

Take-up of Cash Loans vs. Agricultural Input Loans: A Pilot Study

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Smallholder farmers must invest in agricultural inputs (i.e., seeds, chemicals, equipment, land, and labor) during the planting season before earning income from the sale of agricultural produce after harvest. Credit can help relax liquidity constraints. In rural Nigeria, access to credit is limited, especially formal credit from financial institutions. Less than a third of households in rural Nigeria report using credit and only two percent of rural households borrowed credit from formal financial institutions (EFInA 2020). The rest is borrowed informally from friends, family, or local money lenders.

Credit can take many different forms. For example, credit can take the form of a cash loan, where funds are provided to a borrower to make an investment of any kind. Another common form of credit is when specific goods, for instance agricultural inputs, are provided in advance to a payment. In both cases, the borrower must pay back both the loan amount, and any interest incurred from the loan. We partnered with Crop2Cash, a digital financial technology startup company operating in Nigeria, to test take-up for these two forms of credit.

Our Partner: Crop2Cash

The main objective of [Crop2Cash](#) is to provide access to agricultural input loans and other financial services to smallholder farmers in Nigeria. Their products allow farmers to: (i) save money, (ii) get paid by buyers digitally, (iii) receive market price updates via SMS text messages, (iv) build a financial identity to improve their creditworthiness, and (v) buy farm inputs on credit. While all these products are closely linked to each other, as discussed in Ambler et al. (2023), focus group interviews with Crop2Cash clients

conducted in May 2023 revealed that the agricultural input loan program was the most popular and useful service provided by Crop2Cash.

Crop2Cash partners with commercial banks or other funders to finance purchases of fertilizer, agrochemicals, and improved seeds directly from agricultural input companies. Working with farmers, Crop2Cash builds a database with information about each farmer and provides a financial assessment to reduce the risk of providing credit to smallholder farmers perceived by commercial banks. Farmers apply for the agricultural input loans and must meet the following eligibility criteria: farmers must (i) be an active user of Crop2Cash platforms, (ii) have no history of default on payments of previous loans provided by Crop2Cash, and (iii) deposit a cash guarantee—typically between 10 to 30 percent of the input loan value—in the Crop2Cash digital wallet system.

Focus group interviews revealed that although the farmers' experience with this agricultural input loan product is positive, many noted that the addition of a cash loan component to this service would be useful (Ambler et al. 2023). Farmers stated specifically that a small cash loan would help them invest in other inputs, such as labor and equipment costs.

Experimental Design

In this pilot study, we implemented a small experiment in the dry agricultural season beginning in December 2023. As discussed in Ambler et al. (2023), we worked with farmers who applied for and were approved for the agricultural input loan by Crop2Cash. The experiment includes two treatment groups and a control group, defined as follows:

- ▶ Treatment group 1 (T1): Receives a 10 percent cash loan offer in addition to their needs assessment-based input loan.
- ▶ Treatment group 2 (T2): Receives a 10 percent input loan offer in addition to their needs assessment-based input loan.
- ▶ Control group (C): Receives needs assessment-based input loan.

Randomization into the treatment and control groups is at the individual (i.e., farmer) level. Our original goal was for each treatment arm to be limited to roughly 100 farmers. In practice, T1 includes 95 farmers, T2 includes 94 farmers, and the control group includes 97 farmers, giving us a total sample size of 286 farmers. This experimental design enables us to estimate the effect of receiving either an additional cash loan offer or an additional input loan offer on take-up of these loans by simply comparing take-up rates between each of the treatment groups relative to the control group. We also can assess loan performance as measured by loan repayment rates.

Pilot Study Results

The results of this pilot study reveal that take-up of the additional cash loan was much lower than take-up of the additional input loan. In fact, in the full sample, and in several sub-groups of our sample, less than half of farmers who were offered an additional cash loan accepted this loan. This result is surprising, given the reported need for an additional cash loan component of the Crop2Cash input loan program. The results from this pilot study, therefore, motivate additional research to understand the factors that constrain take-up of additional cash loans among smallholder farmer clients of Crop2Cash.

Table 1: Summary Statistics

	Treatment status		
	T1: Cash (N=93)	T2: Input (N=91)	Control (N=92)
Age	39.98 (9.10)	42.26 (9.27)	39.87 (8.95)
Gender			
Female (0/1)	13 (14.0%)	11 (12.1%)	11 (12.0%)
Male (0/1)	80 (86.0%)	80 (87.9%)	81 (88.0%)
Education (years)	9.06 (4.53)	9.36 (4.60)	8.34 (4.19)
Household Size	9.01 (4.88)	10.80 (7.28)	8.67 (4.27)
Household grows:			
Maize	1.00 (0.00)	1.00 (0.00)	0.99 (0.10)
Guinea corn	0.05 (0.23)	0.04 (0.21)	0.04 (0.21)
Yams	0.00 (0.00)	0.01 (0.10)	0.07 (0.25)
Beans	0.45 (0.50)	0.30 (0.46)	0.39 (0.49)
Millet	0.05 (0.23)	0.04 (0.21)	0.03 (0.18)
Farm size (hectares)	1.48 (1.32)	1.73 (1.51)	1.55 (1.78)
Number of men hired	6.04 (3.36)	5.71 (3.16)	5.92 (3.02)
Number of women hired	0.13 (0.63)	0.16 (0.78)	0.24 (1.17)

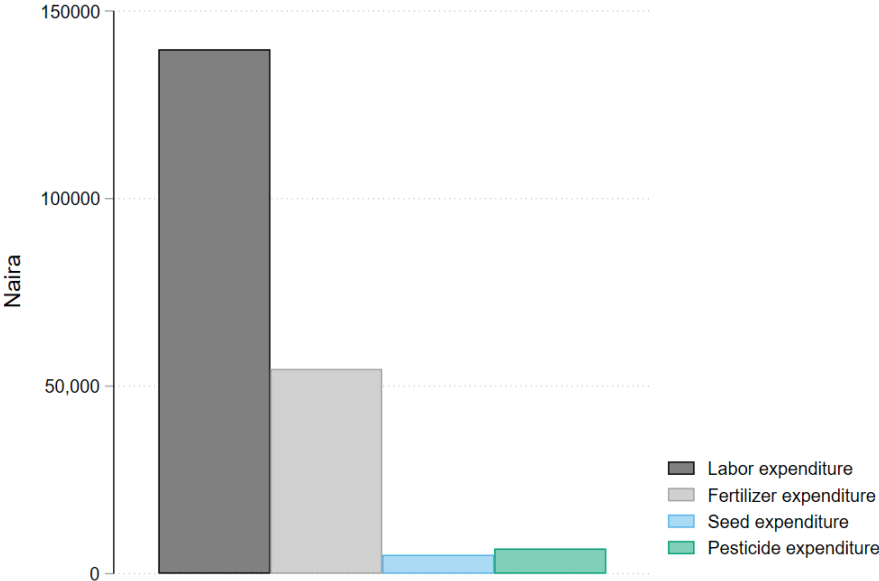
Notes: This table reports means with standard deviations in parentheses and counts with percentages in parentheses.

Table 1 reports summary statistics about the farmers in our sample for each treatment group and the control group. Note that our survey was not able to interview all farmers in our pilot study sample and therefore includes 276 farmers, rather than the full sample of 286 farmers. Farmers in our sample are, on average, between 39 and 42 years old. Two out of every five farmers in our sample are men, and the average farmer in our sample has completed about nine years of schooling. Households include roughly nine people, and maize is the most commonly grown crop on a farm that is roughly one hectare in size, on average. Men are most frequently hired for agricultural labor, with farms hiring about six men in the previous dry season and less than one woman, on average.

Figure 1 illustrates the levels of four key agricultural inputs (i.e., labor, fertilizer, seeds, and pesticides) among farmers in our sample. Labor expenditures are more than double, and nearly three times larger, than fertilizer expenditures. Seeds and pesticides, by contrast, are relatively small expenditure sources for farmers in our sample. This figure supports the statements of farmers from our focus group interviews

in May of 2023 when they reported a need for credit to help pay for labor. At least in theory, helping alleviate liquidity constraints on labor expenditures could help smallholder farmers better utilize other agricultural inputs and achieve higher levels of agricultural productivity.

Figure 1: Agricultural Input Expenditure Levels



Notes: This figure reports means of four distinct agricultural input expenditure categories reported by farmers about the most recent dry season. 1US\$ = 461 Naira in May 2023 (during the focus group); 1US\$= 1,099 Naria in December 2023 during the dry season intervention (when cash and input loans were provided); 1US\$ = 1,226 Naira in April 2024 during the baseline data collection; and 1US\$ = 1,485 Naira in May 2024 (over 300% fall in the value of the Naira just in 12-month time, between May 2023 to May 2024)

To further investigate possible credit needs, we asked respondents two questions. First, we asked if the initial 200,000 Naira input loan, provided to all farmers in our sample, was (i) enough, (ii) not enough, or (iii) more than enough to meet their current agricultural input needs. Second, we asked if the labor they used (i.e., either family or hired) was (i) enough, (ii) not enough, or (iii) more than enough to use their inputs effectively.

We present responses to these questions in Table 2 for each treatment group and the control group. When we ask about the adequacy of the initial input loan amount, we find that between five and six out of every ten farmers report that the initial 200,000 Naira input loan was not enough to meet their agricultural input needs. This may be partially attributed to the high inflationary situation. Although this response represents most of the farmers in our sample, it is not an overwhelming majority. Indeed, between three and four out of every ten farmers report that the initial 200,000 Naira input loan was enough. When we ask about the adequacy of labor used, we find that between five and six out of every ten farmers report that the labor they used was enough. Again, although this response represents most of the farmers in

our sample, it is not an overwhelming majority. Many farmers, by contrast, report that the labor used was not enough. These results show that there might be important heterogeneity in demand for specific types of loan products and motivates specific analysis of heterogeneity in the measured rates of take-up between the two loan offers.

Table 2: Reported Cash and Input Loan Needs

	Treatment status		
	T1: Cash (N=93)	T2: Input (N=91)	Control (N=92)
Is 200,000 Naira input loan enough?			
Enough (0/1)	32 (34.4%)	38 (41.8%)	35 (38.0%)
Not enough (0/1)	61 (65.6%)	53 (58.2%)	56 (60.9%)
More than enough (0/1)	0 (0.0%)	0 (0.0%)	1 (1.1%)
Is labor used enough?			
Enough (0/1)	49 (52.7%)	64 (70.3%)	56 (60.9%)
Not enough (0/1)	43 (46.2%)	27 (29.7%)	35 (38.0%)
More than enough (0/1)	1 (1.1%)	0 (0.0%)	1 (1.1%)

Notes: This table reports means with percentages in parentheses (for binary variables).

We now turn to our main results, the effect of receiving either an additional cash loan offer or an additional input loan offer on take-up of these loans. In column (1) of Table 3, we report results using the full sample of survey data. We find that two out of every five farmers who received an offer for an additional cash loan accepted this offer. By contrast three out of every five farmers who received an offer for an additional input loan accepted this offer. This difference in the take-up rates between these two types of loans is substantial—at roughly 20 percentage points—and, even in our small sample, is statistically significant.

Table 3: Take-up Analysis by Treatment Status

	(1) Full sample	(2) Female	(3) Male	(4) Education < 7 years	(5) Education > 6 years	(6) Farm size < 1 hectare	(7) Farm size > 1 hectare
T1: Cash loan	0.398*** (0.051)	0.308** (0.134)	0.412*** (0.055)	0.314*** (0.066)	0.500*** (0.078)	0.333*** (0.0585)	0.556*** (0.0975)
T2: Input loan	0.604*** (0.052)	0.818*** (0.122)	0.575*** (0.056)	0.511*** (0.075)	0.696*** (0.069)	0.623*** (0.0625)	0.567*** (0.0923)
T1 = T2 (p-value)	0.005	0.008	0.040	0.049	0.062	0.001	0.934
Observations	276	35	241	152	124	198	78
R-squared	0.282	0.461	0.267	0.233	0.333	0.307	0.256

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

Next, we explore how take-up might vary in specific sub-groups of our sample. First, in columns (2) and (3) of Table 3, we explore heterogeneity based on the farmer’s gender. We find qualitatively similar results, with a substantial gap in take-up rates between the additional cash and input loans among both

men and women. Quantitatively, the gap in take-up rates is larger among the female sub-sample (50 percentage points) than it is among the male sub-sample (17 percentage points). Second, in columns (4) and (5), we explore heterogeneity by education attainment. We split the sample by whether the farmer completed more than six years of schooling—which approximately represents the median years of schooling in our sample. We again find qualitatively similar results among both the lower-educated sub-group and the higher-educated sub-group. In fact, quantitatively, the take-up gap is nearly identical among these two sub-groups—at about 20 percentage points. Finally, in columns (6) and (7), we explore heterogeneity by farm size. The typical farm size in our data is one hectare, and therefore, we split our sample based on whether the farm is larger than one hectare. In contrast to the previous heterogeneity analysis, we find meaningful differences across these two sub-groups. Among farmers with smaller farms, we find a substantial gap in take-up rates—of roughly 30 percentage points. However, among farmers with larger farms, we do not find any gap in take-up rates. Instead, about 56 percent of farmers with larger farms accepted both the additional cash loan and the additional input loan.

Table 4: Survey Responses Among Input Loan Offer Group (T2)

	Response to input loan offer (survey response)		
	Decline (N=22)	Accept (N=56)	Total (N=78)
Response to input loan offer (C2C data)			
Decline	21 (95.5%)	6 (10.7%)	27 (34.6%)
Accept	1 (4.5%)	50 (89.3%)	51 (65.4%)
Declined because...			
... do not use the additional inputs offered	0.45 (0.51)	N/A	0.45 (0.51)
... already have the additional inputs offered	0.55 (0.51)	N/A	0.55 (0.51)
... worried about not being able to repay	0.18 (0.39)	N/A	0.18 (0.39)
Response if offered 10% cash loan			
Decline	4 (18.2%)	2 (3.6%)	6 (7.7%)
Accept	18 (81.8%)	54 (96.4%)	72 (92.3%)

Notes: This table reports means with standard deviations in parentheses and counts with percentages in parentheses.

We now turn to investigating reasons why farmers declined the input loan offer. Unfortunately, we are only able to present this analysis for the input loan group (i.e., T2), because there was a data processing error when we collected the data that prevented this information from being collected from the cash loan group (i.e., T1). Additionally, there is some measurement error in the self-reporting of whether the farmer accepted or declined the input loan offer compared with the administrative data provided by Crop2Cash. Although there is a strong correlation between the self-reporting and administrative data, there is one farmer who reports declining the offer when they accepted it and six farmers who report accepting the offer when they declined it. The remainder of the information presented in Table 4 relies on the self-reported information from our survey. The most cited reason for declining the input loan offer, indicated by roughly half of farmers who reported declining the offer, is that the farmer already had the additional

inputs offered or because they do not use the additional inputs offered. About one out of every five farmers who declined the input loan offer did so because they were worried about not being able to repay the loan.

We also asked farmers who received the additional input loan offer a hypothetical question: would they accept or decline an additional 10 percent cash loan offer? The overwhelming majority of farmers responded saying that they would accept this offer. This finding, based on a hypothetical question, contrasts sharply with the “real-world” take-up results of the cash loan presented in Table 3. Taken together, these results highlight a discrepancy between stated and revealed preferences for cash loans and support the view that tends to be skeptical about what people say they will do.

Table 5: Wet Season Plans

	Treatment status		
	Cash (N=93)	Input (N=91)	Control (N=92)
Which additional loan would you prefer (wet season)?			
Input	72 (77.4%)	85 (93.4%)	85 (92.4%)
Cash	21 (22.6%)	5 (5.5%)	7 (7.6%)
Neither	0 (0.0%)	1 (1.1%)	0 (0.0%)

Notes: This table reports counts with percentages in parentheses.

Despite healthy skepticism about the validity of stated preferences, sometimes this is the only information we have. Our survey ended with a hypothetical question about the upcoming wet agricultural season. We asked farmers if they had to choose only one, which additional loan would they prefer? Table 5 reports these results. We find that between seven and eight out of every ten farmers indicated that they would prefer the input loan. These results align well with our core findings reported in Table 3, showing higher rates of take-up for the additional input loan than for the additional cash loan.

Finally, before concluding, we report results on loan performance measured by data on loan repayment taken at the end of the loan recovery period. This data comes from the administrative records of Crop2Cash and therefore uses the full sample of 286 farmers. In columns (1) through (3) of Table 6 we report three different levels of repayment: full, partial, and no repayment. At the end of the loan period, only one farmer (from the control group) had repaid the loan in full. Column (1) is trivial, showing that rates of full repayment does not differ by treatment status. Column (2) shows rates of partial repayment, which about two out of every three farmers in our sample had accomplished by the end of the loan period. The rates of partial repayment are not influenced by treatment status. Column (3) shows rates of no repayment, which characterizes roughly one out of every three farmers in our sample. We find that treatment status does not influence whether the farmer had not begun repaying the loan by the end of the loan period. Columns (4) through (6) of Table 6 report additional measures of loan performance: the total amount of the repayment, the loan balance and the recovery ratio (i.e., total repayment/loan balance).

Each of these three columns show that these measures of loan performance are not influenced by treatment status. Additionally, like the results in columns (1) through (3), there is no difference in the estimated coefficients on the two treatment status indicator variables.

Table 6: Loan Recovery and Performance

	(1) Full Repayment	(2) Partial Repayment	(3) No Repayment	(4) Total Repayment	(5) Loan Balance	(6) Recovery Ratio
T1: Cash loan	-0.010 (0.010)	0.066 (0.069)	-0.055 (0.069)	-694.5 (12,661)	8,694 (12,787)	-0.015 (0.054)
T2: Input loan	-0.010 (0.010)	0.062 (0.069)	-0.052 (0.069)	-8,013 (12,442)	19,715 (12,787)	-0.047 (0.054)
T1 = T2 (p-value)	N/A	0.961	0.961	0.552	0.388	0.537
Observations	286	286	286	286	286	286
R-squared	0.007	0.004	0.003	0.002	0.008	0.003

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

These loan recovery and performance results indicate a season of very low recovery rates and loan performance among the farmers in the pilot study sample, however, these low recovery rates are not influenced by our experimental treatments that provided additional loan offers. Instead, a combination of factors—such as high rates of inflation and a volatile agricultural input pricing environment—likely contributed to the low loan repayment rates. In particular, during the time of this pilot study, inflation rates peaked at 43 percent and drove up the cost of production for farmers. Gasoline, which powers irrigation pumps, tripled in price in the aftermath of the removal of the government’s fuel subsidy. As a result, farmers were faced with multiple needs requiring payment and many chose to delay the repayment of their loans. This result, it should be emphasized, is generalizable and does not reflect any policies or practices of Crop2Cash. Indeed, many other organizations that provided credit in the 2023-2024 dry agricultural season in Nigeria faced similar challenges.

The purpose of this pilot study was to inform subsequent research to be conducted during the wet agricultural season with Crop2Cash. The following lists a series of findings from this pilot study that motivate the future study.

1. While many farmers state interest in an additional cash loan to help cover additional expenditures associated with agricultural production, the take-up rate of the additional cash loan was lower than the take-up rate of the additional input loan. Additionally, when given a hypothetical choice between an additional cash loan or an additional input loan, most farmers choose the additional input loan. This suggests that more work could be done offering different amounts of the cash

loan or distributing the cash loan using different mechanisms to aid in the availability of these funds.

2. Although we find higher take-up rates with the additional input loan than with the additional cash loan, it is worth noting that a 40 percent take-up rate for the additional cash loan does suggest that there is meaningful demand for cash loans. It would be a mistake, therefore, to interpret the results of this pilot study as suggesting that there is limited demand for cash loans. The opposite is true. A substantial share of farmers offered the additional cash loan accept it.
3. One sub-group of farmers in our sample where we do observe similar take-up rates of the additional cash loan, and the additional input loan, is farmers with more than one hectare of cultivated land. This motivates further investigation into heterogeneity by farm size.
4. The primary stated reason for declining the additional input loan offer was that they did not need the provided inputs. This suggests that Crop2Cash considers a way to provide their farmers with an expanded set of available agricultural inputs. This could be done by generating an expanded “menu” within their input loan product or by incorporating cash loans bundled with agreements with local agro-dealers to ensure a readily available supply of agricultural inputs at the time of cash loan distribution.
5. The repayment rate of the loans, measured at the end of the loan period, is very poor. In preliminary discussions with Crop2Cash, we learned that in typical seasons between 80 and 90 percent of farmers repay the loan in full by the end of the loan period. As shown above, in the sample of farmers included in our pilot study, only one farmer had repaid the loan in full by the end of the loan period. While we can rule out that the additional loan offers provided as part of the pilot study influenced these repayment rates, there are a several factors that could explain this poor loan performance. Future research will focus on understanding the source of the challenges faced by farmers in repaying loans during the 2023-2024 dry agricultural season.

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Funding for this work was provided by the CGIAR Research Initiative on Rethinking Markets. This publication has been prepared as an output of the CGIAR Research Initiative on Rethinking Markets and has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI or CGIAR.

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