

## Firm and Market Response to Saving Constraints: Evidence from the Kenyan Dairy Industry

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Farmers in Kenya.

**Location:** Kimabu District in Kenya

**Sample:** 398 dairy farmers

**Timeline:**  
2013 to 2014

**Partners:**  
Innovations for Poverty Action (IPA)  
Land O' Lakes

*In response to lack of access to savings products, farmers often rely on informal savings mechanisms. But how much do farmers value these savings services? In partnership with a local dairy cooperative, researchers utilized a combination of evaluations and surveys to measure dairy farmer responsiveness to various price and timing incentives. Farmers willingly declined daily payments at higher milk prices in favor of monthly payments at slightly lower prices, a practice that “forced” them to save. However, farmers only trusted more established co-op buyers to uphold monthly payment commitments, and preferred to receive daily payments from more mobile, less-established traders.*

**Policy Issue:** Lack of access to savings presents an economic barrier to many of the poor. In a recent study, 77 percent of adults who live on under US\$2 per day reported not having a formal savings account.<sup>1</sup> With limited savings and access to

credit, households cannot maintain their consumption levels when their income fluctuates, and they cannot make costlier (and more productive) investments that would benefit them in the long run.<sup>2</sup> In the absence of formal savings products, such as bank accounts, individuals often seek out unconventional means to achieve their savings goals. For example, farmers might rely on deferred payments from their buyers, in the form of monthly lump-sum payments, to “force” them to save, instead of opting for daily payments. Does access to savings markets influence output markets?

**Context of the Evaluation:** Dairy is Kenya’s largest industry in the agricultural sector, comprising 3.5 percent of total GDP. Small-scale farmers, those who own three cows or less, produce 80 percent of the dairy supply . On average, each dairy cow in Kenya produces between eight and ten liters of milk per day.<sup>3</sup> This study focused on small-scale dairy farmers in the Kiambu district of central Kenya . Farmers in

this evaluation included both females (57 percent) and males (43 percent), who own an average of one or two cows. Many of these farmers rely on other income-generating activities, such as crop farming, to supplement their earnings from dairy production.

Dairy producers in this evaluation typically sell their milk to two different types of buyers: a local co-op and informal traders. The co-op, a partner in this evaluation, involves 2,000 members, receives deliveries at 24 collection centers during set hours in the morning and afternoon, and generally buys relatively large quantities of milk. A large number of informal traders also purchase milk from these farmers, but in smaller quantities.

Farmers milk their cows twice per day, and many deliver milk to buyer(s) twice per day, since they lack refrigerators. While individual sales patterns vary, farmers in this evaluation commonly sell to the co-op in the morning and to traders in the afternoon. The co-op generally defers payment to a lump sum at the start of the following month, while traders generally pay on a daily basis. Contrary to general pricing theory, in which paying up front yields lower prices, the co-op pays a lower price per unit than the daily-paying traders.

**Details of the Intervention:** Researchers undertook a randomized evaluation, as well as two studies of farmers' choices and descriptive data collection, to identify farmer preferences with respect to pricing and timing of payments in the dairy market.

In the two choice studies, farmers faced different purchase offers that varied in price and frequency of payments. In the first choice study, the co-op offered farmers the option to receive payments daily or monthly, with daily payments 16 percent higher per liter of milk than monthly payments. In the second, each day the co-op offered farmers the option to be paid in cash that day or receive payment at the end of the month, and paid farmers an extra KES 5 (around US\$0.06) per liter regardless of which payment scheme the farmers selected. In both of these choice experiments, researchers examined the percentage of farmer who chose to receive payment monthly versus those who received payment daily, to assess if farmers value infrequent payments as a savings mechanism. Also, the researchers surveyed to measure the extent to which farmers perceived differences in the

credibility of the co-op versus that of traders.

To evaluate whether price incentives and changes in payment timing influenced farmer behavior, the researchers conducted a randomized evaluation that assigned 398 farmers between two treatment groups (150 farmers each) and one comparison group (98 farmers). In the first treatment group, the co-op informed farmers that they would receive a 30 percent higher price for afternoon sales for the next three days (representing more than they would typically receive from traders). In the second treatment group, in addition to the price increase, farmers had the option each day to receive their payment daily or retain the standard monthly payment. Researchers then measured the percentage of farmers who delivered to the co-op in the afternoon with the temporary price incentives, as well as the quantities of milk they delivered.

**Results and Policy Lessons:** The results suggest that farmers utilized the infrequent payment schemes of co-ops as commitment devices that encourage them to save. However, they did not trust traders to follow through on these same deferred payments, and preferred daily payments from traders to meet more frequent consumption needs.

*Time Preferences and Buyer Credibility:* The results of the choice studies suggest that farmers preferred less frequent payments to help them save. When offered a higher price for more frequent payments at the co-op, 86 percent of farmers chose to keep their standard monthly payment, whereas 14 percent opted for daily payments. Farmers reported that they preferred monthly payments because they set saving targets for themselves and they did not trust themselves to handle cash properly. They acted similarly when both payments schemes offered the same price. These preferences suggest that farmers saw the infrequent payment scheme of the co-op as a service to help them save. Survey results indicate that farmers did not rely on traders to help them reach their savings targets since they did not consider traders to be as trustworthy as the larger, more established co-ops.

*Price and Liquidity:* In line with the choice studies and surveys, higher prices and more frequent payments led to small changes in farmers' volume of milk sales. Offering the price increase alone for afternoon deliveries resulted in a 0.128-

kilogram increase in afternoon deliveries to the co-op. While there is some evidence that adding flexibility to the payment frequency further increased quantities, this increase was not significantly different from the effect of the price increase alone. Additionally, offering a price increase plus flexibility increased the likelihood of selling to the co-op in the afternoon by 6.8 percentage points. These relatively small changes in milk sales patterns suggest that farmers value the mix of buyers (i.e., traders and the co-op) as they currently utilize them, in order to help them meet frequent and infrequent consumption and investment needs.

<sup>1</sup>Demirguc-Kunt, Asli and Leora Klapper. "Measuring Financial Inclusion: The Global Findex Database." World Bank Policy Research Working Paper No. 6025, April 2012.

<sup>2</sup>Karlan, Dean, Aishwarya Lakshmi Ratan and Jonathan Zinman. 2014. "Savings by and for the Poor: A Research Review and Agenda." *Review of Income and Wealth* 60(1): 36-78.

<sup>3</sup>Wambugu, Stella, Lilian Kirimi and Joseph Opiyo. 2011. "Productivity Trends and Performance of Dairy Farming in Kenya." *Tegemeo Institute of Agricultural Policy and Development*.

**Related Papers Citations:** *Casaburi, Lorenzo, and Rocco Macchiavello. 2019. "Demand and Supply of Infrequent Payments as a Commitment Device: Evidence from Kenya." American Economic Review 2019 109(2): 523-555.*

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