

# Online Appendix to Income Timing, Savings Constraints, and Temptation Spending: Evidence from a Randomized Field Experiment

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March 1, 2017

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## **A Details of worker recruitment, attrition, and work activities**

### **A.1 Worker recruitment**

We worked with MMCT to locate a set of villages that were potential targets for expanding their Sustainable Livelihoods program. The key criteria for a village to be eligible were:

1. *Location.* Villages had to lie within walking distance of the Forest Reserve, because the work activities supported by the program are centered around natural resource management and conservation.
2. *No previous Sustainable Livelihoods program participation.* Because this was an expansion of the program, we excluded areas that were already actively participating in the program, or which had been included in the past.
3. *Not included in any other recent income-generation programs.* The expansion was targeted toward underserved communities to maximize the benefits brought to the neediest people.
4. *Limited geographic range.* The villages for the study had to be physically close enough to each other to allow work and payroll to be organized across all of them together.

Given the criteria above, we settled on a region of Traditional Authority (TA) Nkanda near the Forest Reserve as the target location for the project. Within that region, we picked seven villages that all lie within the catchment area of Mwanamulanje trading centre, the site of one of the largest weekly markets in TA Nkanda.

The selection of workers was handled by the standard operating procedure employed by the Sustainable Livelihoods program. The nature of the program, including the kind of work, the pay rate, and the expected length of employment, was explained at a meeting with the village head and the village development committee (VDC). Each VDC was then tasked with selecting a set of 50 participants and 15 substitutes, with a maximum of one person per household. They were told to use the same criteria they generally use for deciding who should benefit from social programs. Discussions with MMCT and the VDCs revealed that the main criterion used was generally poverty, with some tendency to favor women as being more likely to be disadvantaged. The VDCs were asked to list the workers in order of preference from 1 to 65, and told we would replace workers who dropped out of the program by moving in order from position 51 to position 65 on the list of workers from their own village. This was done for a total of 15 workers at the end of the first round of the study.

## **A.2 Participation, attrition, and replacement of workers**

The original recruitment for round one included 350 workers but 2 people were removed from the sample: one person dropped out before the work started and one person never showed up at payday (only an additional 9 subjects missed any days of work, and all of them are included in the analysis). Before the start of round two of the program, 13 workers left the study, and a total of 15 replacement workers were added. The study protocol specified that only 13 new workers should have been added (to replace the dropouts); too many were mistakenly added, and the extra 2 workers were allowed to stay in the study in order to avoid disappointing them after they had already begun working.

## **A.3 Specifics of work activities**

At the beginning of each round of work, representatives from the project met with the workers from each village to help them decide on the specific activities to pursue for that round, based on guidance from MMCT's Sustainable Livelihoods program. Subjects did two kinds of work during the study: *Tree Planting* and *Milambala*.

Tree Planting had two separate aspects. During the first round of the project, workers prepared pits for trees to be planted in, and nurseries to house the seedlings for later planting; the seedlings were provided by the Department of Forestry as part of a reforestation program

in the area. During round two, which happened once the rainy season had begun, workers did the actual planting of trees. Milambala is a land conservation activity that focuses on building small retaining walls to prevent the inundation of fields and limit environmentally harmful erosion of the topsoil. The principal tools needed for the work were hoes, which all the workers already owned. Milambala also required line levels and ropes, which were provided by the project.

Workers were trained in the tasks for each work activity by officials from Mulanje's District Forestry and District Agricultural Offices for Tree Planting and Milambala respectively. Progress on the work was also overseen by officials from the two departments, who set targets for the work to be done on each day and checked in to make sure it was accomplished.

## B Additional balance tests and summary statistics

### B.1 Balance by round and for the second cross-randomized experiment

Appendix Table B.1 presents the balance tests from Table 2 separately by round. The results are broadly the same as for the pooled balance tests. We have balance both on each individual covariate and for the overall test of any difference across covariates.

In Appendix Table B.2, we show balance tests for our second cross-randomized experiment, Friday vs. Saturday paydays. This second experiment is also balanced on all the individual covariates, as well as for the overall test of any difference.

**Table B.1**  
Balance of baseline variables by round

	Control group:			Treatment group:			Balance test <i>p</i> -value
	Weekly payments			Lump sum payments			
	Mean	SD	N	Mean	SD	N	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Panel A - Round 1</b>							
<i>Demographics</i>							
Male	0.30	0.46	173	0.32	0.47	172	1.000 <sup>a</sup>
Married	0.73	0.45	173	0.67	0.47	172	0.163
Age (Years)	40.5	15.8	173	39.5	14.7	172	0.553
Years of Education Completed	3.5	3.2	173	3.7	3.3	172	0.952
<i>Financial outcomes (in units of MK unless noted)</i>							
Income received since past Friday	3,037	5,237	173	2,394	4,076	172	0.167
Remaining cash holdings out of income received	649	1,718	173	480	1,723	172	0.257
Total spending since Friday	3,785	4,198	173	3,563	4,368	172	0.522
Asset Ownership (PCA)	-0.11	2.40	173	0.14	2.97	172	0.483
Loans received in past month	2,340	6,297	173	2,886	8,457	172	0.625
Loans made in past month	606	1,702	173	547	1,529	172	0.742
Transfers received in past month	802	1,843	173	829	1,941	172	0.866
Transfers made in past month	451	1,269	173	623	1,855	172	0.390
<i>p</i> -value from joint significance of 12 covariates:			0.60				
<b>Panel 2 - Round 2</b>							
<i>Demographics</i>							
Male	0.30	0.46	174	0.37	0.48	177	0.287
Married	0.71	0.46	174	0.71	0.46	177	0.909
Age (Years)	40.7	16.3	174	43.1	17.7	177	0.288
Years of Education Completed	3.9	3.5	174	3.9	3.7	177	0.631
<i>Financial outcomes (in units of MK unless noted)</i>							
Income received since past Friday	3,761	7,263	174	3,987	7,171	177	0.659
Remaining cash holdings out of income received	1,020	2,980	174	1,142	3,069	177	0.508
Total spending since Friday	4,449	6,494	174	4,925	6,419	177	0.834
Asset Ownership (PCA)	-0.03	2.94	168	0.01	2.46	168	0.977
Loans received in past month	4,039	11,014	174	5,328	13,071	177	0.437
Loans made in past month	851	2,156	174	984	2,433	177	0.951
Transfers received in past month	1,322	3,072	174	1,279	2,882	177	0.203
Transfers made in past month	857	2,538	174	1,146	2,878	177	0.697
<i>p</i> -value from joint significance of 12 covariates:			0.81				

*Notes:* Sample includes 359 workers who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). All money amounts are in Malawian Kwacha (MK); during the study period the market exchange rate was approximately MK400 to the US dollar, and the PPP exchange rate was approximately MK160 to the US dollar. Asset index is constructed by taking the first principal component of all asset variables and is normalized to have a mean of zero. For complete variable definitions see Appendix C.

Calculations based on observations at the worker-level, from workers who have any follow-up data, separately by intervention round. All variables denominated in MK are Winsorized at the ninety-ninth and first percentiles to control outliers. The *p*-values in column 7 are from a test that the treatment indicator is zero in a OLS regressions of baseline covariates on an indicator for treatment plus stratification cell fixed effects and using heteroskedasticity-robust standard errors, clustered at the worker level.

<sup>a</sup> Treatment assignment was stratified on gender in round one and so gender is perfectly predicted by stratification cell in this sample.

**Table B.2**  
Balance of baseline variables for Friday-Saturday experiment

	Friday Payday			Saturday Payday			Balance
	Mean	SD	N	Mean	SD	N	test
	(1)	(2)	(3)	(4)	(5)	(6)	<i>p</i> -value
<i>Demographics</i>							
Male	0.30	0.46	348	0.34	0.48	348	0.217
Married	0.70	0.46	348	0.70	0.46	348	0.987
Age (Years)	40.8	16.5	348	41.1	15.9	348	0.851
Years of Education Completed	3.6	3.4	348	3.9	3.4	348	0.342
<i>Financial outcomes (in units of MK unless noted)</i>							
Income received since past Friday	3,207	6,098	348	3,395	6,144	348	0.976
Remaining cash holdings out of income received	760	2,238	348	891	2,694	348	0.774
Total spending since Friday	4,372	5,704	348	4,001	5,295	348	0.100
Asset Ownership (PCA)	-0.08	2.49	342	0.08	2.89	339	0.331
Loans received in past month	3,410	9,612	348	3,909	10,591	348	0.885
Loans made in past month	711	1,920	348	786	2,070	348	0.929
Transfers received in past month	1,022	2,482	348	1,098	2,533	348	0.892
Transfers made in past month	768	2,264	348	775	2,218	348	0.495
<i>p</i> -value from joint significance of 12 covariates:			0.45				

*Notes:* Sample includes 359 workers who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). All money amounts are in Malawian Kwacha (MK); during the study period the market exchange rate was approximately MK400 to the US dollar, and the PPP exchange rate was approximately MK160 to the US dollar. Asset index is constructed by taking the first principal component of all asset variables and is normalized to have a mean of zero. For complete variable definitions see Appendix C.

Calculations based on pooled data set with observations at the worker-round level, from workers who have any follow-up data. All variables denominated in MK are Winsorized at the ninety-ninth and first percentiles to control outliers. The *p*-values in column 7 are from a test that the treatment indicator is zero in a OLS regressions of baseline covariates on an indicator for treatment plus stratification cell fixed effects and using heteroskedasticity-robust standard errors, clustered at the worker level.

## B.2 Outcome measure summary statistics

We utilize three data sources in the analysis in this paper. We present summary statistics from all three data sources in Appendix Table B.3. Respondents spent MK1,538 total during the first three weekends and MK1,347 on the last weekend. 13% of workers purchased the artificial “bond.” At midline, the households’ total spending considering all expenditures from the last Friday prior to being interviewed up to the day of the survey averages MK3,042 (about US\$7.60 or PPP\$19). Respondents report having an average of MK529 (about US\$1.30 or PPP\$3.30) left out of the money they had received since the Friday prior to interviewing.

**Table B.3**  
Summary statistics for outcomes

	Mean	Std. dev.	10th percentile	Median	90th percentile	Obs.
<u>Panel A - Payday data on spending at market on the four payday weekends</u>						
Amount spent on Friday and Saturday						
Weekends 1-3	1,538	1,110	535	1,150	3,000	696
Weekend 4	1,347	1,198	200	1,000	3,100	696
All Weekends	2,891	1,574	1,000	2,700	4,800	696
Amount spent on payday	1,677	1,146	200	1,537	3,200	696
Ratio: Spending on payday / Income received	0.511	0.345	0.061	0.483	1	696
<u>Panel B - Project administrative data - Investment opportunity take-up</u>						
Bought any shares	0.133	0.340	0.000	0.000	1.000	699
Total spent on shares	290	789	0	0	1,500	699
<u>Panel C: Follow-up survey measures</u>						
Income received since past Friday	3,043	2,676	900	3,000	5,000	689
Remaining cash holdings out of income received	529	996	0	0	2,000	689
Itemized Expenditures: Total spending <sup>†</sup>	3,147	2,353	1,010	2,550	5,880	689
Value of net asset purchases in past two months	2,154	7,486	0	0	5,300	689
Loans received in past month	1,957	5,810	0	0	4,400	689
Loans made in past month	524	1,833	0	0	1,000	689
Transfers received in past month	600	1,522	0	0	1,500	689
Transfers made in past month	238	624	0	0	600	689

*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). All money amounts are in Malawian Kwacha (MK); during the study period the market exchange rate was approximately MK400 to the US dollar, and the PPP exchange rate was approximately MK160 to the US dollar. Asset purchases are measured since the previous survey, a period of approximately two months. Loans are measured since November 1<sup>st</sup> in round 1 and since January 1<sup>st</sup> in round 2, a period of approximately one month. Transfers are measured over the month leading up to the survey interview. For complete variable definitions see Appendix C.

<sup>†</sup> Itemized expenditure data does not include all purchases, and so these estimates are likely to be a lower bound; see Section 3.1 for details.



## C Variable definitions

Data used in this paper come from three rounds of “full length” surveys (a baseline and two follow-up interviews), from two- to four-question surveys during paydays as well as from administrative records of the project. We conducted a baseline survey from 4 Oct 2013 to 19 Oct 2013 and two follow-up surveys after the last payday weekend of each round, once from 2 Dec 2013 to 7 Dec 2013 and once from 27 Jan 2014 to 31 Jan 2014. All variables that are created from survey data are Winsorized at the 1st and 99th percentile. All figures in money terms are in local currency units, Malawi Kwacha (MK).

### C.1 Variables from payday surveys

*Amount spent on same day as income receipt* is total market spending on all days that workers received their wages (sum of all four payday Fridays or Saturdays for the weekly payment group; the fourth payday Friday or Saturday for the lump sum payment group).

*Money spent at market on Fridays 1, 2, 3* is the sum of total market spending on the first three payday Fridays.

*Money spent at market on Saturdays 1, 2, 3* is the sum of total market spending on the first three payday Saturdays.

*Money spent at market on Friday 4* is the total market spending on the fourth payday Friday.

*Money spent at market on Saturday 4* is the total market spending on the fourth payday Saturday.

### Sensitivity of payday survey results to variable definitions

Our payday survey variable was recorded only for spending at the market. It also had a different recall period for Fridays and Saturdays: Friday spending was recorded on the following day (Saturday) while Saturday spending was recorded 6 days later (on the next Friday). To assess the importance of these decisions for our results, in round two of the study we also collected two alternate versions of the variable for some of the paydays. One variant had people recall their spending from one week prior. The second had them report spending *outside* the market.

Table C.1 presents estimates of the potential importance of our measurement procedure for our main results. Column 1 shows that there is some evidence of recall bias, and of differences across study arms: shorter recall periods have somewhat lower spending for the treatment group. However, these differences are very small relative to our effects on these

**Table C.1**

Treatment-control differences in the effect of alternative market spending measures

<u>Dependent variable:</u>	(1)	(2)
	Short-long recall difference (MK)	Nonmarket spending (MK)
<b>Lump sum treatment</b>	<b>-95.17**</b> (42.54)	<b>-34.32</b> (57.81)
Dependent variable mean, control group (weekly payments)	152.1	317.3
Number of observations	346	346

*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). All money amounts are in Malawian Kwacha (MK); during the study period the market exchange rate was approximately MK400 to the US dollar, and the PPP exchange rate was approximately MK160 to the US dollar.

outcomes. If the estimated treatment-control difference existed for all three Fridays (the short-recall days) before the final payday weekend, this would explain just 20% of our overall treatment effect.

Column 2 shows that the choice to focus on spending at the market makes a trivial difference for the total amounts recorded. The treatment-control difference in reported nonmarket spending is small and statistically insignificant.

## C.2 Variables from follow-up surveys

*Total spending since last Friday, inclusive [MK]* is the total household spending starting from the fourth payday Friday until the day of the survey interview in the week after the fourth payday. The variable is derived from the difference of the answers to the questions “Since last Friday, how much cash have you received?” and “How much of that cash do you have left?”, respectively.

*Remaining cash out of received since last Friday, inclusive [MK]* is the household’s remaining cash holdings out of money received starting from the fourth payday Friday until the day of the survey interview.

*Self-reported wasteful spending on weekend 4 of round 2* variables ask for money that respondents report as “wasted” or spending which the respondent was tempted into spending that he/she should not have spent:

- *Total since last Friday, inclusive [MK]* is the sum of total wasteful spending starting from the fourth payday Friday until the day of the survey interview in the week after the fourth payday.
- *Friday [MK]* is total wasteful spending on the fourth payday Friday.
- *Saturday [MK]* is total wasteful spending on the fourth payday Saturday.
- *Sunday and after [MK]* is the sum of total wasteful spending starting from the fourth payday Sunday until the day of the survey interview in the week after the fourth payday.

*Expenditure shares based on itemized elicitation* is the sum of itemized expenditures, grouped into different categories as a share of total expenditures across all items based on a large listing of possible items (with items derived from Malawi’s Integrated Household Survey; a select number of items was consolidated or omitted but each category had an “other” option to capture items that were left out; total number of 105 items in 12 categories).

- *Food for consumption at home* includes eight categories of food items typically used for home consumption.
- *Maize only* includes only maize flour and maize grain.
- *Food for consumption out of home* includes all items from the categories “cooked foods from vendor” and “Beverages” which are typically consumed away from home.
- *Non-Food* includes all non-food items.

*Value of net asset purchases since last interview* is the sum of the difference between the value of assets bought and assets sold from an itemized list of common assets (as well as an “other” category) considering purchases and sales since the last interview, i.e. since baseline interview for follow-up 1 and since follow-up 1 for follow-up 2.

### **Phrasing of Questions about Temptation Spending**

Appendix Table C.2 shows how each of the questions about temptation spending was phrased. We present the English translations of the questions here; the original Chichewa questions are available upon request.

**Table C.2**  
Phrasing of Temptation Questions

**1. Expenditures that the respondent commonly regrets**

Do you ever spend money and then later regret it?	0 - No    1 - Yes    [ Yes --> a. ]
a. What do you spend the money on? List as many things as you can think of: <b>Interviewer: Mark all that apply</b>	

**2. Expenditures that are commonly unplanned**

Now think about the plans you make for spending your money. Do you ever make plans or budgets for spending, but then spend money on things you didn't plan on?	0 - No    1 - Yes    [ Yes --> a. ]
a. When this happens, what are the unplanned items? List as many things as you can think of: <b>Interviewer: Mark all that apply</b>	

**3. Expenditures that are wastes of money or that respondent is tempted into buying**

What are things that you sometimes waste money on, or that you are sometimes tempted to buy but should not spend money on? List as many things as you can think of: <b>Interviewer: Do not read options, but mark any that respondent mentions</b>
---

**4. Unplanned purchases on an individual expenditure basis (asked for each good purchase from an itemized list)**

Did you plan to buy [ITEM] or did you decide to buy only when you saw it?
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**5. Own calculation of total money wasted/tempted into spending**

[LAST FRIDAY/LAST SATURDAY/SINCE SUNDAY], how much money did you waste or how much money were you tempted into spending that you should not have spent?
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### **C.3 Variables from baseline surveys**

*Assets index* is an index based on the first principal component of the number of items owned out of 64 common non-financial, non-livestock assets and the number of animals owned out of 9 common types of livestock.

*Total spending* is defined similarly to “Total spending since last Friday, inclusive” described under follow-up variables above, covering the last Friday prior to the interview until the day of the survey interview.

### **C.4 Variables from project records**

*Bought any shares* is an indicator for whether the respondent bought at least one “share” of the investment opportunity offered after the follow-up interviews (see details in main text in Data Collection section).

*Total spent on shares* is the total amount spent on the investment opportunity offered and equals the number shares bought times the price of one share (MK 1,500).

**Table D.1**  
Analysis of order effects in bond purchase impacts for round two

	(1)	(2)	(3)	(4)
	<b>Administrative data on bond sales</b>		<b>Survey data</b>	
<u>Dependent variable:</u>	1(Bought any shares)	Total spent on shares (MK)	Remaining cash out of income received since last Friday (MK)	Income received since last Friday (MK)
<hr/> <u>Round 2 only</u>				
<b>Lump sum treatment</b>	<b>0.0892**</b> (0.0425)	<b>161.3</b> (104.2)	<b>197.3</b> (145.3)	<b>2,190***</b> (330.1)
<b>(Lump sum treatment)X (Lump sum in round 1)</b>	<b>0.00559</b> (0.0690)	<b>59.05</b> (181.7)	<b>132.4</b> (208.7)	<b>-303.2</b> (409.6)
Dependent variable mean, control group (weekly payments)	0.0643	175.4	393.1	2,010
Number of observations	346	346	346	346

*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). 1 USD was worth approximately MK400 at market exchange rates and MK160 at PPP exchange rates during the study period. All regressions control for stratification cell fixed effects, an index of baseline asset ownership based on first principal components, indicators for the number of days after the weekend the interview occurred, baseline total spending and (if available) the baseline value of the outcome variable. For details of the empirical strategy see section 4, and for complete variable definitions see Appendix C. Heteroskedasticity-robust standard errors, clustered by worker, in parentheses.

## D Analysis of order effects

Our experiment re-randomized workers into treatment and control status across the two rounds of the study. This raises the potential concern of order effects: perhaps responses in round two will differ for workers who were treated in round one and those who were untreated. Table D.1 shows that there is no evidence that order effects drive our results: our main result, on bond purchases, is essentially identical for workers who were treated in round 1 and those who were not. However, this analysis has low power: we have 80% power to detect a 19 percentage-point difference between the two groups, which is substantially larger than our main effect estimates.

## E Robustness of results to omitting controls

The tables in this section repeat our main regression analyses, but omit all control variables (including stratification cell indicators). The regression specification for this section is hence:

$$Y_{ir} = \alpha + \beta T_{ir} + \varepsilon_{ir} \tag{1}$$

None of our results are substantively affected by the omission of the controls. Our core result, on bond purchases, remains statistically significant and has an almost-identical point estimate using the no-controls specification.



**Table E.1**Effects of lump sum payments on expenditure levels  
(without controls)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<b>Payday survey panel - Spending at market on the four payday weekends</b>					<b>Household survey data</b>		
<u>Dependent variable:</u>	Amount spent on Friday and Saturday (MK)			Amount spent on payday (MK)	(Spending on payday)/ (Income received)	Income received since last Friday (MK)	Remaining cash out of income received since last Friday (MK)	Total spending <sup>†</sup> since Friday from itemized expenditure data (MK)
	Weekends 1-3	Weekend 4	All Weekends					
<b>Lump sum treatment</b>	<b>-1,289***</b> (74.82)	<b>819.7***</b> (88.59)	<b>-474.4***</b> (127.0)	<b>-928.0***</b> (81.88)	<b>-0.239***</b> (0.0252)	<b>1,466***</b> (213.9)	<b>121.0</b> (74.26)	<b>370.6**</b> (169.0)
Dependent variable mean, control group (weekly payments)	2,184	936.0	3,129	2,142	0.631	2,309	468.5	2,962
Number of observations	696	696	696	696	696	689	689	689

*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). Regressions are run on pooled data from round 1 and round 2. 1 USD was worth approximately MK400 at market exchange rates and MK160 at PPP exchange rates during the study period. Heteroskedasticity-robust standard errors, clustered by worker, in parentheses.

<sup>†</sup> Itemized expenditure data does not include all purchases, and so these estimates are likely to be a lower bound; see Section 3.1 for details.

**Table E.2**

Effects of lump sum payments on asset accumulation, loans, and transfers

	(1)	(2)	(3)	(4)	(5)
<u>Dependent variable:</u>	Value of net asset purchases in past two months (MK)	Loans received in past month (MK)	Loans made in past month (MK)	Transfers received in past month (MK)	Transfers made in past month (MK)
<b>Lump sum treatment</b>	<b>-233.8</b> (575.5)	<b>-101.2</b> (428.7)	<b>-143.3</b> (136.0)	<b>-178.2*</b> (102.7)	<b>-23.30</b> (46.64)
Dependent variable mean, control group (weekly payments)	2,271	2,008	596.2	688.9	249.7
Number of observations	689	689	689	689	689

*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). 1 USD was worth approximately MK400 at market exchange rates and MK160 at PPP exchange rates during the study period. Regressions are run on pooled data from round 1 and round 2. Asset purchases are measured since the previous survey, a period of approximately two months. Loans are measured since November 1<sup>st</sup> in round 1 and since January 1<sup>st</sup> in round 2, a period of approximately one month. Transfers are measured over the month leading up to the survey interview. For details of the empirical strategy see section 4, and for complete variable definitions see Appendix C. Heteroskedasticity-robust standard errors, clustered by worker, in parentheses.

**Table E.3**

Effects of lump sum payments on purchases of risk-free, high-return “bond”  
(without controls)

	(1)	(2)	(3)	(4)
	<b>Administrative data on bond sales</b>		<b>Survey data</b>	
<u>Dependent variable:</u>	1(Bought any shares)	Total spent on shares (MK)	Remaining cash out of income received since last Friday (MK)	Income received since last Friday (MK)
<u>Panel A - Round 1 and 2 pooled</u>				
<b>Lump sum treatment</b>	<b>0.0540**</b> (0.0256)	<b>132.2**</b> (60.74)	<b>121.0</b> (74.26)	<b>1,466***</b> (213.9)
Dependent variable mean, control group (weekly payments)	0.106	223.5	468.5	2,309
Number of observations	699	699	689	689
<u>Panel B - Round 1 only</u>				
<b>Lump sum treatment</b>	<b>0.0191</b> (0.0392)	<b>81.21</b> (83.66)	<b>-4.888</b> (111.1)	<b>1,047***</b> (311.4)
Dependent variable mean, control group (weekly payments)	0.149	274.3	543.0	2,604
Number of observations	348	348	343	343
<u>Panel C - Round 2 only</u>				
<b>Lump sum treatment</b>	<b>0.0893***</b> (0.0328)	<b>183.5**</b> (84.55)	<b>246.2**</b> (103.0)	<b>1,885***</b> (237.1)
Dependent variable mean, control group (weekly payments)	0.0632	172.4	393.1	2,010
Number of observations	351	351	346	346

*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). 1 USD was worth approximately MK400 at market exchange rates and MK160 at PPP exchange rates during the study period. For details of the empirical strategy see section 4, and for complete variable definitions see Appendix C. Heteroskedasticity-robust standard errors, clustered by worker, in parentheses.

**Table E.4**  
Effects of lump sum payments on temptation spending  
(without controls)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	PCA indices of temptation spending		Measures of temptation spending (MK)						
<u>Dependent variable:</u>	Omitting Col. 9 (Both Rounds)	Including Col. 9 (Round 2 Only)	Goods respondent often regrets purchasing	Goods respondent often buys in violation of prior plans	Goods respondent says they waste money on or are tempted to buy	Alcohol and Tobacco	Alcohol, Tobacco, Doughnuts, and Soda	Unplanned Purchases	Self-reported total of money "wasted"
	1 & 2	2 only	1 & 2	1 & 2	1 & 2	1 & 2	1 & 2	1 & 2	2 only
<b>Lump sum treatment</b>	<b>0.0162</b> (0.0690)	<b>-0.0956</b> (0.132)	<b>23.26</b> (14.17)	<b>51.27**</b> (23.10)	<b>-24.33</b> (23.75)	<b>2.800</b> (3.360)	<b>2.507</b> (7.193)	<b>1.679</b> (8.310)	<b>87.13</b> (73.38)
Dependent variable mean, control group (weekly payments)	-0.0423	-0.0106	32.94	36.54	128.7	12.92	64.03	48.73	261.8
Number of observations	689	346	689	689	689	689	689	689	346

*Notes:* PCA index computed by taking the first principal component of all the temptation variables for the control group (weekly payments), and normalizing the predicted values to the control group. Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). 1 USD was worth approximately MK400 at market exchange rates and MK160 at PPP exchange rates during the study period. For details of the empirical strategy see section 4, and for complete variable definitions see Appendix C. Heteroskedasticity-robust standard errors, clustered by worker, in parentheses.

**Table E.5**  
Effects of receiving pay during major weekly market on main outcome variables  
(without controls)

	(1)	(2)	(2)	(4)	(5)	(6)	(7)	(8)
	Payday survey panel - Spending at market on the four payday weekends			Household survey data				Bond sales
<u>Dependent variable:</u>	Amount spent on Friday and Saturday, all Weekends (MK)	Amount spent on payday (MK)	(Spending on payday)/ (Income received)	Income received since last Friday (MK)	Remaining cash out of income received since last Friday (MK)	Total spending† since Friday from itemized expenditure data (MK)	PCA Index of temptation spending (MK)	1(Bought any shares)
<u>Panel A - Lump sum payment group only</u>								
<b>Saturday payday treatment</b>	<b>-873.3***</b> (165.3)	<b>-61.31</b> (115.6)	<b>-0.0191</b> (0.0371)	<b>44.99</b> (212.1)	<b>-166.6</b> (104.9)	<b>-18.19</b> (243.8)	<b>0.0186</b> (0.132)	<b>-0.0288</b> (0.0403)
Dependent variable mean, control group (Friday paydays)	3,082	1,244	0.401	3,753	670.6	3,341	-0.00820	0.174
Number of observations	349	349	349	345	345	345	345	350
<u>Panel B - Lump sum and weekly payment group pooled</u>								
<b>Saturday payday treatment</b>	<b>-821.5***</b> (115.1)	<b>-20.74</b> (89.72)	<b>-0.00525</b> (0.0270)	<b>-77.67</b> (214.3)	<b>-100.7</b> (75.25)	<b>0.536</b> (176.9)	<b>-0.0383</b> (0.0878)	<b>-0.0196</b> (0.0262)
Dependent variable mean, control group (Friday paydays)	3,302	1,687	0.513	3,081	579.2	3,147	-0.0124	0.143
Number of observations	696	696	696	689	689	689	689	699

*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). Regressions are run on pooled data from round 1 and round 2. 1 USD was worth approximately MK400 at market exchange rates and MK160 at PPP exchange rates during the study period. PCA index computed by taking the first principal component of all the temptation variables for the control group (Friday payments), and normalizing the predicted values to the control group. It mirrors column 1 of Table E.4 in omitting the variable observed only in round 2 and computes the index for both rounds. For details of the empirical strategy see section 4, and for complete variable definitions see Appendix C. Heteroskedasticity-robust standard errors, clustered by worker, in parentheses.

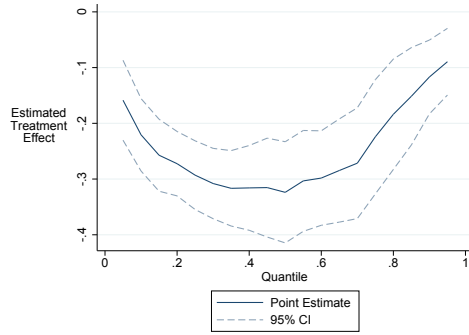
## F Quantile treatment effects

Appendix Figure [F.1](#) presents quantile regression estimates of the lump sum treatment effect for various outcomes. The treatment effects on the share of income spent immediately and on total spending are relatively consistent throughout the distribution of the outcome variable, with slightly stronger effects for higher quantiles. In contrast, the treatment effects on remaining cash holdings and temptation spending are concentrated at the top end of the distribution of the outcome variable.

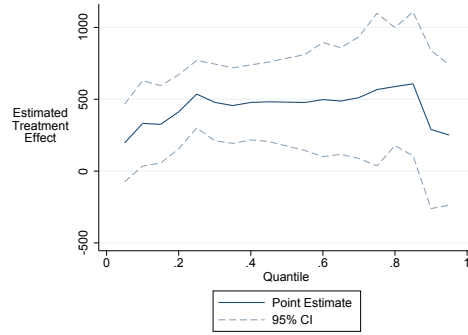
**Figure F.1**

Quantile treatment effects of deferred lump sum wage payments

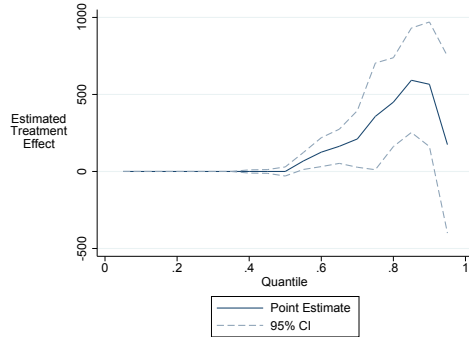
**Panel A:** Quantile treatment effects  
on  
(Spending on payday)/(Income  
received)



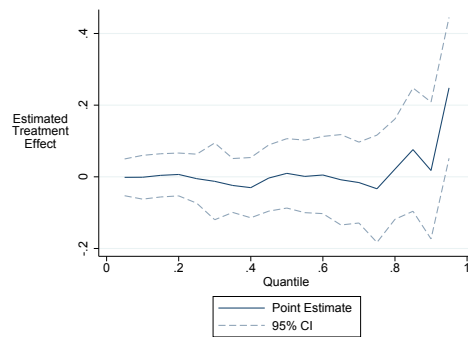
**Panel B:** Quantile treatment effects  
on total spending (in MK)



**Panel C:** Quantile treatment effects  
on remaining cash holdings (in MK)



**Panel D:** Quantile treatment effects  
on  
PCA temptation index



*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). 1 USD was worth approximately MK400 at market exchange rates and MK160 at PPP exchange rates during the study period. All regressions control for stratification cell fixed effects, an index of baseline asset ownership based on first principal components, indicators for the number of days after the weekend the interview occurred, baseline total spending and, if available, the baseline value of the outcome variable. For details of the empirical strategy see section 4, and for complete variable definitions see Appendix C. Heteroskedasticity-robust 95% confidence intervals, clustered by worker, indicated using dashed lines.

## G Derivation of upper-bound discount factor

By the worker's revealed preferences from not choosing the bond,

$$u(1500 + w) + \delta u(w) > u(w) + \delta u(2000 + w) \quad (2)$$

We can then plug in the CRRA functional form for the period-specific utility function ( $u(c_t + w) = \frac{(c_t + w)^{1-\rho}}{1-\rho}$ ) and rearrange the inequality to solve for an upper bound on  $\delta$ :

$$\frac{(1500 + w)^{1-\rho}}{1-\rho} + \delta \frac{(w)^{1-\rho}}{1-\rho} > \frac{(w)^{1-\rho}}{1-\rho} + \delta \frac{(2000 + w)^{1-\rho}}{1-\rho} \quad (3)$$

$$(1500 + w)^{1-\rho} + \delta(w)^{1-\rho} > (w)^{1-\rho} + \delta(2000 + w)^{1-\rho} \quad (4)$$

$$(1500 + w)^{1-\rho} - (w)^{1-\rho} > \delta(2000 + w)^{1-\rho} - \delta(w)^{1-\rho} \quad (5)$$

$$\delta[(2000 + w)^{1-\rho} - (w)^{1-\rho}] < (1500 + w)^{1-\rho} - (w)^{1-\rho} \quad (6)$$

and hence:

$$\delta < \frac{(1500 + w)^{1-\rho} - (w)^{1-\rho}}{(2000 + w)^{1-\rho} - (w)^{1-\rho}} \quad (7)$$

The direction of the inequality is preserved in equation 7 because the monotonicity of utility functions implies that  $(2000 + w)^{1-\rho} - (w)^{1-\rho} > 0$ .



## **H Evidence that market days are tempting environments**

Appendix Table [H.1](#) shows evidence that the workers in our sample perceive market days to be a commonly-encountered tempting environment. Panel A reveals that market days are the most-common response to a question about which environments tempt workers into wasting money. Panel B shows responses to questions that ask workers to compare different environments in terms of how tempting they are. In Panel C, we see that the tempting to purchase items that they should not buy is the most-common reason workers report wasting money. Finally, Panel D shows that workers go to the trading center often - more than once a week on average, and most often on Saturdays, the major market day in the study region.

**Table H.1**  
Evidence of the tempting nature of market days

Panel A - Tempting Situations

"What are situations in which you waste money or are tempted to spend money that you would rather not spend?" (Options not read aloud, response coded by enumerator)	Mean	Obs.
Market days	0.37	346
Going to the trading center in general (not just market days)	0.09	346
State holidays	0.05	346
Going to the Boma	0.01	346
Seeing your sex partner	0.01	346
Friday nights	0.00	346
Other	0.17	346
No response/no situation mentioned	0.39	346

Panel B - Comparisons of which situation is more tempting

Which situation makes you more tempted to spend money you will later regret?	A is more Tempting	B is more Tempting	No Difference	Obs.
A. Market day or A. Having cash in pocket at trading center or A. Friday or A. Market or		B. Day before market day B. Having cash in pocket elsewhere B. Saturday B. The night before the market	0.16 0.18 0.24 0.11	346 345 346 345
	0.69 0.66 0.25 0.74			

Panel C - Reasons you sometimes waste money

Reasons you sometimes waste money (Options not read aloud, response coded by enumerator)	Mean	Obs.
Tempted to buy things I should not	0.42	346
Lack of plans	0.25	346
Buying things on impulse	0.18	346
Drinking	0.06	346
Nothing good to do with the money	0.06	346
Relatives beg for money	0.05	346
Friends beg for money	0.03	346
Other	0.27	346

Panel D - Visits to the market per month

	Mean	Obs.
Total	6.08	365
% on Fridays	0.26	252
% on Saturdays	0.32	252
% on other days of the week	0.42	252

*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both).

## I Fully-interacted regression results

Table [I.1](#) presents a fully-interacted version of table 9. There are no differential effects of being paid on Saturday for workers who are assigned to lump-sum payments.

**Table I.1**

Regression results for interaction of lump-sum payment and Saturday payday treatments

	(1)	(2)	(2)	(4)	(5)	(6)	(7)	(8)
	Payday survey panel - Spending at market on the four payday weekends			Household survey data				Bond sales
<u>Dependent variable:</u>	Amount spent on Friday and Saturday, all Weekends (MK)	Amount spent on payday (MK)	(Spending on payday)/ (Income received)	Income received since last Friday (MK)	Remaining cash out of income received since last Friday (MK)	Total spending† since Friday from itemized expenditure data (MK)	PCA Index of temptation spending (MK)	1(Bought any shares)
<u>Lump sum and weekly payment group pooled</u>								
<b>Saturday payday treatment</b>	<b>-822.6***</b> (153.2)	<b>-37.30</b> (112.7)	<b>-0.00731</b> (0.0334)	<b>-16.59</b> (267.7)	<b>-29.99</b> (109.1)	<b>84.35</b> (237.0)	<b>-0.0634</b> (0.0930)	<b>-0.0224</b> (0.0339)
<b>Lump sum treatment</b>	<b>-534.2***</b> (174.5)	<b>-930.2***</b> (104.4)	<b>-0.238***</b> (0.0324)	<b>1,585***</b> (253.5)	<b>202.8*</b> (106.0)	<b>316.0</b> (223.4)	<b>0.00429</b> (0.119)	<b>0.0532</b> (0.0366)
<b>(Saturday payday)X(Lump sum)</b>	<b>-5.043</b> (232.5)	<b>-23.35</b> (164.6)	<b>-0.0114</b> (0.0508)	<b>142.8</b> (346.1)	<b>-117.8</b> (154.5)	<b>104.4</b> (345.3)	<b>0.109</b> (0.164)	<b>-0.00582</b> (0.0515)
Dependent variable mean, control group (Friday paydays)	3,530	2,151	0.631	2,378	483.5	2,944	-0.0167	0.112
Number of observations	689	689	689	689	689	689	689	689

*Notes:* Sample includes 359 respondents who participated in at least one round of the work program and have data from at least one data source for that round (either the payday data, the survey, or both). Regressions are run on pooled data from round 1 and round 2. 1 USD was worth approximately MK400 at market exchange rates and MK160 at PPP exchange rates during the study period. All regressions control for stratification cell fixed effects, an index of baseline asset ownership based on first principal components, indicators for the number of days after the weekend the interview occurred, baseline total spending and (if available) the baseline value of the outcome variable. PCA index computed by taking the first principal component of all the temptation variables for the control group (Friday payments), and normalizing the predicted values to the control group. It mirrors column 1 of Table E.4 in omitting the variable observed only in round 2 and computes the index for both rounds. For details of the empirical strategy see section 4, and for complete variable definitions see Appendix C. Heteroskedasticity-robust standard errors, clustered by worker, in parentheses.