Banking the Poor: Evidence from a Savings Field Experiment in Malawi

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The poor often save through informal methods outside of the financial systems of developing countries, restricting the extent to which their savings can help fuel growth. Moreover, a growing number of studies show large positive effects on outcomes among the poor from possessing a savings account. However, the vast majority of adults in the developing world do not have even a basic account. This paper uses a randomized field experiment in Malawi with over 2,000 households to examine an innovative approach to spur financial inclusion. The results show that periodic informational visits to a village can sharply increase take-up and use of savings accounts. The impact on adoption probability depends on a few key household characteristics, its effect the strongest for households in middle wealth categories, with educated heads, living outside the immediate vicinity of the bank. Results show account usage is robust among induced adopters. The randomly assigned information intervention is then used to identify sharp causal impacts of savings adoption on agricultural production inputs, crop income, and food consumption among farming households in poor rural areas. These results help extend a fast-growing literature on formal savings by examining a novel and effective method to encourage uptake and better understand the impact of savings accounts among poor farmers – the largest occupational group among the poor.

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I. Introduction

Financial inclusion remains a critical problem throughout much of the developing world. Estimates of access to basic banking services in sub Saharan Africa, for example, show that only about a fifth of all households were banked in the early 2000s, and that the number of bank accounts per adult was only 16% the rate of developed countries (Honohan, 2008; Chaia et. al., 2009; Kendall et. al., 2010). Modest progress has been made in recent years, but many areas continue to lag far behind. Representative data collected over 2009-2011 from Kenya, Malawi, and Uganda, for example, show that only 15%-21% of households in rural areas were banked.

While many people save through informal methods (e.g. buying and holding durable goods or keeping cash at home), this places severe limitations on the extent to which the savings of individuals can help fuel economic growth. Furthermore, a growing number of studies suggest adoption and use of formal savings can lead to large positive effects. Dupas and Robinson (2013) find large effects on business investment and income among market vendors in Kenya, Prina (2012) finds that savings accounts increase total assets as well as raise household investments in health and education, and Callen et. al. (2013) find that savings accounts promote more efficient labor allocation and increase household income as well as improve inventory management among micro-business owners.

This study uses a field experiment to examine a novel method to increase adoption and use of formal savings services, as well as to explore the impacts of account adoption on key indicators of household production and consumption among the poor. The experimental results fall into two broad categories: (i) impacts of a randomly assigned information intervention on adoption and use of simple savings accounts; and (ii) impacts on household production and consumption from formal savings adoption (using the information intervention as a source of exogenous variation). The analysis focuses on impacts among farming households, a population that remains comparatively understudied in this literature – particularly given the centrality of agricultural production in the lives of the world's very poor.

Despite the rapidly growing evidence on the importance of financial inclusion – and expanded use of formal savings in particular – there remains much unknown about how to achieve it. What drives adoption and use of formal financial technologies remains an important question. Bertrand et al. (2010) show in South Africa that marketing and presentation can be as important as prices (interest rates) in recruiting formal borrowers, and that appealing to intuition

(quick, associative responses) is highly effective. In developed country settings, Cole and Shastry (2009) find little evidence that financial literacy itself significantly affects participation in financial markets in the US, and Duflo and Saez (2002) find that peer effects on savings decisions can be strong. More recently, a handful of studies have found that waiving account fees and other costs can increase initial uptake (e.g. Prina, 2013), but then often lead to little or no subsequent use of the account (e.g. Dupas et. al., 2012).

This paper uses a large field experiment on financial service information provision in rural Malawi to examine methods to spur take up and use of formal savings. The experiment took place within a broader project of financial access expansion through a mobile bus-bank that drove out closer to villages in order to extend service access into previously unserved rural areas. Taking the naturally occurring institution of agricultural extension workers as a model, I worked with a local microfinance bank to design an information intervention consisting of periodic visits to treated communities by trained assistants.

My first broad set of results examines the effectiveness of this information intervention at inducing adoption of formal savings accounts as banking services move deeper into unserved areas. I find that even without altering bank fees, informational visits to a village can sharply increase take-up of high-liquidity savings accounts. For example, the information intervention increased the overall proportion of households that adopted individual accounts by an estimated 70% (4 percentage points) over adoption rates in control communities after the bus-bank began operations. However, this reflects the effect across households of all types, whereas I find important and insightful heterogeneities in the information treatment's effect along three key dimensions.

First, while households in the lowest and highest wealth groups are largely unresponsive to the information intervention, those in the middle respond strongly. This suggests not only that there are households simply too poor to open an account, but also that wealthier households already have access to information regarding financial services and thus do not benefit from additional information. Second, households with heads that have a primary education or higher are far more sensitive to the information intervention: while it increases savings adoption in the middle wealth group by about 4 to 5 percentage points among households without educated heads, its estimated effect on households with educated heads is a 14 to 17 percentage point boost in adoption probability. This suggests education is a key factor in whether potential

financial service users are able to understand and make use of information on services that may benefit them, and sheds light on the role of education in financial market integration. Third, distance plays a critical role: the information is effective at encouraging savings adoption only among households outside the immediate vicinity of the bank. While among those living close to the bank there is no measurable effect, for example, in more remote villages the intervention increased individual account uptake rates by as much as 200% (almost 8 percentage points).

Combining all three characteristics results in a subsample of households (the "adoption prone") which are over twice as likely as others to adopt accounts, even absent the information intervention. Moreover, their adoption choice is strongly responsive to the information intervention. When exposed to the randomly assigned information treatment, adoption rates among this group rise by as much as 18 percentage points, nearly tripling their adoption rate absent the treatment. While survey findings (e.g. Dupas et. al., 2012) suggest improvements in marketing may help increase formal banking use, my finding that an information intervention can boost adoption rates by over 160% among likely adopters is the first experimental evidence to my knowledge on the effect of information on formal savings adoption.

I also examine the effects of information on account-use, conditional on adoption. There is marginal evidence that the information treatment may lower average total balances kept in accounts. This is consistent with the fact that it pulls in new users from the middle of the wealth-distribution (rather than the top). Turning to intensity of services-use, measures of frequency with which adopters use their accounts suggest robust use, and show no differences across the treated and control areas. Thus, it does not appear that those being induced to adopt an account use it any more or less than others. The effect of information appears confined to the extensive margin (whether to adopt a new savings technology, not how much to use it). These results are important in light of recent evidence (Dupas et. al. 2012) that lowering bank fees can induce adoption, but without appreciable use. The provision of information through periodic visits by field-based assistants appears to work as a method to spur adoption *and* use.

My second broad set of results contributes to a growing literature on the effects of adopting and using formal savings accounts. While evidence on the effects of simple savings accounts on users remains relatively thin, a handful of recent studies have indicated surprisingly large positive effects. Dupas and Robinson (2013a) show that they sharply raise business investment and private expenditures among female microentrepreneurs in rural towns of Kenya,

Prina (2013) finds they increase total assets and investments in health and education among women in urban slums of Nepal, and Callen et. al. (2014) find large boosts to household income among micro-business owners and daily wage-workers in Sri Lanka. This paper expands our understanding of the effects of formal account adoption to the setting of agricultural production – the primary means of income generation among the very poor.

First, I find that formal savings adoption has large positive impacts on crop inputs. For example, intention to treat estimates show large effects on amount of land cultivated and amounts of fertilizer used – particularly among the adoption prone – as well as rises in the use of crop seedlings. Using the information intervention as a source of exogenous variation, two-stage least squares estimates suggest account adoption can increase the amount of land cultivated by as much as 5 acres on average (tripling the amount of land cropped), raise the average amount of fertilizer applied to crops by over 300 kilograms (roughly quadrupling the amount of fertilizer used), and increase expenditures on crop seedlings by as much as MK 2,200.

The resulting impacts on the value of crops produced are similarly impressive in scale. The intention to treat estimates are large and highly significant – particularly for the value of crops produced for own consumption. Once again, estimates are largest among the likely adopters, among whom estimated impacts on the value of crops sold are also large and significant. Point estimates suggest adopting an account can raise crop income among likely adopters by as much as MK 180,000 on average (more than tripling the total value of reported crop output).

In addition to the effects on household income, I also find strong evidence that account adoption improves household food-consumption. Among the adoption-prone households, the exogenous boost in adoption rates substantially raises the proportion classified as food-secure, increases ability to obtain and consume preferred types of food, and raises consumption of meat.

The remainder of the paper is structured as follows. The following section describes the experiment and the data. Section III examines the effect of the information intervention on adoption rates and heterogeneity across different household types. Section IV discusses results on account usage, while section V examines impacts of account adoption on production choices, crop output, and household food consumption outcomes. Section VI concludes.

II. DATA AND EXPERIMENTAL DESIGN

A. Background and Sampling

To test whether an information campaign can spur meaningful financial inclusion among the poor, I use a formal savings experiment in Malawi – one of the poorest countries in the world, with very low participation in formal financial markets.[1] In late 2007, a local microfinance bank began expanding formal savings access in the three largest districts in the central region of the country – Lilongwe, Mchinji, and Dedza. Expansion occurred through a mobile "bank on wheels" which traveled out from the capital city to make regular stops at six different trading centers (two in each district). This brought the bank physically much closer to people living in these areas, giving them easier access to formal savings. The expansion of access was coupled with an information intervention randomly assigned at the community level, providing an ideal setting to examine the effects of information on adoption and use of savings accounts by the poor.

The data consist of a two-year household panel which spans the initial phases of access expansion. The baseline data was collected over February-April of 2008.[2] The second round was collected over the same period in 2010, after the information intervention. Community sampling followed a matched-pair design. Each pair consisted of two village-clusters, a cluster being defined by enumeration areas (EAs) – sampling units used by Malawi's National Statistics Office that typically include 2-4 villages. Clusters of villages were first categorized based on radial distance from the closest of the six bank's weekly stops, and then further split into two population categories – high and low. Two clusters were then randomly sampled from each population-distance group to form a pair. Finally, within each pair, one of the clusters was randomly selected to receive the information intervention.

From each cluster, 20-23 households were sampled. The final panel contains 56 pairs, or 112 village-clusters (about 325 villages), with a total of 2,006 households. Villages are located at radial distances from the nearest mobile bank stop ranging between 0 and 14 kilometers.

[1] For example, prior to the savings-boost, only 6.0% of the sampled households had a formal loan, while 11.6% had a formal savings account. On the other hand, 23.6% of the sample reported having at least one informal loan from a friend or relative.

[2] Though the mobile bank began operations in late 2007, information collected in focus-group discussions in February and March of 2008 confirms awareness of it was still extremely low. Almost no households in the baseline data report using the bank's services.

B. The Experiment: A Financial Services "Extension Worker"

Lack of trust has been discussed elsewhere as an important barrier to financial service adoption (e.g. Dupas et. al., 2012), and informal discussions and interviews confirms this is a serious issue in Malawi. In order to identify an effective method for spurring adoption and use of financial services by the poor, I conducted over a half dozen focus group discussions on how people living in remote villages obtain information that they trust from outside their local community. Drawing from these discussions and supplementary interviews with community leaders, an information intervention was designed so as to mimic pre-existing methods of information dissemination that are trusted by people in the area.

The model settled on for the structure of the information treatment was thus that of extension workers (such as agricultural extension officers and health extension workers), consisting of periodic visits to each community by trained assistants. This model fit with pre-existing institutions for the spread of information and education about new technologies, practices, and available services. It was also the preferred method suggested by community members themselves on the best way to provide information on financial services. Assistants traveled to the treated villages along dirt roads and paths by foot or bicycle, bringing information on the bank's services and hours. Each assistant was responsible for approximately 20-30 villages, which they visited once or twice a month for visits which lasted up to a few hours. One cluster of each cluster-pair was randomly assigned to this information treatment.

C. Descriptive Statistics and Balance-Check

Table 1 reports statistics on several characteristics of the baseline sample. Column 1 reports the sample mean and standard deviation of each variable. Column 2 reports coefficient estimates (and standard errors) of the difference between the baseline means of the treatment and control groups, for each characteristic. Errors are clustered by village-cluster (the level of randomization). The variables *HFIAP*, *HFIAS*, and *HDDS* are food-security measures. The first two reflect inadequate food quantity or quality. For both indicators, higher values mean less

food-security.[3] *HDDS* focuses on nutritional variety, with higher scores reflecting greater food diversity.[4]

The majority of households (85%) are male-headed, household heads are on average 41 years old, roughly a third of them have a primary education or higher, and the average household size is just over 5 people. About 27% of the households own and operate a non-agricultural business and 16% have a household member with a salaried job. While 12% of the sample report having a formal savings account, 6% report formal loans. Average food-security scores are low: an HFIAP score of 1 means a household is food-secure while a score of 4 means a household is severely food insecure; the average score in the region is 3.2. The average distance from the bank stop is about 8 km.

Estimates of the differences between the treated and control clusters show the two groups are well-balanced, with no more significant differences than should be expected. Table I reports estimates of 20 coefficients, and only 1 is significantly different from zero (at the 5 percent level).

D. Eliminating the Ineligible

To help increase the precision of estimates in the analysis of account adoption effects, I make use of an econometrically advantageous group of households – the ineligibles. Unlike most other studies of savings adoption, these data come from a random sample of households, rather than from a targeted subsample of likely savings adopters. This means the sample includes households clearly too poor to open an account, due to the high opening costs and usage fees. Such households are ineligible for account-adoption, not due to a policy choice but rather due to material constraints. This unusual aspect of the dataset enables these data to examine not only the direct effects of account adoption on service-users, but also the spillover effects on socially connected non-users via social networks – something I exploit in a companion paper that examines impacts on inter-household wealth transfers (Flory, 2016). However, for the present study's focus on adoption, use, and direct impacts of formal savings accounts, identifying and eliminating from the sample those who are *incapable* of adopting helps narrow the sample. By

[3] HFIAP (Household Food Insecurity Access Prevalence) classifies households into one of 4 levels of food insecurity, while HFIAS (Household Food Insecurity Access Scale) is a more continuous measure, ranging from 0 to 21. For a complete description of each indicator, see Coates, Swindale, and Bilinsky (2007).

[4] HDDS (Household Dietary Diversity Score) ranges from 1 to 12. For more on the HDDS indicator, see Swindale and Bilinsky (2006).

restricting the focus to those who can open and use accounts (the *de facto* eligible), the precision of estimates of the impacts of adoption are increased.

To identify the de facto ineligible, I use baseline indicators of wealth. Starting with the household's 2008 food consumption as measured by *HFIAP*, I consider households in the worst of the four food security categories – the severely insecure, which comprise 40% of the sample. To this is added the condition that the household cannot own a cell phone (a material indicator of wealth) and either have no literate household members or be female-headed (indicators of high vulnerability to poverty and low income-earning potential). This creates a subsample of 283 households (14% of the final panel) split evenly across the control and treated areas that are expected to be unable to use formal savings, as the costs are too high. Indeed, as shown in Flory (2016), the encouragement has no impact on service-use among this group, and virtually none of them open an account.[5]

III. RESULTS: ACCOUNT ADOPTION

The information treatment was designed to spur uptake of financial services in particular at the bank operating the mobile "bank on wheels". Since access to loans through the mobile bank was not available to most communities, the emphasis was savings.[6] I first examine the impact on rates of adoption at the bank that implemented the information intervention. However, other financial institutions are still somewhat accessible to people in these areas, though they are generally much further away than the closest mobile bank stop. (Some villagers make periodic trips to the provincial or country capital, where several banks operate, though it may take several hours and a costly bus trip to get there.) If the information intervention raised general awareness of formal financial services and overall basic financial literacy, it is possible that it could also cause individuals to start using services of other financial organizations besides the mobile bank

[5] Whereas eligibility in many settings is determined by program policy, in the current setting it is a function of material constraints. While the use of wealth and vulnerability indicators inevitably introduces some noise in identification of households as account eligible or ineligible, the variables are quite accurate in identifying the ineligible group. Only 4 households in this group, for example, had accounts in the baseline. The key to this strategy is not 100% accuracy in identifying the ineligible, but rather identifying a group in both the treated and control areas that is highly unlikely to respond to the information intervention due to inability to adopt accounts, in order to enhance the precision of instrumented estimates. For further discussion of the ineligible group and this approach, see Flory (2016).

It should also be noted that even in settings in which policy determines eligibility, some households and individuals classified as ineligible often manage to gain access to programs and thereby violate their prescribed classification.

[6] Access to credit from the bank expanded very slowly, village-by-village, a process requiring significant time and other resources, and primarily targeting areas of high economic activity close to the bank stop. As shown in Flory (2016), the information treatment had no effects on use of formal credit.

serving their community. I therefore also test for changes in use of formal savings at any financial organization.

A. Overall Effects on Savings Adoption

Overall, following the introduction of the bank on wheels, 1.9% of all households without accounts in control villages in 2008 opened an individual savings account at the mobile bank over the two year period, while 4.1% of those in the information-treated villages did so, representing a 120% boost in adoption rates over the control villages (χ^2 test, p<0.01). Table 2 reports results from a linear regression of the decision to adopt use of formal savings on a dummy variable indicating assignment of the community to the information intervention, with and without fixed effects at the cluster-pair level, and standard errors clustered at the village-cluster level.[7] The dependent variable is a {0,1} indicator for whether the household has at least one individual account at the mobile bank in 2010. The results in columns 1-2 confirm that, after accounting for intra-class correlation, the information intervention increased the overall proportion of households that adopted formal savings at the mobile bank by an estimated 1.9 (p=0.003) to 2.2 (p=0.010) percentage-points. This is a 104%-120% boost in account uptake over the adoption rate in the control villages.

Looking more broadly at adoption of formal savings at any financial institution, we see that 5.4% of all households without accounts in control villages in 2008 adopted an individual savings account over the two year period, while 9.2% of those in the information-treated villages adopted, representing a 70% boost in adoption rates over the control villages (χ^2 test, p<0.01). Columns 3-4 of Table 2 show the information intervention increased the overall proportion of households that adopted formal savings by an estimated 3.8 (p=0.014) to 3.9 (p=0.000) percentage-points. This represents a 70%-72% boost in account uptake over the adoption rate in the control villages.

Individual accounts are by far the most common type of savings account. However, banks in the area also offer shared or group accounts. Columns 5-8 of Table 2 examine the impacts of the information treatment when including group accounts. In all cases but one, estimates are significant at the .05 level or better. In particular, the information intervention

[7] Pair-level effects account for differential responses to expanded access by pair. Villages in pairs close to the bank-stop, for example, are more likely to start service-use, whether or not they receive the information treatment. Similarly, villages with higher populations have higher a likelihood of residents obtaining access to information about the bank and sharing it among neighbors, thereby also raising adoption likelihood even absent the treatment.

raised the probability of opening an individual or group savings account at the mobile bank by an estimated 2.6 to 2.9 percentage points (126%-140%), and of doing so at any bank by an estimated 3.0 to 3.1 percentage points (32%-33%).

These findings lead to my first main experimental result:

Result 1. *Informational visits to a village can significantly raise local formal savings adoption. The rate of adoption for individual accounts was increased by 126%-140% (2.6-2.9 percentage points) at the mobile bank, and by 70% (4 percentage points) across all financial institutions, through the information intervention.*

This effect is quite large in relative terms (a 70-140% boost). In absolute terms (a 2.6-4 percentage point boost in adoption probability), it may appear more modest, particularly when compared with some of the adoption rates observed in targeted interventions in similar settings. However, it is important to note that this encouragement was not targeted, but rather administered to everyone in the treated communities. The estimated 2.6-4 percentage point boost in adoption rates is insightful as an indicator of the impacts of a non-targeted, generalized information treatment aimed at the general populace. However, this represents the broadest possible approach to assessing its impact on savings uptake, supposing homogeneous effects of the encouragement. There is in fact good reason to expect its effect to vary among different types of households.

B. Heterogeneous Effects: Wealth

One of the most obvious dimensions along which sensitivity to the savings encouragement is likely to vary is wealth level. It is reasonable to expect wealthier households to be in a better position to cover the initial costs of opening an account, and to be more likely to find a savings account useful. That said, however, it is unclear ex-ante what will happen at the top of the distribution. On the one hand, the wealthiest households are likely to have the highest ability and interest in opening a savings account, which may suggest they would be the most responsive to an information intervention designed to boost account adoption. On the other hand, wealthier households tend to already have better access to information on services outside the immediate vicinity of their village (they are more likely to regularly travel to market towns or bigger cities, have social links with other wealthier households, be connected in other ways to

the modern economy, etc.). This could mean that informational visits about financial services add little to the existing knowledge and information sets of wealthier households, and thus have little or no impact on their service adoption decisions.

As a first pass at sensitivity to the encouragement by wealth level, I examine its effects among separate wealth deciles of the sample, using total value of assets in the baseline survey. Table 3 reports the results of a linear regression of a household's decision to adopt a formal savings account on a set of indicators for wealth decile, the information intervention, and interactions between the two (the top decile is the omitted category). Inference is based on cluster-robust errors (village-cluster level), and results are shown with and without cluster-pair fixed effects. An intriguing pattern emerges. As the estimates show, the information intervention has no significant effect on the wealthiest group (decile 10) or on the poorest groups (deciles 1-3). Indeed, the estimates suggest the effect of the encouragement is largest in the middle assets range. Looking at individual accounts for example (columns 1-4), the encouragement raises adoption rates by an estimated 7.9-8.3 percentage point boost to adoption among the 4^{th} decile, 5.4-6.2 percentage points for the 7^{th} decile, 5.7-7.3 for the 8^{th} decile, and 8.8-10.4 percentage points for the 9^{th} decile. Estimates are statistically significant for the 4^{th} and 9^{th} deciles.

This pattern suggests the households most responsive to the encouragement are those above the 30^{th} percentile and below the 90^{th} percentile of the wealth distribution. Examining this pattern more closely, Table 4 reports results from regressions that estimate the effect of the encouragement on three different pooled groups – the poorest (those below the 30% threshold), the middle (those between the 30%-90% thresholds) and the top (highest 10%). As the estimates in columns 2, 4, 6, and 8 show, the encouragement has no discernable effect on account adoption by households in the bottom and top wealth groups. By contrast, it boosts the probability of adoption among households in the middle wealth group by an estimated 6.3 ($p=0.002$) to 6.6 ($p=0.000$) percentage points when looking at individual accounts, and by 4.9 ($p=0.060$) to 5.3 ($p=0.010$) percentage points when including group accounts. This represents a 136-143% boost in the adoption rate for individual accounts and a 56-61% boost in adoption rates of group or individual accounts over adoption rates in the control villages (where 4.6% of the middle wealth group adopted individual accounts and 8.7% adopted group or individual accounts). These findings lead to my first main experimental result:

Result 2. *Sensitivity to informational visits to the village varies by wealth level. Only the middle assets group responds to the intervention, while adoption rates among both the best-off and worst-off households appear unaffected.*

This is consistent with a model in which the wealthiest already have access to information regarding the bank's services, and are therefore no more likely to adopt as a result of informational visits to the village).

C. Heterogeneous Effects: Education

Another dimension along which we may expect probability of adoption and sensitivity to the information intervention to vary is education level. The more educated are more likely to be able to understand, evaluate, and act on information provided on details of opening and using a savings account. To shed light on whether and how education levels affect adoption rates, I run a regression of the adoption decision on whether the household head has at least a primary education, the information intervention, and an interaction of the education and information variables. Table 5 columns 1-4 report the results among the middle wealth category, with and without pair-level effects.[8] The estimates show that households in which the head has a primary education or higher are 7.9 (p=0.04) to 10.8 (p=0.001) percentage points more likely to open a savings account. Turning to the effects of the information intervention, columns 1-2 show it raised adoption of individual accounts an estimated 3.5 (p=0.016) to 5.2 (p=0.001) percentage points, whereas it has no significant effect on adoption when including group accounts (columns 3-4). Turning to the interaction term between information and education, its coefficient is large in all 4 regressions, and significant all but one. The second to last set of rows of the table reports the sum of the coefficients for the information intervention and its interaction with education, as well as F-test p-values (i.e. the magnitude and significance of estimated effects of the information intervention on households with educated heads). As columns 1-2 show, among households with educated heads, the information treatment raised individual account adoption by an estimated 13.8 (p=0.009) to 14.3 (p=0.017) percentage points, while columns 3-4 show it raised adoption of group or individual accounts an estimated 15.7 (p=0.013) to 16.7 (p=0.003) percentage points. These estimates represent a 99-109% increase over the corresponding

[8] Appendix Table A.2 reports results among the bottom and top wealth groups, as well as pooled over all three groups.

adoption rates among households with educated heads in the controls (13.1% of whom adopt individual accounts, 15.8% of whom adopt any type of account). Nonparametric tests and cluster-level regressions also confirm that the information intervention has a highly significant effect on households with heads that have a primary education or higher. These findings lead to my third main result:

Result 3. *Effects of informational visits vary by education level. While they raised adoption rates for individual accounts by a relatively modest 3.5-5.2 percentage points among households with uneducated heads, they increased overall adoption by a much larger 14-17 percentage points (100%) among those with heads that had primary education, in the middle wealth group.*

D. Heterogeneous Effects: Distance

Distance from the bank is also likely to play a role. For example, people living close to the bank's stop are likely to be more aware that it exists, and to know details about its services, than those living further away – simply from information they obtain on their own. This may impact the effectiveness of an information intervention in spurring account uptake. To examine this, Table 5 columns 5-8 report estimates from regressions of the decision to adopt formal savings on an indicator for whether the household lives in a village pair that is over 3 km from the bank-stop, an indicator for the information intervention, and their interaction, among the middle wealth group.[9] Estimates in columns 6-8 suggest that living further away tends to have a negative effect on the probability of adopting an account (though this is only statistically significant in one of the regressions). Turning to the impact of the information intervention, we see that its estimated effect is not significantly different from zero in communities near the bank-stop. However, as we see in the final two rows of estimates in the table, the estimated effects of the information intervention are large and significant among nonlocal villages (those located in pairs 3 or more km away). For example, columns 5 and 6 show that it raises adoption rates of individual accounts by 7.5 (p=0.000) to 7.8 (p=0.000) percentage points – a 190%-200% increase over the adoption rate in nonlocal control villages. This leads to my next main experimental result:

[9] Appendix Table A.3 reports results among the bottom and top wealth groups, as well as pooled over all three groups.

Result 4. *Effects of the information intervention depend on distance. In villages near the bank-stop, informational visits appear to have little to no effect on adoption rates, whereas they have a highly significant effect in communities over 3 km away, approximately tripling adoption rates of individual accounts.*

The findings of heterogeneous effects by distance shed important light on barriers to adoption of financial technologies. Ex-ante, it is unclear whether informational visits would be effective for people living far from the bank's weekly stop, for those living nearby, or what relative differences in magnitudes of effects by distance we should expect. It is perhaps reasonable to suppose that, absent any additional information provided, people living closer to the bank's stop may know more about its services than those living further away, due to information they may obtain on their own. How this affects the role played by an information intervention, however, depends on whether local residents acquire sufficient information on their own to make their adoption choice, and on the magnitude of non-information barriers to adoption imposed by distance for those living further away.

On the one hand, if the information locals obtain on their own is sufficient to determine whether they should open an account, we would expect informational visits to have little or no effect on service adoption among households living relatively close to the bank. On the other hand, if there remains a gap between the information about the bank and its services that locals get on their own and the information necessary to cause the adoption-prone to open an account, the intervention may fill this gap and induce substantial rates of adoption. Moreover, if travel time and costs are high enough for those living further from the bank to be prohibitive even with full information about its financial services, informational visits may increase the desire for service use but do little to spur adoption. If so, informational visits might only be effective at promoting account adoption when distances are low, and ineffective at higher distances.

The importance of this point from an operational perspective is underscored by the fact that it is significantly cheaper and easier to visit potential clients close to the bank's location. The finding that effects of the information intervention are indistinguishable from zero relatively close to the bank's stop, but sharply increase with distance, suggests that information is not a significant barrier for service-adoption for those living close to new financial institutions. On the other hand, it appears to be a significant constraint for those living in more remote areas. From a

practical perspective, these findings help provide guidance for financial service outreach. They suggest, for example that insofar as adoption by first-time users, it may be more efficient to focus on households that are located outside the bank's immediate vicinity. Further study is necessary before drawing firm conclusions, however. What factors underpin the differential effects of information by distance represents an important area for future research.

E. Take-Up Among the Adoption Prone

Results 2 through 4 are useful in identifying those households that are most likely to adopt formal savings as access expands. Combining the three results yields a group of 209 households (12% of the unbanked baseline sample) that fit all three characteristics: situated in the middle income group, having educated household heads, and located over 3 km from the bank. Table 6 reports results from regressions that examine the probability of adoption among this group, as well as the impact of the savings encouragement on their adoption rates. The adoption choice is regressed on an indicator for the information intervention, another indicator for being in this household category, and on the interaction of these two variables. As seen in columns 1 and 3, the adoption rate among this group of households is 6.2 to 6.4 percentage points (132-136%) higher than the uptake rate outside this group, even before accounting for the impact of the information treatment. Turning to the effect of the information intervention, we see that, whereas it has little to no estimated impact on adoption by households outside this group, its estimated impact in uptake by this group is large and highly significant. For example, as shown in columns 2 and 4, it raises adoption of individual accounts by an estimated 16.1 to 17.8 percentage points ($p<0.01$) – a 148%-163% increase over the adoption rate among this group in the control villages (10.9%). These findings lead to my next major result.

Result 5. *The households most sensitive to the information campaign are those with wealth levels in the middle range, heads that have at least a primary school education, and who do not live near the bank. Among this group, informational visits raised account adoption rates by an estimated 16.1 percentage points or more.*

I refer to this category of households that is highly responsive to the information intervention as the adoption prone. It is instructive to consider the adoption rate observed here in

light of the existing literature on formal savings adoption. Dupas and Robinson (2013) also examine uptake among a sample of likely account adopters of similar size – 250 owners of microbusinesses near a market town in rural Kenya. Their encouragement included paying account opening fees and depositing the minimum balance for those who agreed to open an account. Of their sample of 250 microbusiness owners, 41% of those that received the encouragement adopted use of the account.[10] In the current study, 29% of likely adopters in the treated group opened and kept an individual account over the two year period after the bank began operating in their area. (This rises to 33% when including group accounts.) The information encouragement led to an estimated 16-18 percentage point rise in the adoption rate (19 percentage point rise, including group accounts), while the 11% adoption rate in the controls (14% including group accounts) is likely due to the expanded presence of the bank into the area.[11] The combined effects of the reduction in distance and information intervention appear of comparable magnitude.

The information intervention by itself appears to have effects of a similar scale, though lower magnitude, compared to the effects reported in rural Kenya from paying account fees and giving individuals the minimum balance. The difference in magnitudes may be due to other underlying differences across the two settings. In the present study, for example, only 26% of households in the adoption prone group have a microbusiness. This group also lives substantially further from the bank-stop on average compared to the households in Dupas and Robinson (2013). There are also of course likely other important differences across the economic environments of Kenya and Malawi. Nevertheless, the comparison is provocative. At the very least it suggests that informational visits represent a viable alternative to covering account opening costs when considering approaches to accelerate financial deepening and spur meaningful adoption of formal savings services in rural areas of the developing world.

The effectiveness of informational visits among the adoption prone in the findings above is perhaps not surprising. Survey findings (e.g. Dupas et. al., 2012) suggest improvements in marketing can help increase formal banking use. However, my finding that an information

[10] A higher percentage accepted the offer for a free account with the minimum balance already deposited. However, roughly half of those who accepted the account never actually used them or made any deposits, leaving 41% that accepted the account and used it.

[11] Evidence on the effect of the mobile bank's entrance to the area, absent the savings encouragement, is only suggestive. Since the location of the bank-stops was not randomized, the evidence is correlative, and whether the relationship is causal remains unclear. While the fact that 14 % of the adoption prone that did not have accounts in the baseline had started using them 2 years after the bank's entrance is highly suggestive, it should be interpreted with care.

intervention can boost adoption rates by as much as 160% among likely adopters is the first experimental evidence to my knowledge on the effect of informational visits on formal savings adoption.

IV. RESULTS: ACCOUNT USE AMONG ADOPTERS

Initial account adoption is a critical first step in financial deepening and savings mobilization. However, recent research has found that a key challenge to expanding use of formal savings is that encouraging service adoption can increase initial account openings, followed by little or no subsequent use. For example, Dupas and Robinson (2013a) find in an experiment in Kenya that lowering or eliminating bank fees can induce account adoption among the poor, but that the majority of new adopters (almost three-quarters) do not actually use their savings accounts. These findings are important and provocative. On the one hand, they highlight key challenges to expanding financial inclusion among the poor. On the other, they inspire a search for methods that might bring new savers into the financial system in a way that includes robust use of services, thereby accelerating progress toward the twin goals of financial inclusion and savings mobilization.

The preceding analysis showed that periodic informational visits raised adoption rates by 70% overall, doubled adoption rates among all non-locals, and nearly tripled the adoption rate among the most adoption-prone households. While therefore clearly effective as a method for spurring account openings, it is important to know the extent to which accounts were actually used by those who were induced to adopt. To obtain a sense of overall account use by adopters, I look at two key indicators – savings balances and frequency of account transactions.

A. Savings Balances

Among households that began using formal savings over the two-year period just after the mobile bank began operating, the average total amount in individual accounts at the time of the 2010 survey was about MK 12,800 (about USD 85). In communities outside the immediate vicinity of the bank (over 3 km away) this drops slightly to an average of MK 12,300, and among the adoption prone households the average balance is MK 11,500.[12] Since the survey was conducted during the pre-harvest season, when many households have few if any income

[12] When including group accounts, average balances are slightly lower in all three groups: MK 11,500 overall, MK 11,400 in communities outside the vicinity of the bank, and MK 10,100 among the adoption prone.

sources, these amounts likely represent lowest average balances during the year, and should thus be interpreted as lower bounds of annual average balances.

Comparing the savings-encouraged to the non-encouraged yields some interesting patterns – as shown in Figure 1. In control areas, the mean balance was MK 18,200, compared to MK 9,600 in the information treated villages. This difference in mean balances may derive in part from the fact that the information intervention encourages adoption the most among middle wealth groups, rather than the highest, raising the proportion of new adopters from lower wealth groups, and thus lowering the average wealth level of account adopters. One might therefore expect their savings deposits to be lower, bringing down the average across all adopters. However, while the difference in mean balances is high, the overall distribution of balances in the control villages is not significantly different from that in the treated (rank-sum, p=0.154). This remains true when moving to nonlocal communities, where the information intervention was more effective (mean balance of MK 18,600 in controls and MK 9,100 in treated, rank-sum p=0.131) and when focusing on the adoption prone households, those most sensitive to the information intervention (mean balance of MK 14,300 in controls and MK 10,100 in treated, rank-sum p=0.852).[13]

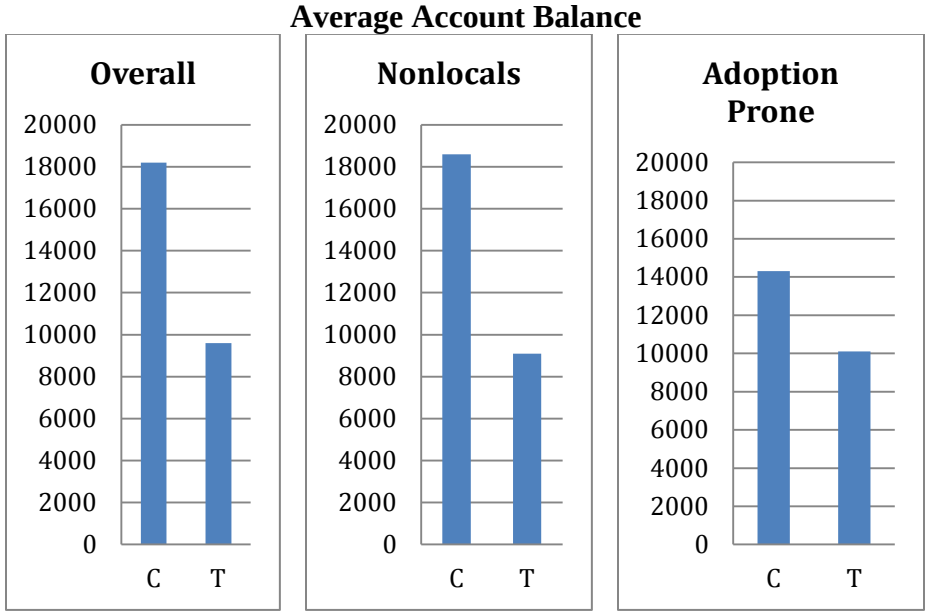

Figure 1: Average balance in formal savings account among adopters at time of survey.

[13] When including group accounts, the average balance across all adopters was MK 11,600 in the controls and MK 11,500 in the treated; across those in nonlocal communities was MK 11,100 in the controls and MK 11,600 in the treated; and among the adoption prone was MK 12,400 in the controls and MK 9,200 in the treated areas.

Columns 1-2 of Table 7 report results from linear regressions of the account balance of adopters at the time of the survey on an indicator for the savings encouragement, an indicator for living outside the immediate vicinity of the bank, and an interaction between the two. Panel A reports results for individual accounts, and panel B includes group accounts. The main estimates of interest are in the last two rows of each panel, which show the estimated effect of the savings encouragement on balances among adopters outside the bank's immediate vicinity (where the encouragement was effective at inducing adoption). The first of these rows reports the sum of the coefficients for the information intervention and its interaction with the indicator for living outside the bank's vicinity, and the second reports p-values for F-tests on statistical significance. In column 1, the estimate is negative and large, but not significant. As column 2 shows, however, when accounting for the fixed effects of cluster pairs, the estimated effect drops by about a third and becomes significant at the .10-level. This suggests account balances may indeed be lower among adopters in the savings encouraged villages by as much as MK 6,600 (or about 35%). As discussed above, these differences in average balance likely derive from the fact that the savings encouragement brought more middle-wealth households into the group of adopters.

B. Frequency of Account Use

While balances during the pre-harvest hungry season help provide likely lower bounds of amounts saved in accounts, they provide little insight on how often accounts are being used. To obtain an indication of how actively accounts are used, I therefore look at recent deposit and withdrawal activity. Roughly one third of adopters used their account at least once in the 30 days prior to the survey interview – 30.2% of all adopters, 29.7% of nonlocal adopters, and 34.2% of adoption-prone adopters. Looking at all new account-holders, 23.3% deposited at least once, 13.9% withdrew at least once, and 6.9% did both. The rates were similar among adopting nonlocals (22.5%, 12.6%, and 5.4%). Among the adoption prone with accounts, 22% deposited at least once, 19.5% withdrew at least once, and 7.1% did both. Figure 2 shows the percentages that recently used their account, by treatment and control status.

Percentage of Adopters Using Account At Least Once, Last 30 Days

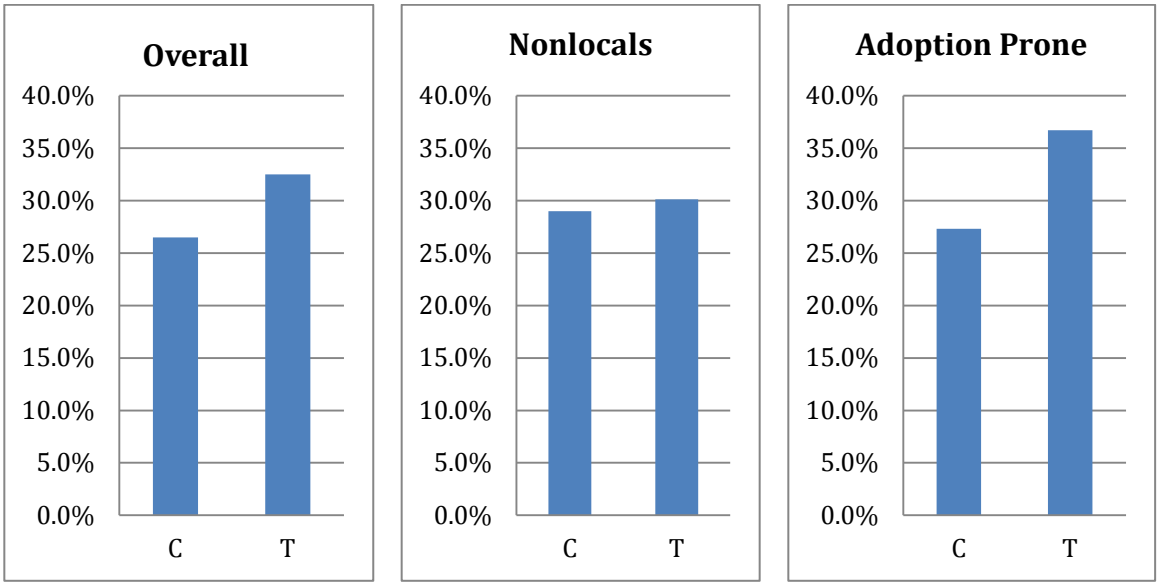

Figure 2: Percentage of adopters that used their account at least once in the 30 days prior to the survey interview.

In nonlocal communities (where the encouragement induced adoption), there is little evidence of differences by treatment status. For example, while 29% of nonlocal adopters in control areas used their account at least once in the last 30 days, 30.1% of those in treated villages did (Pearson's chi-square, p=0.896). Table 7, columns 3-8, report results from regressions that test for differences across treated and control villages in the likelihood of using accounts (columns 3-4), depositing (columns 5-6), or withdrawing (columns7-8), among all new account-users. In terms of evidence for whether induced adopters used accounts any more or less, the main estimates of interest once again are in the last two rows of each panel, which show the estimated impacts of the encouragement on account-use among adopters in nonlocal communities. In all 6 columns, we see that none of the estimates are significant, most are small in magnitude, and the largest among them are actually positive (suggesting adopters in treated areas may have used their accounts more often). There is thus little evidence that households induced by the information intervention to adopt formal savings use their accounts any less than other adopters. These findings lead to my next main experimental result:

Result 6: *In nonlocal communities, the information intervention has no measurable effect on intensity of account use, conditional on adoption. In particular, frequency of account-use is no lower among adopters in treated villages, suggesting robust use among induced adopters.*

The findings that the effect of the information intervention boosts the account adoption rate but does not affect average usage-rates among new users are important in light of the evidence (Dupas et. al. 2013) that lowering bank fees can induce adoption, but sometimes without appreciable use. Informational visits appear to work as a method to spur adoption, while maintaining robust account balances and active account-use among new savers.[14]

V. RESULTS: IMPACTS OF ACCOUNT ADOPTION

While increasing the number of households that open and actively use formal savings accounts is critical for achieving the goals of financial inclusion and savings mobilization, understanding the impacts of savings accounts on adopting households is also of paramount importance. The preceding analysis identified a category of household that is highly sensitive to the information intervention in its adoption rate. This section uses the randomly assigned information intervention as an instrument to identify effects of adoption among this group.

Several recent studies have found large positive effects of formal savings adoption on household income, expenditures, assets, health and education investments, and microbusiness investments (e.g. Callen et. al., 2014; Dupas and Robinson, 2013a; Prina, 2013). These studies have shown impressive effects on microbusiness owners, daily wage-workers, and women living in urban slums. To my knowledge, there is little direct experimental evidence regarding the effects of simple savings accounts on agricultural production.[15] This section tests for evidence of effects of account adoption on production choices and output among poor farmers in low-income rural areas.

[14] Note that this answers the question of whether the information treatment, in addition to boosting adoption, alters the way that new-savers use the account. This is of interest from the perspective of the financial system and the aggregate effects of the information treatment. However, it does not answer the question of whether the adopters actually *induced* by the information intervention to take up a formal account use the accounts differently than those who would have adopted the account absent the treatment (the always-takers). For example, it may on the one hand be the case that induced adopters use the accounts in the same manner as the always-adopters. On the other, it may be that the induced adopters use them less, but that the information treatment causes the always-adopters to use the accounts more. This matters little if the goal is savings mobilization and raising aggregate use of financial services. However, it may be important when thinking about individual and household level effects of formal savings adoption.

[15] Brune et al. (2011) represent an important exception. They find that a rise in ordinary savings account use increases farming investments and subsequent crop output among cash crop farming clubs with tobacco-crop loans in Malawi. While the fact that the farmers they study also have microcredit loans introduces a potential confound (especially if there are interaction effects among different financial services) and the fact that they are tobacco-farmers organized into farming clubs may make them less representative, their findings suggest

A. Production Investments

Recent evidence suggests that savings accounts may help the poor protect income from themselves (e.g. if they have present-biased preferences), as well as from others they may feel pressured to share with, until such time as it can be invested in production-related activities (e.g. Dupas and Robinson, 2013a). In farming, particularly in areas with a single growing season such as Malawi, there is often a substantial lag between the time income is received (harvest season) and the time it may be reinvested in production (planting season). This suggests improved savings technologies may help raise investments in crop production.

Tables 8 and 9 report results from linear regressions of several measures of farming inputs on exposure to the savings encouragement, and on instrumented adoption, to examine any such effects. First, Table 8 reports estimates of the reduced form effect of the savings encouragement – i.e. the intention to treat estimates for account adoption. Its panels progressively zero in on the households most likely to adopt and most responsive to the encouragement, beginning with all baseline non-savers beyond the 3 km cutoff where the savings encouragement is effective (panel A), then moving to the de facto eligible (panel B) among this group, and finally the adoption-prone (panel C). Regressions in the first four columns examine effects on average fertilizer use. Fertilizer is a critical input for crop production (for example Duflo et al., 2008, find income rises on the order of 30%-60% from increased fertilizer use in Kenya.) Columns 5-8 test for evidence of effects on amount of land used (in both number of acres and total self-reported value of land cultivated), and columns 9-10 examine effects on use of crop seedlings. Results are shown with and without pair fixed effects, and inference is based on cluster-robust standard errors.

Looking down across the 3 panels in Table 8, we see the estimated effect of the savings encouragement rises as the sample narrows to households whose adoption choice is more responsive to it. This is important, as it is consistent with accounts as the underlying driver of the observed effects. As panel A shows, estimates across all baseline non-savers are positive. They are only significant, however, for amount of land used: the encouragement leads to an estimated 0.39 to 0.41 increase in the average number of acres cultivated last growing season (columns 5-6), and an estimated MK 47,000 to MK 50,000 increase in the average self-reported value of land used (columns 7-8). Moving to panel B, we see that among account-eligible households the estimates are larger and more significant. As columns 3-4 show, average fertilizer expenditure

among the eligibles is an estimated MK 1,208 to MK 1,604 (13-18%) higher, and land cultivated an estimated 0.49 acres (16%) higher and MK 55,000-MK 58,000 higher in self-reported value, in savings-encouraged villages.

In panel C, among the households whose adoption likelihood is most affected by the information intervention, the encouragement leads to much larger estimated effects with higher levels of significance. As shown in columns 1 and 2, the intention to treat estimates are a 49.6 (p=0.005) to 51.6 (p=0.008) kg rise in the average amount of fertilizer applied to crops, while columns 3 and 4 show intention to treat effects of an estimated 5,207 (p=0.016) to 5,673 (p=0.002) MK increase in fertilizer expenditures. Both measures indicate a roughly 50% increase in fertilizer use over the amount used in the control villages. Columns 5-6 show the encouragement leads to a 0.80 to 0.92 (27%-31%) rise in the number of acres of land cultivated, while columns 7-8 show a substantial rise in the total value of all land used. Finally, as seen in columns 9-10, the savings encouragement leads to an estimated intention to treat effect of a MK 230 to MK 350 rise in expenditures on crop seedlings (significant at conventional levels only in the fixed effects specification, p=.073).

These imply large effects on crop inputs from account adoption. Table 9 shows two-stage least squares estimates for the effect on crop production inputs of adopting an individual savings account, instrumenting for account uptake with the information treatment.[16] As in Table 8, columns 1-4 examine effects on average fertilizer use (kilograms used and amount purchased), columns 5-8 examine effects on amount of land used (acres and total estimated value), and columns 9-10 examine effects on seedling expenditures. Once again, the three panels progressively zero in on households whose adoption choice is most affected by the savings encouragement. Moving down across panels A-C, the magnitudes of the instrumented estimates for effects of adoption are broadly similar – further supporting that the effects are indeed driven by account uptake. The major change across the panels lies in the precision of the estimates: as the strength of the instrument grows when zeroing in on households whose adoption choice is most strongly affected by it, the estimates become more precise – particularly among the adoption prone. Among the eligibles, coefficients indicate a 107 to 158 kg increase in amount of fertilizer used, a MK 25,380 to MK 30,216 rise in fertilizer expenditures, a 10-10.3 rise in the

[16] For two-stage least squares estimates of the effects on crop inputs of adopting any formal account (not restricting to individual accounts), see Flory (2016).

number of acres cultivated, and a MK 1,478 to MK 1,812 rise in amount spent on crop seedlings – though just under half the estimates are significant at conventional levels. Among the adoption prone, estimates are far more precise: the IV point estimates show savings adoption raises fertilizer use by 313 to 323 kg, fertilizer expenditure by MK 32,377 to MK 32,560, land used by 5.0 acres and MK 577,073 in total value, and seedlings expenditure by MK 2,251.

B. Household Income

This large rise in crop inputs is followed by substantial increases in crop output at harvest. Looking at total value of crops produced by adoption-prone households, the mean in control villages is about MK 94,000, compared to a mean of MK 113,000 in the savings-encouraged (rank-sum, p=0.004). This difference comes from both own-consumption and crops sold: the mean value of own crops consumed by the adoption-prone in is MK 65,000 in control villages and MK 74,000 in the savings-encouraged (rank-sum, p=0.027), while the mean income from crops sold is MK 28,000 in the control areas and MK 40,000 in the savings-encouraged (rank-sum, p=0.007).

Table 10 reports estimates from linear regressions of crop output on exposure to the savings encouragement and on instrumented savings adoption, to more closely examine the resulting impacts on crop production. Estimates are shown for the effects on total value of crops consumed by the household (columns 1-2), value of crops sold by the household (columns 3-4), and total value of all crops harvested (columns 5-6). Panels A-C report intention to treat estimates (reduced form effects of the savings encouragement), while panels D-F report two-stage least squares estimates. Just as in Tables 8-9, the panels progressively zero in on households most likely to adopt and for whom the adoption decision is most heavily driven by the randomly assigned encouragement.

Looking across panels A-C, we see once again that estimates for the reduced form effect of the encouragement progressively rise as the sample narrows to those whose adoption decision is more responsive to it, consistent with accounts as the underlying driver. As panels A and B show, estimates across all baseline non-savers, as well as across the eligibles, are positive for all three measures of crop output. They are only significant, however, for the value of crops grown that were consumed by the household, showing an intention to treat estimate of MK 3,309 ($p<0.01$) among all baseline non-savers and MK 3,972 ($p<0.01$) among the eligibles (column 2).

The intention to treat estimates among the adoption prone are much higher, showing an estimated MK 17,836 (p=0.009) to MK 18,999 (p=0.017) rise in value of own crops consumed, an estimated MK11,630 (p=0.050) to MK 14,745 (p=0.014) rise in value of crops sold, and a MK 29,466 (p=0.003) to MK 33, 744 rise in total crop income (p=0.002).

The implied average effects of individual savings account adoption on crop income are quite large. Once again, moving down across panels D-F, the magnitudes of the instrumented estimates for effect of adoption are broadly similar (with the exception of crops sold, for which the estimates are extremely noisy among the larger samples). Estimates are most precise among the adoption prone (panel F): adopting an individual account leads to an estimated MK 108,000 (p=0.025) to MK 116,000 (0.038) increase in average value of own crops consumed, an estimated MK 70,000 (p=0.092) to MK 90,000 (p=0.005) rise in average income from crop sales, and an estimated MK 179,000 (p=0.020) to MK 205,000 (p=0.006) rise in average total crop income.

These estimates for the effects of account adoption on average crop income are remarkably high. The point estimates should therefore perhaps be treated with some caution. Given sample size limitations, the standard errors are still fairly wide, allowing for broad confidence intervals. Figure 1 plots the 95% confidence intervals for the effect of account adoption on crop income in all 6 regression models. Note that all but one of the intervals are well above zero. In particular, the lower bound for the confidence interval for total crop income is.

It is worth pointing out, however, that remarkably large point estimates of the benefits of formal savings adoption are a consistent feature of this literature – enough such that some have begun to refer to the phenomenon as the "magic income effect".[17] Dupas and Robinson (2013a) for example find among a sample of 250 microbusiness owners that account adoption boosts average business investment by an estimated 100%, raises private expenditures by 93%, and increases food expenditures by 32-42%, within just the first few months of use.[18] Indeed, the persistent finding of such large benefits of savings adoption across a growing number of studies has inspired research designs to uncover the source of these dramatic impacts on income and

[17] For example, see Callen et al. (2014).

[18] They also note that, similar to the present study, their large estimates are accompanied by large standard errors and wide confidence intervals. However, they find the large estimated magnitudes are confirmed by qualitative interviews with business owners. (See Dupas and Robinson, 2013a.)

assets (e.g. Callen et al., 2014). The above results suggest that, for farming households, accumulating savings for crop investments such as fertilizer is an important channel.

The point estimates of effects I find among farmers are therefore similar in scale to prior large effects among other types of populations. However, data limitations make it difficult to confirm with certainty that the effects in this study are equally large as those found in other types of settings. The interpretation I want to emphasize is that account adoption leads to a substantial positive effect on crop income. Future research would be helpful in narrowing the range of possible effect sizes and estimating the magnitude of the income benefits with greater precision. The preceding findings lead to my next main experimental result:

Result 7: *Savings account adoption can significantly raise agricultural production investments and output among farmers. Adopting formal savings led to large increases in crop investments and crop income the following harvest.*

C. Food Consumption

The finding on higher household incomes above should translate to higher consumption levels and improved household welfare outcomes. One of the key welfare indicators the data contain is food-consumption. This section examines evidence of impacts from account uptake on food consumption by the adoption prone.

In 2010, while 6.9% of the adoption prone households in control villages were in the "food-secure" HFIAP status, 13.9% of this group was in the food-secure status in savings-encouraged villages – roughly twice as many. Table 11, columns 1-2 of panel A report results from a simple linear regression of an indicator for whether an adoption prone household was food secure in 2010 on an indicator for whether the community received the savings encouragement, with and without pair-level effects.[19] The estimated effect of the intention to treat is a 7.0 (p=.089) to 7.1 (p=.086) percentage point (100%) rise in the probability that the household will be food-secure in 2010. Columns 1-2 of panel C show similar, though stronger, results for regressions run at the cluster-level, where the cluster's percentage of adoption-prone households that are food-secure is regressed on an indicator for receiving the savings

[19] Inference based on cluster-robust standard errors.

encouragement: the intention to treat causes an estimated 8.8 (p=.074) to 9.0 (p=.013) percentage point rise in the proportion of households that are food-secure in 2010.[20] This is a 213%-218 rise over the mean percentage of adoption prone that are food-secure in control clusters.[21]

Panels B and D of Table 11 show the implied estimated impact of account-adoption on the probability of being food-secure in 2010. They report results from two-stage least squares regressions at the household (panel B) and cluster (panel C) levels, using the information treatment as an instrument in the first stage. Household-level results indicate adopting a formal savings account leads to an estimated 39.1 (p=.101) to 40.0 (p=.068) percentage point rise in the probability of being food-secure, while those at the cluster level show an estimated 41.8 (p=.012) to 44.6 (p=.030) percentage point increase.

Account adoption also increases households' ability to consume the food they desire. In 2010, 84% of the adoption-prone group in control communities reported they were unable to eat the types of food they preferred at least once in the last month due to a lack of resources, compared to 69% of the adoption-prone in the savings-encouraged villages. Columns 3-4 of Table 11 show intention-to-treat estimates from linear regressions at the household (panel A) and cluster (panel C) levels. Point estimates of the reduced form effect of the information treatment range from a 14.7 (p=.017) to 23.1 (p=.004) percentage point reduction in the probability that household members were unable to eat the kinds of food they wanted – a 17.5% - 27.2% drop. Columns 3-4 of panels B and D show the implied estimated impact of account-adoption on the probability of being unable to eat desired foods in the twp-stage least squares regression coefficients. The point estimates in all cases are large and highly significant.

Turning from food access to diet and types of food actually consumed, adopting formal savings appears to raise consumption of meat. In 2010, 47.5% of adoption-prone households in control villages reported eating meat at least once in the last week, compared to 61.7% in the savings-encouraged villages.[22] Columns 5-6, panels A and C, of Table 11 show the estimated effect of the intention to treat range from a 14.2 (p=.053) to 17.2 (p=.055) percentage point increase in the probability that household members ate meat at least once in the last week – a

[20] Inference based on heteroskedasticity-robust standard errors.
[21] Non-parametric tests also show significant ITT effects: a Wilcoxon rank-sum test shows the distribution of percentages of adoption prone households that are food-secure in 2010 is higher in the savings encouraged than the controls (p=.036).
[22] This excludes fish. The food-diversity questions asked about fish separately from other types of meat (beef, pork, lamb, goat, rabbit, wild game, kidney, heart, organ meats, etc.). A slightly higher proportion of adoption-prone in savings-encouraged villages also consumed fish, but differences are not significant.

30%-39% rise in this indicator of diet quality. Panels B and D report two-stage least squares estimates of the effect of adopting an account. Point estimates range from a 72.1 (p=.064) to 85.1 (p=.066) percentage point increase in the probability of recently consuming meat. These findings lead to my final major experimental result:

Result 8. *Adopting formal savings can improve food-consumption among poor rural farmers. Account uptake increased food-security, ability to consume desired foods, and consumption of meat among the adoption prone.*

VI. Conclusion

Policy makers and international aid organizations are devoting increasing attention to financial deepening and access expansion in the developing world, and the emphasis is quickly broadening from microcredit to include micro-savings. This may be partly attributable to a desire for savings mobilization among developing country financial institutions looking to increase domestic currency deposits from the unbanked. However, the merits of the turn to towards savings services are also plainly visible in the recent accumulation of studies suggesting large positive effects of formal savings accounts on outcomes among the poor.

However, the question of how best to achieve financial inclusion remains a critical one – particularly in rural areas where rates of formal financial service use are extremely low. A consistent finding of the rich literature on technology adoption is that availability of beneficial technologies does not always lead to their use. Questions of information and trust can play a large role, particularly when a household's savings is on the line, and survey evidence suggests that trust can be an important barrier to financial service adoption.

This paper advances our understanding of ways to spur financial deepening by showing how periodic in-person visits by an informed financial services assistant can have a strong effect on formal savings adoption rates. Even without altering fees, informational visits can sharply increase take-up and active use of high-liquidity formal savings accounts. Importantly, the adoption behavior of certain types of households is much more responsive to information than others. In particular, households that are in the middle wealth category (not the poorest nor the richest), that do not live in the immediate vicinity of the bank, and that have higher education levels (household head with at least a primary education) are highly responsive to the

information intervention, while households outside this group do not appear to strongly respond. Finally, account usage appears just as robust among adopters induced by the information intervention as among those that adopted on their own after the introduction of the mobile bank.

In village settings, repeat informational visits can be effective in recruiting new clients and integrating isolated rural areas into modern financial markets. To my knowledge, these are the first experimental results on this type of approach to spur financial inclusion among the poor.

This study also advances the literature on the impacts of simple savings accounts on outcomes of interest among the poor. Though not entirely absent, farming households remain a much-understudied population in this literature – particularly given the centrality of agricultural production in the lives of the very poor. My findings build on prior research showing that formal accounts can help increase productive investments and income among microbusiness owners and individuals in more urban environments, broadening our understanding of the positive impacts of formal savings to agricultural settings. The large increases I find in critical farming inputs such as land and fertilizer complement similar findings in Brune et al. (2016), and shows they extend to a more general population of farmers. Furthermore, the impressive resulting impacts on crop output and crop sales are encouraging from the perspective of savings mobilization (higher account balances over time) as well as welfare improvements among the poor. Indeed, the large positive estimates for impacts on food consumption show strong gains in household welfare.

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TABLE 1 – HOUSEHOLD LEVEL SUMMARY STATISTICS AND BALANCE CHECK

Demographic Characteristics	Sample Mean (Std. Dev.)	Coefficient (std. errors) on Treatment Dummy	Obsv.
Head is Male	0.85	0.026	2,335
	(0.36)	(0.018)	
Head has Primary Education	0.36	0.037	2,337
	(0.48)	(0.041)	
Head's Age (Years)	41.00	-0.09	2,283
	(13.84)	(0.68)	
Household Size (People)	5.13	0.208	2,335
	(1.98)	(0.103)**	
Bank-Stop Distance (km)	7.92	0.14	2,335
	(3.38)	(0.64)	
HFIAP Category (1-4)	3.22	0.02	2,335
	(0.89)	(0.06)	
HFIAS Score (0-21)	7.79	-0.08	2,329
	(4.68)	(0.34)	
HDDS Score (1-12)	7.14	0.29	2,329
	(2.60)	(0.24)	
One or More Members Literate in Chichewa	0.86	-0.003	2,335
	(0.35)	(0.022)	
Has Business	0.27	0.01	2,334
	(0.44)	(0.03)	
Has Member with Salaried Job	0.16	0.02	2,335
	(0.36)	(0.03)	
Physical Assets (Kwacha)	27,595	4,111	2,335
	(146,818)	(8,230)	
Formal + Informal Account Balances (Kwacha)	2,949	1,337	2,335
	(27,281)	(1,583)	
Livestock Value (Kwacha)	17,765	4,453	2,335
	(70,447)	(3,984)	
Land and Buildings Value (Kwacha)	108,450	12,763	2,335
	(313,660)	(15,619)	
Amount of Land (Acres)	2.62	0.02	2,174
	(1.85)	(0.12)	
Has Formal Savings	0.12	0.03	2,329
	(0.32)	(0.03)	
Has Formal Loan	0.06	0.00	2,332
	(0.24)	(0.01)	
De Facto Ineligibles	0.14	-0.01	2,335
	(0.35)	(0.02)	
Attrition	0.14	-0.002	2,335
	(0.35)	(0.033)	

Notes: Exchange rate was approximately 140 Malawi Kwacha to US $1 during the 2008 survey period. The above table reports descriptive statistics for households in the 2008 cross-section. Except where indicated in parentheses, units are proportions. Standard errors in parentheses, clustered at the village-cluster level *** p<0.01, ** p<0.05, * p<0.1.

TABLE 2 – INFORMATION EFFECTS ON HOUSEHOLD ADOPTION OF FORMAL SAVINGS

	Individual Accounts				Any Savings Account			
	Mobile Bank		Any Bank		Mobile Bank		Any Bank	
	(1) Adopt Savings	(2) Adopt Savings	(3) Adopt Savings	(4) Adopt Savings	(5) Adopt Savings	(6) Adopt Savings	(7) Adopt Savings	(8) Adopt Savings
Information Treatment	0.0194***	0.0223**	0.0392***	0.0384**	0.0264***	0.0292***	0.0305**	0.0296
	(0.00635)	(0.00854)	(0.0107)	(0.0153)	(0.00733)	(0.00990)	(0.0138)	(0.0193)
Constant		0.0187***		0.0538***		0.0209***		0.0934***
		(0.00474)		(0.00794)		(0.00507)		(0.0122)
Pair FE	Y		Y		Y		Y	
Observations	1,788	1,788	1,788	1,788	1,788	1,788	1,788	1,788
R-squared			0.059	0.005				

Notes: The table shows estimates from linear regressions of the decision to open an individual savings account. The sample is restricted to those households that did not have formal savings accounts in 2008. The response variable is an indicator equal to 1 if the household has a formal account. Cluster-robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

TABLE 3. EFFECTS OF SAVINGS ENCOURAGEMENT BY WEALTH DECILE

	Individual Account				Any Account			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Adopt		Adopt		Adopt		Adopt	
Decile 1	-0.129***		-0.146***		-0.144***		-0.169***	
	(0.0453)		(0.0433)		(0.0492)		(0.0495)	
Decile 2	-0.135***		-0.145***		-0.0902		-0.108*	
	(0.0480)		(0.0443)		(0.0588)		(0.0582)	
Decile 3	-0.102**		-0.114**		-0.0937*		-0.105**	
	(0.0474)		(0.0443)		(0.0542)		(0.0518)	
Decile 4	-0.150***		-0.165***		-0.143***		-0.158***	
	(0.0438)		(0.0409)		(0.0462)		(0.0450)	
Decile 5	-0.126***		-0.134***		-0.134***		-0.135***	
	(0.0464)		(0.0442)		(0.0483)		(0.0491)	
Decile 6	-0.123***		-0.135***		-0.121**		-0.126**	
	(0.0426)		(0.0399)		(0.0546)		(0.0521)	
Decile 7	-0.110**		-0.106**		-0.107**		-0.0914*	
	(0.0463)		(0.0437)		(0.0491)		(0.0491)	
Decile 8	-0.129***		-0.116**		-0.0978		-0.0887	
	(0.0470)		(0.0476)		(0.0609)		(0.0601)	
Decile 9	-0.0972		-0.0851		-0.102		-0.0869	
	(0.0589)		(0.0549)		(0.0636)		(0.0602)	
Information	-0.0604		-0.0530		-0.0145		-0.00365	
	(0.0575)		(0.0542)		(0.0630)		(0.0639)	
Information × Decile 1	0.0735	0.013	0.0696	0.017	0.0413	0.0268	0.0333	0.030
	(0.0649)	[0.640]	(0.0611)	[0.546]	(0.0736)	[0.432]	(0.0711)	[0.337]
Information × Decile 2	0.0973	0.037	0.0854	0.032	0.00170	-0.013	-0.0119	-0.016
	(0.0669)	[0.268]	(0.0601)	[0.297]	(0.0791)	[0.776]	(0.0780)	[0.728]
Information × Decile 3	0.0515	-0.009	0.0450	-0.008	0.000544	-0.014	-0.0132	-0.017
	(0.0688)	[0.791]	(0.0627)	[0.806]	(0.0781)	[0.734]	(0.0746)	[0.667]
Information × Decile 4	0.139**	0.079**	0.136**	0.083***	0.0862	0.072*	0.0830	0.079**
	(0.0686)	[0.011]	(0.0644)	[0.009]	(0.0743)	[0.058]	(0.0733)	[0.046]
Information × Decile 5	0.0962	0.036	0.0781	0.025	0.0373	0.023	0.00914	0.005
	(0.0695)	[0.279]	(0.0633)	[0.438]	(0.0734)	[0.537]	(0.0711)	[0.884]
Information × Decile 6	0.0887	0.028	0.0827	0.030	0.0324	0.018	0.0283	0.025
	(0.0616)	[0.365]	(0.0584)	[0.363]	(0.0736)	[0.686]	(0.0734)	[0.618]
Information × Decile 7	0.114	0.054	0.115	0.062	0.0717	0.057	0.0554	0.052
	(0.0739)	[0.229]	(0.0724)	[0.232]	(0.0811)	[0.243]	(0.0835)	[0.390]
Information × Decile 8	0.133*	0.073	0.110*	0.057	0.0263	0.012	0.0139	0.010
	(0.0675)	[0.130]	(0.0651)	[0.258]	(0.0796)	[0.832]	(0.0768)	[0.857]
Information × Decile 9	0.164**	0.104*	0.141*	0.088*	0.123	0.109*	0.0954	0.092
	(0.0823)	[0.053]	(0.0788)	[0.092]	(0.0918)	[0.084]	(0.0914)	[0.131]
Constant			0.175***				0.206***	
			(0.0399)				(0.0458)	
Pair FE	Y				Y			
Observations	1,788		1,788		1,788		1,788	

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

TABLE 4. EFFECTS OF SAVINGS ENCOURAGEMENT BY WEALTH GROUP – BOTTOM, MIDDLE, TOP

	Individual Account				Any Account			
	(1) Adopt	(2) Effect on Each Wealth Tier	(3) Adopt	(4) Effect on Each Wealth Tier	(5) Adopt	(6) Effect on Each Wealth Tier	(7) Adopt	(8) Effect on Each Wealth Tier
Middle 60%	-0.00537		0.00674		-0.0130		0.00793	
	(0.0140)		(0.0137)		(0.0218)		(0.0222)	
Top 10%	0.131***		0.145***		0.118**		0.136***	
	(0.0481)		(0.0454)		(0.0527)		(0.0512)	
Information	0.0131		0.0137		-0.000697		-0.000933	
	(0.0179)		(0.0181)		(0.0222)		(0.0213)	
Information × Middle 60%	0.0531**	0.066***	0.0491*	0.063***	0.0534*	0.053**	0.0498	0.049*
	(0.0254)	[0.000]	(0.0248)	[0.002]	(0.0308)	[0.010]	(0.0308)	[0.060]
Information × Top 10%	-0.0848	-0.072	-0.0750	-0.061	-0.0249	-0.026	-0.00897	-0.010
	(0.0644)	[0.237]	(0.0596)	[0.287]	(0.0719)	[0.697]	(0.0698)	[0.881]
Constant			0.0395***				0.0789***	
			(0.0111)				(0.0149)	
Pair Effects	Y				Y			
Observations	1,788		1,788		1,788		1,788	

Cluster- robust standard errors in parentheses, F-test p-values in brackets, *** p<0.01, ** p<0.05, * p<0.1

TABLE 5. EFFECTS OF SAVINGS ENCOURAGEMENT BY EDUCATION AND DISTANCE

	Effects by Education				Effects by Distance			
	Individual Account		Any Account		Individual Account		Any Account	
	(1) Adopt	(2) Adopt	(3) Adopt	(4) Adopt	(5) Adopt	(6) Adopt	(7) Adopt	(8) Adopt
Information	0.0519***	0.0345**	0.0299	0.0127	0.0402	-0.0409	0.0476	-0.0419
	(0.0158)	(0.0141)	(0.0208)	(0.0219)	(0.0599)	(0.0577)	(0.0600)	(0.0612)
Head educated	0.106***	0.108***	0.0788**	0.0900**				
	(0.0325)	(0.0303)	(0.0384)	(0.0359)				
Information ×Head educated	0.0861	0.108*	0.137**	0.144**				
	(0.0606)	(0.0600)	(0.0631)	(0.0617)				
Over 3 km					0.0153	-0.0721*	-0.0555	-0.0475
					(0.0380)	(0.0392)	(0.0417)	(0.0396)
Information × Over 3 km					0.0374	0.116*	0.0179	0.101
					(0.0617)	(0.0612)	(0.0634)	(0.0671)
Constant		0.0234***		0.0679***		0.111***		0.130***
		(0.00732)		(0.0168)		(0.0383)		(0.0353)
Pair Effects	Y		Y		Y		Y	
Information Effect on Educated	0.138***	0.143**	.167***	.157**				
[F-test p-value]	[0.009]	[0.0169]	[0.003]	[0.013]				
					0.078***	0.075***	.066***	.059**
Information Effect on Nonlocals					[0.000]	[0.000]	[0.002]	[0.033]
[F-test p-value]								
Observations	1,062	1,062	1,062	1,062	1,064	1,064	1,064	1,064

Sample restricted to households in the middle wealth group. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

TABLE 6. EFFECTS OF SAVINGS ENCOURAGEMENT ON THE ADOPTION PRONE VS. OTHER HOUSEHOLDS

	Individual Account				Any Account			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Adopt	Effect on Adoption-Prone	Adopt	Effect on Adoption-Prone	Adopt	Effect on Adoption-Prone	Adopt	Effect on Adoption-Prone
Adoption Prone	0.0640*		0.0619*		0.0408		0.0509	
	(0.0335)		(0.0323)		(0.0388)		(0.0375)	
Information	0.0210*		0.0184		0.00757		0.00635	
	(0.0107)		(0.0129)		(0.0133)		(0.0168)	
Information ×Adoption Prone	0.140**	0.161***	0.160**	0.178 ***	0.181***	0.187***	0.188***	.194***
	(0.0614)	[0.006]	(0.0634)	[0.005]	(0.0624)	[0.002]	(0.0648)	[0.004]
Constant			0.0470***				0.0878***	
			(0.00807)				(0.0119)	
Pair Effects	Y				Y			
Observations	1,783		1,783		1,783		1,783	

Sample restricted to households without formal savings in the baseline. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

TABLE 7. EFFECTS OF INFORMATION INTERVENTION ON AMOUNTS SAVED AND FREQUENCY OF ACCOUNT-USE BY ADOPTERS

	(1) Balance (MK)	(2) Balance (MK)	(3) Any Use	(4) Any Use	(5) Deposit	(6) Deposit	(7) Withdrawal	(8) Withdrawal
Panel A: Individual Accounts								
Information	-1,103	8,610	0.390*	0.366***	0.247	0.268***	0.571***	0.514***
	(13,897)	(11,634)	(0.228)	(0.138)	(0.167)	(0.0732)	(0.193)	(0.155)
Over 3 km	2,633	-642.1	0.108	0.578***	0.0550	0.649***	0.132**	0.713***
	(11,855)	(9,591)	(0.142)	(0.205)	(0.143)	(0.152)	(0.0523)	(0.253)
Information × Over 3 km	-8,602	-15,563	-0.378	-0.261	-0.264	-0.283**	-0.580***	-0.470***
	(15,600)	(12,316)	(0.248)	(0.170)	(0.190)	(0.112)	(0.204)	(0.168)
Constant	16,032		0.182		0.182		0	
	(9,911)		(0.122)		(0.122)		(5.50e-09)	
Pair FE		Y		Y		Y		Y
Information Effect on Nonlocals	-9,705	-6,593*	0.012	0.105	-0.017	-0.015	-0.01	0.044
[F-test p-value]	[0.175]	[p=0.090]	[p=0.902]	[p=0.296]	[0.846]	[0.857]	[0.900]	[0.506]
Observations	130	130	129	129	129	129	129	129
Panel B: Individual or Group Accounts								
Information	-3,257	5,593	0.433*	0.543***	0.333	0.480**	0.500***	0.471***
	(9,772)	(7,555)	(0.218)	(0.190)	(0.210)	(0.183)	(0.143)	(0.106)
Over 3 km	-2,898	-12,830	0.176	0.263	0.133	0.302	0.0857**	0.519***
	(8,304)	(10,025)	(0.147)	(0.214)	(0.146)	(0.233)	(0.0358)	(0.0848)
Information × Over 3 km	3,773	2,734	-0.497**	-0.502**	-0.407*	-0.504**	-0.461***	-0.430***
	(11,453)	(12,061)	(0.236)	(0.208)	(0.228)	(0.200)	(0.151)	(0.116)
Constant	13,957*		0.267**		0.267**		0	
	(7,459)		(0.130)		(0.130)			
Pair FE		Y		Y		Y		Y
Information Effect on Nonlocals	516	8,327	-0.064	0.041	-0.074	-0.024	0.039	0.041
[F-test p-value]	[0.931]	[0.378]	[0.482]	[0.628]	[0.406]	[0.763]	[0.412]	[.398]
Observations	193	193	190	190	190	190	191	191

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

TABLE 8. EFFECTS OF ACCOUNT ADOPTION ON PRODUCTION INVESTMENTS – INTENTION TO TREAT EFFECTS

	Fertilizer (kg)		Fertilizer (MK)		Land (Acres)		Land (MK)		Seedlings (MK)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: ITT Estimates, All Households										
Information Treatment	7.063	3.626	1,206	784.6	0.413*	0.388***	49,626*	47,120**	62.36	62.52
	(8.109)	(4.617)	(858.7)	(511.3)	(0.213)	(0.130)	(26,017)	(19,788)	(61.93)	(48.32)
Mean in control villages	*98.16*		*8,250*		*2.949*		*82,623*		*457.9*	
Pair FE		Y		Y		Y		Y		Y
Observations	1,555	1,555	1,549	1,549	1,542	1,542	1,551	1,551	1,549	1,549
Panel B: ITT Estimates, Eligibles										
Information Treatment	7.789	4.726	1,604*	1,208**	0.486**	0.487***	57,587*	54,673**	69.08	74.06
	(8.714)	(5.145)	(960.0)	(602.5)	(0.233)	(0.155)	(29,763)	(22,185)	(67.47)	(52.62)
Mean in control villages	*105.1*		*9,021*		*3.067*		*89,896*		*497.6*	
Pair FE		Y		Y		Y		Y		Y
Observations	1,311	1,311	1,308	1,308	1,309	1,309	1,317	1,317	1,306	1,306
Panel C: ITT Estimates, Adoption-Prone										
Information Treatment	49.58***	51.57***	5,207**	5,673***	0.803**	0.915***	148,836	105,567*	230.1	346.7*
	(17.28)	(18.91)	(2,112)	(1,734)	(0.315)	(0.310)	(106,489)	(57,714)	(195.9)	(190.5)
Mean in control villages	*105.0*		*10,524*		*2.926*		*75,432*		*701.3*	
Pair FE		Y		Y		Y		Y		Y
Observations	200	200	198	198	197	197	197	197	200	200

Notes: Sample restricted to households without formal savings in the baseline living in nonlocal communities (more than 3 km from the bank-stop). Cluster-robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

TABLE 9. EFFECTS OF ACCOUNT ADOPTION ON PRODUCTION INVESTMENTS – TREATMENT EFFECTS ON THE TREATED

	Fertilizer (kg)		Fertilizer (MK)		Land (Acres)		Land (MK)		Seedlings (MK)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: All Households										
Adopt Formal Savings	158.2	90.42	25,009	18,040	9.238*	9.200**	1.099e+06	1.093e+06*	1,461	1,665
	(168.2)	(105.2)	(18,136)	(11,077)	(5.009)	(3.777)	(720,451)	(579,951)	(1,496)	(1,332)
Constant	91.22***		7,176***		2.520***		31,119		390.1***	
	(11.50)		(1,225)		(0.296)		(37,357)		(98.04)	
Pair FE		Y		Y		Y		Y		Y
Observations	1,555	1,555	1,549	1,549	1,542	1,542	1,542	1,542	1,549	1,549
Panel B: Eligibles										
Adopt Formal Savings	158.4	107.0	30,216	25,380**	9.950*	10.29**	1.165e+06	1.130e+06*	1,478	1,812
	(166.2)	(106.2)	(18,879)	(11,760)	(5.261)	(4.206)	(785,065)	(594,389)	(1,493)	(1,348)
Constant	96.79***		7,476***		2.520***		25,368		415.8***	
	(12.99)		(1,463)		(0.357)		(47,936)		(115.1)	
Pair FE		Y		Y		Y		Y		Y
Observations	1,311	1,311	1,308	1,308	1,309	1,309	1,309	1,309	1,306	1,306
Panel C: Adoption-Prone										
Adopt Formal Savings	313.0**	322.9**	32,560**	32,377***	5.00**	5.00***	889,570	577,073*	1,547	2,251*
	(149.5)	(138.4)	(15,621)	(10,178)	(2.120)	(1.594)	(802,074)	(298,898)	(1,425)	(1,261)
Constant	69.47***		6,793**		2.364***		-24,418		525.9*	
	(24.10)		(2,789)		(0.395)		(99,791)		(285.5)	
Pair FE		Y		Y		Y		Y		Y
Observations	200	200	198	198	197	197	197	197	200	200

Notes: Sample restricted to households without formal savings in the baseline living in nonlocal communities (more than 3 km from the bank-stop). Cluster-robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

TABLE 10. EFFECTS OF ACCOUNT ADOPTION ON CROP INCOME

	Own-Consumption		Crops Sold		Total Crop Income	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: ITT Estimates, All Households						
Information Treatment	3,375	3,309***	843.0	264.4	4,965	4,224
	(2,472)	(1,247)	(1,851)	(1,222)	(5,172)	(3,265)
Mean in control villages	*43,656*		*16,604*		*66,090*	
Pair FE		Y		Y		Y
Observations	1,573	1,573	1,558	1,558	1,580	1,580
Panel B: ITT Estimates, Eligibles						
Information Treatment	3,513	3,972***	1,283	477.8	5,068	5,387
	(2,670)	(1,365)	(2,127)	(1,492)	(5,790)	(4,004)
Mean in control villages	*46,488*		*19,075*		*71,451*	
Pair FE		Y		Y		Y
Observations	1,331	1,331	1,320	1,320	1,335	1,335
Panel C: ITT Estimates, Adoption Prone						
Information Treatment	17,836***	18,999**	11,630**	14,745**	29,466***	33,744***
	(6,641)	(7,813)	(5,837)	(5,879)	(9,613)	(10,322)
Mean in control villages	*49,901*		*24,571*		*74,472*	
Pair FE		Y		Y		Y
Observations	200	200	200	200	200	200
Panel D: ToT Estimates, All Households						
Adopt Individual Account	69,681	72,538**	17,480	5,789	106,448	96,471
	(47,874)	(28,542)	(37,306)	(26,170)	(107,330)	(74,609)
Constant	40,555***		15,904***		61,365***	
	(3,258)		(2,700)		(7,007)	
Pair FE		Y		Y		Y
Observations	1,573	1,573	1,558	1,558	1,580	1,580
Panel E: ToT Estimates, Eligibles						
Adopt Individual Account	65,918	77,516**	24,218	9,403	98,703	109,355
	(48,454)	(30,109)	(39,529)	(28,634)	(110,749)	(81,563)
Constant	43,003***		17,888***		66,241***	
	(3,698)		(3,247)		(8,168)	
Pair FE		Y		Y		Y
Observations	1,331	1,331	1,320	1,320	1,335	1,335
Panel F: ToT Estimates, Adoption Prone						
Adopt Individual Account	108,056**	115,573**	70,455*	89,692***	178,511**	205,266***
	(48,295)	(55,718)	(41,787)	(32,160)	(76,621)	(74,882)
Constant	38,645***		17,232**		55,878***	
	(7,547)		(7,028)		(11,762)	
Pair FE		Y		Y		Y
Observations	200	200	200	200	200	200

Notes: Sample restricted to households without formal savings in the baseline living in nonlocal communities (more than 3 km from the bank-stop). Cluster-robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

TABLE 11. EFFECTS OF ACCOUNT ADOPTION ON FOOD CONSUMPTION

	Food-Secure		Unable to Eat Desired Food		Consumed Meat	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Intention to Treat Estimates (ITT)						
Information Treatment	0.0696*	0.0706*	-0.147**	-0.201***	0.142*	0.136*
	(0.0403)	(0.0405)	(0.0603)	(0.0594)	(0.0722)	(0.0759)
Mean in control villages	*0.0693*		*0.838*		*0.475*	
Pair FE		Y		Y		Y
Observations	209	209	206	206	206	206
Panel B: Instrumented Effect of Adoption (ToT)						
Adopt Formal Savings	0.391	0.400*	-0.867**	-1.145***	0.839*	0.776*
	(0.238)	(0.220)	(0.419)	(0.362)	(0.433)	(0.420)
Constant	0.0268		0.935***		0.381***	
	(0.0500)		(0.0793)		(0.0925)	
Pair FE		Y		Y		Y
Observations	209	209	206	206	206	206
Panel C: Cluster-Level Intention to Treat Estimates (ITT)						
Information Treatment	0.0900**	0.0876*	-0.165**	-0.231***	0.172*	0.151
	(0.0355)	(0.0474)	(0.0705)	(0.0833)	(0.0880)	(0.115)
Mean in control villages	*0.0412*		*0.849*		*0.442*	
Pair FE		Y		Y		Y
Observations	77	77	77	77	77	77
Panel D: Cluster-Level Instrumented Effect of Adoption						
Adopt Formal Savings	0.446**	0.418**	-0.817**	-1.100***	0.851*	0.721*
	(0.206)	(0.167)	(0.389)	(0.306)	(0.464)	(0.389)
Constant	-0.00139		0.927***		0.361***	
	(0.0370)		(0.0824)		(0.0985)	
Pair FE		Y		Y		Y
Observations	77	77	77	77	77	77

Notes: Cluster-robust (panels A and B) and heteroskedasticity-robust (panels C and D) standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

APPENDIX TABLES