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Savings revisited

A replication study of a savings intervention in Malawi

November 2018

Replication Paper 18

Agriculture

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Summary

We replicate and reanalyse data from the randomised controlled trial of a programme originally carried out by Brune and colleagues to facilitate formal savings for Malawian tobacco farmers. The results from their study indicate that offering farmers access to personal savings accounts increased farmers' banking transactions and enhanced the well-being of their households. Our pure replication shows results consistent with those reported in Brune and colleagues, except for a few minor discrepancies that do not detract from their conclusions. The results from the various estimation analyses we carried out also broadly support the conclusions from the original study. We also conducted a separate analysis focussing on the subset of farmers who chose to make use of the savings vehicles offered. We found that this subset of farmers, compared with the overall treatment group, had far greater positive effects on their agricultural output.

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1. Introduction

This paper reports on a replication study examining the work reported in Brune and colleagues (2016) and further analysing the data collected in their study. The original work, which our paper explores further, studied the effects of improving access to financial services for tobacco farmers in Malawi and is widely regarded as an important contribution to the academic literature on agricultural microfinance.

The rural poor in developing countries have, effectively, long been shut off from financial services, making investment and capital formation problematic (Armendáriz and Morduch 2005). Among the many reasons for this exclusion are some crucial issues identified by economists: information problems, selection problems and other problems inherent in the credit allocation process (Akerlof 1970; Stiglitz and Weiss 1981; Hoff and Stiglitz 1993; Hermes and Lensink 2007). Measures that improve access to financial services for smallholder farmers thus have potential for alleviating poverty by making investment and capital formation easier. Reducing poverty and strengthening agricultural production in this fashion links directly to two of the Sustainable Development Goals (goals 1 and 2) and forms key parts of most developing countries' economic strategies.

Microcredit has seen massive interest from policymakers and donors in recent decades. However, microcredit faces key problems, for many of the same reasons that have kept financial services out of reach for many of the poor. This is especially true for agriculture. Thus, for instance, Andersson and colleagues (2011), studying an aquaculture district in Bangladesh, found that formal microlenders continued to have substantial problems in selecting farmers who were good credit risks; and Giné and colleagues (2012), studying rural credit in Malawi, found that borrowers who were poor credit risks were more likely than other borrowers to exploit the opportunities provided by information asymmetries between borrowers and lenders.

Most microcredit has, in practice, been aimed at the urban poor rather than the rural poor. What little credit has been made available to farmers has therefore tended to be linked to purchases of specific inputs, which have not necessarily been made available in the quantities the farmers would have purchased if they had had better access to credit and greater leeway in allocating the credit among different input purchases (Selander et al. 2006). In a survey of studies of African microfinance schemes, Stewart and colleagues (2010) found positive effects from microcredit schemes but stronger effects for savings than for credit schemes. A more critical review paper by Duvendack and colleagues (2011), surveying almost 60 studies from a wider range of developing countries, found only mixed evidence of improved well-being from microcredit schemes and found that many of the evaluations had low internal validity, making it difficult to draw firm conclusions.

To improve farmers' ability to build up capital in their farming activities through microfinance, many academics, policymakers and donors (Deaton 1989; Robinson 2001; CGAP and IFC 2013) have therefore favoured improving access to savings rather than loans. The main reasons why farmers have had poor access to savings facilities in the past have been linked to, amongst other things, the costs of maintaining bank branches in rural areas or managing the large numbers of small deposits and withdrawals that are common in poorer farming communities. These problems often lead to high transaction

costs for farmers trying to access banking services, but are potentially easier to address than problems in credit markets.

In theory, improving access to savings, whether low-frequency[1] or high-frequency[2] could not only improve farmers' well-being but also, in many cases, improve their income and capital formation (Armendáriz and Morduch 2005). Indeed, the prevalence of informal savings mechanisms in many developing countries suggests that the demand for such vehicles is real (Rutherford 2000), and that improving access to formal savings – which would be less sensitive to community-level income shocks than informal savings – could improve well-being amongst the poor (Dercon 2002).

However, it is uncertain whether improved access to savings vehicles can raise longer-term income and improve capital formation to the same extent as improved access to loans. Many of the targeted farmers have extremely low incomes and thus a low capacity to save out of their current income. Dupas and colleagues (2018) find only small effects on savings from improved access to banking, explicitly identified by experiment participants as being due to their low capacity to save, and whose results suggest that at least some of the observed effect merely entailed a shift from informal cash savings to formal bank savings.

Apart from poverty, numerous other issues make it difficult for households to save money, such as short-term pressures to spend on relatives and other members of the household's social network (Platteau 2000; Anderson and Baland 2002); self-control problems linked to impatience and/or hyperbolic discounting behaviour, leading to cash on hand being spent faster than initially planned, potentially providing a need for committed savings mechanisms where deposits can only be accessed at pre-specified times (Ashraf et al. 2006; Gugerty 2007); and theft.

Even with access to formal savings, many of these issues would remain, albeit possibly in diminished form. It is uncertain, therefore, how much households would save in practice if they were given access to new savings devices and how much difference this would make for their farming. Stewart and colleagues (2012), in a systematic review of 17 existing studies (mainly working papers, rather than peer-reviewed journals, and including studies from urban as well as rural areas), find no consistent evidence that micro-savings interventions lead to increased business expenditure or investment. Given that improved access to savings has become a popular option for improving farmers' access to financial services in many developing countries, it is surprising that so little research has been done on what impact such improved access actually has.

The study in Malawi by Brune and colleagues (2016) made an important contribution to the literature on microfinance. They showed how improved access to savings (as well as to activities encouraging savings) affected not only such savings but also subsequent farming patterns. In their study, they collaborated with a Malawian bank in a field experiment aimed at tobacco farmers. These farmers already had access, through

[1] E.g. consumption smoothing between years and setting aside funds to finance large but rare investments.

[2] E.g. consumption smoothing over a single year or shorter period and setting aside funds to pay for inputs to be used in farming in a given year.

farmers' clubs, to credit packages from the bank that permitted them to borrow money for fertiliser purchases. However, for most farmers the quantities of fertiliser they were able to buy using these borrowed funds were substantially smaller than the optimal levels. Even for farmers who were able to purchase optimal quantities of fertiliser, there was scope to further improve profitability if more funds were available at the beginning of the planting season. Thus, relaxing the liquidity constraint at the beginning of the planting season by increasing savings from the previous harvest could improve profitability for most of the farmers involved.

The setup prior to the experiment was that farmers sold their output jointly through their club, the bank loans repaid through a deduction from the proceeds, and the remainder paid to the club's bank account. Representatives of the club then withdrew the funds in cash and paid the proceeds from the harvest sales to individual farmers in cash. In the experiment, clubs were allocated randomly to different treatments and to a control group. In all these groups, farmers were provided with financial training and encouraged to save income from their harvest so they could pay for agricultural inputs more easily at the beginning of the next planting season.[3] Farmers in the control group continued to be paid in cash by their clubs after the harvest had been sold, and farmers in the treatment groups were offered help in setting up personal bank accounts into which their harvest income could be deposited.

In one set of treatment groups, farmers were offered ordinary bank accounts where deposits and withdrawals could be made at any time. In another set of treatment groups, farmers were offered the same ordinary account and a committed account for their harvest income, where withdrawals from the committed account could only be made at a pre-specified time. Finally, the bank account treatment was combined with a lottery treatment, also intended to spur savings; lottery tickets were distributed based on how much money participants had in their bank accounts, on average, during selected qualifying periods. For the two types of bank account, farmers were assigned into one of three groups: (i) a control group with no lottery; (ii) a group in which farmers were given raffle tickets without the number of raffle tickets (hence, the bank balances) becoming public knowledge; and (iii) a group in which farmers were also given raffle tickets, but the number of raffle tickets (hence, the bank balances) was also made known to the public.

Brune and colleagues (2016) found that helping farmers set up accounts did lead some of them to choose to deposit their harvest revenue and that more money was spent on inputs with consequently higher yields and higher income from the next harvest. It might seem, therefore, that the intervention had exactly the intended effect. However, a surprising finding was that the extra money used to buy inputs at the beginning of the next planting season was largely not derived from post-harvest bank deposits. Instead, farmers withdrew most of the harvest income they had deposited well in advance of the next planting season, usually shortly after depositing it. Despite this, farmers in the treatment groups spent more money on inputs than the control group at the beginning of the subsequent planting season.

[3] In a survey of studies on financial literacy, Miller and colleagues (2014) found that financial literacy training was usually found to improve savings rates. Although the financial training provided as part of this experiment was relatively limited, even the farmers in the control group were likely to have begun saving more than farmers who were not part of the experiment at all.

Furthermore, the group with committed accounts spent more on inputs than either the control group or the group targeted for ordinary accounts, but the amounts deposited in the committed accounts were not large enough to account for the difference in input spending. Thus, it seems that although the intervention led to more money being used for input purchases at the beginning of the next planting season, this effect did not come about through the anticipated savings channel, but through some other effect on farmers' behaviour.

The two lottery treatments had no statistically discernible additional impact on people's saving behaviour compared with the 'control' group with bank accounts but no lottery incentive. Because the different lottery treatment groups were relatively small, fairly large effects would have been needed to produce statistically significant results. Furthermore, since most farmers kept very little money in their accounts, the direct-incentive effects of the lotteries must have been small.

That a savings intervention has the intended impact on participants' well-being, but not through the expected channels, is not a unique finding. Prina (2015), reporting on a field experiment where inhabitants in the slums of Pokhara in Nepal were offered access to bank accounts, similarly found that participants' self-reported financial well-being had improved, even though there were no statistically significant impacts on any measurable outcomes. Arguably, an intervention that improves participants' well-being can well be defensible, even if the exact channels through which this happens are poorly understood. Nonetheless, it is clear that further exploration of the results could help shed light on this finding.

Replication studies are an important part of academic research generally, but they are particularly important for policy-oriented research, for at least two reasons. One reason is that an unreplicated study risks having a disproportionate impact on policy because the findings are not robust to minor changes in the methodologies. The other reason is the risk that policymakers may ignore results from an individual study; additional work (including replication research) leading to similar conclusions will tend to support the initial findings, making them harder to ignore.

Given the dearth of studies on the effects of policies to improve access to savings vehicles, and given the somewhat surprising findings, a replication study of the work reported in Brune and colleagues (2016) has the potential to contribute positively to the literature. Policies to improve access to savings vehicles are frequently designed based on relatively little research evidence; thus, when research evidence is available, it is clearly desirable – for both reasons described above – to examine how robust the results are. This is particularly the case when, as here, the channels through which the results were achieved remain poorly understood.

Our replication study consisted of several steps. Following the typology of Brown and colleagues (2014), the first entailed a push-button replication component and the second entailed a pure replication component. Both components aimed to confirm that we could reproduce the results reported in the original study. Next was an estimation analysis component, in which we conducted various sensitivity analyses on the results reported in the original study. A fourth and final theory of change component comprised exploring issues that had not been examined in the original study. In line with best practice for

replication studies, all these steps were specified in a work plan prior to the beginning of our analysis (Stage and Thangavelu 2017).

2. Push-button replication

We began with a push-button replication, so called because, ideally, it should only entail pushing a button, rerunning the original authors' code on the data set they compiled to confirm their original results can be reproduced.

The authors were kind enough to share their Stata code and their data file with us. The data we received were not raw data; a fair amount of the initial data cleaning had already been carried out in the file the authors sent us, and the .do file we received primarily included the actual regressions reported in the paper. The data cleaning done prior to construction of the data file we received included winsorising of the most extreme 1 per cent of outlier values (for variables that only took positive values, the top 1 per cent values were winsorised, while for those that could also take negative values, the top and bottom 1 per cent values were winsorised).

Furthermore, in their communication with us, the authors noted that they had identified a couple of minor typographical errors in the published tables and provided us with a corrected list of results. None of these typographical errors affected the conclusions drawn in the published paper.

Rerunning the provided code on the provided data, we could reproduce almost all the results reported in the published paper; we present our results in the appendix tables. The only exceptions were (i) the typographical errors identified by the authors, (ii) what appear to be a few additional typographical errors in one table (Appendix Table A7) and (iii) a few test results and subsample averages reported in the tables that, as far as we could tell, were not calculated using the code we had received, and must thus have been calculated using other code. These exceptions are identified in Appendix Tables A1 through A7. In all other cases, our results were exactly the same as those reported in the Brune and colleagues (2016) paper. In the few cases where our results differed, this did not affect the conclusions drawn in their paper.

3. Pure replication

The next step was to write our own code and run it on the same data. The authors had used Stata; we used R for this part of the replication study. Our aim was to confirm that the results were not sensitive to idiosyncrasies in individual software packages.

Table 1 provides descriptive statistics on the size of the control group and the various treatment groups, a group offered ordinary savings accounts only and a group offered both ordinary and committed savings accounts, and (for both savings accounts groups) a further split into two groups that were offered different lottery treatments, and one control group that was offered savings accounts but no lottery. This effectively divided the full group into seven groups of similar size; the control group (which, being only one seventh of the overall sample, is rather small); three treatment groups that were offered ordinary savings accounts only, possibly combined with lottery treatments; and three treatment groups that were offered ordinary and committed savings accounts, possibly also combined with lottery treatments.

Table 1: Assignment of clubs to treatment conditions – pure replication

	No savings intervention	Savings intervention	
		Ordinary accounts offered	Ordinary and commitment accounts offered
No raffle	Group 0: 42 clubs	Group 1: 43	Group 4: 42
Public distribution of raffle tickets	n/a	Group 2: 44	Group 5: 43
Private distribution of raffle tickets	n/a	Group 3: 43	Group 6: 42

Note: The results reported in this table were produced by R code written by the authors and are completely consistent with those in Table 1 on page 193 of the original authors' paper.

The descriptive statistics our pure replication generated for the seven groups are identical to the analogous descriptive statistics provided in the original paper and in Table A1 from our push-button replication. As noted in Section 1, the lottery treatments had no discernible impacts on behaviour, and in most of their analysis the original authors therefore merged the different treatment groups into two larger groups, based on what kind of savings vehicles they were offered help with setting up. The original authors thus primarily compared the control group that was not offered any treatment – except the general encouragement to save more – to all farmers offered any kind of savings accounts (the *Any* treatment), all farmers offered ordinary savings accounts only (the *Ordinary* treatment) and all farmers offered ordinary and committed savings accounts (the *Commitment* treatment). We followed their approach in our analysis.

Table 2 provides descriptive statistics on the values measured in the baseline survey. Almost all the values are identical to those reported in the original paper, apart from a few minor typographical errors already identified by the authors. All values are also identical to those produced in our push-button replication. Some 63 per cent of farmers already had bank accounts of some kind, although this included payroll accounts that could not be used for savings. The average savings in the baseline survey was MK3,000 (about US$23), far less than the average amount spent on inputs at the beginning of the planting season, and far less than the average proceeds from selling the crop after the harvest.

Table 3 reports on balance tests for pre-treatment characteristics. All our results are identical to those reported in the original published paper. We note that farmers in the *Ordinary* treatment group spent significantly more cash on inputs than farmers in the control group and that, as a result, spending by the entire *Any* treatment group was significantly higher than that of the control group. Although we followed the original authors' approach in our pure replication, we explored this issue further in our subsequent estimation analysis (Section 4).

Tables 4 through 7 report on regressions estimating the impacts of the interventions on certain outcome variables. The outcome variables in Table 4 were farmers' total deposits into all their bank accounts; their deposits into ordinary savings accounts set up as part of the experiment; their deposits into commitment accounts set up as part of the experiment; their deposits into other accounts unrelated to the experiment (as described in the discussion of Table 2); and their total withdrawals from all their bank accounts. The first two rows in Table 4 (*Panel A*) report on the results of estimating

$$Y_{ij} = \delta + \alpha Savings_j + \beta_S' \mathbf{S}_j + \beta_H' \mathbf{H}_{ij} + \varepsilon_{ij}, \quad (1)$$

while rows in the remainder of the table (*Panel B*) report on the results of estimating

$$Y_{ij} = \delta + \alpha_1 Ordinary_j + \alpha_2 Commitment_j + \beta_S' \mathbf{S}_j + \beta_H' \mathbf{H}_{ij} + \varepsilon_{ij},, \quad (2)$$

where Y_{ij} is the dependent variable in each column; α in Equation 1 is the effect of participating in any of the treatments; α_1 and α_2 in Equation 2 are the effects of participating in the *Ordinary* and *Commitment* treatments, respectively; $\mathbf{S}_j$ is a vector of stratification dummies; and $\mathbf{H}_{ij}$ is a vector of household characteristics.

All our results in Table 4 are identical to those reported by the original authors. Some 20 per cent of farmers in the treatment groups actually deposited money into one or several of the accounts related to the experiment. The overall treatment is statistically significant in all regressions, except *Deposits into other accounts* (where no effect was to be expected). Moreover, the *Ordinary* and *Commitment* treatments are both statistically significant but do not differ significantly from each other except (obviously) in their effect on deposits into committed savings accounts. Average deposits into ordinary and committed savings accounts were substantial; however, average withdrawals, made after these deposits but prior to the subsequent planting season's input purchases, were almost as large.

Table 2: Summary statistics – pure replication

	Mean	Standard deviation	10th percentile	Median	90th percentile	Observations
Treatment condition						
Control group	0.135	0.341				3,150
Panel A						
Any treatment	0.865	0.341				3,150
Panel B						
Ordinary treatment	0.448	0.497				3,150
Commitment treatment	0.417	0.493				3,150
Panel C						
Ordinary, no raffle	0.146	0.354				3,150
Ordinary, private raffle	0.149	0.356				3,150
Ordinary, public raffle	0.153	0.360				3,150
Commitment, no raffle	0.136	0.342				3,150
Commitment, private raffle	0.142	0.349				3,150
Commitment, public raffle	0.139	0.346				3,150
Baseline characteristics						
Number of members per club	13.88	6.44	9	11	23	299
Female	0.063	0.243				3,150
Married	0.955	0.208				3,150
Age (years)	45.02	13.61	28	44	64	3,150
Years of education	5.45	3.53	0	6	10	3,150
Household size	5.79	1.99	3	6	9	3,150
Asset index	–0.02	1.86	–1.59	–0.67	2.46	3,150
Livestock index	–0.03	1.15	–1.00	–0.36	1.37	3,150
Land under cultivation (acres)	4.67	2.14	2.50	4.03	4.02	3,150
Cash spent on inputs (MK)	25,169	41,228	0	10,000	64,500	3,150
Proceeds from crop sales (MK)	125,657	174,977	7,000	67,000	300,000	3,150
Has bank account	0.634	0.482				3,150
Savings in cash at home (MK)	1,244	3,895	0	0	3,000	3,150
Savings in bank accounts (MK)	2,083	8,265	0	0	3,000	2,949
Hyperbolic	0.102	0.303				3,117
Patient now, impatient later	0.304	0.460				3,117
Net transfers made in past 12 months (MK)	1,753	7,645	–2,990	500	8,100	3,150

	Mean	Standard deviation	10th percentile	Median	90th percentile	Observations
Missing value for formal savings and cash	0.064	0.244				3,150
Missing value for time preferences	0.010	0.102				3,150
Transactions with partner institution						
Any transfer via direct deposit	0.154	0.361				3,150
Deposit into ordinary accounts, pre-planting (MK)	18,472	82,396	0	0	38,907	3,150
Deposit into commitment accounts, pre-planting (MK)	615	5,367	0	0	0	3,150
Deposit into other accounts, pre-planting (MK)	296	3,804	0	0	0	3,150
Total deposits into accounts, pre-planting (MK)	19,383	84,483	0	0	40,694	3,150
Total withdrawals from accounts, pre-planting (MK)	18,621[i]	81,744	0	0	38,562[i]	3,150
Net of all transactions, pre-planting (MK)	762	13,857	0	0	649	3,150
Net of all transactions, November–December (MK)	–848	6,870	0	0	1.930	3,150
Net of all transactions, January–April (MK)	–269	4,032	0	0	3.830	3,150
Any active account with Opportunity Bank of Malawi	0.322	0.467				3,150
Endline survey outcomes						
Land under cultivation (acres)	4.52	2.66	2.00	4.00	8.00	2,835
Cash spent on inputs (MK)[ii]						
Total value of inputs (MK)	68,046	84,014	1,500	43,750	157,272	2,835
Proceeds from crop sales (MK)	109,604	162,580	0	56,000	270,000	2,835
Value of crop output (sold and not sold) (MK)	177,747	201,131	27,480	115,582	387,203	2,835
Farm profit (output – input) (MK)	110,703	156,747	0	70,372	264,953	2,835
Total expenditure in last 30 days (MK)	11,905	13,219	2,250	7,500	26,000	2,835
Household size	5.80	2.15	3.00	6.00	9.00	2,835
Total transfers made (MK)	3,152	5,099	0	1,300	8,000	2,835
Total transfers received (MK)	2,204	4,377	0	500	6,050	2,835
Total net transfers made (MK)	939	5,896	–3,000	350	5,750	2,835
Tobacco loan amount (MK)	40,787	77,962	–3,000	350	5,750	2,835
Has fixed deposit account	0.067	0.250				2,835
Not interviewed in follow-up	0.100	0.300				2,835

Note: The results in this table were produced by R code written by the authors. The results are completely consistent with those in Table 2 on pp.198–199 of the original paper, except for the following minor differences: [i] as noted in Table A2 in the appendix, the authors identified a few typographical errors on this line; our results here are identical to those from our push-button replication; [ii] as noted in Table A2 in the appendix, this variable appears not to have been included in the data set provided to us by the original authors.

Table 3: Test of balance in baseline characteristics: ordinary least squares regressions – pure replication

	Panel A	Panel B		Control group
	Any treatment	**Ordinary treatment**	**Commitment treatment**	**Mean dependent variable**
Female	0.044***	0.042***	0.045***	0.024
	(0.012)	(0.013)	(0,013)	
Married	–0,018**	–0.018*	–0.019*	0.972
	(0.009)	(0.010)	(0.010)	
Age (years)	–1.42	–1.45	–1.39	46.23
	(0.93)	(0.98)	(0.97)	
Years of education	0.14	0.19	0.09	5.31
	(0.20)	(0.22)	(0.22)	
Household size	–0.03	–0.02	–0.04	5.81
	(0.13)	(0.13)	(0.13)	
Asset index	0.08	0.09	0.07	–0.11
	(0.11)	(0.12)	(0.12)	
Livestock index	–0.07	–0.07	–0.06	0.03
	(0.09)	(0.09)	(0.09)	
Land under cultivation (acres)	–0.01	0.02	–0.05	4.67
	(0.14)	(0.15)	(0.15)	
Proceeds from crop sales (MK)	6,997	8,294	5,604	117,495
	(8,891)	(9,639)	(9,779)	
Cash spent on inputs (MK)	3,918*	4,459**	3,337	21,798
	(2,027)	(2,209)	(2,357)	
Has bank account	–0.021	–0.005	–0.039	0.658
	(0.029)	(0.031)	(0.032)	
Savings in accounts or cash	371	367	376	3,235
	(550)	(588)	(612)	
Hyperbolic	0.012	0.000	0.024	0.095
	(0.017)	(0.018)	(0.019)	
Patient now, impatient later	–0.054	–0.034	–0.076**	0.352

	Panel A	Panel B		Control group
	Any treatment	**Ordinary treatment**	**Commitment treatment**	**Mean dependent variable**
	(0.034)	(0.037)	(0.036)	
Net transfers made in past 12 months	72	320	–195	1,655
	(452)	(475)	(476)	
Missing value: Formal savings and cash	–0.002	0.000	–0.004	0.066
	(0.013)	(0.015)	(0.014)	
Missing value: Time preference	0.001	0.000	0.003	0.009
	(0.005)	(0.005)	(0.005)	
***p*-values for *F*-test of joint significance of baseline variables**	0.1481	0.8851	0.6168	
Number of observations	3,150			

Note: The results in this table were produced by R code written by the authors. The results are completely consistent with Table 3 on p.201 of the original authors' published paper. Standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 4: Impact of treatments on deposits and withdrawals: ordinary least squares regressions – pure replication

	March 2009–April 2010: Any transfer via direct deposit (take-up)		March–October 2009 Total deposits into accounts (MK)		Deposits into ordinary accounts (MK)		Deposits into commitment accounts (MK)		Deposits into other accounts (MK)		Total withdrawals from accounts (MK)	
	(1)		(2)		(3)		(4)		(5)		(6)	
Panel A												
Any treatment	0.194***		17,609***		16,807***		668***		134		–16,761***	
	(0.036)		(3,910)		(3,773)		(224)		(163)		(3,819)	
Panel B												
Ordinary treatment		0.181***		16,513***		16,611***		–88		–9		–16,071***
		(0.040)		(4,840)		(4,743)		(181)		(163)		(4,745)
Commitment treatment		0.207***		18,801***		17,021***		1,490***		290		–17,511***
		(0.039)		(4,360)		(4,137)		(358)		(202)		(4,235)
Baseline variables												
Dummy for female respondent	0.0122	0.0121	4,066	4,056	3,743	3,741	479.4	472.8	–156.6	–157.9	–4,089	–4,083
	(0.0218)	(0.0218)	(6,536)	(6,539)	(6,417)	(6,416)	(344.5)	(337.4)	(215.7)	(219.3)	(6,447)	(6,447)
Dummy for married	–0.0218	–0.0218	–3,594	–3,595	–2,545	–2,545	–445.1	–445.2	–604.7	–604.7	3,119	3,119
	(0.0349)	(0.0348)	(4,824)	(4,814)	(4,563)	(4,563)	(450.4)	(447.5)	(736.1)	(735.1)	(4,683)	(4,677)
Age (years)	0.00105	0.00104	155.0	154.7	152.4	152.4	3.300	3.107	–0.682	–0.718	–174.9	–174.7
	(0.000682)	(0.000685)	(114.2)	(114.4)	(109.8)	(109.9)	(8.500)	(8.394)	(6.706)	(6.694)	(110.0)	(110.2)
Years of completed education	0.00595***	0.00598***	781.7**	784.4**	761.4**	761.9**	15.49	17.34	4.808	5.159	–839.6**	–841.3**
	(0.00207)	(0.00207)	(365.9)	(365.9)	(353.7)	(353.4)	(31.14)	(30.99)	(13.03)	(13.03)	(352.0)	(352.0)
Number of household members	0.00478	0.00478	905.4	905.8	888.7	888.8	16.67	16.94	0.0388	0.0901	–718.2	–718.4
	(0.00309)	(0.00309)	(721.0)	(720.4)	(699.9)	(700.0)	(44.55)	(44.31)	(42.86)	(42.63)	(683.2)	(683.0)
Asset index	–0.000698	–0.000729	458.4	455.6	546.8	546.3	–9.556	–11.46	–78.91*	–79.27*	–332.7	–330.9
	(0.00528)	(0.00530)	(1,524)	(1,523)	(1,507)	(1,506)	(52.99)	(53.21)	(41.53)	(41.55)	(1,484)	(1,484)
Livestock index	–0.00307	–0.00318	–1,841	–1,851	–1,884	–1,886	–71.70	–78.49	114.4*	113.1*	2,208	2,214
	(0.00662)	(0.00659)	(2,130)	(2,133)	(2,109)	(2,109)	(69.87)	(70.31)	(64.47)	(64.51)	(2,036)	(2,038)
Land under cultivation (acres)	0.00564	0.00568	2,303**	2,308**	2,046**	2,046**	143.2*	146.0*	114.5	115.0	–2,317**	–2,320**
	(0.00436)	(0.00437)	(1,063)	(1,060)	(1,018)	(1,016)	(80.85)	(79.85)	(81.75)	(81.89)	(1,027)	(1,025)
Proceeds from crop sales during 2008 season (MK)	9.96e-08	9.90e-08	0.0923***	0.0922***	0.0915***	0.0915***	0.000458	0.000423	0.000334	0.000327	–0.0972***	–0.0972***
	(6.97e-08)	(6.99e-08)	(0.0284)	(0.0284)	(0.0282)	(0.0282)	(0.00131)	(0.00130)	(0.000676)	(0.000672)	(0.0291)	(0.0291)

	March 2009–April 2010: Any transfer via direct deposit (take-up)		March–October 2009 Total deposits into accounts (MK)		Deposits into ordinary accounts (MK)		Deposits into commitment accounts (MK)		Deposits into other accounts (MK)		Total withdrawals from accounts (MK)	
	(1)		(2)		(3)		(4)		(5)		(6)	
Cash spent on inputs for the 2009 season (MK)	–1.41e-07	–1.39e-07	0.0904	0.0906	0.0934	0.0935	–0.00350	–0.00340	0.000481	0.000500	–0.0877	–0.0878
	(2.13e-07)	(2.12e-07)	(0.0895)	(0.0895)	(0.0872)	(0.0873)	(0.00478)	(0.00473)	(0.00233)	(0.00231)	(0.0892)	(0.0892)
Dummy for ownership of any formal bank account	0.0487***	0.0496***	4,220	4,305	4,049	4,064	–34.45	24.07	205.9**	217.0**	–3,330	–3,383
	(0.0165)	(0.0166)	(3,247)	(3,228)	(3,065)	(3,055)	(348.1)	(339.6)	(97.63)	(98.20)	(3,273)	(3,258)
Amount of savings in bank or cash (missing values replaced with zeros)	–2.96e-07	–3.07e-07	0.152	0.151	0.155	0.154	–0.00139	–0.00203	–0.000906	–0.00103	–0.114	–0.113
	(5.45e-07)	(5.46e-07)	(0.230)	(0.231)	(0.226)	(0.226)	(0.00765)	(0.00761)	(0.00511)	(0.00515)	(0.226)	(0.226)
Dummy for hyperbolic (missing values replaced with zeros)	0.00356	0.00242	10,635*	10,535*	10,040*	10,021*	–165.2	–234.9	761.1**	747.9**	–9,687*	–9,624*
	(0.0223)	(0.0219)	(5,726)	(5,819)	(5,672)	(5,764)	(200.1)	(208.9)	(383.2)	(378.5)	(5,573)	(5,674)
Dummy for *Patient now, impatient later* (missing values replaced with zeros)	–0.0158	–0.0149	–302.8	–220.4	–471.1	–456.3	158.1	215.0	10.17	20.95	–97.63	–149.6
	(0.0142)	(0.0143)	(3,238)	(3,179)	(3,101)	(3,043)	(322.7)	(317.7)	(159.1)	(156.6)	(3,227)	(3,167)
Net transfers made to social network over 12 months	1.57e–06**	1.62e-06**	0.478*	0.482*	0.487*	0.488*	6.55e-05	0.00307	–0.00952	–0.00895	–0.465*	–0.468*
	(7.85e-07)	(7.77e-07)	(0.284)	(0.286)	(0.279)	(0.280)	(0.0140)	(0.0139)	(0.00909)	(0.00923)	(0.275)	(0.277)
Dummy for missing value in savings amount	0.0166	0.0166	5,398	5,399	4,260	4,260	602.3	603.2	535.9	536.0	–6,015	–6,016
	(0.0344)	(0.0345)	(6,293)	(6,279)	(5,991)	(5,990)	(467.4)	(451.9)	(536.8)	(536.8)	(6,140)	(6,131)
Dummy for missing value in hyperbolic and *Patient now, impatient later*	0.0797	0.0788	–3,569	–3,643	–3,429	–3,442	–337.4	–388.5	197.1	187.4	3,391	3,437
	(0.0535)	(0.0542)	(4,126)	(4,136)	(4,141)	(4,141)	(212.7)	(277.7)	(330.0)	(337.6)	(4,097)	(4,104)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal**	0.432		0.642		0.931		0.00		0.074		0.764	
Mean dependent variable in control group	0.00		3,281		3,107		0.00		174		3,256	
Number of observations	3,150		3,150		3,150		3,150		3,150		3,150	

Note: The results in this table were produced by R code written by the authors. The results reported for *Panel A* and *Panel B* are completely consistent with Table 4 on p.205 of the original authors' published paper. The results reported under the *Baseline variables* heading are not included in the original paper. Standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 5 reports on the results of running the same regressions as those in Table 4 but with various account balances as at 22 October 2009 (just prior to the next planting season) as the dependent variables. Again, all our results are identical to those reported by the original authors. The overall treatment was statistically significant in all regressions; the *Ordinary* treatment had statistically significant impacts on overall account balances and on balances held in ordinary savings accounts, while the *Commitment* treatment had statistically significant impacts not only on these two outcome variables but also on balances held in committed savings accounts, as well as balances held in other bank accounts.

Table 6 reports on the results of the treatments on agricultural outcomes in the 2009–2010 farming season and on household expenditure after the 2010 harvest. The land under cultivation was significantly higher for the treatment groups than for the control group; as can be seen in Table 2, there is no corresponding difference for this variable between the treatment and control groups in the baseline survey. For all other regressions reported here, the results are significantly different from those for the control group for the *Commitment* treatment group and (as a result) for the *Any* group, but not for the *Ordinary* treatment group. This is one of the issues we explore further in our estimation analysis (Section 4).

Notably, for both the *Ordinary* and *Commitment* treatment groups, the average additional value of farming inputs, compared to the control group, was substantially higher than the average additional bank balances held by farmers in these two groups and reported in Table 5. Thus, although improved bank balances at the start of the planting season undoubtedly played a role, the additional spending on farming inputs cannot easily be explained by this alone. The *Ordinary* and *Commitment* treatment groups both saw higher average crop revenue, higher average profits and higher average subsequent household expenditure than the control group; although the differences between the *Ordinary* group and the control group are not statistically significant, the average differences are all in the *Ordinary* group's favour. As the original authors note, for the treatment group as a whole the improvement compared to the control group was substantial. On average, treated farmers spent more than 13 per cent more on inputs than farmers in the control group, had revenue 15 per cent higher than those in the control group, and had average household spending in the endline survey more than 10 per cent higher than those in the control group. Judging from these results, the treatment clearly made a difference for the treated farmers.

Since the increased input spending reported in Table 6 could not be explained solely by the increased bank balances reported in Table 5, the original authors explored a number of possible other mechanisms (Table 7) through which the treatments might have affected subsequent outcomes. Access to the savings accounts could have affected access to the loans provided by the bank or made it easier to refuse to provide transfers to other households, but the original authors found no impact on loans or on transfers, and neither did we. The only statistically significant effect in this table is, encouragingly but not surprisingly, that treated farmers were more likely than farmers in the control group to still have a deposit account in the endline survey.

Table 5: Impact of treatments on savings balances: ordinary least squares regressions – pure replication

	All accounts, in total (1)		Ordinary accounts only (2)		Commitment accounts only (3)		Other accounts (4)	
Panel A								
Any treatment	1,863***		1,167***		435***		262**	
	(412)		(302)		(154)		(124)	
Panel B								
Ordinary treatment		1,301***		1,167***		–26		160
		(442)		(349)		(129)		(129)
Commitment treatment		2,475***		1,167***		935***		372**
		(524)		(364)		(238)		(187)
Baseline variables								
Dummy for female respondent	171.4	166.5	–826.2**	–826.2**	–79.77	–83.78	1,077	1,077
	(1,053)	(1,054)	(375.4)	(375.2)	(181.0)	(183.8)	(920.2)	(920.3)
Dummy for married	–5.740	–5.802	–65.81	–65.81	–260.4	–260.4	320.5	320.4
	(682.7)	(686.0)	(421.9)	(422.0)	(298.6)	(299.9)	(367.6)	(368.4)
Age (years)	28.47	28.33	23.21	23.21	–0.521	–0.638	5.787	5.761
	(19.06)	(19.09)	(16.11)	(16.14)	(6.385)	(6.358)	(6.449)	(6.471)
Years of completed education	52.75	54.12	9.456	9.456	7.238	8.364	36.05*	36.30*
	(61.39)	(61.36)	(53.39)	(53.27)	(24.22)	(24.05)	(21.68)	(21.72)
Number of household members	115.1	115.3	–15.85	–15.85	46.30	46.46	84.63	84.67
	(144.0)	(143.7)	(121.1)	(121.1)	(41.43)	(41.28)	(58.37)	(58.23)
Asset index	110.5	109.1	42.37	42.37	14.88	13.72	53.26	53.01
	(178.3)	(178.2)	(151.6)	(151.6)	(49.69)	(49.66)	(83.53)	(83.42)
Livestock index	–243.3	–248.4	–144.8	–144.8	–66.36	–70.49	–32.17	–33.08
	(381.6)	(382.1)	(391.9)	(391.4)	(68.74)	(69.25)	(74.33)	(74.86)
Land under cultivation (acres)	142.5	144.6	131.0	131.0	66.38	68.08	–54.91	–54.53
	(149.3)	(149.9)	(99.78)	(100.0)	(53.84)	(53.42)	(66.77)	(66.69)
Proceeds from crop sales during 2008 season (MK)	0.00356	0.00353	0.00312	0.00312	0.000318	0.000297	0.000125	0.000120
	(0.00394)	(0.00395)	(0.00391)	(0.00391)	(0.00123)	(0.00123)	(0.00110)	(0.00110)
Cash spent on inputs for the 2009 season (MK)	0.0151	0.0152	0.0184*	0.0184*	–0.00323	–0.00317	–6.40e-05	–5.05e-05
	(0.0111)	(0.0111)	(0.0106)	(0.0106)	(0.00354)	(0.00352)	(0.00211)	(0.00210)

	All accounts, in total (1)		Ordinary accounts only (2)		Commitment accounts only (3)		Other accounts (4)	
Dummy for ownership of any formal bank account	471.6	515.2	359.6	359.6	68.99	104.6	43.07	50.95
	(461.5)	(463.4)	(351.4)	(353.7)	(211.6)	(210.5)	(162.8)	(165.2)
Amount of savings in bank or cash (missing values replaced with zeros)	0.0771	0.0766	0.0644	0.0644	–0.00956	–0.00995	0.0223	0.0222
	(0.0573)	(0.0571)	(0.0529)	(0.0529)	(0.00759)	(0.00763)	(0.0283)	(0.0282)
Dummy for hyperbolic (missing values replaced with zeros)	764.8	713.0	949.5	949.4	–175.5	–217.9*	–9.174	–18.55
	(881.5)	(876.0)	(904.4)	(903.4)	(121.7)	(126.7)	(182.4)	(183.7)
Dummy for *Patient now, impatient later* (missing values replaced with zeros)	199.0	241.4	99.45	99.48	90.04	124.7	9.545	17.21
	(569.2)	(563.3)	(472.2)	(465.5)	(241.3)	(241.1)	(191.6)	(191.0)
Net transfers made to social network over 12 months	0.0184	0.0207	0.0270	0.0271	–0.00639	–0.00456	–0.00224	–0.00184
	(0.0480)	(0.0477)	(0.0447)	(0.0444)	(0.00824)	(0.00812)	(0.0100)	(0.00992)
Dummy for missing value in savings amount	352.8	353.5	–608.6	–608.6	235.9	236.5	725.5	725.6
	(850.3)	(844.9)	(516.8)	(516.9)	(293.3)	(287.8)	(582.8)	(582.7)
Dummy for missing value in hyperbolic and *Patient now, impatient later*	–1,005	–1,043*	–277.9	–277.9	–155.5	–186.6	–571.5	–578.3
	(609.6)	(612.6)	(410.1)	(413.5)	(113.1)	(154.9)	(392.1)	(391.2)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal**	0.019		0.999		0.00		0.290	
Mean dependent variable in control group	364		302		0		62	
Number of observations	3,150		3,150		3,150		3,150	

Note: The results in this table were produced by R code written by the authors. The results reported for *Panel A* and *Panel B* are completely consistent with Table 5 on p.210 of the original paper. The results reported under the *Baseline variables* heading are not included in the original paper. Standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 6: Impact of treatments on agricultural outcomes in 2009–2010 season and household expenditure after 2010 harvest – pure replication

	Land under cultivation (acres)		Total value of inputs (MK)		Proceeds from crop sales (MK)		Value of crop output (sold and not sold) (MK)		Farm profit (output – input) (MK)		Total expenditure in 30 days before survey (MK)	
	(1)		(2)		(3)		(4)		(5)		(6)	
Panel A												
Any treatment	0.30**		8,023*		19,595**		23,921**		16,927**		1,151*	
	(0.15)		(4,131)		(8,996)		(11,529)		(9,117)		(601)	
Panel B												
Ordinary treatment		0.27*		5,946		13,358		17,223		12,872		885
		(0.16)		(4,504)		(9,518)		(12,204)		(9,577)		(650)
Commitment treatment		0.33**		10,297**		26,427***		31,259**		21,369**		1,442**
		(0.16)		(4,563)		(9,979)		(12,510)		(10,064)		(656)
Baseline variables												
Dummy for female respondent	0.238	0.239	–6,666	–6,590	–23,529	–23,300	–25,007	–24,762	–15,971	–15,823	739.4	749.1
	(0.218)	(0.219)	(6,586)	(6,560)	(14,850)	(14,775)	(18,729)	(18,725)	(16,880)	(16,885)	(1,074)	(1,072)
Dummy for married	0.505**	0.507**	–4,508	–4,333	6,206	6,732	428.8	993.7	5,983	6,325	878.4	900.8
	(0.232)	(0.233)	(6,449)	(6,429)	(11,742)	(11,701)	(15,363)	(15,314)	(12,802)	(12,786)	(886.6)	(888.5)
Age in years	0.00763*	0.00760*	–55.67	–57.53	–911.1***	–916.7***	–840.6***	–846.6***	–798.3***	–801.9***	–53.57**	–53.81**
	(0.00431)	(0.00432)	(111.5)	(111.9)	(218.4)	(217.8)	(280.9)	(280.6)	(227.7)	(227.4)	(23.19)	(23.28)
Years of completed education	0.0435***	0.0435***	831.5**	834.4**	962.5	971.1	1,778*	1,787*	797.0	802.6	103.6	103.9
	(0.0141)	(0.0141)	(396.0)	(397.0)	(778.3)	(777.6)	(954.2)	(954.8)	(803.0)	(802.1)	(73.09)	(73.12)
Number of household members	0.0586**	0.0585**	1,621***	1,619***	3,143**	3,138**	3,443*	3,438*	2,018	2,015	494.7***	494.5***
	(0.0234)	(0.0234)	(606.8)	(606.1)	(1,421)	(1,418)	(1,787)	(1,781)	(1,537)	(1,534)	(112.7)	(112.6)
Asset index	0.0926**	0.0926**	4,045***	4,042***	10,304***	10,294***	16,966***	16,955***	13,220***	13,214***	966.2***	965.7***
	(0.0375)	(0.0376)	(1,237)	(1,239)	(2,737)	(2,745)	(2,984)	(2,994)	(2,553)	(2,560)	(213.5)	(213.6)
Livestock index	0.280***	0.279***	2,428	2,413	7,903**	7,860**	14,346***	14,299***	11,462***	11,433***	305.1	303.2
	(0.0514)	(0.0515)	(1,522)	(1,528)	(3,089)	(3,105)	(4,107)	(4,132)	(3,550)	(3,561)	(285.9)	(287.0)
Land under cultivation (acres)	0.287***	0.287***	1,905**	1,909**	3,991**	4,003**	8,460***	8,473***	6,888***	6,896***	351.5**	352.0**
	(0.0316)	(0.0316)	(871.4)	(870.9)	(1,772)	(1,773)	(2,220)	(2,222)	(2,028)	(2,030)	(172.4)	(172.2)
Proceeds from crop sales during 2008 season (MK)	1.96e-06***	1.96e-06***	0.102***	0.102***	0.251***	0.251***	0.277***	0.277***	0.188***	0.188***	0.0131***	0.0131***
	(5.58e-07)	(5.59e-07)	(0.0213)	(0.0214)	(0.0421)	(0.0421)	(0.0470)	(0.0469)	(0.0379)	(0.0379)	(0.00315)	(0.00315)
Cash spent on inputs for the 2009 season (MK)	1.80e-06	1.81e-06	0.180**	0.180**	–0.0269	–0.0267	0.00638	0.00658	–0.174	–0.174	–0.00395	–0.00395
	(1.66e-06)	(1.66e-06)	(0.0706)	(0.0707)	(0.143)	(0.143)	(0.157)	(0.157)	(0.139)	(0.139)	(0.00825)	(0.00825)

	Land under cultivation (acres)			Total value of inputs (MK)			Proceeds from crop sales (MK)			Value of crop output (sold and not sold) (MK)			Farm profit (output – input) (MK)			Total expenditure in 30 days before survey (MK)	
	(1)			(2)			(3)			(4)			(5)			(6)	
Dummy for ownership of any formal bank account	0.147	0.149	9,475***	9,651***	13,038**	13,566**	19,258***	19,825***	9,608*	9,951*	591.7	614.2					
	(0.106)	(0.106)	(2,612)	(2,632)	(5,354)	(5,447)	(6,694)	(6,800)	(5,467)	(5,550)	(505.1)	(501.5)					
Amount of savings in bank or cash (missing values replaced with zeros)	–2.11e-06	–2.13e-06	0.0827	0.0815	0.688*	0.684*	0.838*	0.834*	0.712*	0.710*	–0.00500	–0.00516					
	(4.36e-06)	(4.37e-06)	(0.179)	(0.179)	(0.410)	(0.408)	(0.463)	(0.461)	(0.406)	(0.405)	(0.0316)	(0.0316)					
Dummy for hyperbolic (missing values replaced with zeros)	0.190	0.187	2,764	2,520	13,498	12,764	7,905	7,116	5,603	5,126	1,151	1,120					
	(0.156)	(0.156)	(3,956)	(3,959)	(8,456)	(8,393)	(9,566)	(9,555)	(8,625)	(8,638)	(844.3)	(841.9)					
Dummy for *Patient now, impatient later* (missing values replaced with zeros)	–0.0401	–0.0382	2,395	2,543	2,876	3,321	5,281	5,759	2,311	2,600	–335.8	–316.9					
	(0.100)	(0.100)	(2,857)	(2,860)	(5,742)	(5,748)	(7,259)	(7,250)	(6,273)	(6,286)	(498.2)	(498.1)					
Net transfers made to social network over 12 months	6.42e-06	6.53e-06	0.293	0.303	0.359	0.387	0.956*	0.986*	0.652	0.670	0.00344	0.00461					
	(6.22e-06)	(6.24e-06)	(0.216)	(0.216)	(0.455)	(0.456)	(0.578)	(0.579)	(0.488)	(0.489)	(0.0379)	(0.0380)					
Dummy for missing value in savings amount	–0.106	–0.105	33.53	112.6	–13,681	–13,444	–20,060*	–19,805*	–20,029**	–19,875**	62.98	73.10					
	(0.200)	(0.200)	(4,853)	(4,832)	(9,503)	(9,558)	(11,024)	(11,037)	(9,996)	(10,018)	(964.1)	(961.9)					
Dummy for missing value in hyperbolic and *Patient now, impatient later*	–0.0831	–0.0816	–6,465	–6,347	26,110	26,465	15,614	15,995	20,082	20,312	4,556	4,571					
	(0.280)	(0.278)	(10,669)	(10,599)	(36,307)	(36,229)	(38,712)	(38,626)	(32,006)	(32,007)	(3,243)	(3,250)					
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal**	0.614			0.246			0.086			0.117			0.246			0.283	
Mean dependent variable in control group	4.28			60,372			91,747			155,685			95,210			10,678	
Number of observations	2,835			2,835			2,835			2,835			2,835			2,835	

Note: The results in this table were produced by R code written by the authors. The results for *Panel A* and *Panel B* are completely consistent with Table 6 on p.212 of the original paper. The results reported under the *Baseline variables* heading are not included in the original paper. Standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 7: Impact of treatments on household size, transfers and fixed deposit demand – pure replication

	Household size		Tobacco loan amount (MK)		Total transfers made (MK)		Total transfers received (MK)		Total net transfers made (MK)		Has fixed deposit account	
	(1)		(2)		(3)		(4)		(5)		(6)	
Panel A												
Any treatment	0.14		3,158		215		–301		477		0.032***	
	(0.09)		(4,583)		(249)		(248)		(322)		(0.012)	
Panel B												
Ordinary treatment		0.15'		2,920		134		–288		394		0.016
		(0.09)'		(5,068)		(267)		(262)		(342)		(0.012)
Commitment treatment		0.13'		3,418		304		–316		568		0.050***
		(0.09)'		(4,897)		(275)		(258)		(347)		(0,014)
Baseline variables												
Dummy for female respondent	–0.184*	–0.185*	–11,110**	–11,101**	209.0	211.9	634.6	634.1	–385.0	–381.9	–0.0552***	–0.0546***
	(0.109)	(0.109)	(5,578)	(5,572)	(518.1)	(517.3)	(462.5)	(461.9)	(651.6)	(649.7)	(0.0142)	(0.0142)
Dummy for married	0.238	0.237	–117.6	–97.56	–334.6	–327.7	–625.4	–626.5	477.4	484.4	–0.0325	–0.0312
	(0.199)	(0.199)	(5,311)	(5,316)	(449.0)	(450.4)	(541.8)	(541.3)	(664.2)	(665.5)	(0.0265)	(0.0263)
Age in years	–0.0145***	–0.0145***	169.0	168.8	9.290	9.218	26.86***	26.87***	–18.55*	–18.62*	–0.00121**	–0.00122***
	(0.00265)	(0.00265)	(109.5)	(109.6)	(8.078)	(8.105)	(7.557)	(7.566)	(9.951)	(9.969)	(0.000469)	(0.000470)
Years of completed education	–0.0206**	–0.0206**	341.9	342.2	112.3***	112.4***	116.9***	116.9***	–4.339	–4.224	–0.00121	–0.00119
	(0.00970)	(0.00970)	(350.8)	(351.0)	(28.55)	(28.49)	(25.87)	(25.88)	(35.79)	(35.73)	(0.00151)	(0.00151)
Number of household members	0.766***	0.766***	2,315***	2,314***	134.8***	134.8***	42.17	42.18	96.09	96.02	0.00201	0.00200
	(0.0176)	(0.0176)	(599.0)	(599.2)	(47.70)	(47.68)	(48.04)	(48.03)	(59.22)	(59.14)	(0.00262)	(0.00261)
Asset index	0.0225	0.0225	29.66	29.27	277.7***	277.6***	97.15	97.17	166.7	166.6	0.00350	0.00348
	(0.0227)	(0.0227)	(1,184)	(1,185)	(97.38)	(97.48)	(76.26)	(76.28)	(113.7)	(113.9)	(0.00394)	(0.00395)
Livestock index	0.0444	0.0445	364.4	362.7	5.245	4.677	7.198	7.294	49.40	48.81	0.0108**	0.0107*
	(0.0363)	(0.0362)	(1,400)	(1,399)	(121.3)	(121.2)	(97.34)	(97.31)	(135.4)	(135.4)	(0.00543)	(0.00547)
Land under cultivation (acres)	0.0149	0.0149	2,396***	2,397***	41.63	41.79	32.69	32.66	18.66	18.82	–0.00311	–0.00308
	(0.0182)	(0.0182)	(821.5)	(821.3)	(66.51)	(66.52)	(44.49)	(44.50)	(72.77)	(72.81)	(0.00288)	(0.00289)
Proceeds from crop sales during 2008 season (MK)	4.63e-07*	4.63e-07*	0.0530**	0.0530**	0.00375***	0.00376***	–0.00165	–0.00165	0.00507***	0.00507***	1.26e-07**	1.26e-07**
	(2.64e-07)	(2.64e-07)	(0.0207)	(0.0207)	(0.00127)	(0.00127)	(0.00101)	(0.00101)	(0.00135)	(0.00135)	(5.31e-08)	(5.23e-08)
Cash spent on inputs for the 2009 season (MK)	–1.79e-06*	–1.79e-06*	0.00889	0.00890	0.00922*	0.00922*	0.00247	0.00247	0.00534	0.00535	–2.74e-07	–2.74e-07
	(9.56e-07)	(9.57e-07)	(0.0638)	(0.0638)	(0.00472)	(0.00471)	(0.00319)	(0.00319)	(0.00511)	(0.00510)	(1.76e-07)	(1.74e-07)
Dummy for ownership of any formal bank account	0.0157	0.0148	1,016	1,036	296.2	303.1	28.22	27.06	277.5	284.5	0.0215*	0.0229**
	(0.0713)	(0.0714)	(2,869)	(2,870)	(222.6)	(224.1)	(190.7)	(190.7)	(257.8)	(258.7)	(0.0110)	(0.0110)
	–1.99e-06	–1.98e-06	0.0182	0.0181	0.0212	0.0211	0.00134	0.00134	0.0196	0.0196	–5.70e-08	–6.66e-08

	Household size		Tobacco loan amount (MK)		Total transfers made (MK)		Total transfers received (MK)		Total net transfers made (MK)		Has fixed deposit account	
	(1)		(2)		(3)		(4)		(5)		(6)	
Amount of savings in bank or cash (missing values replaced with zeros)	(3.55e-06)	(3.55e-06)	(0.126)	(0.126)	(0.0132)	(0.0132)	(0.0108)	(0.0108)	(0.0140)	(0.0140)	(6.08e-07)	(6.09e-07)
Dummy for hyperbolic (missing values replaced with zeros)	–0.0208	–0.0196	10,960**	10,932**	665.3*	655.8*	–400.1*	–398.5*	1,061***	1,051***	–0.0150	–0.0169
	(0.0826)	(0.0830)	(4,353)	(4,377)	(361.1)	(360.6)	(229.7)	(229.3)	(381.7)	(380.5)	(0.0170)	(0.0168)
Dummy for *Patient now, impatient later* (missing values replaced with zeros)	–0.0479	–0.0487	1,836	1,853	–202.9	–197.2	–18.62	–19.59	–222.7	–216.8	–0.0209**	–0.0198**
	(0.0614)	(0.0614)	(2,794)	(2,789)	(188.5)	(189.1)	(185.0)	(185.2)	(245.0)	(246.1)	(0.00976)	(0.00969)
Net transfers made to social network over 12 months	4.10e-06	4.05e-06	–0.106	–0.105	0.0377**	0.0380**	0.00903	0.00897	0.0266	0.0270	3.17e-07	3.87e-07
	(3.57e-06)	(3.56e-06)	(0.217)	(0.217)	(0.0175)	(0.0175)	(0.0131)	(0.0131)	(0.0212)	(0.0212)	(5.75e-07)	(5.73e-07)
Dummy for missing value in savings amount	–0.0871	–0.0875	–3,821	–3,812	–653.3**	–650.2**	146.9	146.4	–765.4**	–762.2**	0.0114	0.0120
	(0.105)	(0.106)	(3,660)	(3,665)	(302.5)	(302.2)	(312.7)	(312.7)	(359.5)	(359.3)	(0.0219)	(0.0216)
Dummy for missing value in hyperbolic and Patient now, impatient later	0.517*	0.517*	–7,017	–7,003	–1,097*	–1,092*	–995.3	–996.1	–98.79	–94.06	–0.0728***	–0.0719***
	(0.310)	(0.310)	(11,746)	(11,741)	(623.8)	(622.1)	(670.5)	(669.2)	(844.4)	(838.0)	(0.0122)	(0.0121)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal**	0.748		0.899		0.431		0.856		0.483		0.008	
Mean dependent variable in control group	5.72		40,147		2,872		2,492		418		0.039	
Number of observations	2,835		2,835		2,835		2,835		2,835		2,835	

Note: The results in this table were produced by R code written by the authors. The results for *Panel A* and *Panel B* are completely consistent with Table 7 on p.214 of the original paper, except for the following minor differences: [i] The original paper reports –0.004 and 0.019 as the coefficient and standard error for the *Commitment* treatment group, rather than the 0.13 and 0.09 we found; and–0.010 and 0.019 as the coefficient and standard error for the *Ordinary* treatment group, rather than the 0.15 and 0.09 we found. Standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 7 is the one case where we found results that differed from those reported in the original paper. Our results for the *Household size* variable were consistent with those from our push-button replication but not with the results reported in the original authors' published paper. Neither our results nor those reported by the authors were statistically significant, and the authors made nothing of their results other than to note that household size appears not to have been affected by the treatment, a conclusion our results also support. Since the authors' reported results for the *Commitment* and *Ordinary* treatment groups are inconsistent with those they reported for the *Any* treatment group (which should be close to the average of the values for the two separate treatment groups), we strongly suspect that this was simply a typographical error by the original authors.

4. Estimation analysis

Our replication plan specified a series of robustness checks to be carried out and, with one exception, we achieved this goal. In most cases, our findings were very similar to those reported by Brune and colleagues (2016). Our robustness checks included examining how important outlier observations (observations that included extreme values for one of the explanatory variables and/or for one of the output variables) were for the results, which we did in two sets of robustness checks, in which we either (a) removed extreme observations outright or (b) reduced their importance. Our robustness checks also included examining whether the choices of explanatory variables (other than the key treatment variables) affected the results.

4.1 Outlier management

The original study's results – confirmed by our replications in sections 2 and 3 – raise the possibility that outliers in one or more groups might be affecting them. As noted in the discussion of Table 3, it is clear that farmers in the *Ordinary* treatment groups reported spending significantly more cash on inputs, on average, in the baseline survey carried out at the beginning of the experiment than farmers in the other groups did. Furthermore, as noted in the discussion of Table 6, farmers in the *Commitment* group spent significantly more on inputs after the treatment than those in the control group did, while farmers in the *Ordinary* group did not, leading to an outcome where statistically significant results for the *Any* treatment group are primarily being driven by the *Commitment* subset of the treatment group. In the case of both the high spending on inputs in the baseline survey and the case of high post-treatment spending, we felt it was worth exploring whether small numbers of outliers might be driving the results. Thus, several of the robustness checks specified in our replication plan aimed at dealing with this possibility.

Two approaches frequently used in the literature to reduce the importance of outliers are trimming and winsorising (Dixon 1960). We applied both. For pre-set percentages, these approaches entail identifying the observations that have values for a variable that are in the (lowest or) highest percentile of the variable in question, and then either dropping those observations altogether (trimming) or replacing the input expenditure variable with the variable's value at the edge of that percentile (winsorising). As noted in our earlier discussion of the data, the authors had already done some outlier management by winsorising the top 1 per cent of all variable values for variables that only took zero or

positive values and the highest and lowest 1 per cent of the values for variables that could take both negative and positive values. We expanded on this outlier management and (a) trimmed the 1 per cent and 5 per cent of respondents with the highest values and (b) winsorised the 5 per cent of respondents with the highest values for the baseline *Cash spent on inputs* and the post-treatment *Total value of inputs* variables discussed above.

Some reduction in statistical significance was to be expected from this procedure; however, if removing a very small group of extreme outliers had affected the results dramatically, that would be an important finding. From a policy perspective, outcomes for a few outliers is usually not of interest, so if a few outliers account for most of the estimated impact of the intervention, then that would affect how useful the results are likely to be for policy purposes.

Our results from the extreme-value management for pre-experiment cash-input spending are reported in Tables A8 through A19 in the appendix. In almost all cases, our results are very similar to those in the original study. Some reduction in statistical significance was only to be expected, particularly from the more extreme 5 per cent trimming and winsorising, but – if anything – it is remarkable how little loss of statistical significance there was. Almost all results that were statistically significant in the original study remained so in our replication, with most exceptions being results that were only statistically significant at the 10 per cent level in the original study.

Our results from the extreme-value management for post-experiment total input spending are reported in Tables A20 through A28 in the appendix. These results were affected somewhat more by our robustness checks. Not surprisingly, the results were most affected for the regression (in Tables A22 and A26, respectively) where *Total input spending* was the dependent variable. However, for the 5 per cent trimming, noticeable effects on the results were also apparent for several of the other outcome variables, with loss of statistical significance as well as considerable changes in the values of the estimated coefficients.

Table 8 shows the results corresponding to those in the original Table 6 (the table showing impacts on agricultural production) for all the trimming and winsorising treatments. As can be seen from the table, the results when observations with extreme values for *Cash spent on inputs* from the baseline survey are trimmed or winsorised remain largely similar to those in the original paper. The only coefficient in the original regression that is statistically significant at the 1 per cent level is only significant at the 5 per cent level in some of the new regressions; coefficients that are statistically significant at the 5 per cent level are, in some cases, only significant at the 10 per cent level; and some coefficients that are significant at the 10 per cent level are no longer significant in some of the new regressions. However, such minor effects are to be expected.

Table 8: Comparison of results from tables 6, A10, A14, A18, A22 and A26

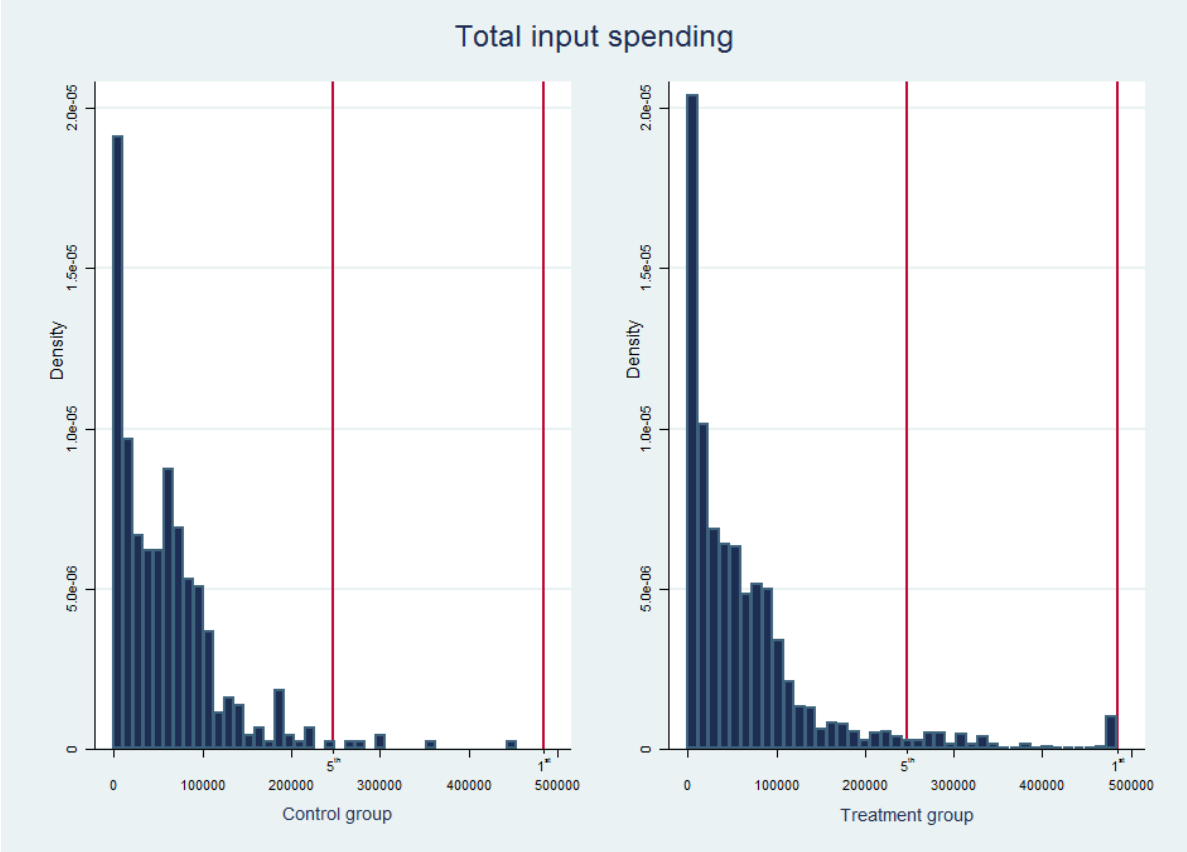
	Land under cultivation (acres)	Total value of inputs (MK)	Proceeds from crop sales (MK)	Value of crop output (sold and not sold) (MK)	Farm profit (output – input) (MK)	Total expenditure in 30 days before survey (MK)
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Table 6						
Any treatment	0.30**	8,023*	19,595**	23,921**	16,927**	1,151*
Ordinary treatment	0.27*	5,946	13,358	17,223	12,872	885
Commitment treatment	0.33**	10,297**	26,427***	31,259**	21,369**	1,442**
Table A10 (results after trimming of the observations with the 1% most extreme baseline values for *Cash spent on inputs*)						
Any treatment	0.286*	7,912*	18,154**	22,327**	15,559*	1,108*
Ordinary treatment	0.243	5,861	12,132	15,113	10,908	911.6
Commitment treatment	0.333**	10,162**	24,762***	30,243**	20,664**	1,323**
Table A14 (results after trimming of the observations with the 5% most extreme baseline values for *Cash spent on inputs*)						
Any treatment	0.283*	6,189	17,653**	20,838*	15,586*	1,057*
Ordinary treatment	0.244	3,794	11,373	13,534	11,111	887.6
Commitment treatment	0.326**	8,792*	24,480**	28,779**	20,451**	1,241*
Table A18 (results after winsorising of the observations with the 5% most extreme baseline values for *Cash spent on inputs*)						
Any treatment	0.303**	8,144*	19,701**	23,794**	16,731*	1,141*
Ordinary treatment	0.275*	5,973	13,482	17,044	12,732	875.0
Commitment treatment	0.333**	10,510**	26,478***	31,150**	21,090**	1,431**
Table A22 (results after trimming of the observations with the 1% most extreme endline values for *Total input spending*)						
Any treatment	0.271*	5,856	17,657**	21,384*	15,867*	1,026*
Ordinary treatment	0.260*	4,885	13,383	16,461	12,192	837.1
Commitment treatment	0.283*	6,925	22,363**	26,804**	19,915**	1,233*
Table A26 (results after trimming of the observations with the 5% most extreme endline values for *Total input spending*)						
Any treatment	0.215	-232.3	12,974	15,434	15,564*	677.0
Ordinary treatment	0.198	-1,797	6,989	10,495	12,307	479.3
Commitment treatment	0.234	1,495	19,581**	20,885*	19,159**	895.3

Note: Only estimated coefficients and levels of statistical significance displayed; for other information about the respective regressions, see original tables.

When observations with the 1 per cent most extreme values for *Total input spending* from the endline survey are trimmed, apart from the effects for that variable itself, there is one case where a coefficient that is significant at the 5 per cent level in the original regression is no longer statistically significant in the new regression; all other changes in statistical significance are from the 1 per cent to the 5 per cent level, from the 5 per cent to the 10 per cent level, or loss of significance for coefficients that are significant at the 10 per cent level in the original regressions. When observations with the 5 per cent most extreme values for the *Total input spending* variable are trimmed, the results are, as noted earlier, more pronounced and few coefficients remain statistically significant. However, explicitly selecting 'outliers' based on whether they displayed large impacts for the outcome variable(s) in question is, of course, likely to reduce statistical significance and change coefficient values; the fact that our procedure had these effects does not, in our view, indicate any problems with the original authors' analysis.

Figure 1 displays the distribution of the *Total input spending* variable in control and treatment groups. As may be noted, the treatment group clearly has more observations both near and beyond the threshold values. Thus, while extreme values obviously affect the exact results, it is also clear that the values for the *Total input spending* variable differ in general between the two groups and that the results are not merely driven by a few outliers.

Figure 1: Distribution of values for the *Total input spending* variable from the endline survey, indicating the 1% and 5% cut-off thresholds used in the robustness checks



4.2 Choices of explanatory variables

An additional step in the robustness checks was to examine the effects of deselecting some explanatory variables. In the original paper, the authors reported that baseline variables from the first round of the survey were included in the regressions; however, the estimated coefficients for those variables were not reported in the paper or in the online appendices, making it difficult to judge how important the variables were for the outcomes. We originally intended to examine variable exclusion in two separate approaches. The first approach would have been to drop those household variables that were not statistically significant in any regression and see whether their exclusion affected the results for the variables that remained. However, as can be seen from Tables 4 through 7, where we (unlike the original authors) also report the results for the baseline variables, all household variables were statistically significant in at least one (in most cases, several) of the reported regressions. Thus, this part of our replication plan was moot once we had obtained the results for the household variables.

The second variable-exclusion approach envisaged in our replication plan was to drop the entire $\mathbf{H}_{ij}$ vector from equations (1) and (2) and keep only the stratification dummies $\mathbf{S}_j$, instead estimating a modified set of equations, as follows:

$$Y_{ij} = \delta + \alpha Savings_j + \beta_S' \mathbf{S}_j + \varepsilon_{ij}, \quad (3)$$

$$Y_{ij} = \delta + \alpha_1 Ordinary_j + \alpha_2 Commitment_j + \beta_S' \mathbf{S}_j + \varepsilon_{ij},, \quad (4)$$

The results from these regressions are reported in Tables A29 through A32. The results are, once again, very similar to those in the original study. Most outcome variables that were statistically significant had larger coefficients and, occasionally, higher levels of statistical significance than their counterparts in the original study.

5. Theory of change analysis: effects for farmers who responded to the treatment

Although all farmers in the treatment groups were offered one of the bank account treatments, less than 20 per cent of those in the treatment groups responded to the treatment, in the sense that they actually opened and used one or more of the offered accounts. The standard approach in assessing the impact of a treatment like this is to examine the effect for the entire group that was offered the treatment. This is the approach the original authors took, and is what we did in sections 2 through 4.

However, it is presumably also of interest to policymakers to know what effect a policy has on those who make use of the opportunities that it offers, not merely what average effect offering a policy opportunity has on those who are eligible for it, whether they use it or not. We wish to point out, for instance, that a common approach in other agricultural extension activities is to ensure adoption by some farmers in the hope that early adopters' success will gradually encourage others to follow suit. In our replication plan, we speculated that something similar could happen here: even if, relatively speaking, only a few farmers adopted the new savings vehicles at an early stage, if they had noticeable success with these vehicles, then that should encourage adoption by other

farmers in the longer term. We therefore proposed exploring the outcomes for farmers that adopted the offered savings vehicles and made use of them.

The original authors estimated two 'likelihood of take-up' probits as functions of baseline characteristics – one for opening an account and one for opening and using it, as reported in Table C7 of their online Appendix C. We re-estimated these probits (Table 9), and all our results are identical to those reported by the original authors.

Our initial intention was to use these probit results to generate comparison groups for a counterfactual analysis in a switching regression. After we had studied the data, however, it became clear that we could use a simpler approach: using propensity score matching to identify comparison farmers in the control group would require far less experimentation with the data, and thus be more in line with the general philosophy of replication studies.

In our propensity score matching, we employed the same variables as in the original authors' probits to select observations in the control group that were comparable to farmers in the treatment group who had opened and made use of the offered accounts.[4] The control group of farmers who were not offered the treatment was relatively small, only one seventh of the total sample. This group is used as source for an even smaller number of observations, comparable to farmers who took up the treatment, affecting the precision of the analysis.

[4] The analysis was carried out using the default settings for the psmatch2 command in Stata.

Table 9: Probit regression of take-up as a function of baseline characteristics

	Ordinary and commitment treatment observations only		Commitment treatment observations only	
	Any active account with OBM[a]	**Any transfer via direct deposit**	**Any active account with OBM[b]**	**Any transfer via direct deposit**
	(1)	**(2)**	**(3)**	**(4)**
Female	–0.0129	0.0233	–0.0492	0.0225
	(0.0290)	(0.0225)	(0.0372)	(0.0313)
Married	–0.0272	–0.0324	–0.0284	–0.0380
	(0.0434)	(0.0374)	(0.0608)	(0.0553)
Age (years)	0.000303	0.00146*	4.88e-05	0.00207***
	(0.000881)	(0.000752)	(0.00109)	(0.000755)
Years of education	0.00901***	0.00677***	0.00907***	0.00773**
	(0.00289)	(0.00233)	(0.00323)	(0.00316)
Household size	0.00364	0.00642*	0.00173	0.00339
	(0.00425)	(0.00350)	(0.00574)	(0.00427)
Asset index	0.00280	0.000543	–0.0130	–0.0137**
	(0.00665)	(0.00564)	(0.00862)	(0.00682)
Livestock index	0.00753	–0.00284	0.00576	0.00607
	(0.00867)	(0.00733)	(0.00972)	(0.00820)
Land under cultivation (acres)	0.00659	0.00548	0.00866	0.00506
	(0.00556)	(0.00497)	(0.00696)	(0.00514)
Has bank account	0.222***	0.0589***	0.227***	0.0622**
	(0.0260)	(0.0185)	(0.0394)	(0.0288)
Savings in accounts and cash (in MK10,000s)	–0.00845	–0.00448	0.00792	–0.0103
	(0.00887)	(0.00582)	(0.0146)	(0.00936)
Hyperbolic	–0.00685	0.00723	–0.0368	–0.00102
	(0.0276)	(0.0241)	(0.0347)	(0.0269)
Patient now, impatient later	–0.0147	–0.0155	–0.0182	–0.0326
	(0.0200)	(0.0165)	(0.0291)	(0.0281)
Cash spent on inputs (in MK10,000s)	–0.00500*	–0.00117	–0.00124	0.00120
	(0.00280)	(0.00239)	(0.00384)	(0.00343)
Proceeds from crop sales (in MK10,000s)	0.00160**	0.000880	–0.000305	0.000775
	(0.000792)	(0.000775)	(0.00113)	(0.00103)
Net transfers made in past 12 months (in MK10,000s)	0.0171	0.0163*	0.00904	0.0174
	(0.0106)	(0.00902)	(0.0136)	(0.0115)
Mean dependent variable	0.335	0.178	0.319	0.177
Pseudo-R^2	0.268	0.246	0.334	0.308
Number of observations	2,726	2,726	1,314	1,314

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects. Missing values for hyperbolic dummy, for dummy *Patient now, impatient later*, and for savings in accounts and cash have been replaced with zeros, and dummies for missing values are included as controls. For readability, monetary variables are defined in units of MK10,000. [a] = 1 if the respondent had an active account with Opportunity Bank of Malawi (OBM); *active* means all steps of account registration were completed including payment of opening fee, and balance exceeds minimum (if applicable) when data were provided on 22 October 2009, and zero if not. [b] = 1 if the respondent deposits any harvest revenue to the respondent's individual savings account, and zero if not. Standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Descriptive statistics for the farmers who took up the treatment and for the control group are provided in Table 10. Comparing baseline and endline values for the farmers who took up the treatment is not straightforward, as the variables are defined slightly differently. However, comparing the take-up group with the comparison group selected from the control group permits us to identify a number of potentially interesting results.

Table 10: Comparison of baseline and endline averages for farmers opening and using bank accounts with averages for a comparison group selected from the control group using propensity score matching

	Averages		
Variables	Adopters	Control	p > | t |
Baseline characteristics			
Female	0.04680	0.02956	0.200
Married	0.96305	0.98522	0.047
Age (years)	49.64000	49.84700	0.822
Years of education	5.37440	5.61580	0.304
Household size	5.94830	6.15020	0.148
Asset index	0.15102	0.02271	0.365
Livestock index	–0.01102	–0.12079	0.195
Land under cultivation (acres)	4.96570	5.01340	0.754
Cash spent on inputs (MK)	25471	23056	0.427
Proceeds from crop sales (MK)	1.6e5	1.5e5	0.460
Has bank account	0.80788	0.79803	0.725
Savings in cash at home (MK)	909.58	889.41	0.928
Savings in bank accounts (MK)	2,402.7	1,120.5	0.008
Hyperbolic	0.11576	0.09852	0.428
Patient now, impatient later	0.29557	0.25123	0.157
Net transfers made in past 12 months (MK)	2,348.3	1,484.8	0.125
Endline survey outcomes			
Land under cultivation (acres)	5.7346	4.5083	0.000
Total value of inputs (MK)	1.1e5	66,039	0.000
Proceeds from crop sales (MK)	2.0e5	1.1e5	0.000
Value of crop output (sold and not sold) (MK)	2.8e5	1.7e5	0.000
Farm profit output (output – input) (MK)	1.7e5	1.1e5	0.000
Total expenditure in last 30 days (MK)	15761	10887	0.000
Household size	5.94330	5.82270	0.000
Total transfers made (MK)	4,278.5	3,022.2	0.000
Total transfers received (MK)	2,503.3	2,796.3	0.000
Total net transfers made (MK)	1,747.4	218.7	0.004
Tobacco loan amount (MK)	71,640	54,006	0.000
Has fixed deposit account	0.10345	0.02956	0.000

As may be seen from the table, the two groups' averages for the baseline variables are in most cases very similar, but average values for the endline variables differ markedly.

[5,6] There was no significant difference between the groups in the size of land under cultivation or in the amount of cash spent on inputs in the baseline survey, but the endline survey reports the adopters of the bank accounts using markedly more land and spending far more on inputs than the comparison group. Presumably as a result of this, proceeds and profits in the endline survey are substantially higher for the adopters than for the control group, as are – importantly for household welfare – expenditure averages for the last 30 days prior to the endline survey. Profits and expenditure are both some 50 per cent higher for the adopter group than for the control group in the endline survey.

It should be emphasised that although we think it is interesting to try to estimate outcomes for farmers who actually made use of the offered savings vehicles, there are a number of potential statistical issues that make this analysis less clear-cut than the analyses reported in sections 2 through 4. As described in Section 1, all farmers in the treatment and the control groups were provided with general encouragement to save more for future input purchases. Thus, even farmers in the control group had characteristics that were slightly different from those of farmers in the general population.

There is also a possibility that farmers in the same club affected each other's behaviour to some extent, even if they did not make the same choices about savings vehicles, so that observations of different farmers in the same club are not fully independent from a statistical standpoint. Thus, for instance, a farmer who chose not to open a savings account might nonetheless see neighbours who did subsequently spending more on inputs, and choose to emulate that behaviour. To the extent that these types of effects mattered, it seems likely that they would reduce the estimated impact of opening and using the savings accounts, so the fact that these impacts were nonetheless estimated to be so large is, we believe, interesting. Nonetheless, these cautions need to be borne in mind.

6. Concluding remarks

Brune and colleagues (2016) research is an important contribution to the academic literature on the impact of microfinance. Although we hope our replication study also contributes to this literature, we would like to stress that the replication work was not occasioned by any misgivings on our part about the original research; rather, we were interested in the original study and hoped to enhance its relevance to policymakers and future researchers.

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[5] One potentially important exception is that the take-up group had larger average *Savings in bank accounts* prior to the experiment. However, the difference in averages is quite small in absolute numbers (compared to, e.g. the outcomes in the endline survey), and there is no comparable difference in the *Has bank account* dummy variable, suggesting that this difference does not reflect differences in the understanding of, or willingness to use, financial instruments. Exploratory matching analyses using fewer variables, in which there was no significant difference between the two groups for this variable, gave largely similar results for the endline variables.

[6] Based on a suggestion from a reviewer, we also attempted to use the same matching procedure to select a 'control' group from the remainder of the treatment group, i.e. from farmers who were offered the treatment but did not adopt it. If it had been possible to create a control group from this group, none of whom actually adopted the offered treatment, then that would have indicated that the decision to adopt the treatment was based mainly on unobservables, invalidating the matching procedure. However, the control group we selected in this fashion was markedly different from the group of farmers who adopted the treatment, indicating that the matching could be done using the available observable variables.

We only had access to data that had already been cleaned and winsorised. However, our results were generally supportive of the original study. All our results from the push-button and pure replications are consistent with the results reported by the original authors. In the few cases of minor discrepancies between their results and ours, these discrepancies do not affect the conclusions drawn in their paper. Thus, our replication results fully support not only the results reported in the original paper but also the authors' conclusions drawn from their findings.

The results from the robustness checks carried out in our estimation analysis are also generally in support of the findings in the original paper. In some cases, these checks led to lower statistical significance and/or smaller estimated coefficients than in the original study, while in other cases, they led to higher statistical significance and/or larger coefficients. Nonetheless, these checks did not reveal any systematic problems with the original analysis.

Moreover, in our examination of farmers who had chosen to make use of the offered financial products – an extension the original authors did not make in their study – our results also indicate support for the findings from the original study. Adopting the offered savings vehicle led to substantial increases in farm output and profits. The time frame studied in the experiment was relatively short, and adoption of the savings vehicles was fairly limited during this time. However, considering the large effects for farmers who did adopt the savings vehicles, it does not seem unreasonable that neighbours who observed this would also begin to adopt the treatment, and that, in future, its positive effects could grow even beyond those reported in the original study.

There is a risk that policymakers will ignore findings from unreplicated research, because they are not convinced the results are robust. This is especially the case when, as here, the original study has identified effects from a treatment but is unable to identify the mechanisms through which those effects occurred. In our replication study, we have examined a number of potential weaknesses in the original study and consistently found results that were either identical to, or similar to, those reported by the original authors. This strongly suggests that the effects they identify are there, even if the exact causal mechanisms remain unclear.

It is clear that more research is needed to identify the causal mechanisms through which improved access to savings vehicles led to improved farming outcomes and improved well-being among the targeted farmers. Notably, in similar future experiments, it would probably be useful to include survey questions probing farmers' access to different social networks that provide informal mechanisms for savings and borrowing. Qualitative in-depth interviews with some of the participating farmers could help explore their motives for making use of the vehicles or not. We also believe a larger control group would have made it easier to evaluate some of the effects studied, both for our study and for the original authors, and recommend that future experiments on similar topics ensure a sufficiently large control group.

Nonetheless, even if the exact mechanisms remain to be investigated, it is obvious that farming outcomes and well-being were improved by this intervention. Thus, we would make recommendations similar to those of the original authors. Offering these savings vehicles to more farmers would thus be good agricultural policy.

Appendixes

Table A1: Assignment of clubs to treatment conditions – push-button replication

	Assignment of clubs to treatment conditions		
	No savings intervention	Savings intervention	
		Ordinary accounts offered	Ordinary and commitment accounts offered
No raffle	Group 0: 42 clubs	Group 1: 43	Group 4: 42
Public distribution of raffle tickets	n/a	Group 2: 44	Group 5: 43
Private distribution of raffle tickets	n/a	Group 3: 43	Group 6: 42

Note: The results reported in this table were produced by the Stata code provided by the authors of the original study and are completely consistent with Table 1 on p.193 of their published paper.

Table A2: Summary statistics – push-button replication

	Mean	Standard deviation	10th percentile	Median	90th percentile	Observations
Panel A						
Any treatment	0.865	0.341				3,150
Panel B						
Ordinary treatment	0.448	0.497				3,150
Commitment treatment	0.417	0.493				3,150
Panel C						
Ordinary, no raffle	0.146	0.354				3,150
Ordinary, private raffle	0.149	0.356				3,150
Ordinary, public raffle	0.153	0.360				3,150
Commitment, no raffle	0.136	0.342				3,150
Commitment, private raffle	0.142	0.349				3,150
Commitment, public raffle	0.139	0.346				3,150
Baseline characteristics						
Number of members per club	13.88	6.44	9	11	23	299
Female	0.063	0.243				3,150
Married	0.955	0.208				3,150
Age (years)	45.02	13.61	28	44	64	3,150
Years of education	5.45	3.53	0	6	10	3,150
Household size	5.79	1.99	3	6	9	3,150
Asset index	–0.02	1.86	–1.59	–0.67	2.46	3,150
Livestock index	–0.03	1.15	–1.00	–0.36	1.37	3,150
Land under cultivation (acres)	4.67	2.14	2.50	4.03	4.02	3,150
Cash spent on inputs (MK)	25,169	41,228	0	10,000	64,500	3,150
Proceeds from crop sales (MK)	125,657	174,977	7,000	67,000	300,000	3,150
Has bank account	0.634	0.482				3,150
Savings in cash at home (MK)	1,244	3,895	0	0	3,000	3,150
Savings in bank accounts (MK)	2,083	8,265	0	0	3,000	2,949
Hyperbolic	0.102	0.303				3,117
Patient now, impatient later	0.304	0.460				3,117
Net transfers made in past 12 months (MK)	1,753	7,645	-2,990	500	8,100	3,150
Missing value for formal savings and cash	0.064	0.244				3,150
Missing value for time preferences	0.010	0.102				3,150
Transactions with partner institution						
Any transfer via direct deposit	0.154	0.361				3,150

	Mean	Standard deviation	10th percentile	Median	90th percentile	Observations
Deposit into ordinary accounts, pre-planting (MK)	18,472	82,396	0	0	38,907	3,150
Deposit into commitment accounts, pre-planting (MK)	615	5,367	0	0	0	3,150
Deposit into other accounts, pre-planting (MK)	296	3,804	0	0	0	3,150
Total deposits into accounts, pre-planting (MK)	19,383	84,483	0	0	40,694	3,150
Total withdrawals from accounts, pre-planting (MK)	18,621[ii]	81,744	0	0	38,562[ii]	3,150
Net of all transactions, pre-planting (MK)	762	13,857	0	0	649	3,150
Net of all transactions, November–December (MK)	–848	6,870	0	0	1.930	3,150
Net of all transactions, January–April (MK)	–269	4,032	0	0	3.830	3,150
Any active account with Opportunity Bank of Malawi	0.322	0.467				3,150
Endline survey outcomes						
Land under cultivation (acres)	4.52	2.66	2.00	4.00	8.00	2,835
Cash spent on inputs (MK)[iii]						
Total value of inputs (MK)	68,046	84,014	1,500	43,750	157,272	2,835
Proceeds from crop sales (MK)	109,604	162,580	0	56,000	270,000	2,835
Value of crop output (sold and not sold) (MK)	177,747	201,131	27,480	115,582	387,203	2,835
Farm profit output (output – input) (MK)	110,703	156,747	0	70,372	264,953	2,835
Total expenditure in last 30 days (MK)	11,905	13,219	2,250	7,500	26,000	2,835
Household size	5.80	2.15	3.00	6.00	9.00	2,835
Total transfers made (MK)	3,152	5,099	0	1,300	8,000	2,835
Total transfers received (MK)	2,204	4,377	0	500	6,050	2,835
Total net transfers made (MK)	939	5,896	–3,000	350	5,750	2,835
Tobacco loan amount (MK)	40,787	77,962	–3,000	350	5,750	2,835
Has fixed deposit account	0.067	0.250				2,835
Not interviewed in follow-up	0.100	0.300				2,835

Note: The results reported in this table were produced by the Stata code provided by the authors of the original study and are completely consistent with Table 2 on pp.198–199 of their published paper, except for the following minor differences: [i] On the first line of reported results, *Control group*, no values were calculated by the code provided by the original authors, but since all farmers were members of either the control group or one of the treatment groups, the mean value must by definition be given by 1 minus the mean value of the *Any treatment* variable, and the standard deviation must by definition be the same as the standard deviation of the *Any treatment* variable, which in both cases gives the values reported in the original authors' paper. When we calculated these values ourselves as part of our pure replication, this produced the same results (Table 2) as those reported in the original authors' table. [ii] When providing us with their data and code, the original authors identified two typographical errors on the *Total withdrawals from accounts, pre-planting (MK)* line: the authors stated that the mean value (which had been reported as 18,600) should have been reported as MK18,651, while our result for this value was MK18,621 (which, rounded off to the nearest hundred, would actually give the MK18,600 reported in the published paper); and the 10th and 90th percentile values had been flipped, presumably because these were recorded as negative values in the data set. When we calculated these values ourselves as part of our pure replication, this produced the same results (Table 2) as those reported here. [iii] The original authors' code and data did not provide any values for the *Cash spent on inputs* variable from the endline survey. This variable was not used in any of their subsequent analyses, and we had not planned to use it in our replication study, so the omission of this variable from the code and data did not affect our analysis.

Table A3: Test of balance in baseline characteristics: ordinary least squares regressions – push-button replication

	Panel A	Panel B		Control group
	Any treatment	Ordinary treatment	Commitment treatment	Mean dependent variable[ii]
Female	0.044***	0.042***	0.045***	
	(0.012)	(0.013)	(0,013)	
Married	–0,018**	–0.018*	–0.019*	
	(0.009)	(0.010)	(0.010)	
Age (years)	–1.42	–1.45	–1.39	
	(0.93)	(0.98)	(0.97)	
Years of education	0.14	0.19	0.09	
	(0.20)	(0.22)	(0.22)	
Household size	–0.03	–0.02	–0.04	
	(0.13)	(0.13)	(0.13)	
Asset index	0.08	0.09	0.07	
	(0.11)	(0.12)	(0.12)	
Livestock index	–0.07	–0.07	–0.06	
	(0.09)	(0.09)	(0.09)	
Land under cultivation (acres)	–0.01	0.02	–0.05	
	(0.14)	(0.15)	(0.15)	
Proceeds from crop sales (MK)	6,997	8,294	5,604	
	(8,891)	(9,639)	(9,779)	
Cash spent on inputs (MK)	3,918*	4,459**	3,337	
	(2,027)	(2,209)	(2,357)	
Has bank account	–0.021	–0.005	–0.039	
	(0.029)	(0.031)	(0.032)	
Savings in accounts or cash	371	367	376	
	(550)	(588)	(612)	
Hyperbolic	0.012	0.000	0.024	
	(0.017)	(0.018)	(0.019)	
Patient now, impatient later	–0.054	–0.034	–0.076**	
	(0.034)	(0.037)	(0.036)	
Net transfers made in past 12 months	72	320	–195	
	(452)	(475)	(476)	
Missing value: Formal savings and cash	–0.002	0.000	–0.004	
	(0.013)	(0.015)	(0.014)	
Missing value: Time preference	0.001	0.000	0.003	
	(0.005)	(0.005)	(0.005)	
***p*-values for *F*-test of joint significance of baseline variables**	[i]	0.8851	0.6168	
Number of observations	3,150			

Note: The results reported in this table were produced by the Stata code provided by the authors of the original study and are completely consistent with Table 3 on p.201 of their published paper, except for the following minor differences: [i] The original authors' code did not provide for this test to be carried out. When we carried out this test as part of our pure replication, our results (Table 3) were in line with those reported in the original authors' table. [ii] The original authors' code did not provide any values for the mean dependent variable in the control group. When we calculated these values ourselves as part of our pure replication, this produced the same results (Table 3) as those reported in the original authors' table. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table A4: Impact of treatments on deposits and withdrawals: ordinary least squares regressions – push-button replication

	March 2009–April 2010: Any transfer via direct deposit (take-up)	March–October 2009				
		Total deposits into accounts (MK)	Deposits into ordinary accounts (MK)	Deposits into commitment accounts (MK)	Deposits into other accounts (MK)	Total withdrawals from accounts (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.194***	17,609***	16,807***	668***	134	–16,761***
	(0.036)	(3,910)	(3,773)	(224)	(163)	(3,819)
Panel B						
Ordinary treatment	0.181***	16,513***	16,611***	–88	–9	-16,071***
	(0.040)	(4,840)	(4,743)	(181)	(163)	(4,745)
Commitment treatment	0.207***	18,801***	17,021***	1,490***	290	–17,511***
	(0.039)	(4,360)	(4,137)	(358)	(202)	(4,235)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal**	0.432	0.642	0.931	0.00	0.074	0.764
Mean dependent variable in control group[i]						

Note: The results reported in this table were produced by the Stata code provided by the authors of the original study and are completely consistent with Table 4 on p.205 of their published paper, except for the following minor differences: [i] The original authors' code did not provide any values for the mean dependent variable in the control group. When we calculated these values ourselves as part of our pure replication, this produced the same results (Table 4) as those reported in the original authors' table. *** denotes significance at the 1% level.

Table A5: Impact of treatments on savings balances: ordinary least squares regressions – push-button replication

	All accounts, in total	Ordinary only	Commitment only	Other
	(1)	(2)	(3)	(4)
Panel A				
Any treatment	1,863***	1167***	435***	262**
	(412)	(302)	(154)	(124)
Panel B				
Ordinary treatment	1,301***	1,167***	–26	160
	(442)	(349)	(129)	(129)
Commitment treatment	2,475***	1,167***	935***	372**
	(524)	(364)	(238)	(187)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal**	0.019	0.999	0.00	0.290
Mean dependent variable in control group[i]				

Note: The results reported in this table were produced by the Stata code provided by the authors of the original study and are completely consistent with Table 5 on p.210 of their published paper, except for the following minor differences: [i] The original authors' code did not provide any values for the mean dependent variable in the control group. When we calculated these values ourselves as part of our pure replication, this produced the same results (Table 5) as those reported in the original authors' table. ** and *** denote significance at the 5% and 1% levels, respectively.

Table A6: Impact of treatments on agricultural outcomes in 2009–2010 season and household expenditure after 2010 harvest – push-button replication

	Land under cultivation (acres)	Total value of inputs (MK)	Proceeds from crop sales (MK)	Value of crop output (sold and not sold) (MK)	Farm profit (output – input) (MK)	Total expenditure in 30 days before survey (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.30**	8,023**	19,595**	23,921**	16,927*	1,151*
	(0.15)	(4,131)	(8,996)	(11,529)	(9,117)	(601)
Panel B						
Ordinary treatment	0.27*	5,946	13,358	17,223	12,872*	885
	(0.16)	(4,504)	(9,518)	(12,204)	(9,577)	(650)
Commitment treatment	0.33**	10,297**	26,427***	31,259**	21,369**	1442**
	(0.16)	(4,563)	(9,979)	(12,510)	(10,064)	(656)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal**	0.614	0.246	0.086	0.117	0.246	0.283
Mean dependent variable in control group[i]						

Note: The results reported in this table were produced by the Stata code provided by the authors of the original study and are completely consistent with Table 6 on p.212 of their published paper, except for the following minor differences: [i] The original authors' code did not provide any values for the mean dependent variable in the control group. When we calculated these values ourselves as part of our pure replication, this produced the same results (Table 4) as those reported in the original authors' table. *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table A7: Impact of treatments on household size, transfers and fixed deposit demand – push-button replication

	Household size	Tobacco loan amount (MK)	Total transfers made (MK)	Total transfers received (MK)	Total net transfers made (MK)	Has fixed deposit account
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.14	3,158	215	–301	477	0.032***
	(0.09)	(4,583)	(249)	(248)	(322)	(0.012)
Panel B						
Ordinary treatment	0.15'	2,920	134	–288	394*	0.016
	(0.09)'	(5,068)	(267)	(262)	(342)	(0.012)
Commitment treatment	0.13'	3,418	304	–316	568	?0?.050***
	(0.09)'	(4,897)	(275)	(258)	(347)	(0.014)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal**	0.748	0.899	0.431	0.856	0.483	0.008
Mean dependent variable in control group[ii]						

Note: The results reported in this table were produced by the Stata code provided by the authors of the original study and are completely consistent with Table 7 on p.214 of their published paper, except for the following minor differences: [i] The original authors' published paper reported somewhat different results here (–0.004 and 0.019 as the coefficient and standard error for the commitment treatment group, rather than the 0.13 and 0.09 that we found, and –0.010 and 0.019 as the coefficient and standard error for the ordinary treatment group, rather than the 0.15 and 0.09 that we found). Neither the results they report, nor those we do, are statistically significant. [ii] The original authors' code did not provide any values for the mean dependent variable in the control group. When we calculated these values ourselves as part of our pure replication, this produced the same results (Table 7) as those reported in the original authors' table. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table A8: Table 4 after trimming of the observations with the 1%most extreme values for the *Cash spent on inputs* variable in the baseline survey

	March 2009–April 2010: Any transfer via direct deposit (take-up)	March–October 2009				
		Total deposits into accounts (MK)	Deposits into ordinary accounts (MK)	Deposits into commitment accounts (MK)	Deposits into other accounts (MK)	Total withdrawals from accounts (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.193***	16,772***	15,977***	660.9***	133.7	–15,877***
	(0.0354)	(3,649)	(3,510)	(223.0)	(163.4)	(3,532)
Panel B						
Ordinary treatment	0.182***	15,541***	15,632***	–94.78	3.798	–14,955***
	(0.0395)	(4,564)	(4,468)	(181.4)	(163.1)	(4,439)
Commitment treatment	0.206***	18,115***	16,354***	1,485***	275.5	–16,882***
	(0.0389)	(4,055)	(3,820)	(357.6)	(201.8)	(3,912)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal [a]**	0.4604	0.582	0.8728	0.000	0.1010	0.6714
Number of observations	3,117	3,117	3,117	3,117	3,117	3,117

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been trimmed at 1%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] = This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *** denotes significance at the 1% level.

Table A9: Table 5 after trimming of the observations with the 1%most extreme values for the *Cash spent on inputs* variable in the baseline survey

	All accounts, in total	Ordinary only	Commitment only	Other
	(1)	(2)	(3)	(4)
Panel A				
Any treatment	1,769***	1,089***	421.9***	257.4**
	(399.2)	(283.5)	(152.7)	(125.5)
Panel B				
Ordinary treatment	1,120***	987.2***	–32.09	165.3
	(412.5)	(312.1)	(130.0)	(130.7)
Commitment treatment	2,476***	1,201***	917.0***	357.9*
	(528.4)	(362.0)	(237.8)	(190.1)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal [a]**	0.0068	0.5570	0.000	0.3466
Number of observations	3,117	3,117	3,117	3,117

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been trimmed at 1%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

Table A10: Table 6 after trimming of the observations with the 1% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	Land under cultivation (acres)	Total value of inputs (MK)	Proceeds from crop sales (MK)	Value of crop output (sold and not sold) (MK)	Farm profit (output – input) (MK)	Total expenditure in 30 days before survey (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.286*	7,912*	18,154**	22,327**	15,559*	1,108*
	(0.149)	(4,081)	(8,585)	(11,141)	(8,860)	(604.1)
Panel B						
Ordinary treatment	0.243	5,861	12,132	15,113	10,908	911.6
	(0.160)	(4,457)	(9,141)	(11,827)	(9,309)	(654.6)
Commitment treatment	0.333**	10,162**	24,762***	30,243**	20,664**	1,323**
	(0.158)	(4,510)	(9,525)	(12,080)	(9,789)	(656.5)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.4225	0.2476	0.0882	0.0830	0.1723	0.4228
Number of observations	2,803	2,803	2,803	2,803	2,803	2,803

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been trimmed at 1%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

Table A11: Table 7 after trimming of the observations with the 1% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	Household size	Tobacco loan amount (MK)	Total transfers made (MK)	Total transfers received (MK)	Total net transfers made (MK)	Has fixed deposit account
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.143*	3,278	192.4	–308.7	461.5	0.0318***
	(0.0847)	(4,637)	(247.2)	(247.9)	(319.6)	(0.0116)
Panel B						
Ordinary treatment	0.150	3,363	119.8	–311.1	402.6	0.0163
	(0.0907)	(5,117)	(264.2)	(262.5)	(338.7)	(0.0121)
Commitment treatment	0.136	3,185	272.0	–306.1	526.1	0.0488***
	(0.0913)	(4,931)	(274.0)	(257.9)	(345.6)	(0.0141)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.8411	0.9634	0.4722	0.9752	0.6154	0.0109
Number of observations	2,803	2,803	2,803	2,803	2,803	2,803

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been trimmed at 1%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. * and *** denote significance levels at 10% and 1%, respectively.

Table A12: Table 4 after trimming of the observations with the 5% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	March 2009–April 2010: Any transfer via direct deposit (take-up)	March–October 2009				
		Total deposits into accounts (MK)	Deposits into ordinary accounts (MK)	Deposits into commitment accounts (MK)	Deposits into other accounts (MK)	Total withdrawals from accounts (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.193***	15,786***	14,999***	683.7***	102.6	–14,914***
	(0.0359)	(3,437)	(3,286)	(237.3)	(170.9)	(3,300)
Panel B						
Ordinary treatment	0.180***	14,487***	14,593***	-90.95	–14.51	–13,929***
	(0.0400)	(4,173)	(4,072)	(191.6)	(170.5)	(4,029)
Commitment treatment	0.207***	17,193***	15,440***	1,523***	229.4	–15,981***
	(0.0392)	(3,845)	(3,586)	(380.8)	(209.4)	(3,681)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.4228	0.5178	0.8326	0.00	0.1478	0.6119
Number of observations	2,992	2,992	2,992	2,992	2,992	2,992

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later (missing values replaced with zeros)*; *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been trimmed at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *** denotes significance at the 1% level.

Table A13: Table 5 after trimming of the observations with the 5% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	All accounts, in total	Ordinary only	Commitment only	Other
	(1)	(2)	(3)	(4)
Panel A				
Any treatment	1,711***	1,013***	442.0***	256.4*
	(419.6)	(291.2)	(165.3)	(131.8)
Panel B				
Ordinary treatment	1,032**	917.0***	–37.63	152.8
	(442.6)	(331.7)	(143.6)	(133.3)
Commitment treatment	2,447***	1,116***	961.8***	368.7*
	(551.1)	(363.9)	(256.3)	(200.8)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.0077	0.5987	0.000	0.3083
Number of observations	2,992	2,992	2,992	2,992

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been trimmed at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

Table A14: Table 6 after trimming of the observations with the 5% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	Land under cultivation (acres)	Total value of inputs (MK)	Proceeds from crop sales (MK)	Value of crop output (sold and not sold) (MK)	Farm profit (output – input) (MK)	Total expenditure in 30 days before survey (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.283*	6,189	17,653**	20,838*	15,586*	1,057*
	(0.144)	(4,084)	(8,942)	(11,460)	(9,346)	(594.7)
Panel B						
Ordinary treatment	0.244	3,794	11,373	13,534	11,111	887.6
	(0.157)	(4,448)	(9,394)	(12,056)	(9,747)	(649.3)
Commitment treatment	0.326**	8,792*	24,480**	28,779**	20,451**	1,241*
	(0.154)	(4,536)	(9,806)	(12,325)	(10,178)	(650.4)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.4821	0.1806	0.0635	0.0677	0.1769	0.5032
Number of observations	2,668	2,668	2,668	2,668	2,668	2,668

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been trimmed at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. * and ** denote significance levels at 10% and 5%, respectively.

Table A15: Table 7 after trimming of the observations with the 5% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	Household size	Tobacco loan amount (MK)	Total transfers made (MK)	Total transfers received (MK)	Total net transfers made (MK)	Has fixed deposit account
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.133	2,492	124.7	–324.7	410.4	0.0295**
	(0.0855)	(4,645)	(250.9)	(259.4)	(327.2)	(0.0119)
Panel B						
Ordinary treatment	0.142	3,127	54.62	–364.9	393.8	0.0147
	(0.0918)	(5,127)	(267.6)	(275.7)	(346.6)	(0.0126)
Commitment treatment	0.124	1,802	200.9	–281.1	428.5	0.0457***
	(0.0924)	(4,925)	(276.8)	(270.0)	(352.7)	(0.0142)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.7941	0.7324	0.4850	0.6176	0.8879	0.0154
Number of observations	2,668	2,668	2,668	2,668	2,668	2,668

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been trimmed at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. ** and *** denote significance levels at 5% and 1%, respectively.

Table A16: Table 4 after winsorising of the observations with the 5% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	March 2009–April 2010: Any transfer via direct deposit (take-up)	March–October 2009				
		Total deposits into accounts (MK)	Deposits into ordinary accounts (MK)	Deposits into commitment accounts (MK)	Deposits into other accounts (MK)	Total withdrawals from accounts (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.193***	17,878***	17,079***	668.1***	130.6	–17,049***
	(0.0356)	(3,933)	(3,795)	(223.8)	(163.9)	(3,844)
Panel B						
Ordinary treatment	0.181***	16,799***	16,900***	–87.57	–14.00	–16,383***
	(0.0397)	(4,818)	(4,720)	(181.0)	(163.5)	(4,726)
Commitment treatment	0.207***	19,047***	17,273***	1,487***	287.3	–17,772***
	(0.0391)	(4,418)	(4,198)	(357.0)	(202.5)	(4,290)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.4324	0.6465	0.9376	0.000	0.0701	0.7714
Number of observations	3,150	3,150	3,150	3,150	3,150	3,150

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been winsorised at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *** denotes significance at the 1% level.

Table A17: Table 5 after winsorising of the observations with the 5% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	All accounts, in total	Ordinary only	Commitment only	Other
	(1)	(2)	(3)	(4)
Panel A				
Any treatment	1,885***	1,193***	433.5***	258.3**
	(416.3)	(309.6)	(153.0)	(123.5)
Panel B				
Ordinary treatment	1,319***	1,189***	–26.29	155.5
	(451.5)	(361.9)	(129.1)	(128.0)
Commitment treatment	2,498***	1,196***	932.0***	369.7**
	(524.0)	(367.0)	(236.6)	(186.7)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.0198	0.9858	0.0000	0.2838
Number of observations	3,150	3,150	3,150	3,150

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been winsorised at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. ** and *** denote significance levels at 5% and 1%, respectively.

Table A18: Table 6 after winsorising of the observations with the 5% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	Land under cultivation (acres)	Total value of inputs (MK)	Proceeds from crop sales (MK)	Value of crop output (sold and not sold) (MK)	Farm profit (output – input) (MK)	Total expenditure in 30 days before survey (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.303**	8,144*	19,701**	23,794**	16,731*	1,141*
	(0.150)	(4,164)	(8,980)	(11,523)	(9,101)	(600.9)
Panel B						
Ordinary treatment	0.275*	5,973	13,482	17,044	12,732	875.0
	(0.161)	(4,525)	(9,492)	(12,198)	(9,570)	(650.3)
Commitment treatment	0.333**	10,510**	26,478***	31,150**	21,090**	1,431**
	(0.159)	(4,605)	(9,973)	(12,504)	(10,045)	(654.9)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.6068	0.2265	0.0871	0.1152	0.2544	0.2826
Number of observations	2,835	2,835	2,835	2,835	2,835	2,835

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been winsorised at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

Table A19: Table 7 after winsorising of the observations with the 5% most extreme values for the *Cash spent on inputs* variable in the baseline survey

	Household size	Tobacco loan amount (MK)	Total transfers made (MK)	Total transfers received (MK)	Total net transfers made (MK)	Has fixed deposit account
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.138	3,334	215.4	–317.9	494.1	0.0320***
	(0.0850)	(4,566)	(249.5)	(249.2)	(323.1)	(0.0115)
Panel B						
Ordinary treatment	0.150	3,126	128.6	–309.1	410.7	0.0162
	(0.0912)	(5,045)	(267.7)	(263.1)	(342.3)	(0.0121)
Commitment treatment	0.126	3,560	310.1	–327.5	584.9*	0.0492***
	(0.0914)	(4,893)	(276.5)	(259.3)	(349.2)	(0.0140)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.7150	0.9122	0.4010	0.9075	0.4834	0.0086
Number of observations	2,835	2,835	2,835	2,835	2,835	2,835

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of cash spent on inputs (MK) have been winsorised at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. * and *** denote significance levels at 10% and 1%, respectively.

Table A20: Table 4 after trimming of the observations with the 1% most extreme values for the *Total input spending* variable in the endline survey

	March 2009–April 2010: Any transfer via direct deposit (take-up)	March–October 2009				
		Total deposits into accounts (MK)	Deposits into ordinary accounts (MK)	Deposits into commitment accounts (MK)	Deposits into other accounts (MK)	Total withdrawals from accounts (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.199***	17,191***	16,403***	647.0***	141.3	–16,530***
	(0.0365)	(3,813)	(3,685)	(229.3)	(178.7)	(3,767)
Panel B						
Ordinary treatment	0.185***	16,707***	16,824***	–98.61	–18.11	–16,587***
	(0.0403)	(4,809)	(4,725)	(175.0)	(177.9)	(4,763)
Commitment treatment	0.214***	17,724***	15,939***	1,468***	316.9	–16,468***
	(0.0403)	(4,109)	(3,873)	(372.7)	(222.8)	(4,042)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.3697	0.8305	0.8472	0.000	0.0693	0.9796
Number of observations	2,806	2,806	2,806	2,806	2,806	2,806

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of total value of input (MK) have been trimmed at 1%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *** denotes significance at the 1% level.

Table A21: Table 5 after trimming of the observations with the 1% most extreme values for the *Total input spending* variable in the endline survey

	All accounts, in total	Ordinary only	Commitment only	Other
	(1)	(2)	(3)	(4)
Panel A				
Any treatment	1,754***	1,028***	396.5***	329.5**
	(413.0)	(295.8)	(145.6)	(144.5)
Panel B				
Ordinary treatment	1,035**	875.8***	–49.14	208.2
	(417.5)	(311.0)	(120.3)	(148.3)
Commitment treatment	2,545***	1,195***	887.3***	463.0**
	(550.8)	(389.5)	(230.1)	(216.5)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.0032	0.3957	0.000	0.2645
Number of observations	2,806	2,806	2,806	2,806

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of total value of inputs (MK) have been trimmed at 1%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. ** and *** denote significance levels at 5% and 1%, respectively.

Table A22: Table 6 after trimming of the observations with the 1% most extreme values for the *Total input spending* variable in the endline survey

	Land under cultivation (acres)	Total value of inputs (MK)	Proceeds from crop sales (MK)	Value of crop output (sold and not sold) (MK)	Farm profit (output – input) (MK)	Total expenditure in 30 days before survey (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.271*	5,856	17,657**	21,384*	15,867*	1,026*
	(0.145)	(3,945)	(8,789)	(11,199)	(8,876)	(588.7)
Panel B						
Ordinary treatment	0.260*	4,885	13,383	16,461	12,192	837.1
	(0.156)	(4,326)	(9,276)	(11,792)	(9,284)	(641.9)
Commitment treatment	0.283*	6,925	22,363**	26,804**	19,915**	1,233*
	(0.154)	(4,325)	(9,761)	(12,178)	(9,787)	(639.0)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.8308	0.5656	0.2216	0.2266	0.2687	0.4378
Number of observations	2,806	2,806	2,806	2,806	2,806	2,806

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of total value of inputs (MK) have been trimmed at 1%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. * and ** denote significance levels at 10% and 5%, respectively.

Table A23: Table 7 after trimming of the observations with the 1% most extreme values for the *Total input spending* variable in the endline survey

	Household size	Tobacco loan amount (MK)	Total transfers made (MK)	Total transfers received (MK)	Total net transfers made (MK)	Has fixed deposit account
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.139	2,590	192.7	–282.9	438.6	0.0316***
	(0.0851)	(4,571)	(244.8)	(241.7)	(315.0)	(0.0116)
Panel B						
Ordinary treatment	0.144	2,610	100.4	–279.1	356.0	0.0159
	(0.0914)	(5,033)	(261.8)	(256.7)	(333.3)	(0.0121)
Commitment treatment	0.134	2,569	294.3	–287.2	529.5	0.0487***
	(0.0917)	(4,884)	(271.7)	(251.7)	(341.2)	(0.0141)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.8848	0.9916	0.3571	0.9594	0.4746	0.0095
Number of observations	2,806	2,806	2,806	2,806	2,806	2,806

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for* hyperbolic (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of total value of inputs (MK) have been trimmed at 1%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *** denotes significance at the 1% level.

Table A24: Table 4 after trimming of the observations with the 5% most extreme values for the *Total input spending* variable in the endline survey

	March 2009–April 2010: Any transfer via direct deposit (take-up)	March–October 2009				
		Total deposits into accounts (MK)	Deposits into ordinary accounts (MK)	Deposits into commitment accounts (MK)	Deposits into other accounts (MK)	Total withdrawals from accounts (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.187***	14,220***	13,420***	665.0***	134.5	–13,308***
	(0.0365)	(3,033)	(2,891)	(230.3)	(183.2)	(2,972)
Panel B						
Ordinary treatment	0.177***	14,186***	14,177***	6.894	1.959	–13,566***
	(0.0403)	(3,840)	(3,764)	(152.5)	(181.0)	(3,801)
Commitment treatment	0.199***	14,257***	12,585***	1,391***	280.9	–13,024***
	(0.0403)	(3,332)	(3,051)	(383.0)	(228.8)	(3,259)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.5008	0.9855	0.6707	0.000	0.1354	0.8893
Number of observations	2,693	2,693	2,693	2,693	2,693	2,693

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for* hyperbolic (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of total value of input (MK) have been trimmed at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *** denotes significance at the 1% level.

Table A25: Table 5 after trimming of the observations with the 5% most extreme values for the *Total input spending* variable in the endline survey

	All accounts, in total	Ordinary only	Commitment only	Other
	(1)	(2)	(3)	(4)
Panel A				
Any treatment	1,731***	973.2***	398.1***	359.3**
	(395.1)	(292.7)	(139.2)	(157.6)
Panel B				
Ordinary treatment	1,128***	836.7***	46.46	244.6
	(378.9)	(296.3)	(92.38)	(154.3)
Commitment treatment	2,396***	1,124***	786.3***	486.0**
	(563.8)	(414.3)	(225.5)	(232.5)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.0170	0.4829	0.0002	0.2978
Number of observations	2,693	2,693	2,693	2,693

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of total value of input (MK) have been trimmed at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. ** and *** denote significance levels at 5% and 1%, respectively.

Table A26: Table 6 after trimming of the observations with the 5% most extreme values for the *Total input spending* variable in the endline survey

	Land under cultivation (acres)	Total value of inputs (MK)	Proceeds from crop sales (MK)	Value of crop output (sold and not sold) (MK)	Farm profit (output – input) (MK)	Total expenditure in 30 days before survey (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.215	–232.3	12,974	15,434	15,564*	677.0
	(0.142)	(3,579)	(8,334)	(10,695)	(8,621)	(575.9)
Panel B						
Ordinary treatment	0.198	–1,797	6,989	10,495	12,307	479.3
	(0.154)	(3,845)	(8,693)	(11,202)	(8,936)	(626.8)
Commitment treatment	0.234	1,495	19,581**	20,885*	19,159**	895.3
	(0.152)	(3,889)	(9,441)	(11,707)	(9,565)	(632.1)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.7452	0.2574	0.0808	0.2055	0.3076	0.4169
Number of observations	2,693	2,693	2,693	2,693	2,693	2,693

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of total value of input (MK) have been trimmed at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. * and ** denote significance levels at 10% and 5%, respectively.

Table A27: Table 7 after trimming of the observations with the 5% most extreme values for the *Total input spending* variable in the endline survey

	Household size	Tobacco loan amount (MK)	Total transfers made (MK)	Total transfers received (MK)	Total net transfers made (MK)	Has fixed deposit account
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.136	–838.8	135.2	–279.9	379.5	0.0276**
	(0.0868)	(4,300)	(239.5)	(250.2)	(307.0)	(0.0117)
Panel B						
Ordinary treatment	0.144	–791.9	36.53	–287.7	301.4	0.0109
	(0.0930)	(4,695)	(256.8)	(266.5)	(324.6)	(0.0123)
Commitment treatment	0.128	–890.6	244.1	–271.3	465.8	0.0460***
	(0.0933)	(4,566)	(262.9)	(259.1)	(331.3)	(0.0142)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.8205	0.9772	0.3011	0.9195	0.4801	0.0059
Number of observations	2,693	2,693	2,693	2,693	2,693	2,693

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of total value of input (MK) have been trimmed at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. ** and *** denote significance levels at 5% and 1%, respectively.

Table A28: Table 6, column 2, after winsorising of the observations with the 5% most extreme values for the *Total input spending* variable in the endline survey

	Total value of inputs (MK)
	(2)
Panel A	
Any treatment	4,546
	(3,678)
Panel B	
Ordinary treatment	3,013
	(3,983)
Commitment treatment	6,225
	(4,027)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.256
Number of observations	2,835

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects and the following baseline variables: *dummy for male respondent*; *dummy for married*; *age in years*; *years of completed education*; *number of household members*; *asset index*; *livestock index*; *land under cultivation*; *proceeds from tobacco and maize sales during the 2008 season*; *cash spent on inputs for the 2009 season*; *dummy for ownership of any formal bank account*; *amount of savings in bank or cash* (missing values replaced with zeros); *dummy for hyperbolic* (missing values replaced with zeros); *dummy for patient now, impatient later* (missing values replaced with zeros); *net transfers made to social network over 12 months*; and *dummy for missing value in savings amount*. The highest values of total value of input (MK) have been winsorised at 5%. The planting season is November–April. Fertiliser application occurs in November–December. Fertiliser purchases occur in both the pre-planting period (October and before) and the start of planting season (November–December). *Net deposits* are deposits minus withdrawals. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

Table A29: Table 4 after dropping all household variables from the regressions

	March 2009–April 2010: Any transfer via direct deposit (take-up)	March–October 2009				
		Total deposits into accounts (MK)	Deposits into ordinary accounts (MK)	Deposits into commitment accounts (MK)	Deposits into other accounts (MK)	Total withdrawals from accounts (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.194***	18,971***	18,167***	673.5***	130.8	–18,108***
	(0.0356)	(3,881)	(3,742)	(217.3)	(160.0)	(3,792)
Panel B						
Ordinary treatment	0.183***	18,226***	18,316***	–74.11	–15.63	–17,777***
	(0.0399)	(4,868)	(4,774)	(172.6)	(160.0)	(4,797)
Commitment treatment	0.206***	19,772***	18,007***	1,477***	288.2	–18,463***
	(0.0392)	(4,461)	(4,231)	(352.8)	(201.0)	(4,313)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.493	0.768	0.9515	0.000	0.0751	0.893
Number of observations	3,150	3,150	3,150	3,150	3,150	3,150

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *** denotes significance at the 1% level.

Table A30: Table 5 after dropping all household variables from the regressions

	All accounts, in total	Ordinary only	Commitment only	Other
	(1)	(2)	(3)	(4)
Panel A				
Any treatment	1,958***	1,231***	417.4***	309.7**
	(424.2)	(304.4)	(142.2)	(136.3)
Panel B				
Ordinary treatment	1,425***	1,252***	–37.48	209.8
	(464.6)	(363.3)	(121.7)	(136.5)
Commitment treatment	2,532***	1,209***	906.2***	417.0**
	(545.5)	(374.7)	(224.3)	(198.3)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.0436	0.9165	0.000	0.3016
Number of observations	2,835	2,835	2,835	2,835

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. ** and *** denote significance levels at 5% and 1%, respectively.

Table A31: Table 6 after dropping all household variables from the regressions

	Land under cultivation (acres)	Total value of inputs (MK)	Proceeds from crop sales (MK)	Value of crop output (sold and not sold) (MK)	Farm profit (output – input) (MK)	Total expenditure in 30 days before survey (MK)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.311*	10,004**	23,460**	28,502**	19,777**	1,454**
	(0.165)	(4,282)	(9,055)	(11,467)	(9,098)	(656.1)
Panel B						
Ordinary treatment	0.306*	8,790*	18,658*	24,003*	17,086*	1,265*
	(0.178)	(4,721)	(9,636)	(12,221)	(9,593)	(696.4)
Commitment treatment	0.317*	11,324**	28,675***	33,388**	22,699**	1,658**
	(0.178)	(4,883)	(10,520)	(13,063)	(10,368)	(732.0)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.9361	0.5598	0.2594	0.3774	0.4933	0.4881
Number of observations	2,835	2,835	2,835	2,835	2,835	2,835

Note: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

Table A32: Table 7 after dropping all household variables from the regressions

	Household size	Tobacco loan amount (MK)	Total transfers made (MK)	Total transfers received (MK)	Total net transfers made (MK)	Has fixed deposit account
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Any treatment	0.0956	2,806	368.5	–294.7	610.4**	0.0327***
	(0.140)	(4,591)	(238.2)	(242.2)	(304.3)	(0.0117)
Panel B						
Ordinary treatment	0.117	2,669	314.6	–273.4	544.8*	0.0174
	(0.150)	(5,121)	(252.6)	(258.5)	(322.1)	(0.0122)
Commitment treatment	0.0729	2,954	426.9	–317.8	681.7**	0.0494***
	(0.149)	(4,940)	(274.8)	(251.1)	(339.4)	(0.0141)
***p*-value of *F*-test: Coefficients on ordinary and commitment treatments are equal[a]**	0.6753	0.4951	0.6178	0.7822	0.5986	0.0108
Number of observations	2,835	2,835	2,835	2,835	2,835	2,835

Notes: Standard errors (in parentheses) are clustered at the club level. US$1 is approximately MK145. All regressions include stratification cell fixed effects. [a] This tests the equality of means in the *Ordinary* and *Commitment* treatment groups. *, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

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