members who hawk.⁴ Among those who say the co-op should punish, 46 percent say the co-op should fine these members; 41 percent

the co-op should expel members; 30 percent the co-op should refuse to buy milk (all these sanctions are part of the by-laws).

These differences in beliefs are likely to reflect differences in attitudes towards the co-op management rather than differences in information. Farmers stating the co-op should not act against defecting members do not appear to be less informed about provisions in the by-laws and are equally likely to report to have read them.⁵ Perhaps more tellingly, farmers against sanctions (i) report lower levels of trust in the co-op board members (but not in other co-op members, nor in generic trust); (ii) are significantly more negative in eight out of ten questions about co-op management.⁶ They also are more likely to report that a bonus would be more effective at increasing deliveries from members than the penalties stated in the by-laws.

IV. Conclusions

Studying a cooperative's attempt to increase deliveries by members, we have shown what the threat of sanctions leads to highly heterogeneous response among members. While some members "exit," other members increase their deliveries. Despite the cooperative not actually enforcing the threatened sanctions, we find positive effects that persist for several months.⁷

⁵We asked six true/false questions to assess farmers' knowledge of the co-op's by-laws. Farmers against sanctions are more likely to answer they do not know the answer to the question. However, conditional on answering, there is no difference in response. Note that in four out of the six questions, respondents are essentially equally split between "true" and "false." In the two questions in which respondents are not split, the majority of respondents got the answer wrong in one of the two questions. Being not able to respond is hardly a sign of less information in this case.

⁶The questions are adapted from standard workplace satisfaction questionnaires: 1. Co-op management is competent in doing its job; 2. I am satisfied with services provided by the co-op; 3. Co-op has communicated effectively strategy, rules and procedures; 4. Milk collector is fair to me; 5. It is very important that all members attend the general annual meeting; 6. Co-op management shows enough interest in the needs of their members; 7. Services provided by the co-op are distributed equitably among members; 8. I feel a sense of pride in selling milk to the co-op and being a member; 9. Small members are adequately represented. 10. Co-op is financially sustainable. Tellingly, only 4 and 5 are not different across the two groups.

⁷The persistent positive effects likely arise from changes in members' perceptions of the co-op engagement and attempts to improve while the negative ones arise from

⁴Reasons given are that members should be free to sell their milk and that the co-op pays prices lower than traders.

Surveying noncompliant members, we discuss suggestive evidence for why organizations might fail to enforce threats and apply sanctions that would benefit members as a whole: heterogeneity in beliefs about the legitimacy of those sanctions. This highlights the crucial role played by managers in sustaining relational contracts. In particular, it echoes recent developments in the relational contract literature about the role of clarity in defining what parties are supposed to do and how they are supposed to react to defections. An important role of managers, then, is to communicate to members the sources of value generated by the organization. In companion research (Casaburi and Macchiavello 2014), we show that one key source of value created by the co-op is the ability to *credibly* promise deferred payments to members and explore the implications for market structure and co-op strategy of the resulting interlinkages.

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exit. There is no evidence that effects vanish over time for members surrounded by noncompliers, nor are they likely to arise from rescinding valuable relationships with traders.

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