Deferring Wages and Labor Supply in Malawi

Analysis Plan Part 5:
Analyzing Net Impacts on Flow Outcomes

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Abstract:

This document is the fifth portion of the analysis plan for a randomized controlled trial (RCT) evaluation studying the effects of a deferred wage payment option on workers' investments, consumption, well-being and labor supply. Between January and May 2017, the Lujeri Tea Estates will allow randomly selected workers the choice of deferring a portion of their bi-weekly wages into a savings account to be paid out at the end of the agricultural season. The present document specifies our plan for analyzing the net impact of the deferred wages product on flow outcomes (as opposed to stocks), taking into account the structure of the data that we will collect on these outcomes. We focus here particularly on the third high-frequency survey (HFS-3) that we are collecting beginning on May 10th, 2017. This document was posted after the first day of data collection began for the HFS-3, but before any of the PIs had seen any of the data.

Overview:

This document is the fifth portion of the analysis plan for a randomized controlled trial (RCT) evaluation studying the effects of a deferred wage payment option on workers' investments, consumption, well-being and labor supply. For further details on our setting and analysis of labor supply outcomes, see Part 1 of our pre-analysis plan. The present document specifies our plan for analyzing the net impact of the deferred wages product on flow outcomes (as opposed to stocks), taking into account the structure of the data that we will collect on these outcomes. We focus here particularly on the third high-frequency survey (HFS-3) that we are collecting beginning on May 10th, 2017. This document was posted after the first day of data collection began for the HFS-3 but before any of the PIs had seen any of the data.

Basic Analysis for the HFS-3

Our intervention will induce a large increase in available cash for the treatment group in the period immediately following the disbursement of the deferred lump-sum wages. In a credit- and savings-constrained context like ours, this will in turn cause large changes in spending after the lump sum payout. The HFS-3 is designed to measure that spending, and to detect differences between the treatment group and the control in the level of expenditure in the period following the payout. It uses a growing window for flow variables (such as expenditures and savings – see list below), where the recall period is either two weeks or since the day of the payout, whichever is shorter.

Our basic analysis for the HFS-3 will examine outcomes separately from the earlier waves of data collection (HFS-1 and HFS-2). We will look for simple treatment-control differences in outcomes on the survey. This will be our approach for most categories of variables on the survey, such as stocks of savings or loans or point-in-time outcomes such as whether children are in school. The slight exceptions to this will the flow variables that use the growing window mentioned above.

In our preferred specification, we first convert flow variable amounts to a rate by dividing by the number of days in the recall window, and estimate equation 1 as originally written in our previous analysis plan. In addition, we estimate an augmented version of equation 1 in Section 4.4 of Part 1 of the analysis plan. Note that we will add the number of days since the payout as a control on the right-hand side of the regression.

Analyzing Net Changes in Flow Variables

One goal of the HFS-3 is to measure the net changes that the treatment induces for the flow variables we collect, considering both the pre-payout savings period and the period following the payout. Consider total expenditures. When the workers are accruing savings we expect this to fall, and after the payout we expect it to rise. Thus, a calculation of the net effects on flows must account for both periods. Our plan for doing this is to estimate two quantities, the effect on total spending during the season and the effect on total spending after the season, and then take the difference between the two.

To compute the effect of the deferred wages treatment on total spending during the season (before the payout), we will estimate equation 1 in Section 4.4 of Part 1 of the analysis plan using the

combined HFS-1 and HFS-2 data. Our specific plans for these estimates are laid out in those sections. These estimates will yield an average treatment effect over a typical fourteen-day window during the harvest season. We will then scale that up to the length of the entire savings period, from the day when the first workers learned their treatment assignments through the day before the payout.

To compute the effect of the deferred wages treatment on total spending after the season ends and the payout arrives, we will first convert the flow variables into a rate per day as described above, by dividing each variable by the number of days since the payout. We will the estimate the following augmented version of our basic regression equation from part 1 of the analysis plan:

$$y_{ist} = \alpha + \beta Treat_i + \delta_s + \gamma Z_i + \eta y_{isB} + f(D_{ist}) + Treat_i * g(D_{ist}) + \epsilon_{ist} \quad (1)$$

where D_{ist} is the number of days that have passed since the payout. All other variables are defined in the same way as in Part 1 of the analysis plan.[1] The terms f(.) and g(.) are flexible functions of the number of days since the payout. Our goal is to consistently estimate g(.). To do this, we will enter the same function for both f(.) and g(.), with the latter differing only in that it is interacted with $Treat_i$. Our main specification will use a quintic polynomial for f(.) and g(.). We will also explore exponential decay functions, and functions that group the data into weeks and use indicators for the number of weeks.

The estimate of g(.) represents the effect of the treatment on expenditure for any point in time after the payout. To construct an estimate of the effect on total expenditure after the payout, we will integrate this function from 0 days up to a reasonable upper bound. We will plan to use 90 days, but will consider integrating up to infinity if this is reasonable given our estimates (i.e. if the function asymptotes toward zero).

Once we have constructed estimates of the treatment effect on expenditure during the season and after the payout, we will take the difference. This is our estimate of the net effect of the treatment on the flow variables.

List of Flow Outcomes

The following is a list of the flow outcomes that we will analyze using the procedure described above. These variables are constructed in the same way as we described in the earlier parts of the analysis plan, and any portion of the earlier parts of the analysis plan not explicitly contradicted in this document still applies to them. In particular, our plans for winsorizing the variables and our process for conducting multiple comparisons adjustments is unchanged for the HFS-3.

- Total expenditures
- Storable food expenditures
- Perishable food expenditures
- Total food expenditures (=storable plus perishable)

[1] The posted version of Part 1 of the analysis plan has a typo in this formula: it omits the coefficient on the baseline value of the outcome variable. This was always intended to be a control in an ANCOVA-style regression, and we include the coefficient here for clarity.

- Expenditures on the sum of house improvements, big household items, and other large purchases

- Expenditures on items that cost more than MKW 5,000
- Bought anything that cost more than MKW 5,000
- Expenditures on items that cost more than MKW 10,000
- Bought anything that cost more than MKW 10,000

- Wasteful expenditures

- Total food consumption
- Perishable food consumption
- Storable food consumption

- Transfers received (cash and non-cash)
- Transfers given (cash and non-cash)
- Loans received (cash and non-cash)
- Loans given (cash and non-cash)
- Net flow into financial savings (formal and informal)
- Net flow into financial + in-kind savings (formal and informal)
- Net additions into storable food (expenditure minus consumption)

- Net additions into business inventory (savings module)

- Total household income from survey
- Total Income from the administrative data