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Appendix to

Seasonal liquidity, rural labor markets and agricultural production

A.1 Model Appendix

We use this Appendix to derive the optimality conditions for labor supply and consumption and show comparative statics with respect to effective interest rates and initial resources, which are necessary for the model predictions described in Section 2.

Rational households optimally choose consumption c_{it}, and labor input d_i to maximize utility over two periods:

$$\max_{c,d} \; log(c_{i1}) + \rho log(c_{i2}) \tag{A.1}$$

subject to the period-specific budget constraints

$$c_{i1} \leq S_{i0} + (h(c_{i1}) - d_i)w + B_i$$

$$c_{i2} \leq y_i(d_i) - B_i r_i^e,$$

where r_i^e is the effective interest rate, $r_i^e = 1 + r_i$. Combining the two period-specific constraints, we can set up the Lagrangian as follows

$$\max_{c,d,h} \; log(c_{i1}) + +\rho log(c_{i2}) + \lambda[y_i(d_i) + S_{i0}r_i^e + (h(c_{i1}) - d_i)wr_i^e - c_{1i}r_i^e - c_{2i}]. \tag{A.2}$$

The first order conditions are given by

$$\frac{\partial \mathcal{L}}{\partial c_{i1}} = \frac{1}{c_{i1}} + \lambda[-r_i^e + h'_{c_{i1}} wr] = 0$$

$$\frac{\partial \mathcal{L}}{\partial c_{i1}} = \rho \frac{1}{c_{i2}} + \lambda[-1] = 0$$

$$\frac{\partial \mathcal{L}}{\partial d_i} = \lambda[\beta A_i d_i^{\beta-1} - wr_i^e] = 0$$

$$\frac{\partial \mathcal{L}}{\partial \lambda} = y_i(d_i) + S_{i0}r_i^e + (h_i(c_{i1}) - d_i)wr_i^e - c_{i1}r_i^e - c_{i2} = 0 \tag{A.3}$$

Optimal labor demand Given that d_i only appears in the budget constraint, it is straightforward to derive the optimal level of on-farm investment. As long as $\lambda \neq 0$, d_i^* must satisfy

$$\beta A_i d_i^{\beta-1} = wr_i^e.$$

Rearranging this term, we get

$$d_i^* = (\frac{\beta A_i}{w r_i^e})^{\frac{1}{1-\beta}}. \tag{A.4}$$

Optimal consumption The partial derivatives with respect to c_{i1} and c_{i2} imply that

$$\rho \frac{1}{c_{i2}} = \frac{1}{c_{i1}} \frac{1}{r_i^e - h'_{c_{i1}} w r},$$

which can be rearranged to

$$c_{i2} = c_{i1} \rho r_i^e (1 - h'_{c_{i1}} w).$$

To derive a closed form solution, we assume that effective labor supply increases linearly with first period consumption, i.e., $h_i = \phi c_{i1}$, and that $0 < \phi < \frac{1}{w}$ to ensure an interior solution. We can then restate the consumption optimality condition as

$$c_{i2} = c_{i1} \rho r_i^e (1 - \phi w).$$

Plugging this into equation (A.3) we get

$$y_i(d_i) + S_{i0} r_i^e + (\phi c_{i1} - d_i) w r_i^e - c_{i1} r_i^e - c_{i1} \rho r_i^e (1 - \phi w) = 0$$

which rearranges to

$$y_i(d_i) + S_{i0} r_i^e - d_i w r_i^e = c_{i1}(-\phi w r_i^e + r_i^e + \rho r_i^e (1 - \phi w)).$$

This yields

$$c_{i1}^* = \frac{y_i(d_i)/r_i^e + S_{i0} - d_i w}{(1+\rho)(1-\phi w)} \tag{A.5}$$

and

$$c_{i2}^* = \rho r_i^e \frac{y_i(d_i)/r_i^e + S_{i0} - d_i w}{(1+\rho)}. \tag{A.6}$$

Under the alternative assumption that labor supply is fixed, optimal consumption patterns are given by

$$c_{i1}^* = \frac{y(d_i)/r_i^e + S_{i0} + (h - d_i) w}{(1+\rho)}, \tag{A.7}$$

and

$$c_{i2}^{*} = \frac{\rho r_i^e [y(d_i)/r_i^e + S_{i0} + (h - d_i)w]}{(1+\rho)}. \tag{A.8}$$

Impact on Labor Input and Agricultural Output Deriving optimal farm investment with respect to interest rates we get:

$$\frac{\partial d_i^*}{\partial r_i^e} = -\frac{1}{1-\beta}(\frac{\beta A_i}{w})^{\frac{1}{1-\beta}}(\frac{1}{r_i^e})^{\frac{\beta}{1-\beta}}. \tag{A.9}$$

Given that $0 < \beta < 1$, this term is strictly negative: higher interests increase the marginal costs of capital, and always result in lower on-farm investment. The magnitude of this response increases with farm productivity A_i. If effective labor supply is not constrained by consumption ($\frac{\partial h_i}{\partial c_{1i}} = 0$), this will mechanically increase net demand $(d_i - h_i)$ among treated farmers. In order for labor markets to clear in equation (3), wages must increase. The total treatment effect on labor demand is given by

$$\frac{\partial d_i}{\partial r_i^e} = \frac{\partial d_i}{\partial r_i^e} + \frac{\partial d_i}{\partial w}\frac{\partial w}{\partial r_i^e}.$$

The first term is zero for untreated farmers, who will reduce labor demand in response to increasing wages, while the net effect on treated farmers must always be positive. In the new equilibrium, labor is reallocated from untreated to treated farmers.

The predictions become more nuanced when labor supply increases in response to positive income and consumption shocks ($\frac{\partial h_i}{\partial c_{1i}} > 0$). With endogenous labor supply, the effect of lowering hungry season interest rates on farmer net labor supply is positive as long as

$$\frac{\partial d_i}{\partial r_i^e} > \frac{\partial h_i}{\partial c_{1i}}\frac{\partial c_{1i}}{\partial r_i^e}.$$

Given that the left hand side of this expression increases with A_i as shown in equation (A.9), the net labor response becomes a function of farm productivity. Equilibrium wages will increase as long as increases in aggregate demand dominate aggregate supply effects, i.e.,

$$\sum_{i=1}^{N} \frac{\partial d_i}{\partial r_i^e}(w) - \sum_{i=1}^{N} \frac{\partial h_i}{\partial c_{1i}}\frac{\partial c_{1i}}{\partial r_i^e} > 0.$$

If this expression is negative, additional labor supply will be absorbed at lower equilibrium wages by untreated farmers, whose income would then increase. Any increase in net labor demand from treated farmers will result in lower labor inputs and lower output among untreated farmers, whose interest rates are unchanged by the treatment.

Impact on Consumption The derivative of optimal first period consumption with respect to the effective interest rate is

$$\frac{\partial c_{i1}^*}{\partial r_i^e} = \frac{1}{(1+\rho)(1-\phi w)}[-(\frac{1}{r_i^e})^2 y_i(d_i) + y_i'(d_i)/r_i^e].$$

The first term in brackets is unambiguously negative; by equation (A.9), the same must also hold for the second term. Conceptually, higher interest rates result both in a negative income and substitution effect, and thus unambiguously reduce first period consumption.

The derivative of optimal second period consumption with respect to the effective interest rate is given by

$$\frac{\partial c_{i2}^*}{\partial r_i^e} = \frac{\rho}{1+\rho}(y_i(d_i)/r_i^e + S_{i0} - d_i w) + \frac{\rho r_i^e}{1+\rho}[-(\frac{1}{r_i^e})^2 y_i(d_i) + y_i'(d_i)/r_i^e].$$

The second term is negative as above and captures income effects. These negative income effects are partially offset by positive substitution effects towards the second period (first term). This second effect increases with initial savings: better endowed households will be able to transfer more resources to the second period if interest rates increase. Results are qualitatively the same with $\frac{\partial h_i}{\partial c_{1i}} = 0$. Compared to our main scenario with positive labor responses, an inelastic labor supply implies on average larger wage effects and smaller effects on output as any additional labor demand has to be completely absorbed by untreated farmers.

Heterogeneous Impacts If interest rates decrease with initial resources (S_{i0}), the largest absolute reduction in interest rates ($r_i^e - \hat{r}$) will be experienced by the poorest farmers, who will also experience the largest declines in consumption seasonality. Changes in output are a direct function of labor demand, which increases with lower interest rates. As shown in equation (A.9), the labor demand response also increases with farm productivity. The partial (second) derivative of the output response to interest rates with respect to initial resources (S_{i0}) is given by

$$\frac{\partial y}{\partial d_i}(A_i)\frac{\partial d_i}{\partial r_i^e}(S)/\partial S_{i0} = \frac{\partial y}{\partial d_i}\frac{\partial d_i}{\partial A_i}\frac{\partial A_i}{\partial S_{i0}}\frac{\partial d_i}{\partial r_i^e} + \frac{\partial y}{\partial d_i}\frac{\partial d_i}{\partial r_i^e}\frac{\partial d_i}{\partial A_i}\frac{\partial r_i}{\partial S_{i0}}.$$

The first term captures the additional output effect for better endowed (higher S_{i0}) farms that are on average more productive ($\frac{\partial A_i}{\partial S_{i0}} > 0$); the second terms captures the smaller interest rate improvements for better endowed farms. If the second term is larger than the first term, output and labor effects will be largest among poorest farms and vice versa. It should be noted that the magnitude of the first term depends on the correlation between productivity and initial reserves. If this correlation is zero, loan impact will always be higher for poor farms. If this correlation is large and positive, productivity effects may dominate the differential interest rate effect.

A.2 Model Calibration and Simulation

The main objectives of our model simulations are twofold: first, to simulate the impact of lower interest rates on the welfare of treated and untreated households (the latter of which are not in our data) in treatment villages, and second, to simulate the effects of a scaled up version of the program that lowered interest rates for all farmers (which was not our design). To match the simulations to our setting, we calibrated the model such that the observed distribution of agricultural output at baseline matched the empirical distribution, conditional on the initial distribution of grain and cash resources measured at baseline.

We use the following parametric assumptions. First, we assume that average initial resources corresponds to grain and cash reserves at baseline, with an observed mean of 400 Kwacha, and a median of 50. Evidence on subjective discount rates in sub-Saharan Africa is limited, but the available estimates suggest a range of 5-10 percent per year (Bauer and Chytilová 2010). We thus assume a subjective discount rate (ρ) of 5 percent over the six month intervention period. Survey questions collected self-reported interest rates that are high on average and vary considerably, with reported rates of up to 100 per month. To ensure our model is not driven by outliers in reported interest rates, we imposed a maximum rate of 150 percent over the six month period, with minimum rates of 50 percent so that the loan program lowered interest rates for all farmers (consistent with the close to 100 percent loan take up at a six month interest rate of 30 percent). Given that we find increasing household labor supply in response to treatment, we assume that labor supply is constrained by first period consumption. Specifically, we assume that all households have a fixed minimum labor supply of 0.5 and that labor supply then increases linearly with additional first period consumption ($\phi = 0.0001$). Average land size was assumed to be equal to 1, and β was set such that the marginal effect of labor and the second unspecified input factor were the same ($\beta = 0.5$). These basic parametric assumptions are summarized in Table A.1.

To calibrate our model to the empirical setting, we further assume that the distribution of farm-level productivity A_i is log-normal, and correlated with S_{i0}. The empirically observed correlation between farm-level fixed effects (estimated from the panel, controlling for treatment only) and our baseline measure of S_{i0} was 0.4, which we use in the calibration. We then identify the joint distribution of A_i andS_{i0} that creates outcomes most similar to the empirical distribution of agricultural output (mean output value of 3100 Kwacha, standard deviation 2800 Kwacha) as well as to the targeted correlation between A_i and$S_{i0}(0.4)$. For this joint distribution of A_i andS_{i0} the model was then set up to iteratively determine the market clearing wage for any distribution of interest rates. As shown in the following table, the mean and standard deviation of the simulated distribution of agricultural output were very close to the empirical distribution. The simulated market clearing wage in the baseline simulation with interest rates ranging between 50 and 150% was 13.9 Kwacha per day, which is relatively close to the empirically observed range.

When we simulate a reduction in credit market interest rates for 50 percent of farmers, the calibration model shows an increase in wages to 15.3 Kwacha, which corresponds to a 10 percent increase relative to baseline, similar to the estimated treatment effect. When we instead simulate a scenario with full treatment, the wages increases by 37 percent, with a new estimated equilibrium wage of to 20.2 Kwacha. These results are summarized in Table A.2.

Table A.1: Parametric assumptions for model simulations

Parameter	Value
ρ	0.95
r^e	1.5-2.5
$h(0)$	0.5
ϕ	0.0001
β	0.5
S_{i0} (mean, median)	400, 50
$\text{corr}(S_{i0}, A_i)$	0.40

Notes: Values used to calibrate the model. ρ is the subjective discount rate; r^e is the effective interest rate; $h(0)$ is the lower bound of labor supply; ϕ is the marginal increase in labor supply in response to first period consumption; β is the relative productivity of labor; S_{i0} is baseline reserves, measured in Kwacha; $corr(S_{i0}, A_i)$ is the correlation between baseline reserves and productivity. The target correlation of 0.4 between S_{i0} and A_i was estimated using a panel fixed effects model.

Table A.2: Model simulation comparisons

	Baseline data	Simulated baseline	Simulated partial treatment effect (log change)	Simulated full treatment effect (log change)
Wage (w)	15.3	13.9	0.096	0.374
Ln(y), mean	7.8	7.7	0.096	0.061
Ln(y), SD	0.9	0.77	-0.019	-0.050
Hungry season consumption (c_1)	NA	713	0.199	0.386
Overall utility	NA	12.9	0.335	0.537

Notes: Comparison of outcomes observed at baseline to simulated outcomes. All measures are in Zambian Kwacha. Average exchange rate during the study period was 6 Zambian Kwacha per USD. Column 1 shows baseline values. Columns 2-4 show estimates from our calibrated model, with column 3 restricted to treated farmers for comparison with our estimated treatment effects (shown in the main text). Wages correspond to daily ganyu earnings. In the simulations, wages are computed over the entire season, and then divided by 100 working days. Ln(y) is the log of agricultural output value (gross). Hungry season consumption is measured in Kwacha over a three month period at the household level. Overall utility is measured on a logarithmic scale.

B.1 Appendix tables and figures

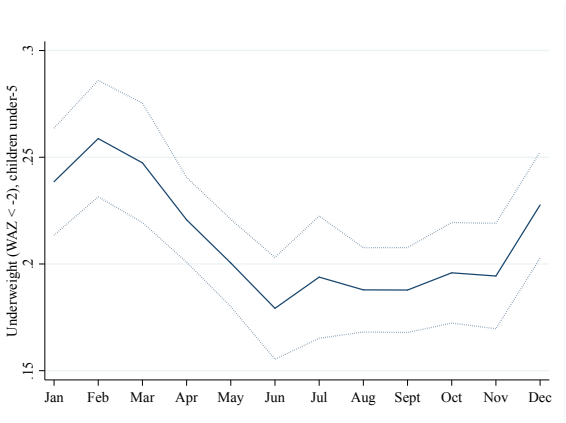

Figure B.1: Seasonal variation in child weight

Notes: Fraction of children under 5 classified as underweight in the Zambia demographic and health survey data from the 2001/2, 2007 and 2013/14 survey rounds. Note that DHS sampling is not representative by month.

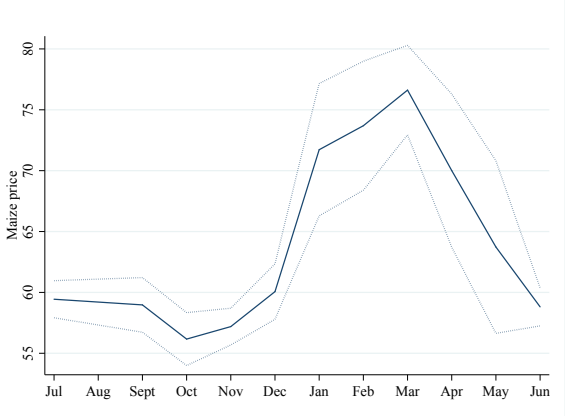

Figure B.2: Seasonal variation in maize prices

Notes: Data from market surveys in Chipata town that record the maize price per 50 kilogram bag, by month. Surveys were conducted with an average of 31 vendors per month between September 2013 (prior to the launch of the intervention) and May 2015 (shortly before the start of the endline survey). Means and 95 percent confidence intervals are conditioned on year, transaction type (buy or sell) and maize type (kernels or pounded maize). Because data come from the district capital as opposed to the study villages, the figure may over- or under-state the seasonal fluctuations in the study villages.

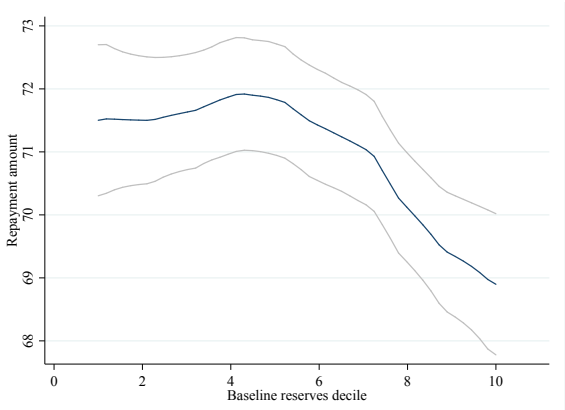

Figure B.3: Interest rates by baseline resources (grain and cash savings)

Notes: Responses to survey question asking how much respondent would have to repay in a month for 50 Kwacha borrowed today from a source other than friends or family. The sample is restricted to the control group and the confidence intervals are from a local polynomial smoothing. The x-axis shows deciles of a measure of baseline cash and grain reserves.

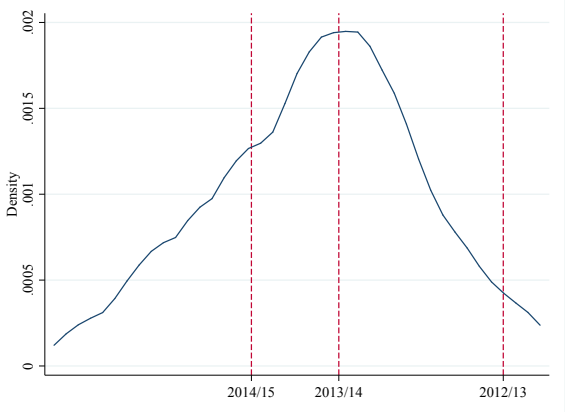

Figure B.4: Rainfall realizations in project years, relative to long run average

Notes: Data from the Msekera Agricultural Research Station in Chipata District, Zambia (Msekera 2015). Annual rainfall data from 1970 through 2015, by growing season. The baseline year preceding the project was 2012/13. Year 1 was 2013/14 and year 2 was 2014/15.

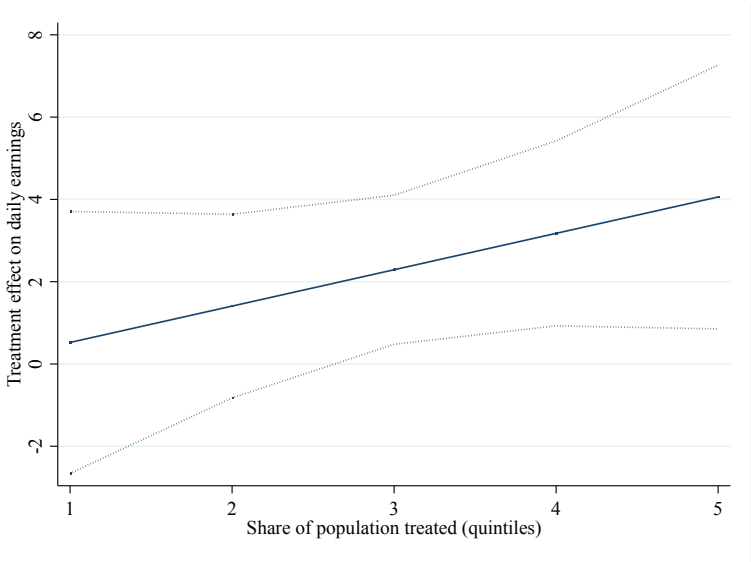

Figure B.5: Treatment effect on daily earnings, by share of village treated

Notes: Village level mean daily reported earnings during the hungry season, in villages treated for the first time (pooled across years) relative to the control group. Regressions control for number of households in the village and geographic variables. Figure shows 90 percent confidence intervals based on standard errors clustered at the village level.

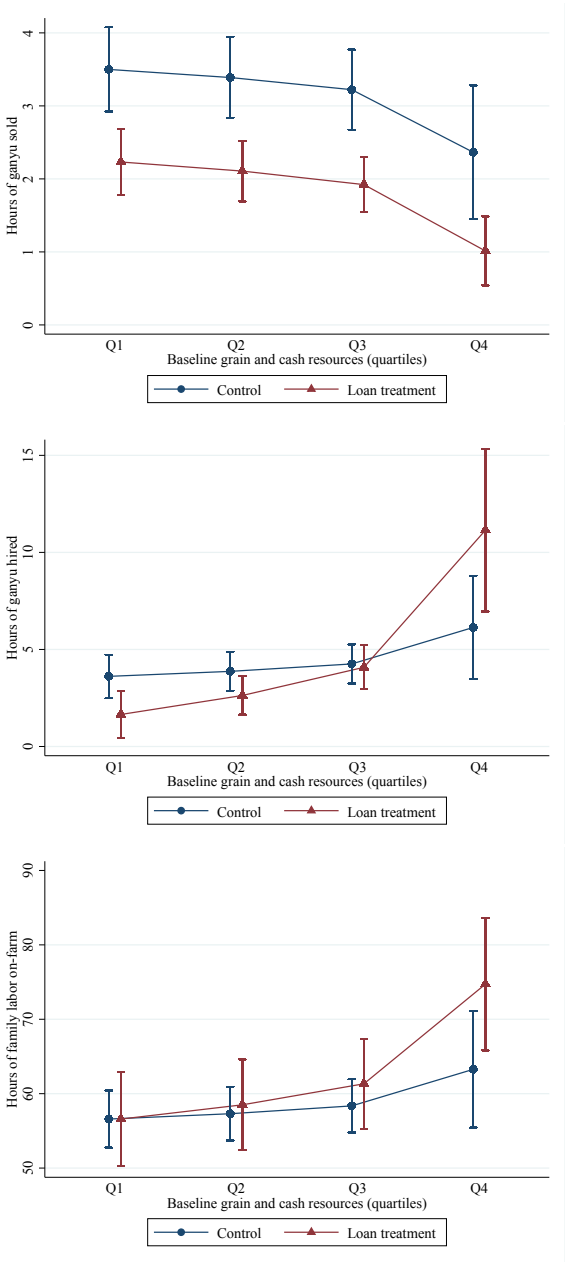

Figure B.6: Effect on labor market participation, by baseline reserves, year 2

Notes: Plots are the same is in Figure 4, for year 2 newly treated villages only.

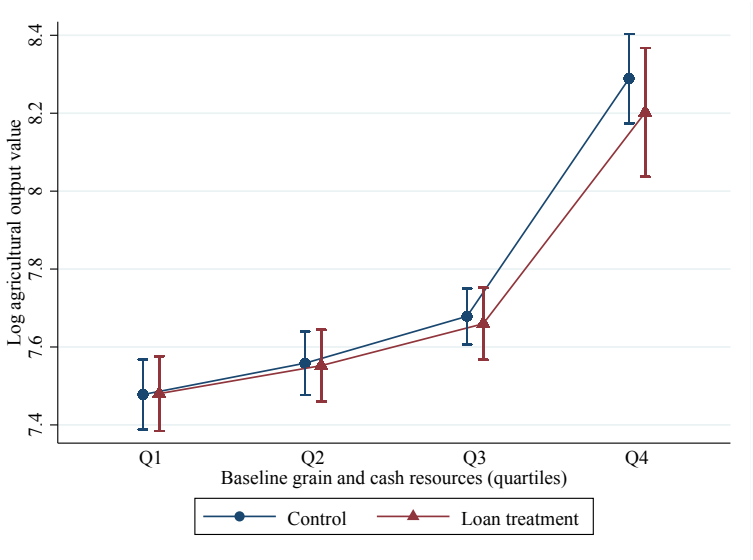

Figure B.7: Effect on log agricultural output, by baseline reserves, year 2

Notes: Plots are the same is in Figure 5, for year 2 newly treated villages only.

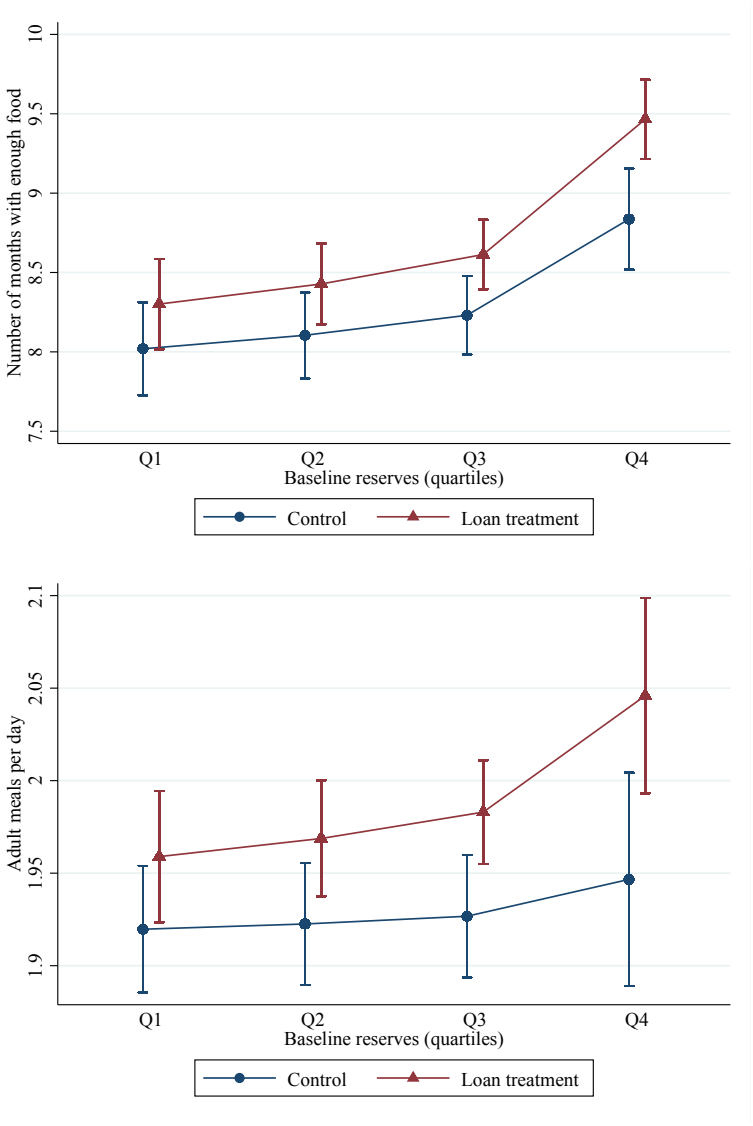

Figure B.8: Treatment effect on consumption variables, by baseline reserves, year 2

Notes: Plots are the same is in Figure 6, for year 2 newly treated villages only.

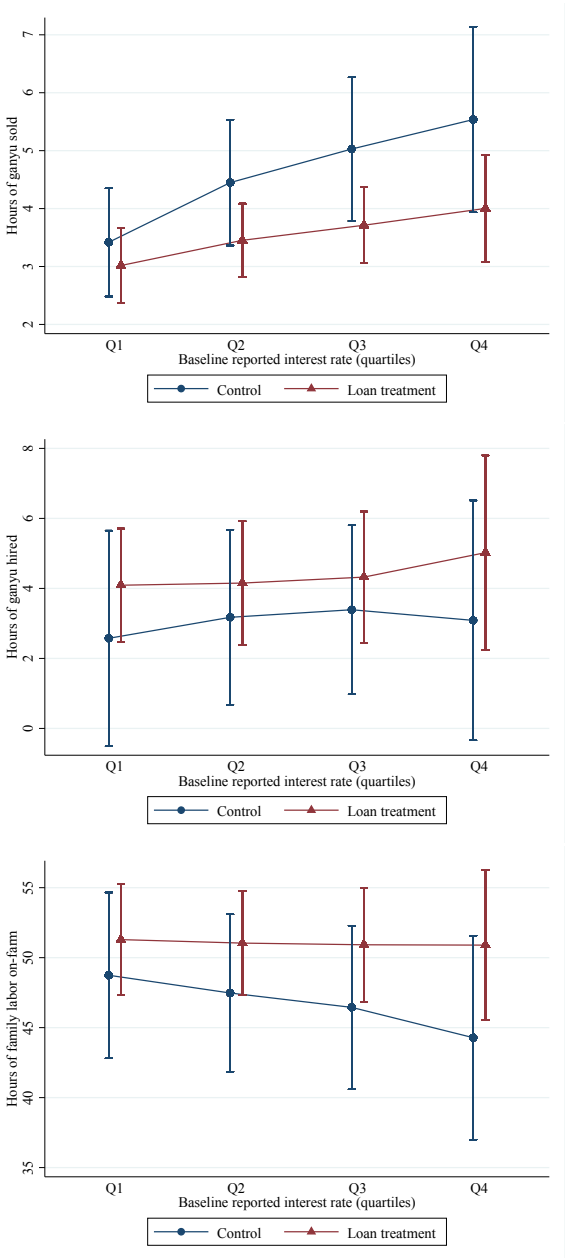

Figure B.9: Effect on labor market participation, by baseline interest rates

Notes: Plots are the same is in Figure 4, using an alternative proxy for heterogeneity in effective interest rates.

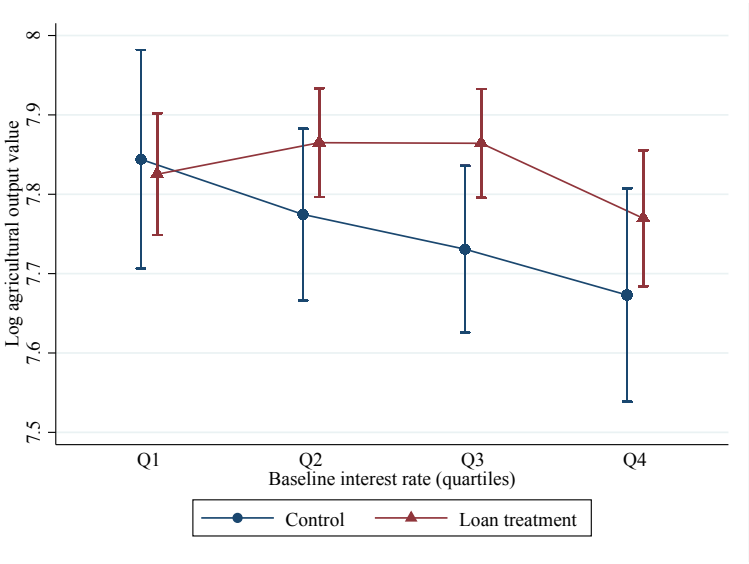

Figure B.10: Effect on log agricultural output, by baseline interest rates

Notes: Plots are the same is in Figure 5, using an alternative proxy for heterogeneity in effective interest rates.

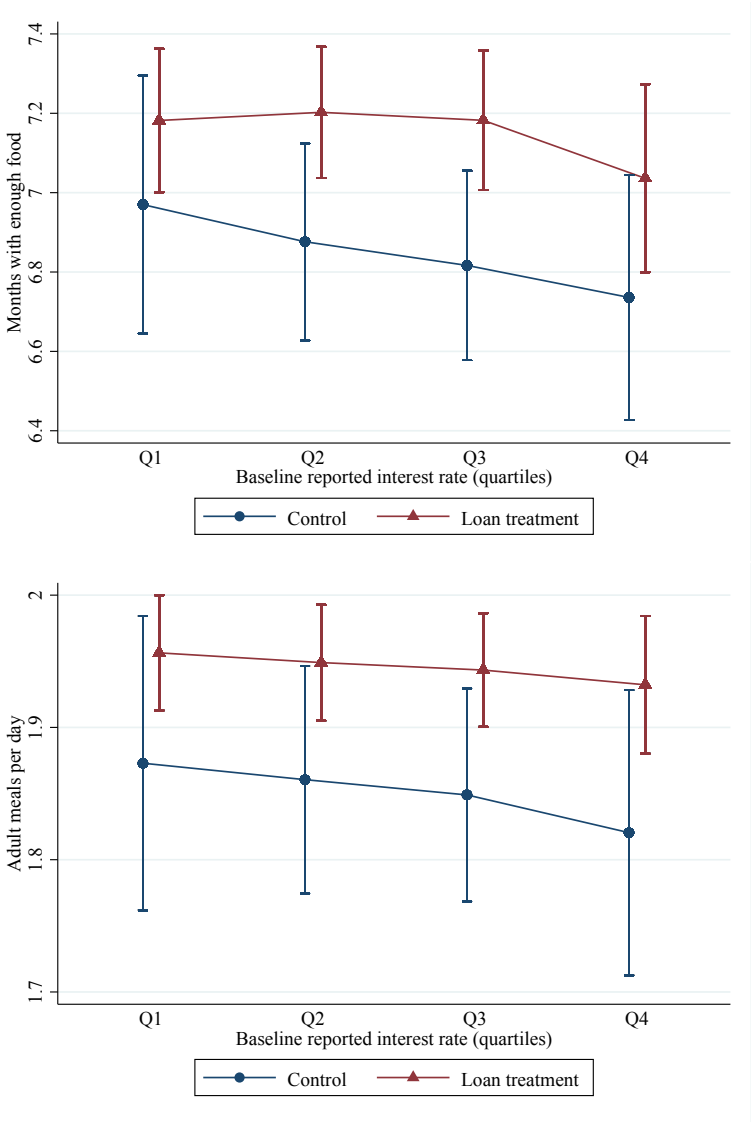

Figure B.11: Effect on consumption variables, by baseline interest rates

Notes: Plots are the same is in Figure 6, using an alternative proxy for heterogeneity in effective interest rates.

Table B.1: Loan treatments

	Loan (January)	Repayment (July)	Implied interest
	A. Maize loan		
Offer	3 bags (50 kg ea)	4 bags (50 kg ea)	30%
Value (official)	K 195	K 260	33%
Value (reported)	K 261	K 234	-10%
	B. Cash Loan		
Offer	K 200	K 260	30%

Notes: Columns describe the loan and repayment terms, and the implied interest rate for the maize and cash loan treatment arms. The official value is the government-set maize price. The reported value is the average reported in the harvest survey for buying and selling maize.

Table B.2: Attrition, by survey round

Year 1 treatments								
	Baseline	Y1 Harvest	Y2 Endline	Midline	Labor 1	Labor 2	Labor 3	Labor 4
Eligible	3139	3139	3139	1223	1531	1704	1673	827
Control group mean	0.32	0.96	0.96	0.98	0.85	0.79	0.82	0.85
Cash loan treatment	0.34	0.009	-0.007	-0.010	-0.025	-0.023	0.032	-0.021
		(0.008)	(0.009)	(0.011)	(0.024)	(0.028)	(0.024)	(0.025)
Maize loan treatment	0.34	0.000	0.004	-0.005	-0.021	-0.036	0.004	-0.065
		(0.009)	(0.009)	(0.010)	(0.028)	(0.031)	(0.031)	(0.024)
Year 2 treatments								
	Baseline	Y1 Harvest	Y2 Endline	Midline	Labor 1	Labor 2	Labor 3	Labor 4
Control group mean	0.53	0.97	0.96	0.98	0.83	0.78	0.83	0.83
Cash loan treatment	0.23	-0.000	-0.012	-0.010	-0.003	0.052	0.026	0.003
		(0.008)	(0.009)	(0.013)	(0.025)	(0.026)	(0.024)	(0.021)
Maize loan treatment	0.24	-0.008	0.010	-0.001	0.015	-0.060	-0.013	-0.015
		(0.008)	(0.008)	(0.010)	(0.029)	(0.036)	(0.036)	(0.023)
Early notification sub-treatment	0.50	0.012	-0.025	0.007	0.003	-0.052	0.008	-0.013
		(0.010)	(0.010)	(0.015)	(0.035)	(0.043)	(0.040)	(0.028)
Cash repayment sub-treatment	0.51	-0.003	0.002	0.000	-0.017	-0.094	-0.037	-0.033
		(0.010)	(0.011)	(0.015)	(0.035)	(0.041)	(0.040)	(0.027)

Notes: Column 1 shows the share of sampled baseline households by treatment arm in Year 1 (Panel A) and Year 2 (Panel B). Each subsequent column reports the number of eligible households and the regression of whether the household was in the survey round on treatment indicators, conditional on being eligible for the survey. Standard errors are clustered at the village level.

Table B.3: Attrition, by participation stage

Year 1					
		Invited	At meeting	Eligible	Take up
Cash loan treatment	N	1023	1023	1023	1009
	Share		1.00	1.00	0.99
Maize loan treatment	N	1019	1019	1016	999
	Share		1.00	1.00	0.98
Year 2					
		Invited	At meeting	Eligible	Take up
Cash loan treatment					
Pooled	N	701	660	658	643
	Share		0.94	1.00	0.98
Notification timing sub-treatment					
Standard notification	N	356	328	328	319
	Share		0.92	1.00	0.97
Early notification	N	345	332	330	324
	Share		0.96	0.99	0.98
Cash repayment sub-treatment					
Standard repayment	N	336	320	319	311
	Share		0.95	1.00	0.97
Cash only repayment	N	365	340	339	332
	Share		0.93	1.00	0.98
Maize loan treatment					
Pooled	N	718	663	662	639
	Share		0.92	1.00	0.97
Notification timing sub-treatment					
Standard notification	N	351	327	327	314
	Share		0.93	1.00	0.96
Early notification	N	367	336	335	325
	Share		0.92	1.00	0.97
Cash repayment sub-treatment					
Standard repayment	N	365	333	332	324
	Share		0.91	1.00	0.98
Cash only repayment	N	353	330	330	315
	Share		0.93	1.00	0.95

Notes: Table reports stages of household self-selection into eligibility. To be eligible, households had to attend the meeting (before learning treatment status) and hand in a consent form (after learning treatment status).

Table B.4: Summary statistics, by baseline resources

	Baseline grain and cash reserves			
	Q1	Q2	Q3	Q4
Baseline liquid reserves in Kwacha	87.689	303.555	632.688	2456.543
	[52.906]	[71.212]	[131.594]	[3140.612]
Age of HH head	45.288	42.552	41.230	41.711
	[16.498]	[15.413]	[14.548]	[13.359]
Female HH head	0.364	0.295	0.219	0.148
	[0.482]	[0.456]	[0.414]	[0.355]
HH members <5	0.925	0.922	0.964	0.961
	[0.984]	[0.902]	[0.874]	[0.954]
HH members 5-14	1.566	1.606	1.762	2.070
	[1.488]	[1.456]	[1.533]	[1.560]
HH members 15-64	2.168	2.259	2.499	2.817
	[1.189]	[1.159]	[1.264]	[1.410]
HH members >64	0.236	0.169	0.159	0.145
	[0.497]	[0.443]	[0.457]	[0.425]
HH did ganyu last year	0.749	0.678	0.599	0.456
	[0.434]	[0.468]	[0.490]	[0.498]
HH plans to do ganyu	0.771	0.700	0.600	0.456
	[0.421]	[0.458]	[0.490]	[0.498]
Acres of maize	1.825	2.031	2.298	3.134
	[0.983]	[1.056]	[1.236]	[1.705]
Acres of cash crops	0.774	0.934	1.129	1.311
	[0.966]	[1.022]	[1.200]	[1.295]
Baseline harvest value	1783.114	2265.881	3029.573	5146.266
	[1784.946]	[1759.697]	[2101.804]	[3531.302]
Crop diversity index	2.703	2.909	3.077	3.357
	[0.994]	[0.993]	[1.087]	[1.112]
Asset quintile	2.185	2.668	3.150	4.004
	[1.250]	[1.270]	[1.298]	[1.158]
Livestock value	1453.643	1997.187	3363.149	6938.573
	[3247.572]	[3629.446]	[5714.426]	[9137.440]
Input value	233.034	299.994	440.274	1024.885
	[455.743]	[493.898]	[537.268]	[1832.906]
Hired ganyu last year	0.171	0.260	0.323	0.532
	[0.376]	[0.439]	[0.468]	[0.499]
Adults working on farm	2.534	2.512	2.653	2.996
	[1.294]	[1.247]	[1.295]	[1.513]
Adults working in other IGA	1.260	1.191	1.108	1.027
	[1.017]	[0.953]	[0.982]	[0.961]

Notes: Baseline means and standard deviations by each quartile of baseline grain and cash resources. All monetary values are in Zambian Kwacha.

Table B.5: Randomization balance

	Year 1					Year 2				
	Control	Cash	Maize	(1) vs (2)	(1) vs (3)	Control	Cash	Maize	(6) vs (7)	(6) vs (8)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age of HH head	42.79	42.88	42.44	0.89	0.60	42.62	42.99	42.57	0.58	0.94
	[14.99]	[15.28]	[14.96]			[15.34]	[14.67]	[14.90]		
Female HH head	0.24	0.27	0.25	0.15	0.56	0.25	0.26	0.26	0.75	1.00
	[0.43]	[0.44]	[0.44]			[0.44]	[0.44]	[0.44]		
HH members <5	0.92	0.97	0.93	0.22	0.94	0.92	0.94	0.99	0.64	0.10
	[0.91]	[0.94]	[0.94]			[0.91]	[0.94]	[0.96]		
HH members 5-14	1.78	1.72	1.76	0.41	0.79	1.72	1.75	1.82	0.70	0.14
	[1.53]	[1.54]	[1.49]			[1.51]	[1.55]	[1.53]		
HH members 15-64	2.47	2.42	2.41	0.39	0.26	2.43	2.48	2.41	0.39	0.72
	[1.26]	[1.32]	[1.26]			[1.28]	[1.31]	[1.27]		
HH members >64	0.17	0.19	0.17	0.45	0.97	0.18	0.17	0.17	0.43	0.66
	[0.44]	[0.47]	[0.46]			[0.46]	[0.46]	[0.46]		
HH did ganyu last year	0.61	0.64	0.61	0.31	0.89	0.62	0.63	0.62	0.42	0.98
	[0.49]	[0.48]	[0.49]			[0.49]	[0.48]	[0.49]		
HH plans to do ganyu	0.62	0.64	0.63	0.41	0.58	0.63	0.64	0.62	0.60	0.74
	[0.49]	[0.48]	[0.48]			[0.48]	[0.48]	[0.48]		
Acres of maize	2.37	2.30	2.30	0.25	0.27	2.34	2.25	2.35	0.11	0.88
	[1.41]	[1.29]	[1.40]			[1.33]	[1.37]	[1.45]		
Acres of cash crops	0.97	1.04	1.10	0.14	0.01	1.06	0.95	1.07	0.03	0.87
	[1.08]	[1.17]	[1.18]			[1.16]	[1.06]	[1.18]		
Baseline harvest value	3096.84	3037.52	3032.01	0.62	0.60	3092.47	3031.35	2993.88	0.62	0.40
	[2811.88]	[2607.47]	[2765.99]			[2712.90]	[2888.19]	[2597.12]		
Crop diversity index	2.98	3.04	3.01	0.17	0.49	3.05	2.96	2.98	0.05	0.15
	[1.12]	[1.02]	[1.08]			[1.11]	[1.00]	[1.06]		
Asset quintile	3.06	3.01	2.93	0.48	0.05	2.98	3.04	3.00	0.38	0.78
	[1.39]	[1.43]	[1.42]			[1.40]	[1.44]	[1.43]		
Livestock value	3586.02	3304.44	3423.57	0.30	0.56	3250.01	3479.29	3805.57	0.40	0.05
	[6220.08]	[6023.12]	[6590.77]			[6326.98]	[5759.96]	[6657.90]		
Input value	533.17	494.11	472.32	0.45	0.11	482.01	556.28	481.58	0.14	0.99
	[915.21]	[1365.20]	[807.08]			[808.15]	[1652.91]	[759.37]		
Hired ganyu last year	0.31	0.34	0.31	0.28	0.93	0.31	0.33	0.33	0.31	0.38
	[0.46]	[0.47]	[0.46]			[0.46]	[0.47]	[0.47]		
Adults working on farm	2.69	2.69	2.65	1.00	0.49	2.67	2.72	2.63	0.45	0.54
	[1.36]	[1.36]	[1.35]			[1.38]	[1.34]	[1.32]		
Adults working in other IGA	1.13	1.13	1.18	0.89	0.20	1.14	1.15	1.17	0.80	0.52
	[1.00]	[0.97]	[0.98]			[0.98]	[0.98]	[0.98]		

Notes: Baseline means and standard deviations (in brackets) by treatment and year. P-values reported in columns 4, 5, 9 and 10 are for each treatment relative to the year's control group mean, with standard errors clustered at the village level.

Table B.6: Randomization balance, year 2 sub-groups

	Year 2 treatment status									
	Never treated	Year 1 only	Year 2 new	Year 2 repeat	(1) vs (2)	(1) vs (3)	(1) vs (4)	(2) vs (3)	(2) vs (4)	(3) vs (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age of HH head	42.83	42.49	42.71	42.80	0.67	0.92	0.77	0.77	0.76	0.95
	[15.18]	[15.44]	[14.67]	[14.83]						
Female HH head	0.24	0.26	0.24	0.26	0.40	0.62	0.84	0.84	0.63	0.49
	[0.43]	[0.44]	[0.43]	[0.44]						
HH members <5	0.89	0.94	0.98	0.96	0.28	0.25	0.19	0.19	0.30	0.09
	[0.90]	[0.92]	[0.93]	[0.96]						
HH members 5-14	1.79	1.67	1.74	1.80	0.11	0.82	0.25	0.25	0.19	0.88
	[1.56]	[1.47]	[1.48]	[1.56]						
HH members 15-64	2.45	2.41	2.51	2.42	0.55	0.27	0.76	0.76	0.88	0.87
	[1.27]	[1.28]	[1.23]	[1.31]						
HH members >64	0.19	0.18	0.15	0.18	0.89	0.19	0.45	0.45	0.78	0.51
	[0.45]	[0.46]	[0.43]	[0.47]						
HH did ganyu last year	0.62	0.61	0.60	0.63	0.72	0.57	0.63	0.63	0.38	0.89
	[0.49]	[0.49]	[0.49]	[0.48]						
HH plans to do ganyu	0.64	0.63	0.60	0.64	0.75	0.24	0.91	0.91	0.47	0.91
	[0.48]	[0.48]	[0.49]	[0.48]						
Acres of maize	2.40	2.31	2.32	2.29	0.19	0.77	0.38	0.38	0.34	0.14
	[1.38]	[1.30]	[1.47]	[1.39]						
Acres of cash crops	0.96	1.12	0.98	1.02	0.01	0.20	0.21	0.21	0.37	0.36
	[1.04]	[1.23]	[1.14]	[1.12]						
Baseline harvest value	3004.40	3148.91	3261.86	2931.45	0.29	0.30	0.41	0.41	0.12	0.95
	[2508.17]	[2836.14]	[3282.33]	[2542.05]						
Crop diversity index	2.98	3.10	2.98	2.96	0.03	0.28	0.03	0.03	0.04	0.85
	[1.14]	[1.09]	[1.09]	[1.01]						
Asset quintile	3.01	2.97	3.15	2.98	0.58	0.04	0.48	0.48	0.92	0.86
	[1.40]	[1.39]	[1.37]	[1.46]						
Livestock value	3345.43	3188.85	4015.51	3522.65	0.62	0.04	0.08	0.08	0.26	0.31
	[6160.48]	[6433.71]	[6310.82]	[6199.16]						
Input value	504.44	467.64	584.45	497.30	0.37	0.03	0.33	0.33	0.71	0.80
	[909.25]	[736.19]	[924.79]	[1379.83]						
Hired ganyu last year	0.31	0.31	0.32	0.34	0.97	0.79	0.24	0.24	0.19	0.36
	[0.46]	[0.46]	[0.47]	[0.47]						
Adults working on farm	2.72	2.64	2.63	2.69	0.24	0.58	0.93	0.93	0.71	0.48
	[1.40]	[1.36]	[1.28]	[1.35]						
Adults working in other IGA	1.16	1.12	1.07	1.19	0.51	0.22	0.58	0.58	0.21	0.99
	[1.04]	[0.95]	[0.93]	[1.00]						

Notes: Year 2 randomization balance, based on treatment status in both years. Baseline means and standard deviations (in brackets) by year 2 treatment. P-values are based on standard errors clustered at the village level.

Table B.7: Heterogeneous treatment effects, by baseline reserves

	Hours sold	Hours hired	Family hours on-farm	Log output	Adult meals
	(1)	(2)	(3)	(4)	(5)
Any loan treatment	-1.452	-1.701	5.679	0.081	0.089
	(0.604)	(1.571)	(6.806)	(0.128)	(0.040)
Baseline reserves	-0.082	0.218	0.629	0.038	0.004
	(0.045)	(0.099)	(0.398)	(0.006)	(0.002)
Loan x Reserves	0.057	0.456	1.170	0.000	-0.001
	(0.054)	(0.273)	(0.582)	(0.009)	(0.004)
Reserves^2	0.000	-0.001	-0.005	-0.000	-0.000
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)
Loan x Reserves^2	-0.000	-0.004	-0.014	-0.000	-0.000
	(0.000)	(0.002)	(0.005)	(0.000)	(0.000)
Year 1 control mean	3.99	3.01	43.84	7.75	1.92

Notes: Heterogeneous treatment effects, by baseline grain and cash reserves (x100 Kwacha), year 1 only. All specifications are conditional on month or year fixed effects and include geographic controls, and cluster standard errors at the village level.

Table B.8: Other consumption smoothing

	Input loan	Low interest informal loan	High interest informal loan	Sold asset	Sold livestock	Green maize
	(1)	(2)	(3)	(4)	(5)	(6)
			A. Year 1 - Pooled treatment arms			
Any loan treatment	0.006	-0.011	-0.026	-0.009	0.034	0.010
	(0.025)	(0.009)	(0.007)	(0.012)	(0.022)	(0.028)
			B. Year 2 - Pooled treatment arms			
Any loan treatment	-0.054	-0.000	-0.017	0.022	0.023	0.055
	(0.042)	(0.011)	(0.017)	(0.020)	(0.029)	(0.040)
Treated in Y1	-0.005	0.003	-0.030	-0.003	0.051	0.048
	(0.035)	(0.010)	(0.012)	(0.015)	(0.029)	(0.024)
Loan x Treated in Y1	0.042	-0.012	0.009	-0.023	-0.017	-0.069
	(0.050)	(0.013)	(0.019)	(0.023)	(0.039)	(0.046)
Loan + Y1 + Loan x Y1	-0.017	-0.009	-0.037	-0.004	0.057	0.035
	(0.035)	(0.009)	(0.012)	(0.014)	(0.027)	(0.029)
			C. By treatment arm - Pooled years			
Cash	-0.022	-0.008	-0.012	-0.000	0.015	0.023
	(0.020)	(0.006)	(0.007)	(0.009)	(0.018)	(0.033)
Maize	-0.002	-0.012	-0.027	0.000	0.030	0.036
	(0.023)	(0.007)	(0.005)	(0.010)	(0.019)	(0.030)
Year 1 control mean	0.43	0.05	0.06	0.07	0.30	0.30
Year 2 control mean	0.45	0.03	0.06	0.08	0.34	0.14
Year 1 = Year 2 new	0.47	0.12	0.04	0.23	0.38	0.17
Year 1 = Year 2 repeat	0.83	0.21	0.09	0.69	0.78	0.09
Cash = Maize	0.40	0.57	0.01	0.99	0.50	0.71
Observations	6,032	6,033	6,033	6,032	6,033	5,869

Notes: Treatment effects on other consumption smoothing strategies. Columns 1-5 are measured during the long recall surveys (cols 1-5) and capture outcomes over the previous growing season (N=6,033). Column 6 is measured during short recall surveys from January 2014 to June 2016, with a recall period of one week (N=5,870). Outcome variables are: an indicator for whether the household took a formal loan including in-kind inputs (column 1), a low interest (column 2) or high interest (column 3) informal loan, sold any assets or livestock (column 4 and 5) and consumed any green maize in the past week (column 6). All specifications include baseline controls, geographic controls, and cluster standard errors at the village level. Panel C also conditions on year and column 6 on month fixed effects. Panel B also shows the total effect for repeat treatment in year 2, relative to the year 2 control group: Loan + Y1 + Loan x Y1.

Table B.9: Average treatment effects: Health and nutrition outcomes

	Any illness	Self-reported health PCA	Acres weeded per hour	Bicep circumfrence	Waist circumfrence	Grip strength repetitions	Grip strength duration
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			A. Year 1 - Pooled treatment arms				
Any loan treatment		0.006	0.002	-0.053	-0.803	1.845	4.675
		(0.086)	(0.002)	(0.332)	(1.104)	(1.787)	(2.034)
			B. Year 2 - Pooled treatment arms				
Any loan treatment	-0.073	0.040	0.001	-0.579	-1.298	0.726	0.534
	(0.052)	(0.154)	(0.002)	(0.389)	(0.975)	(2.795)	(3.344)
Treated in Y1	-0.012	-0.051	0.004	-0.493	-0.965	-0.037	-0.480
	(0.037)	(0.130)	(0.002)	(0.325)	(0.771)	(2.603)	(2.857)
Loan x Treated in Y1	0.017	0.050	-0.005	0.496	1.349	2.618	1.875
	(0.062)	(0.189)	(0.003)	(0.433)	(1.211)	(3.385)	(3.838)
Loan + Y1 + Loan x Y1	-0.068	0.039	0.000	-0.576	-0.914	3.307	1.930
	(0.034)	(0.124)	(0.002)	(0.321)	(0.780)	(2.512)	(2.932)
			C. By treatment arm - Pooled years				
Cash	-0.092	-0.010	0.001	-0.283	-1.003	2.827	2.243
	(0.035)	(0.075)	(0.002)	(0.205)	(0.773)	(1.275)	(1.507)
Maize	-0.030	0.067	-0.001	-0.071	-0.809	0.673	3.218
	(0.032)	(0.078)	(0.001)	(0.215)	(0.726)	(1.438)	(1.676)
Year 1 control mean		-0.09	0.03	27.46	78.40	39.20	34.94
Year 2 control mean	0.78	0.01	0.04	26.41	80.68	43.33	34.59
Year 1 = Year 2 new		0.68	0.47	0.90	0.72	0.75	0.63
Year 1 = Year 2 repeat		0.54	0.23	0.98	0.49	0.70	0.78
Cash = Maize	0.11	0.38	0.15	0.35	0.80	0.14	0.58
Observations	1,388	2,545	2,375	2,510	2,514	2,129	2,155

Notes: Treatment effects on health and nutrition-related outcomes, measured during the short recall surveys during the hungry season, with a 2-week recall window in column 1. Columns 1 and 2 are measured only during year 2. Outcome variables are: an indicator for whether the household had any illnesses in the past two weeks (column 1), an aggregate score of self reported health (column 2), self-reported number of acres weeded per hour (column 3), and measures of bicep and waist circumference (column 4 and 5) and grip strength test outcomes (column 6 and 7). All specifications are conditional on month fixed effects, include baseline controls, and cluster standard errors at the village level. Columns 2-7 also control for respondent gender and age. Panel C also conditions on year. Panel B also shows the total effect for repeat treatment in year 2, relative to the year 2 control group: Loan + Y1 + Loan x Y1.

Table B.10: Average treatment effects: Decision-making and cognition

	Expenditure on					Performance on		
	Clothing	Beer	Tobacco	Sweets	Tea	Ravens	Stroops 2	Stroops 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				A. Year 1 - Pooled treatment arms				
Any loan treatment	0.027	0.032	-0.037	0.013	-0.054			
	(0.042)	(0.036)	(0.034)	(0.036)	(0.044)			
				B. Year 2 - Pooled treatment arms				
Any loan treatment						0.086	-0.188	-0.231
						(0.120)	(0.098)	(0.118)
Treated in Y1						0.020	-0.137	-0.163
						(0.097)	(0.081)	(0.100)
Loan x Treated in Y1						-0.142	0.264	0.248
						(0.148)	(0.120)	(0.146)
Loan + Y1 + Loan x Y1						-0.035	-0.061	-0.146
						(0.092)	(0.071)	(0.094)
				B. By treatment arm				
Cash	0.007	0.057	-0.024	0.020	-0.058	-0.026	-0.012	-0.030
	(0.048)	(0.040)	(0.037)	(0.042)	(0.050)	(0.090)	(0.063)	(0.081)
Maize	0.046	0.008	-0.048	0.006	-0.050	-0.005	0.002	-0.101
	(0.048)	(0.041)	(0.038)	(0.042)	(0.049)	(0.078)	(0.070)	(0.084)
Year 1 control mean	0.39	0.19	0.21	0.44	0.40			
Year 2 control mean						0.03	0.33	0.26
Cash = Maize	0.39	0.19	0.48	0.74	0.87	0.84	0.84	0.44
Observations	907	907	907	907	907	1,353	1,323	1,320

Notes: Columns 1-5 report treatment effects on indicators of temptation spending over the past two weeks, measured during during the hungry season in year 1, and asked only for married couples (N=907 in midline survey). Columns 6-8 report z-scores of performance on cognitive tests: the Raven's Progressive Matrices test (column 6), a congruent task in the numerical version of the Stroop test (column 7) and an incongruent task in the Stroop test (column 8). All columns are conditional on month fixed effects, include baseline controls, and cluster standard errors at the village level. Columns 6-8 also control for for respondent gender and age. Panel C also conditions on year. Panel B also shows the total effect for repeat treatment in year 2, relative to the year 2 control group: Loan + Y1 + Loan x Y1.

Table B.11: Average treatment effects: Affect and motivation

	Mental health problem index (1)	Feel anxious (2)	Trouble sleeping (3)	Affect daily work (4)	Easily tired (5)	Worried about food (6)
			A. Year 1 - Pooled treatment arms			
Any loan treatment						-0.122
						(0.033)
			B. Year 2 - Pooled treatment arms			
Any loan treatment	-0.030	-0.063	-0.018	-0.063	-0.096	-0.076
	(0.018)	(0.064)	(0.043)	(0.039)	(0.034)	(0.055)
Treated in Y1	0.001	0.019	0.026	-0.026	-0.002	0.023
	(0.015)	(0.043)	(0.033)	(0.039)	(0.032)	(0.037)
Loan x Treated in Y1	0.012	0.014	-0.002	0.057	0.057	-0.124
	(0.022)	(0.078)	(0.053)	(0.052)	(0.044)	(0.066)
Loan + Y1 + Loan x Y1	-0.017	-0.030	0.006	-0.032	-0.041	-0.177
	(0.013)	(0.043)	(0.031)	(0.038)	(0.033)	(0.038)
			C. By treatment arm - Pooled years			
Cash	-0.022	-0.061	-0.009	-0.037	-0.086	-0.086
	(0.012)	(0.046)	(0.032)	(0.030)	(0.027)	(0.025)
Maize	-0.021	-0.045	-0.031	-0.011	-0.028	-0.192
	(0.014)	(0.041)	(0.033)	(0.031)	(0.030)	(0.027)
Year 1 control mean						0.71
Year 2 control mean	0.04	0.65	0.26	0.31	0.28	0.66
Year 1 = Year 2 new						0.02
Year 1 = Year 2 repeat						0.29
Cash = Maize	0.95	0.76	0.56	0.46	0.09	0.00
Observations	1,388	1,388	1,388	1,388	1,386	2,574

Notes: Treatment effects on proxies for affect, depression and motivation, measured during the short recall surveys during the hungry season, with a 2-week recall window in column 6. Columns 1-5 are measured only during year 2. Outcome variables are: an index of mental health problems (column 1), feelings of anxiety and nervousness (column 2), trouble sleeping (column 3), mental health problems are affecting daily work (column 4), feeling fatigued all the time (column 5), worry about food (column 6). All outcomes are self-reported and columns 2-5 are part of the index reported in column 1. Column 6 is part of the food security index reported in Table 6. All specifications are conditional on month fixed effects, include baseline controls, and cluster standard errors at the village level. Columns 2-7 also control for respondent gender and age. Panel C also conditions on year. Panel B also shows the total effect for repeat treatment in year 2, relative to the year 2 control group: Loan + Y1 + Loan x Y1.

Table B.12: Notification timing

	Hours sold	Hours hired	Hours on-farm (family)	Log output	Adult meals	Acres cash crops	Input value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Any loan treatment	-0.960	-1.374	11.903	0.042	0.074	135.425	0.097
	(0.631)	(1.490)	(6.379)	(0.125)	(0.033)	(206.383)	(0.172)
Loan x Early	0.274	3.435	-0.745	0.048	0.005	100.463	0.182
	(0.654)	(2.423)	(9.397)	(0.144)	(0.037)	(245.623)	(0.204)
Year 2 control mean	2.71	3.10	53.15	7.70	1.97	1299.11	1.06

Notes: Impacts of loan notification timing in year 2 on main outcomes (columns 1-5) and planting season production decisions (columns 6 and 7). Only main effects are reported, which excludes the interaction with treatment in year 1. The reference group (*Any loan treatment*) is the timing used to announce the loans in year 1. Early notification involved informing farmers of the loan program at planting time in September. The timing of the actual loan delivery was the same across the timing sub-treatments. All specifications include baseline controls, and cluster standard errors at the village level. Columns 1, 2, 3 and 5 also include month fixed effects and are restricted to the hungry season.

Table B.13: Income effect control

	Hours sold	Hours hired	Hours on-farm (family)	Log output	Adult meals
	(1)	(2)	(3)	(4)	(5)
Control gift	0.705	0.489	6.934	-0.004	0.045
	(0.559)	(1.122)	(3.791)	(0.066)	(0.033)
Pure control mean	2.71	3.10	53.15	7.70	1.97

Notes: Impact of a small (60 Kwacha) cash grant given to 5-6 villages, relative to the pure control group, pooling across both years of the program. Main effects, which exclude the interaction with treatment in year 1 from the year 2 treatment effect. All specifications include baseline controls, and cluster standard errors at the village level. Columns 1-3 and 5 are conditional on month fixed effects.

Table B.14: Reporting bias

	A. Social desirability bias			
	Labor survey		Endline survey	
	(1)	(2)	(3)	(4)
Any loan treatment	-0.016		0.051	
	(0.144)		(0.099)	
Cash		-0.098		-0.013
		(0.160)		(0.124)
Maize		0.067		0.114
		(0.194)		(0.117)
Control mean	21.76	21.76	20.66	20.66
	B. Self-reported maize yields			
	Year 1		Year 2	
	(1)	(2)	(3)	(4)
Objective measure	0.870	-31.009	0.051	-98.775
	(0.316)	(123.080)	(0.011)	(115.340)
Any loan treatment		0.051		0.051
		(0.099)		(0.099)
Objective measure x Loan		0.150		0.014
		(0.623)		(0.037)
Control mean	613.57	613.57	613.57	613.57

Notes: Tests for self-reporting bias by treatment. Panel A regresses an index of social desirability bias on treatment, with cross sectional data from two survey rounds: labor survey round 3 (hungry season, immediately after receiving year 2 loans) and endline survey (harvest survey, immediately after repaying year 2 loans). Panel B regresses self reported maize yields on an objective measure of maize productivity, the loan treatment and an interaction of the two, along with a control for the share of the self reported yield that comes from hybrid maize. In year 1 (columns 1 and 2), the objective measure is a measure of maize height during the hungry season. In year 2 (columns 3 and 4), the objective measure is based on the number of maize kernels counted during a systemic on-field sampling. No baseline controls are included in these regressions. Standard errors are clustered at the village level.

C.1 Survey descriptions

1. Baseline survey (November-December 2013, N=3139): Survey of up to 22 households per village, conducted with household heads. The baseline survey includes sections on household demographics (including individual roster, employment roster of working household members, general household information about assets owned and food insecurity faced, farming information for 2012-2013 season, expected farming activity for 2013-2014 season, risk and time preferences).

2. Midline survey (February-March 2014, N=1193): Hungry season survey of 1200 randomly selected households, stratified on treatment. One week and one month recall questions on labor supply, ganyu earnings, consumption, basic strength and anthropometric measurement.

3. Labor surveys (January 2014-August 2015, N=4679): Rolling survey of ˜70 households per week (7 of the baseline households in 2 villages per day). The list of baseline households for each village were randomized and the first ˜7 households interviewed, in cases where a household could not be interviewed (temporarily busy, moved, etc.), the household was skipped and the next household on list visited. Survey asks one week and one to two day recall questions on household labor allocation, ganyu earnings, and consumption. Four rounds of labor surveys were conducted (a new round started once all villages were visited). The third round coincided with the hungry season in year 2 and serves as a second midline survey.

4. Maize price survey (September 2013-May 2015): Survey of maize vendors in Chipata town markets. Enumerators recorded both purchase and sales price for both unpounded and pounded maize (mealie meal) monthly from an average of 31 vendors per month.

5. Midline maize assessment (February-March 2014, N=380): On-field assessments of maize height (measurement) and visual records (photographs) for a sample of 380 households in 64 villages. Only households with their nearest field within a 30 minute walk were eligible.

6. Harvest survey, year 1 (July-September 2014, N=3028): Survey of all baseline households. Includes sections on changes to household composition, shocks experienced by the household, agricultural productivity. Includes anthropometric measures for adults and children.

7. Endline survey, year 2 (July-September 2015, N=3005): Survey of all baseline households. Similar structure to harvest survey.

C.2 Choice experiments

Hypothetical choice experiments were conducted on a convenience sample of participants in November and December 2013. In the initial wave of questions, 72 respondents were interviewed, one-third of which were female. The surveys took place in villages in and around the study area, but not eligible for the study either because they were too large (>100 households) or they had participated in the pilot program. Respondents were approached by an enumerator who explained the exercise, emphasizing that the offers were hypothetical and that responses would not affect any future programs they might be offered. In spite of these disclaimers, which were intended to minimize strategic responses and avoid building expectations, respondents took the decision tasks seriously.

Six scenarios were presented to respondents, involving different dichotomous choices that varied a relevant parameter of the loan offer. The ordering of the parameter set were varied across respondents.

Scenario 1: Maize loan versus cash loan

Script: *Suppose that we had two loans available that would start in January. The first would offer three (3) bags of [50 kg maize] in January that you have to repay in June. The second would offer cash that you would have to repay in June. Please take your time to make your choice, as I will be going through different categories. Would you prefer a cash loan that paid _ _ _ _ Kwacha that you would pay back in June or would you prefer the [maize] loan that you would pay back in June?*

Parameters: 50, 110, 150, 175, 250, 275, 350, 375, 425, 450, 600 Kwacha

Scenario 2: Cash repayment

Script: *Now, supposed the loan changed so that you could still receive three (3) bags of [mealie meal / maize] in January. But instead of repaying in maize in June, you had to repay in cash. I'm going to go through some different repayment amounts. You should tell me whether you would choose to take up a loan that gave you [maize] in January and had to repay that amount of cash in June. Would you be willing to take up a loan that gave you 3 bags of [maize] in January and required that you repay _ _ _ Kwacha in June?*

Parameters: 600, 450, 400, 325, 275, 250, 200, 175, 125, 100, 75, 50 Kwacha

Scenario 3: Cash gift vs. maize loan

Script: *Again, suppose, we were to offer a loan that offered three (3) bags of [maize] in January that you had to repay in June. Would you prefer to take that loan or would you prefer to receive _ _ _ _ Kwacha in January, which you would not require to pay back?*

Parameters: 10, 30, 60, 80, 100, 110, 130, 150, 175, 200, 250 Kwacha

Scenario 4: Cash gift vs. cash loan

Script: *Suppose now that the loan was cash instead and we were to offer a loan that provided 200 Kwacha in January that you had to repay in June without any interest (repay 200 Kwacha in June). Would you prefer to take that loan or would you prefer to receive _____ Kwacha in January which you would not require to pay back.*

Parameters: 10, 30, 60, 80, 100, 110, 130, 150, 175, 200, 250 Kwacha

Scenario 5: Maize loan repayment month

Script: *Suppose, we were to offer a loan that offered three (3) bags of [maize] in January that required you to repay four (4) bags. I'd like you to think about whether you would choose to take that loan. I will list different months when the repayment would be due. Would you be willing to take a loan of three bags of [mealie meal / maize] in June that required you repay 4 bags if the repayment were due in _____?*

Parameters: February, March, April, May, June, July, August, September, October, November, December

Scenario 6: Cash loan repayment month

Script: *Again, let's look at this activity but considering a loan in cash instead of maize: Suppose, we were to offer a loan that offered 200 Kwacha in cash in January that required you to repay 330 Kwacha in cash. Would you be willing to take that loan for 200 Kwacha in cash that repaid 265 Kwacha if the repayment were due in _____?*

Parameters: February, March, April, May, June, July, August, September, October, November, December