Formal Savings Spillovers on Microenterprise Growth and Production Decisions Among Non-Savers in Villages: Evidence from a Field Experiment

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Formal Savings Spillovers on Microenterprise Growth and Production Decisions Among Non-Savers in Villages: Evidence from a Field Experiment

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(PRELIMINARY DRAFT – PLEASE DO NOT CITE WITHOUT PERMISSION)

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Abstract

This paper uses a randomized field experiment to identify the spillover effects of increased formal savings-use on non-farm business activity and production decisions of *non-savers* in villages. A panel analysis of 2,006 households in Central Malawi shows that a randomly assigned formal savings encouragement exogenously increases adoption of high-liquidity formal savings accounts in village communities. This increases receipts of cash assistance by *non-saving* households in the middle wealth-stratum, who may be on the margins for deciding to operate a non-farm business, or start growing cash crops or high-yielding crop varieties (HYVs). The hypothesized channel of effects is that expanded formal savings-use increases liquidity and decreases transaction costs, lowers the cost of making transfers, and thus increases receipts of cash aid even by non-saving households. Increased cash assistance is then linked among these households to increased probability of operating a non-farm enterprise or switching to HYVs or cash crops. This may result from a perception of increased security, which causes households to be more willing to take on higher-risk, higher-reward production activities. To date, little is known about how microfinance affects pre-existing informal insurance practices, and whether the production choices among those who utilize informal practices change as safety nets based on inter-household transfers strengthen or weaken when financial markets expand. This paper helps fill that gap.

Keywords: Microfinance, formal savings, indirect effects, micro-enterprise, informal insurance, HYVs adoption

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Introduction

Households across the developing world face frequent, often severe, adverse income and consumption shocks, particularly in rural settings. In the face of such risk and uncertainty, many households can engage in a wide variety of ex-ante risk management strategies and ex-post coping tactics. It has been shown that one way households may address this volatility is by making production choices which smooth income, or reduce its variance (e.g. Morduch, 1995; Antle 1987, Bliss and Stern, 1987). While this may help reduce the risk of low income realizations and the low consumption and welfare outcomes which often follow, "income-smoothing" often comes with the cost of lower expected profits.

This paper examines the spillover effects of expanding formal savings markets on the safety nets and informal insurance options of *non-savers*, and the consequent effects this has on household production decisions. In particular, it examines evidence showing that an exogenous increase in local formal savings adoption results in higher probability that a *non-saving* household will start a non-agricultural enterprise, as a result of improvements in local informal safety nets caused by formal savings expansion. Results also show increases in the proportion of households using high-yielding varieties (HYVs) and cash crops.

Interest in non-credit microfinance services has grown sharply in recent years among development policy-makers and practitioners, as well as among researchers. Several large aid organizations have made it their mission, for example, to expand access to formal savings across the developing world. Yet, as projects of financial deepening are pushed forward, there remain crucial gaps in our understanding of the full effects. In particular, there is scant reliable evidence on what the encounter of formal finance with pre-existing informal institutions will yield. Given the high interdependence of households in villages, it is important to examine what the effects of expanding financial markets may be on non-users of services. It is unclear *a priori* how pre-

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existing informal systems will be affected by the introduction of market-based instruments, and whether this may incite changes in production among non-users.

The hypothesized causal chain is that a boost in adoption of high-liquidity formal savings accounts decreases transaction costs. This reduces the cost of making transfers, leading to increases in transfer receipts even among *non*-savers. The sharp boost in inter-household transfer activity across all wealth levels in the village changes subjective beliefs over whether an outside household will help if one is hit with a negative income shock. For households on the margin of deciding whether to engage in a higher-risk, higher-reward production activity, this can reduce the cost of failure, and encourage them to "take the plunge". The perceived strengthening of their informal safety nets may cause them to feel secure enough to take on the extra risk of operating a non-agricultural business, or shifting their farm production to riskier but more lucrative crops, which yield higher long-run returns.

2. The Potential Impact of Changes in Safety Nets on Production Decisions

Many responses to risk are based on interdependence among households. Variously referred to as "hunger insurance", local "social security", "non-market institutions", and "informal insurance arrangements", these practices can fulfill a crucial function for individuals in poor, rural communities. Many studies, across a variety of settings, show that households frequently address short-falls in income through informal loans from friends and relatives (Platteau and Abraham, 1987; Townsend, 1995a, 1995b; Fafchamps and Lund, 2003; Udry, 1994). Assistance from other households also commonly takes the form of gifts (Cox and Jimenez (1998), Fafchamps and Lund (2003), Dercon et. al. (2008)). These inter-household wealth flows are typically interpreted as informal contractual arrangements between parties who

provide each other assistance in times of need (Coate & Ravallion, 1993; and Kletzer and Wright, 1992; Fafchamps, 1992). More recent work suggests motivations other than mutual insurance can also play an important role (Hoff and Sen, 2006; Baland et. al., 2007; Comola and Fafchamps 2010).

Other methods a household might use to reduce uncertainty, or to mitigate negative consequences from poor outcomes, involve choices a household can make as an isolated unit. Several studies have shown that one strategy households pursue is to adjust production decisions and diversify income-generating activities so as to dampen income volatility. While reducing the scope for variation in realized income (and, more to the point, raising lower bounds for expected income ranges), this often unfortunately lowers efficiency, reduces profits, and diminishes total household incomes over the long-run. Morduch (1995) reviews several ways this practice of "income-smoothing" has been documented in other studies as a method to reduce the risk of low income. Antle (1987) shows that rice farmers in southern India use labor well beyond profit-maximizing levels, evidence that rural households use techniques and inputs that reduce variability of profits but lower net expected returns. Bliss and Stern (1982) find evidence in northern India of fertilizer usage far below profit-maximizing levels, suggesting production choices aimed to minimize potential investment losses (and thus income reductions) in case the crop fails.

Walker and Ryan (1990) and Bliss and Stern (1982) provide evidence that households sometimes delay the onset of production to await more accurate weather predictions. While this allows them to limit production and cut potential losses when they know weather is likely to be poor, this practice of waiting again substantially reduces total expected yields.[2] Morduch (1990)

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[2] Bliss and Stern (1982) estimate that delaying production by two weeks can reduce yields by 20% , in the village they study in northern India.

also finds that vulnerability of consumption to income shocks is linked to use of lower-risk, but lower-yielding, crop-varieties.

While it may help prevent dangerously low consumption swings, this method for handling adverse shocks can thus have substantial negative long-run impacts on the poor. Formal financial services deepening may have an important impact in the context of this approach to dealing with risk. Any effects from expanding financial markets that worsen a household's choice-set of ex-post risk-coping mechanisms may exacerbate total income losses from ex-ante income-smoothing of this sort. On the other hand, if indirect effects lead to an improvement in a household's ex-post options for dealing with negative shocks, it should induce movements towards greater efficiencies in production, and higher net incomes among such households.

This study hypothesizes that the expansion of access to high-liquidity formal savings causes a reduction in the cost of sharing wealth, or making transfers. Villagers in the study area are often explicit that they use durable goods and livestock (often goats, radios, or bicycles) to save, indicating a demand for non-cash wealth-storage options. They also note, however, that it can take more than a week to find a buyer when they need to sell an asset in order to obtain the cash for something else. In addition, since markets are fragmented, spatially covariate shocks which cause others nearby to try to liquidate similar assets at the same time drive up supply and depress prices, causing depreciation of stored wealth. A household which saves through durables, when asked by a friend or relative for cash assistance, must consider not only the cost of the amount of assistance provided, but also the time and effort required to liquidate stored wealth which may be shared, as well as potential depreciation.

As households increasingly monetize their wealth, these costs may drop considerably. As one formal saver aptly puts it, "You can withdraw from a bank any time. If you want to sell a

goat, you must find a buyer, and you need to settle on a price." This suggests a causal chain through which a boost in formal savings adoption increases liquidity, reduces the cost of making transfers, and increases transfer receipts among *non*-savers. This then affects their production decisions. In the case of the village "middle class", the perceived strengthening of their informal safety nets may cause them to feel secure enough to take on the extra risk of operating a non-agricultural business which yields higher long-run returns.

3. The Data and Empirical Approach

To test the empirical effects of formal savings adoption on nearby non-savers in rural areas of the developing world, we draw on household survey data from Malawi. Malawi is among the poorest countries, has low participation in formal financial markets in rural areas, and significant incidence of inter-household assistance, gifts, and loans.[3] In late 2007, a local microfinance bank rapidly expanded formal savings access to rural areas of the three largest districts of central Malawi – Lilongwe, Mchinji, and Dedza. Expansion occurred through a mobile van-bank, which traveled along paved roads, and had six different stops at local trading centers – three stops along the highway running 110 km west from the capital city of Lilongwe (located in the center of Lilongwe district), and three stops along the highway running 90 km south.

This expansion of formal services into the thin financial environment of rural Malawi provides an ideal setting to examine the interaction between formal savings markets and

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[3] In 2008, 6.0% of the sampled households had at least one current formal loan, while 11.6% of the households had one or more formal savings accounts. Only 2.8% of the sampled households reported both formal savings and formal credit, so about 14.7% of the sample reported using formal savings accounts, formal credit, or both. On the other hand, 23.6% of the sample reported having at least one current informal loan from a friend or relative.

indigenous safety-net systems and the consequent spillover effects on production decisions. 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. This was prior to any measurable use of the bank's services in these areas.[4] The second round was collected over the same period in 2010, after an information campaign designed to encourage use of the bank's services.

Community sampling followed a matched-pair design. Each pair consisted of two village-clusters, a cluster being defined by enumeration areas (EAs) – sampling units defined by Malawi's National Statistics Office that typically include 2-4 villages[5]. Clusters of villages were first categorized based on distance from the mobile van-bank stop: (i) within 5km; (ii) 5-10 km; (iii) more than 10 km. They were then further split into two population categories: high versus 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 an 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 mobile bank call-point ranging between 0 and 14 kilometers.

The Information Intervention

Drawing from focus group discussions on the ways people obtain trustworthy information from sources outside the village, we designed a formal savings encouragement that would mirror these other methods of information dissemination, to serve as an instrument. The

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[4] 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, and almost no households in the baseline data report using the bank's services.

[5] For very large villages, the EA may consist of only one village; in a few cases, the EA might include as many as 5 villages. Both of these cases are rare in the data.

backbone of this information campaign consisted of periodic visits (via foot and bicycle) to each village from a paid Field-Based Promotional Assistant (FBPA). The FBPA brought informational materials on the bank's services, talked with community members, and left promotional materials in each village assigned to the information-treatment.

Descriptive Statistics and Balance-Check

Table 1 reports descriptive statistics on several important household dimensions of the baseline sample. As the statistics are from the baseline, it includes the 341 households that attrited and which are not part of the final full panel. The table presents overall figures, then split by information-treated and non-treated. The HFIAP-Score is a 4-point food-security indicator that forms the basis for vulnerability-categories. The HFIAS-score is a 21-point food-security indicator. (For both indicators, higher values imply less security.) Category A through Category G are household vulnerability indicators, defined in the next section, such that these take a value of 1 if the household belongs to the category. Unless otherwise indicated, the reported values are percentages of households in the sample for which the indicator variable is true. The column of differences indicates statistically significant differences based on two-sided t-tests (Mann-Whitney U-tests for household size and HFIAP), with standard levels of significance indicated.

The randomization appears to have been successful at achieving a balance across the information-treated and non-treated clusters along most household dimensions, with a few exceptions. There is a small, but statistically significant, difference in household size. Clusters that received the information intervention also have a slightly lower percentage of female-headed households. In addition, there appears to be a greater prevalence of formal savings in the

information-treated clusters, even prior to the intervention. Importantly, there is clearly *no* difference in the probability of maintaining a non-agricultural enterprise.

Table 1*: Characteristics of Households in Baseline, Overall and by Treated & Control Clusters*

	Overall	Control	Treated	Difference
Number of HHs (qty)	2,352	1,178	1,174	4
Head is Male	0.851	0.838	0.864	.026*
HH Size (People)	5.13	5.03	5.23	0.20**
Head's Age (Years)	41.0	41.1	40.9	-0.15
Bank-Stop Distance (km)	7.92	7.87	7.98	0.11
HFIAP Score (1-4)	3.22	3.21	3.23	0.02
HFIAS Score (1-21)	7.78	7.81	7.75	-0.07
Has Cell phone	0.132	0.120	0.145	0.025*
Has Literate Members	0.858	0.860	0.856	-0.004
Has Salaried Member	0.155	0.144	0.166	0.022
Has Business	0.265	0.259	0.270	0.011
Physical Assets (Kwacha)	27,440	25,286	29,592	4,306
Amount of Land (Acres)	2.620	2.607	2.632	0.025
Has Formal Savings	0.117	0.100	0.134	0.033**
Has Formal Loan	0.061	0.061	0.061	-0.000
Attrition	0.140	0.140	0.139	
Number of HHs (qty)	2335	1161	1174	

Notes: The above table reports descriptive statistics for households in the 2008 cross-section. Except where indicated in parentheses, units are proportions.

4. Information Intervention Effects on Financial Services Adoption

Access to credit through the microfinance organization's "bank on wheels" was not available to most communities.[6] The information intervention thus served essentially as an

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[6] Access to formal credit from the van-bank is expanded slowly, on a village-by-village basis. It involves significant resources – several visits to a village by a bank officer, meetings with prospective borrowers and village leaders,

encouragement to open a formal savings account with the bank. Inasmuch as it raised general awareness and literacy with respect to financial services, however, it is plausible the campaign might induce individuals to start using services of other financial organizations within the region. As other organizations might be able to offer loans, it is possible the information campaign could have induced higher formal credit use. The analyses therefore test for changes in use of formal savings or formal credit at any financial organization.

Effect of Instrument on Adoption of Formal Services

Table 2 shows the effect of the information intervention on changes in household financial service-use. It reports results from a simple linear regression of the decision to adopt (quit) use of formal savings (credit) on a dummy variable indicating assignment of the community to the information intervention, with 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 formal savings account (columns 1-4), or at least one current formal loan (columns 5-8), in 2010. This is equivalent to regressing the percentage of households in the cluster with formal savings (credit) on the information dummy, accounting for pair-level effects, and explicitly correcting for heteroskedasticity across clusters due to variation in number of households in each cluster (FGLS).

People living nearest the bank's weekly location are likely to know more about its services than those living further away, independent of whether they receive the information

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risk assessments, etc. The banking officers explain that this process, which takes 1-2 months, first targets areas closest to the bank's stop, and those with the greatest economic activity.

[7]The fixed effects account for the possibility that pairs experience the bank's expansion of formal services access differently. For example, villages in pairs closer to the bank-stop may be more responsive to access expansion than those in pairs further away, regardless of whether they are encouraged or non-encouraged.

intervention. For example, those living in the market center where the bank stops are less likely to need the information campaign to learn about its services. Each specification is thus first run for the entire sample, and then restricted to clusters for which both members of the cluster-pair are at least one kilometer from the nearest bank-stop.

Columns 1 and 2 show results when the sample is restricted to households which did not have formal savings accounts in 2008 (i.e. the baseline non formal-savers). The coefficient estimates for the information dummy in these regressions show that the encouragement increased the percentage of previously non-saving households that adopted formal savings by about 3.1 percentage-points overall, and by 3.5 percentage points among clusters one or more kilometers from the bank's stop. This represents a boost to savings adoption rates of 33% and 38%, respectively, over control villages.[8] The larger magnitude and significance of estimated effects as distance increases confirms that the information is more effective at promoting savings-adoption in more remote locations.[9]

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[8] Among control clusters, 9.4% of those without formal savings in 2008 adopted formal savings by 2010. When restricting to clusters beyond the 1 km threshold, 9.6% of the previous non formal-savers adopt formal savings.
[9] The increasing effect of the information intervention with distance is even more clear when including a 3 km threshold: It raises local adoption rates by 3.1 percentage points (from 9.3% to 12.4%) across the whole sample, 3.5 percentage points (from 9.3% to 12.8%) across clusters one or more km from the bank's stop, and 3.7 percentage points (from 8.7% to 12.4%) across clusters three or more km from the bank's stop (results not shown).

Table 2. Effects of Information Campaign on Adoption and Dis-Adoption of Formal Savings and Formal Credit

	Formal Savings				Formal Credit			
	Start Formal Savings		Stop Formal Savings		Start Formal Credit		Stop Formal Credit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Has Svgs	Has Svgs	Has Svgs	Has Svgs	Has Loan	Has Loan	Has Loan	Has Loan
Information	0.0306**	0.0347**	-0.0441	-0.0068	-0.00708	-0.00693	0.00782	-0.0752
	(0.0138)	(0.0145)	(0.063)	(0.0603)	(0.416)	(0.430)	(0.948)	(0.619)
FSAV in 2008	N	N	Y	Y				
FCRED in 2008					N	N	Y	Y
Observations	1,784	1,593	217	169	1,860	1,651	120	93
R-squared	0.064	0.066	0.270	0.308	0.038	0.035	0.396	0.419

Notes: Cluster-robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The table shows estimates from linear regressions of the decision to start or stop formal financial service-use. All regressions include cluster-pair fixed effects. Columns 1 & 2 restrict sample to households without formal savings in 2008, columns 3 & 4 restrict to those with formal savings. Columns 5 & 6 restrict to households without current formal loans in 2008, columns 7 & 8 to those with formal loans.

Columns 3 and 4 show results from analogous regressions, but for which the sample is restricted to households that had a formal savings account in 2008. Here, the coefficient on the information dummy represents any effect of the information intervention on the proportion of previous formal-savers that stopped formal savings-use. As the estimates clearly show, the information had no effect on stopping use of formal savings.

Results from regressions analogous to those for columns 1-4, but for changes in formal credit use, are reported in columns 5-8. For columns 5 and 6, the sample is restricted to households with no formal loan in 2008; for columns 7 and 8, the sample is restricted to those with a formal loan in 2008. The estimates show the information intervention had no effect on changes in use of formal credit.

5. Effects of Local Formal Savings Uptake on Receipts of Assistance Among Non-Savers

This section examines the reduced-form effect of the savings encouragement on transfer receipts by other households in the same community, before looking at the instrumented effect of the formal savings adoption rate on receipts of cash assistance by the second wealth quartile. The randomly assigned information treatment serves as an instrument for the adoption decision to enable unbiased inferences about the impact of formal savings on transfers. Discussion of the impacts of formal savings expansion on transfer receipts begins with a brief look at simple percentage changes across the encouraged and non-encouraged clusters.

While the baseline includes data on a broad range of financial services and transactions, the detailed questions on inter-household transfers were not added to the questionnaire until the endline survey. Discussion of the impacts of formal savings adoption

on inter-household transfers is therefore focused a cross-sectional analysis of the endline data. Since the savings-encouragement is randomly assigned, we may interpret relationships between the encouragement and household outcomes as causal.

We gathered data on cash gifts of 50 kwacha (about $.30) or more, received over a 90-day recall period preceding the interview.[10] The vast majority are from within the local community. While we did not gather data on the actual distances between giving and receiving households, nor on whether the households were located in the same village, the data do include total round-trip travel times required to obtain each gift. About 80% of the reported round-trip travel times are below 30 minutes (implying one-way trips of a maximum 5-15 minutes)[11]. Given that the standard mode of transport in these areas is usually walking, and sometimes bicycling, this suggests that most of these transfers are between households within the same village, or at furthest from neighboring villages.

Table 3 shows simple comparisons of the percentage of households receiving cash gifts in the control and savings-encouraged clusters. We see a large difference in receipts of cash gifts from other households across savings-encouraged and non-encouraged areas. While 20.8% of all households in the non-encouraged areas received a cash gift in the last 90 days, 30.6% of those in the encouraged areas received one. (Fisher's Exact test, p=0.000.) This change in the proportion of households represents a difference of almost 50%. In addition, while 7.4% of all households in the non-encouraged areas received more

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[10] Interviewers were intensively trained on the difference between a "gift" and a loan, the latter carrying with it an expectation of repayment of some type of wealth in the future. In addition, the module I added to the survey with questions on gifts came after a section in which detailed information was already gathered on loans. Interviewers were trained to distinguish between the two and collect information on each only in their respective parts of the questionnaire.
[11] The question was asked so as to include time spent at the location of where they were requesting or receiving the gift. That is, it is a total time-cost figure, inclusive of time spent communicating with anyone providing assistance.

than one cash gift, 12.0% of all those in the savings-encouraged areas received multiple cash gifts – a difference of 62%. This difference is also highly significant (p<.001; results not shown).

Table 3. Percentage of Households that Received at Least One Cash Gift

	Control Clusters (No. Households)	Treated Clusters (No. Households)	Difference (Fisher's Exact p-value)
By Distance			
All Households	20.8% (995)	30.6% (997)	9.8 pctg points (p = 0.000)
Households One or More Km From Stop	20.3% (931)	30.6% (922)	10.3 pctg points (p = 0.000)
By Wealth-Level			
Wealthiest 50%	24.7% (465)	33.8% (527)	9.1 pctg points (p = 0.002)
Bottom 50%	17.3% (530)	27% (470)	9.7 pctg points (p = 0.000)

Notes: The number of households in each category above is slightly smaller than the actual total number of households overall and total number in each category, as there are a few randomly missing responses for the cash gift receipt question.

As the figures in Table 3 show, this relationship between the formal savings encouragement and incidence of cash-gift receipts is stronger along two dimensions. First, we see that as distance increases, the effect is stronger. Recall that eh strength of the information treatment in spurring formal savings adoption is more effective in more remote locales. Second, we see that poorer households experience a stronger effect in both absolute and relative terms. Among the top two wealth quartiles, households in the savings-encouraged areas have a 9.1 percentage point higher probability of receiving a cash gift, a difference of 37%. Among the bottom two quartiles, those in the savings encouraged villages have a 9.7 percentage point higher probability than comparable households in the control villages, a difference of 56%.

6. Effects of Local Formal Savings Uptake on Production Activity of *Non-Savers*

This section examines the reduced-form relationship between the encouragement that raised local formal savings adoption and boosted inter-household transfers, and changes in household production activities. The focus of our analysis is the second wealth quartile. These households are likely to be those most sensitive to changes in local transfer-practices: they have high enough wealth and income to enable changes toward higher-risk higher-reward income-generating activities, but low enough income so as to be dissuaded by the costs of negative shocks in the absence of safety nets. That is, they are wealthy enough to be near the margin of being able to start a business, vulnerable enough to hunger that they may avoid running a business in order to smooth income and prevent dangerous drops, and receive a strong exogenous boost to their receipts of cash assistance. In addition, these households are not responsive to the formal savings encouragement.

Table 4, column 1 reports results from a linear regression where the response variable indicates changes in whether a household in the second wealth quartile operates a non-agricultural business. The variable takes a value of 1 if a household goes from having no business in 2008 to having a business in 2010, a value of 0 if there is no change, and a value of -1 if a household goes from having a business to having no business in 2010. The coefficient for the information intervention represents its impact on the two-year change in percentage of this category of households that run a non-farm business. All regressions include standard errors clustered at the village-cluster level, and cluster-pair fixed effects.[12]

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[12] Results are robust to omitting pair fixed effects.

As column 1 shows, the reduced-form effect of the encouragement is to increase the proportion of households in the second wealth quartile operating non-farm businesses. There is an 8.2 percentage-point increase, relative to the control communities (p=.030). Since results above show that the savings encouragement is more effective one or more kilometers from the bank stop, and that the resulting increase in local transfers is also 5% higher in these communities, column 2 examines the effect on changes in non-farm enterprises restricting to communities one or more kilometers from the bank stop. Just as the effect on transfer receipts is higher when restricting attention to the more remote communities, so is the effect on non-farm businesses: the coefficient estimate increases from 8.17 to 8.6, an increase of 5%.

Table 4: Change in Proportion of Households with a Non-Farm Business

VARIABLES	(1) Change in Proportion w/ Business	(2) 1+ km Change in Proportion w/ Business	(3) Change in Proportion w/ Business	(4) 1+ km Change in Proportion w/ Business
Savings Encouragement	0.0817**	0.0860**	0.102**	0.112***
	(0.0371)	(0.0389)	(0.0392)	(0.0404)
Formal Svcs 2008			N	N
Observations	491	464	436	417
R-squared	0.095	0.094	0.122	0.120

Notes: The sample for column 1 includes all households in the second wealth quartile. Column 2 restricts to the households in this category in village-clusters for which both cluster pairs are located more than one km from the bank-stop. Column 3 includes all households in the second wealth quartile which reported no formal financial service use in the baseline survey. Column 4 restricts to households in this category in village-clusters for which both cluster pairs are located more than one km from the bank-stop. Cluster-robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Households not linked to the formal financial sector may be more sensitive to changes in local informal insurance practices, as these may be their only recourse to assistance if struck by low income realizations. To test this hypothesis, columns 3 and 4 report estimates when restricting the sample to households in the second wealth quartile which reported no formal

financial services use in the baseline. The regression reported in column 3 includes all households in this category, while that reported in column 4 includes those in communities more than a kilometer from the bank-stop. The coefficient estimates show significance and magnitudes both increase in this sample, the estimated impact of the information intervention rising by 25%-30% (2.0 to 2.6 percentage points). It is the households that were not previously participating in formal financial markets that are driving the result.[13] Once again, note that the effect is stronger when restricting to the more remote locales: the coefficient estimate increases from 10.2 to 11.2, an increase of 10%.

Taking a closer look at the changes driving the effect among this group suggest it is driven largely by households starting businesses. The percentage of households in the second wealth quartile that did not use formal services which went from no business to one or more businesses over the two-year period is 5.6 points higher in the treated communities, rising to 5.9 points higher when restricting to the more remote communities (both significant at the .10-level).[14] This is 60% higher than the control areas (in which 9.2% of this category of households started a business over the two years, and 9.7% in the more remote communities.)[15]

Adopting new crop technologies, such as planting high-yielding varieties of a crop, may also be viewed by new users as a risky undertaking. In Malawi, for example, while many farmers are aware of the higher yields of genetically modified maize, it is also widely believed that improper cultivation (before harvest) and storage risks (after harvest) can make it more susceptible to large losses than traditional maize varieties. Starting to grow cash crops may also

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[13] Among the 54 households in the second wealth quartile that did report formal savings or formal credit use in the baseline, there is actually a 15 percentage-point *decrease* in the proportion of households with non-fram businesses in the information treated villages, though this is not significant (p=0.51).

[14] See Appendix XXX, Table XXX. Regressions include pair-level fixed effects and cluster-robust standard errors.

[15] In addition, lower proportions of households in this group that already had businesses switched to having no off-farm businesses, in the treated compared to control villages. However, the effect is not statistically different from zero.

be viewed as a high-risk, high-reward undertaking. While tobacco-growing is generally thought to be quite lucrative in Malawi, exposure to international markets can mean wide swings in sale prices from year to year, making profits unpredictable.

Table 5: Change in Proportion of Households Raising HYVs or Cash Crops

VARIABLES	(1) Change in Proportion Growing HYV Maize	(3) Change in Proportion Growing Tobacco	(5) Change in Proportion Growing Either
Savings	0.0881	0.0372	0.152**
Encouragement	(0.0557)	(0.0351)	(0.0723)
Observations	431	439	415
R-squared	0.120	0.149	0.173

Notes: Sample restricted to households in the second wealth quartile which reported no formal financial services use in the baseline survey. Pair-level fixed effects included. Cluster-robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

If the costs of negative income shocks absent insurance are dissuading farmers from growing crops they would otherwise choose to grow, then perceived improvements in access to informal insurance can affect crop choice. Table 5 examines the reduced-form relationship between the savings encouragement and changes in the cultivation of two crops: improved maize and tobacco (the major cash crop for the region). The sample is restricted to households in the second wealth quartile which reported no formal financial services use in the baseline. Regressions include cluster-pair fixed effects, and standard errors clustered at the village cluster level. The response variable in each column is an indicator for whether a household started growing the crop (1), made no change (0), or stopped growing the crop (-1). Column 1 reports

results for households growing improved maize, column 2 reports results for tobacco, and column 3 reports results for either maize or tobacco.[16]

As columns 1 and 2 show, the sign for the effect of the savings encouragement on the proportion of households growing maize and the proportion growing tobacco is positive. Yet it is not significant at conventional levels for either. As column 3 shows, however, the reduced form effect of the encouragement on the change in the proportion of households growing either improved maize or tobacco is large and significant. The estimated effect is a 15.2 percentage-point increase in the proportion of households growing at least one of these crops.

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[16] The response variable for column 3 takes a value of 1 if a household started either crop, a value of -1 if it stopped either crop, and a zero if there was no change in either crop. Any households that started one crop and stopped the other (6% of this category: 7% of control villages and 5% of treated villages) were dropped.

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