

Revealed Employment Preferences Under Debt Waiver

Abstract

While welfare schemes can serve as a valuable safety net, they may also give rise to unintended consequences which may not be fully captured during implementation. We study the 2008 debt waiver scheme implemented in India to study its impact on the employment outcomes of its beneficiaries. We observe that farmers who benefitted from the waiver tend to work less in agriculture and tend to shift towards casual and wage employment. This effect is enhanced during dry seasons, for marginalized populations and in districts where more casual employment options are available. We show that this effect is propagated by credit constraints faced by waiver beneficiaries due to moral hazard. By performing a battery of falsification tests, we rule out alternative explanations and establish that this employment shift acts as a coping mechanism to maintain basic consumption. This tendency of waiver beneficiaries to shift away from their previous occupation of agriculture can help to understand issues surrounding agriculture in India.

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1. Introduction

Social insurance schemes are implemented by governments the world over to allow the target population to maintain their living status in times of distress. Though the type of welfare provided can vary by time, quantity and method of provision, it is typically intended to target a particular group towards a specific objective. Though its consumption smoothing effects are undeniably beneficial in the short-run, it also increases the risk of unintended negative consequences that the target group may face in the long-run. Debt reliefs or waivers are one such scheme that intends to liberate the poor from debt traps and re-start their business cycle. In a study by Debbie and Song (2014) on impact of Chapter 13 bankruptcy, the authors find that it leads to an increase in earnings and decrease in foreclosures. Also, debt interventions during economic shocks can help to improve both ex-ante and ex-post efficiency (Bolton and Rosenthal (2002)). However, many studies have also documented the credit-related externalities that such welfare programs give rise to in the medium- to long-run. Studies have shown that households which availed debt relief have poor access to future credit opportunities, Han, Keys and Li (2013), Jagtiani and Li (2014), De and Tantri (2017).

Just as the effects of the schemes can be permanent or transitory, so can be the effects of its unintended consequences. The windfalls created out of such credit market interventions by the government can lead to a shift in recipients' consumption preferences or labor preferences through a change in their labor allocation. In our study, we use the debt-waiver scheme implemented in India to understand the occupational and employment preferences of the target population. Credit market interventions have been used before in other emerging markets in different forms. Ratanavararak and Chantarat (2022) observe debt moratorium programs that have been running for over two decades for farmers in Thailand and find that debt moratorium leads to higher debt accumulation while increasing the investment in agriculture for those with smaller debt. High debt in households puts stress on their consumption levels, investment potential and operating margins thereby negatively affecting their earnings potential. This may eventually lead to a debt-trap in which households are unable to come out of the debt, creating a permanent dent in their living status. In such situations, a debt waiver can relieve the pressure of credit repayment and can freshly kickstart the credit-investment-consumption lifecycle of a household. On the other hand, such schemes can hamper the credit culture in the economy thereby leaving a long-term permanent shift in the repayment culture caused by moral hazard. In this paper, we study a different dimension along which debt relief may operate, namely a potential shift in employment preferences caused by such schemes.

This study attempts to investigate the shift in employment preferences of debt waiver beneficiaries of the 2008 agricultural debt waiver scheme in India. The scheme fully waived the defaulted agricultural loans of all landholders of size up to 2 hectares and partially waived (25%) the loans of others. At the time of its implementation, it was one the largest schemes in terms of value, amounting to USD 14.4 billion. This cost to the exchequer accounted for approximately 1.2% of the nation's GDP and 7.6% of the total tax revenue.

The scheme waived the loans not by individual credits to the borrower of the loan but by recapitalization of banks which gave the loans. The scheme was announced on the floor of the parliament on February 29, 2008, by the Finance Minister and was unanticipated as there was no widespread agricultural distress (or) weather shock. The government also in its previous recommendations had not discussed the provision

of an agricultural package to alleviate rural distress. With the macroeconomic situation also not under any difficult circumstances, the announcement of the program was completely unexpected and thus it serves as an exogenous event. Another feature of the program eligibility which is based on the amount of land pledged (less than 2 hectare) makes it difficult for the farmers to manipulate their landholding as transactions in land are highly illiquid with huge search and transaction costs. Also, eligible farmers had to be in default status as on December 31, 2007, two months before the announcement of the debt waiver program on February 29, 2008 (and continued to be in defaulted status on February 29, 2008), making it impossible to manipulate behavior to be in default status at the time of announcement.

Since we do not have the data on individual households and whether they received the waiver or not, we measure the intent to treat effect of the scheme on the beneficiaries. The features of the scheme help us to use the regression discontinuity design to study the impact on the target group. We use the National Sample Survey Organization (NSSO) 66th round of survey data on employment and consumption for our study. NSSO regularly conducts national level surveys of both rural and urban households by way of stratified sampling. The round considered, i.e., 66th round covers the period from June 2009 to July 2010 around one year after the implementation of the debt waiver program. This round is a “thick” round which is undertaken every five years by the NSSO, consisting of a larger sample size with coverage extending to almost all districts in the country while the “thin” rounds of survey are comparatively smaller in sample size and coverage. We use a sharp regression discontinuity design using parametric estimation to estimate the treatment effects on the employment occupational preferences on the targeted beneficiaries.

We can observe from the regression discontinuity plots where we use the procedure mentioned in Calonico et al. (2015). We employ the evenly spaced for bins of the running variable and show them from Figures 1 to 9. The waiver beneficiaries are placed on the left side of the plot as they have their landholding less than 2 hectares. When compared to the right side of the plot (i.e., the non-beneficiaries), we can observe that the waiver beneficiaries experienced reduced consumption, lower share of their household members engaged in agriculture and received higher share of income from casual employment during the week ending the date of survey.

We show that debt waiver leads to 12 percent increase in the proportion of individuals in an agricultural household to move towards casual employment with a commensurate decrease in the same with respect to self-employment i.e., agriculture. We also observe that the share of casual employment in household income increases by 25 percent and household days spent in the same increases by 14 percent.

We subject our results to a series of robustness tests to eliminate other factors that could potentially cause the observed effects. We use a “false” (placebo) eligibility cut-off for landholding and a false year where we assume that the debt waiver was provided in a year other than the original year of 2008. Also, we run the same specification for non-agricultural households in rural areas which did not receive the debt waiver and do not find the observed effects in this sample of the population.

2. Literature review

Our study observes the impact of debt waiver on employment preferences and the channels through which the effect propagates in beneficiary households. To explore various possibilities of the impact, we

observe consumption and income patterns along with the credit outcomes. In this aspect, we find our study is close to that of Kanz (2016). He documents that the 2008 debt waiver scheme had a no effect on savings, consumption or investment. Instead, it led to greater reliance on informal credit and lower agricultural productivity. It was also observed that debt waiver did not lead to improvements in consumption or savings rather it reduced productivity and investment.

With respect to employment outcomes, our study is related to Zimmermann (2020) where the role of employment guarantee scheme was studied in determining employment preferences. She notes that guaranteed employment helps individuals to undertake risky ventures by engaging in self-employment and family employment. Credit outcomes could also determine employment choices whenever a farmer is in a distress or default state. Gine and Kanz (2018) find that the waiver scheme led to an increase in loan defaults, reduced loan performance and loan defaults becoming more sensitive to electoral cycle. Mukherjee et al (2018) differs from above by observing the heterogeneous effects of waiver by classifying beneficiaries into distressed and non-distressed borrowers. They find that loan performance worsens for non-distressed borrowers while it increases for distressed borrowers.

To understand a possible mechanism behind the shift in employment, we observe credit outcomes of the beneficiary households post the waiver. In this aspect, our study is similar to those which focus on bankruptcy outcomes. Cole, Bump and Garriga (2009) find that post-bankruptcy, individuals are excluded from credit markets but only for a short period of time. Similarly, De and Tantri (2017) find that waiver beneficiaries in India experience an increase in credit constraints leading to rationing of credit. Thus, moral hazard has a significant role to play in determining credit supply to debt waiver beneficiaries. Waivers can reduce credit supply from formal institutions making beneficiaries rely on informal credit which is significantly costlier than formal credit, underlying an increase in default premium. Gine and Kanz (2018) observed that credit re-allocation was seen from districts with higher waiver program exposure to districts with lower exposure indicating that lenders restrict credit to beneficiaries due to moral hazard. Post-program loan performance too deteriorates significantly in districts with higher program exposure confirming that borrowers engaged in strategic default expecting future bailouts.

Other studies study debt relief impacts by analyzing the outcome through changes in bankruptcy laws like Demiroglu et al (2014). He shows that debt relief provided during the housing crisis in United States increased the probability of loan default. Studies such as Dobbie and Song (2015), Athreya (2002) and Chatterjee and Gordon (2012) deal with the consumption patterns of waiver beneficiaries and find that the relief helps them to smoothen consumption. Most of these studies deal with ex-post effects on consumption and credit behavior of beneficiary households while much needs to be explored regarding their employment outcomes.

3. Agricultural Debt Waiver and Debt Relief Scheme (ADWDRS)

The ADWDR scheme of 2008 was announced by the Finance Minister of India as part of the budget speech on February 29, 2008 as a nation-wide program to benefit small and marginal farmers. To qualify for debt relief, a loan had to be overdue or restructured as on December 31, 2007 and continue to be so as on February 29, 2008. The amount of relief depended on the size of the landholding possessed by a farmer. Small and marginal farmers defined for the purpose of the program are farmers with landholdings of 2

hectares or less, were eligible for a full (100%) waiver, while other farmers defined as those with more than 2 hectares, qualified for partial (25%) loan relief conditional on repayment of the remaining 75%. Full waivers were processed immediately with the target date set to June 2008 and deadline for partial waivers was extended several times due to difficulties in determining their eligibility, thus only a fraction of the eligible borrowers eventually participating in the waiver program. Given the difficult conditions attached to the partial waiver, the deadline was extended several times. Considering the above issues in partial waivers, including them in our analysis is likely to distort our study, hence we drop them from our study making us employ sharp regression discontinuity design to estimate the treatment effects.

4. Conceptual framework

A simple representative agricultural household maximizes utility, which is a function of consumption C and leisure l . Consumption of the household depends on agricultural production Y which is a function of labor L and inputs x with cost w_x minus the repayment of borrowing B . The household labor L can be allocated towards agricultural activities (l^{ag}) or non-agricultural activities (l^{nonag}). Apart from this the household can also hire labor l^{hire} whose cost is w_{hire} .

We can define the agricultural production as a function of labor and inputs, $Y = f(l^{ag}, l^{hire}, x) = f(L - l^{nonag} - l, l^{hire}, x)$, where l^{ag} can be expressed as the labor that remains after the household has chosen the amount of labor l^{nonag} for non-agricultural labor and leisure l deducted from total labor L . This utility is maximized subject to the budget constraint according to which the total cost of inputs ($w_x \cdot x$) and hired labor ($w_{hire} \cdot l^{hire}$) cannot exceed the total of non-agricultural income ($w_{nonag} \cdot l^{nonag}$) and borrowing B . The model can be expressed as follows,

$$\max_{x, l^{hire}, l^{nonag}, l} U\{[f(L - l^{nonag} - l, l^{hire}, x) - B], l\} \text{ subject to } w_x \cdot x + w_{hire} \cdot l^{hire} \leq B + w_{nonag} \cdot l^{nonag}$$

The household maximizes the following Lagrangian function by choosing agricultural inputs, hired labor and non-agricultural labor.

$$\mathcal{L} = U\{[f(L - l^{nonag} - l, l^{hire}, x) - B], l\} + \lambda[B + w_{nonag} \cdot l^{nonag} - w_x \cdot x - w_{hire} \cdot l^{hire}]$$

where λ is the shadow price of liquidity.

The first-order conditions are the following,

$$\frac{\partial \mathcal{L}}{\partial x} = 0 \Rightarrow U_f f_x = \lambda \cdot w_x \quad - (2.1)$$

$$\frac{\partial \mathcal{L}}{\partial l^{hire}} = 0 \Rightarrow U_f f_{l^{hire}} = \lambda \cdot w_{hire} \quad - (2.2)$$

$$\frac{\partial \mathcal{L}}{\partial l^{nonag}} = 0 \Rightarrow U_f f_{l^{nonag}} = \lambda \cdot w_{nonag} \quad - (2.3)$$

$$\frac{\partial \mathcal{L}}{\partial l} = 0 \Rightarrow U_f f_{l^{ag}} = U_l \quad - (2.4)$$

$$\frac{\partial \mathcal{L}}{\partial \lambda} = 0 \Rightarrow B \geq w_x \cdot x + w_{hire} \cdot l^{hire} - w_{nonag} \cdot l^{nonag} \quad - (2.5)$$

The interpretations of the above first-order conditions shed light on the relationships between agricultural labor, non-agricultural labor and credit constraints.

4.1 Agricultural activity and non-agricultural labor

Let us consider an external shock to the market in the form of an input cost shock and observe how agricultural households re-allocate their labor to adjust to the new input costs. For example, when input costs w_x decrease, then as seen from (2.1) the household reacts by increasing the input quantity x . This increases the marginal product of labor, hence for conditions (2.2) and (2.3) to hold, the household increases hired labor l^{hire} and agricultural labor l^{ag} . An increase in the quantity of inputs and subsequent increase in labor allocation towards agriculture expands the overall agricultural output. Also, from conditions (2.3) and (2.4) taken jointly imply that total household labor does not vary, causing non-agricultural labor l^{nonag} to decrease. So, when there is no constraint to borrowing, there is an inverse relationship between agricultural activity and non-agricultural labor.

4.2 Credit constraints and agricultural labor

To explore the relationship between credit constraints and labor outcomes, let us consider the case when there is a tightening of credit constraints. With credit constraints, the shadow price of liquidity λ increases, thereby increasing the cost of purchased inputs. Hence, the households will use less agricultural inputs x and hired labor l^{hire} as evident from (2.1) and (2.2). Also, the opportunity cost of agricultural labor goes up as income from non-agricultural labor ($w_{nonag} \cdot l^{nonag}$) substitutes for borrowing B due to increased credit constraints. Hence the household's labor allocation towards agricultural activities decreases. Thus, there is an inverse relationship between credit constraints and agricultural activities.

4.3 Credit constraints and non-agricultural labor

In this state of tightened credit constraints, conditions (2.3) and (2.4) jointly imply that leisure l becomes costlier than before. This makes the households consume less leisure and increase its labor supply. Since allocation of labor towards agriculture reduces as seen before, households increase non-agricultural labor supply. Thus, there is a positive relationship between the tightness of credit constraints and non-agricultural labor.

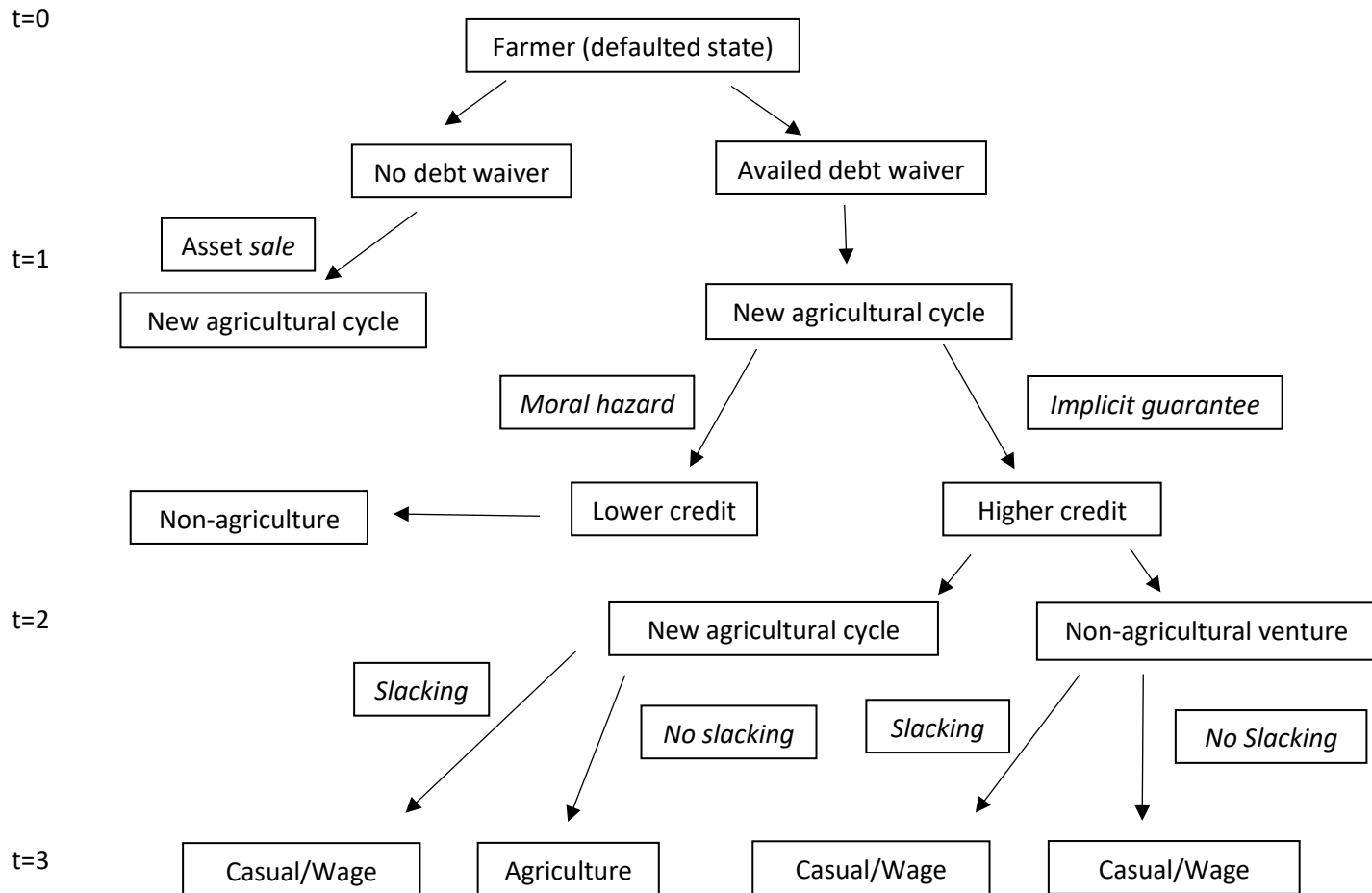
4.4 Agricultural Cycle, Debt Waiver and Employment Outcomes

Consider the simple agricultural life cycle of a farmer who had taken credit for agricultural activities. We now consider the possibility of a negative shock that may lead a borrower to default on their debt. In the absence of a debt waiver, the farmer would have to get new credit or sell the land to repay the existing loan. Note that selling the land in distress would fetch a lower price compared to a normal situation. Once availing the new line of credit, the farmer can move away from the distress scenario and kickstart the normal business cycle. Here, he faces the same cost for new credit which he manages by reducing the expenditure on consumption and investment. Household savings can act as collateral to secure new loans thereby providing cushion in times of distress.

In a scenario where there is a debt waiver ($B = 0$), it acts as a windfall that frees the farmer from repayment commitments thereby one can expect to immediately restart their normal business operations, which involves ploughing, sowing, maintaining, harvesting and sale of the produce. Agricultural lenders can view waiver beneficiaries in two ways. One possibility is that lenders reduce credit exposure due to moral hazard concerns; or lenders may maintain the same or higher level of credit due to the implicit guarantee provided by the government against future defaults. Here, we must note that in case of a debt waiver, the government fulfils the credit obligations to the lending institutions instead of the farmer as against the lender absorbing the loss. Thus, the lender does not get affected by the waiver.

In the case of prevalence of moral hazard, institutions lower their credit supply to waiver beneficiaries, who shift towards non-agricultural activities like casual employment in case of unskilled and wage employment in cases where the individual is semi-skilled. With an implicit guarantee, credit supply increases, helping farmers to either restart their agriculture or venture out of agriculture to obtain higher returns than agriculture. If they remain in agriculture and slack expecting a future waiver, they are more likely to default, accentuating their shift towards casual/wage employment. If they are successful in a non-agricultural venture without slacking, they permanently move out of agriculture and if they fail they shift towards casual/wage employment assuming no waivers for non-agricultural ventures. This cycle of agriculture with debt waiver and employment choices is explained with the help of a flowchart in Figure 1 below.

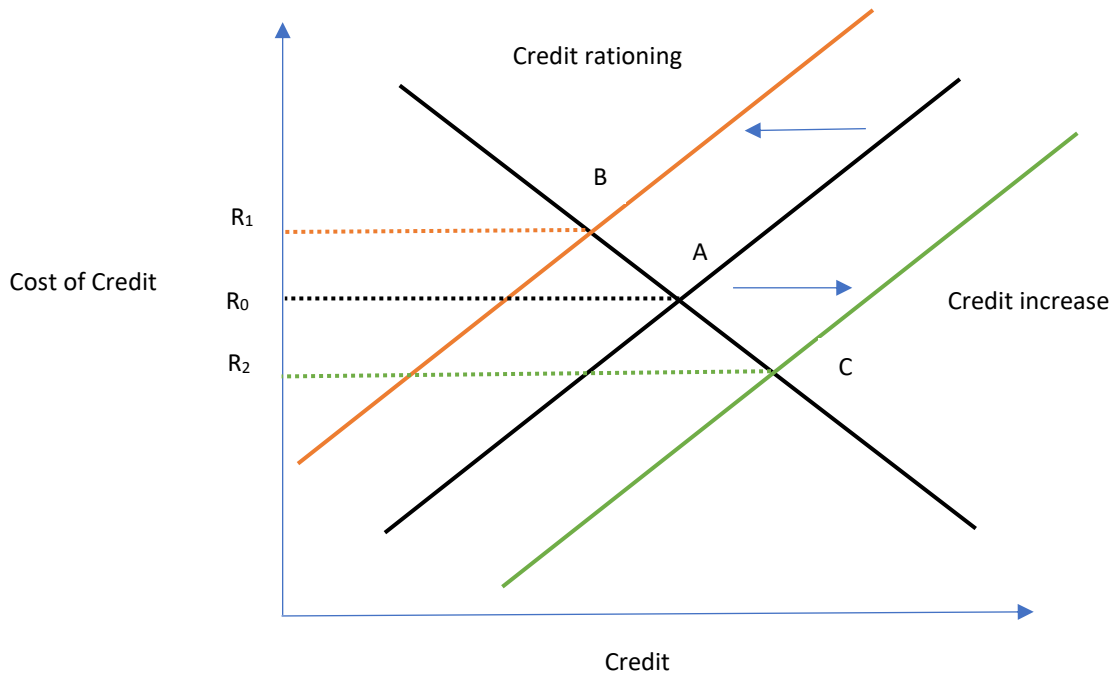
Figure 1: An Agricultural Cycle with Debt



4.5 Debt Waiver and Credit Outcomes

As noted above in subsection 6.4, farmers who benefitted from a debt waiver can experience either increased credit (with low credit cost) or reduced credit (with high credit cost). We can observe some empirical evidence to observe which effect prevails in such a situation. As discussed in Section 2, Kanz (2016) observes that debt waiver increased the reliance on informal credit underscoring an increase in default premium for waiver beneficiaries. Gine and Kanz (2018) too observed that credit re-allocation occurred from districts with high waiver program exposure to those with low exposure, indicating that lenders restrict credit to beneficiaries due to moral hazard. This moral hazard problem of waiver beneficiaries and their credit outcomes can be explained with the help of a graph in Figure 2 below.

Figure 2: Credit Supply and Demand



In equilibrium, farmers obtain credit from lenders whose cost R_0 is commensurate with the overall risk profile of the borrower i.e., point A in Figure 2 above. When debt is waived, the lender may have moral hazard concerns, leading to a lower supply of and credit raising the cost of borrowing to R_1 . On the other hand, the lender may instead observe an implicit guarantee from the government for waiver beneficiaries in future and can increase the credit to them shifting the supply outward thereby reducing the cost of borrowing to R_2 .

4.6 Liquidity Requirements and Employment Outcomes

Liquidity also plays another major role in restarting the agricultural operations of farmers in distress. Access to liquidity will help them to come out of their default state and obtain access to new lines of credit. Debt waiver in this situation may provide an avenue to access new lines of credit but moral hazard induced credit constraints increase its cost as seen from Figure 2 above. In order to access credit, they engage in casual employment opportunities, which can act as collateral for future credit opportunities (Dey and Imai (2014)) and also provide regular liquidity. Also, the windfall from waiver will free up the reserves to employ in other skilled professions that can increase the chances of future credit opportunities. Such casual employment acts as insurance to households in managing agricultural production risks thereby reducing uncertainty about future income flows (Gehrke (2019)).

Hence, moral hazard induced credit constraints may undermine future credit opportunities thereby shifting their occupational choices towards casual employment. This drying up of credit reinforces the shift towards casual employment as farmers would want to maintain consumption and liquidity through such employment opportunities.

Savings can prove to be a differentiating factor between the groups who remain in agriculture and those shifted to casual employment. Savings of waiver beneficiaries will be reduced to maintain consumption or to get collateral to finance new lines of credit (formal or informal) which would be costlier than before due to moral hazard. Finally, the shift from agriculture to casual employment will be accentuated once savings levels are reduced, making it difficult to restart the agricultural cycle.

Thus, we have the following key testable implications:

Hypothesis 1: Waiver beneficiaries reduce their engagement in agricultural activities

From subsection 6.1, we can observe that farmers reduce their labor supply towards agriculture in response to a waiver when there are no credit constraints. Waiver beneficiaries who faced credit constraints as seen from Figure 1 above will have difficulty in accessing new lines of credit reducing their labor in agriculture. Among those who did not face credit constraints, there is high chance of shifting away from agriculture by using low-cost credit to venture in non-agricultural activities or by slacking in a new agricultural cycle. Overall, we expect a net reduction in the number of individuals among beneficiary households engaging in agriculture. We can also observe a reduction in the proportion of individuals in beneficiary households engaged in agriculture. NSSO provides data on the household member's occupation and work details for the week at the time of survey and we can use them to test the above hypothesis.

Hypothesis 2: Waiver beneficiaries shift towards casual labor and wage/salaried employment

From subsection 6.2 and 6.3, we observe that increase in credit constraints reduces labor towards agricultural activities and increase towards non-agricultural activities. Also, as seen from Figure 2, credit constraints faced by waiver beneficiaries increase the cost of credit making them to seek casual/wage employment. They can use such income for consumption or for accessing new lines of credit. Such casual employment provides opportunities for unskilled workers who can also use low-cost opportunities to upskill themselves using which they can engage in semi-skilled/skilled employment. Thus, we can observe an increase in the number of individuals among beneficiary households engaging in casual labor along with skilled wage labor. At the same time, we also expect an increase in vocational training undertaken to take part in wage employment.

Hypothesis 3: Waiver beneficiaries increase their income from casual and wage employment

Due to an increase in the shift towards casual and wage employment, we can observe a similar increase in income derived from such employment. At the household level, we can expect an uptick in share of income from casual employment compared to other sources of income.

Hypothesis 4: Waiver beneficiaries decrease their discretionary consumption

Consumption could potentially decrease in a defaulted agricultural household as they search for new credit and employment opportunities to service the debt. This remains true even when they get a windfall in the form of debt waiver. Expectations of future credit constraints and a perceived increase in credit cost due to credit rationing on part of the lenders drive this effect. Among different types of consumption,

discretionary items will be reduced while basic consumption like food will remain covered possibly due to income from casual employment.

5. Data

We use the National Sample Survey Organization (NSSO) survey for our analysis which is conducted annually and collects detailed information on consumer expenditure using a stratified sampling methodology. Apart from this, NSSO also conducts periodical surveys on employment-unemployment details at the household-level along with some surveys on selected themes like housing conditions, education expenditure, service sector enterprises and others. It also has “thick” rounds of surveys that consists of large samples covering almost all districts of India conducted every five years and regular “thin” survey rounds that are comparatively smaller in size.

We use the 66th round of survey conducted in the period June 2009 to July 2010 forming the “thick” round of survey having employment and unemployment details covering approximately 100,000 households across all states in India. Here the interviewers ask the households their consumption expenditures, type of household based on their occupation, their last one week’s earnings in cash and the type and time spent on different types of job. The survey also covers basic household details such as age, sex, education, landholding, social group, religion, and other relevant demographic information which helps us to understand their living status.

For our analysis, we remove household members with age less than 18, to understand the employment and earnings pattern of households. We classify the household status as self-employed if they are an own account worker or working in a household enterprise. Wage and salary earners are classified as wage employees and casual laborers are those who work in casual works along with a category of those who are unemployed and are seeking work. To develop variables for measurement, we add up the weekly time spent, and the weekly wage earned in each type of work and find their proportion at the household level. We use the data from the 62nd round of NSSO survey to observe any pre-existing trends in the pre-debt waiver period and 68th round of NSSO survey to observe the long-term effects of the post-debt waiver period.

Apart from the NSSO data, we also use the India Human Development Survey – II data (IHDS-II) conducted during the year 2011-12. We use this survey data to assess the credit outcomes of the waiver program as details regarding credit are not available from the NSSO survey. The IHDS-II survey conducted 3 years after the 2008 waiver program contains details on the no. of loans taken in the past 5 years. It has details about the largest loan taken (loan value, source, and interest rate) which we use to measure credit outcomes. It also has information about the year in which the largest loan was taken which was used to arrive at the loan taken after the debt waiver implementation.

6. Empirical strategy

The debt waiver was announced in February 2008, hence we focus on the NSSO 66th round survey conducted from July 2009 to June 2010, approximately one year after the announcement and implementation of the debt waiver. As discussed before, the eligibility rules help us to employ regression discontinuity method where we compare the farmers around the 2 hectares cut-off landholding.

We use the regression discontinuity design using the following specification,

$$Y_{id} = \alpha + \beta_1 treat_i + \beta_2 treat_i \times x_i + \beta_3 treat_i \times x_i^2 + \gamma_d + \epsilon_i \quad - (1)$$

In the above specification, we have Y_i as the outcome variable of interest of household i in district d and x_i refers to the landholding of the household. $treat_i$ is a binary variable referring to households whose landholding is less than or equal to 2 hectares, classified as marginal or small farmers. The co-efficient of interest β captures the difference between the treated and the untreated population around the eligibility cut-off of 2 hectares. We use both linear and quadratic interaction terms as a measure to ensure that our results are robust to change in specification when the running variable is allowed to change linearly and quadratically on both sides of the cut-off. We run the above regression for rural households who are self-employed in agriculture as they are the beneficiaries of the debt waiver program. We also use the industrial classification code for each household to identify the occupation of the household. We restrict the un-treated sample up to the landholding size of 4 hectares to be equidistant from the 2 hectares cut-off. We use the sampling weights given for households and absorb all time-invariant differences across districts using district fixed effects, γ_d . The standard errors estimated are heteroscedasticity-robust and are adjusted for correlation of ϵ_i over time within districts by clustering at the district-level.

7. Main Results

We use the 66th round of the NSSO round which provides the data of sample households in the form of “thick” round providing all India coverage across all districts for the year June 2009 to July 2010. The two modules of the 66th round namely, the consumption expenditure and the employment-unemployment modules provide household-member level data regarding consumption and employment activities respectively. We remove all individuals below the age of 18 for our study and consider only rural households for our analysis.

We observe our primary results from column 1 Panel A of Table 2 where we observe waiver beneficiary households experiencing less number of members getting involved in agricultural activities. From column 1 Panel B of Table 2, we can observe that there is a 11% drop in the proportion of members in an agricultural household engaging in agricultural activities while there is a 12% increase in the same for casual employment compared to non-waiver beneficiaries.

The above decrease in household involvement in agricultural activities also show up in their time allocation towards such activities over a week. From column 1 Panel A of Table 3, we observe that there is a decrease of close to 3 days spent in agricultural activities in a beneficiary household compared to a non-beneficiary household. On the other hand, we find that there is approximately 2 day increase in casual employment, from column 3 Panel A of Table 2. Similar pattern can also be observed in the proportion of time spent in agricultural activities, wage employment and casual employment from Panel B of Table 3. We find that proportion of days spent in agriculture reduced by 13% and it increased by almost the same quantity in casual employment. Both these results are consistent with our hypothesis 1 and 2, where we expect labor allocation away from agricultural activities and towards casual employment.

The shift towards casual employment is even more evident from an increase in its share of total household weekly income as seen from column 2 Panel A of Table 4. From column 2 Panel B of Table 4, we find that the share of income from casual labor increases by 25% for the beneficiary households compared to the non-beneficiary households. When it comes to daily earnings, it increased for casual employment by INR 21 while decreased for wage employment by INR 15. This trend is consistent with the hypothesis that beneficiary households engage more unskilled casual employment to mitigate credit constraints while reducing their involvement in skilled wage/salaried employment.

Though we don't find any conclusive evidence that beneficiary households look to receive skills training to supplement their casual income and improve their productivity levels, we find from column 3 of Table 6 that the proportion of members not receiving any training has significantly reduced by 33% indicating there might be an upskilling channel at work.

Finally, we observe the results for consumption across 6 categories including monthly per capita consumption expenditure. We include cereals, pulses, vegetables, milk & milk products, sugar and salt in basic food while meats, eggs, fish, fruits, beverages and oil are coded as luxury food. Pan, tobacco and other intoxicants are included under the head intoxicants while we include furniture, recreational goods, household appliances, vehicles and other personal goods under durable goods. We find from Table 7 that households reduce their discretionary consumption on some items while maintaining the levels on basic foods.

8. Impact on Credit Outcomes

Debt waiver to the farmers in defaulted state creates moral hazard as lenders expect slacking behavior from waiver beneficiaries. This may lead to a lack of credit opportunities from financial institutions and higher cost of credit, in case they obtained credit. On the other hand, waivers can also act as a type of implicit guarantee from the government towards such farmers thereby adding an extra layer of cover and security for the loans taken. This could pave the way for increased credit uptake and lower cost of credit from the lenders. In order to understand this scenario, we use the India Human Development Survey II (IHDS II) conducted during the year 2011-12 (three years after the debt waiver) which is a nationally representative survey covering approximately 42,000 households with detailed information on their demographics, education, employment, income, expenditure and assets. From the survey, we make use of the data related to credit taken in last 5 years, number of loans taken and details of the largest loan taken. We restrict the sample size to loans taken in past 3 years as it corresponds immediately to the implementation of debt waiver in 2008. The majority of the IHDS II survey corresponds to the year 2012 (90 percent in year 2012 and 10 percent in year 2011), hence loans taken 3 years ago corresponds to the years 2009, 2010 and 2011 which denote the first 3 years after the debt waiver in the year 2008.

We document our findings in Table 8, where in Panel A we find that waiver beneficiaries did differentially face a lack of credit opportunities post the waiver in 2008. Waiver beneficiaries have a 15 percent less chance than non-beneficiaries in obtaining loan as evident from column (1) and from column (3), we can observe that the number of loans too decreases by 58 percent for the beneficiaries. In order to narrow down other possibilities of obtaining loan, we take the largest loan value taken and from column (4) we find that the largest loan value obtained by waiver beneficiaries is 70 percent less than that of non-

beneficiaries indicating that even if they obtain the loan it is significantly smaller. Finally, we observe the results for interest rate obtained for the loan from column (4). From the data on monthly rate charged for the loan, we find that waiver beneficiaries experience an increase in credit cost of approximately 1 percent compared to non-beneficiaries. The combination of reduced credit quantity and increased cost of credit indicates a restriction in credit for waiver beneficiaries. These results indicate that waiver beneficiaries experience significant credit constraints, both in terms of credit opportunities and cost of credit due to moral hazard concerns.

It is also imperative for us to analyze the sources of the loan obtained as it helps to find the channel of propagation of the credit constraints faced by the beneficiaries. From Panel B, we find that formal sources such as banks and financial institutions reduce their exposure to them as seen from column (1). Thus, they have to depend on informal sources of funding such as money lenders, friends, family, relatives and other financial groups like self-help groups, non-profit organizations and others as evident from columns (2), (3) and (4).

9. Role of Employment Guarantee

During the time period considered in the 66th round 2009-10, employment guarantee scheme, National Rural Employment Guarantee Act was established and implemented across the entire nation. The scheme provides for minimum 100 days of employment for those who seek a job under the right to employment framework. The type of work provided is largely unskilled and is related to development of public infrastructure like roads, desilting, irrigation canals and other related projects. Though it was implemented in all states, seven states namely Andhra Pradesh, Chhattisgarh, Himachal Pradesh, Madhya Pradesh, Tamil Nadu, Rajasthan and Uttarakhand in particular corner the majority of the employment generated in the program. Hence, the waiver beneficiaries in these states experience more opportunities than other states to obtain casual work employment. We estimate the above regression results for agricultural households in these so-called “star states,” and observe their effect compared to non-star states and tabulate the main results in Table 9. We find from all the effects in activity, intensity, income and daily wages that there is a significant shift from agricultural activities to casual employment and this effect is higher in star states compared to other states due to the implementation of NREGA scheme whereby waiver beneficiaries have greater propensity to join for casual employment. Finally, household consumption is maintained in these star states indicating that households maintain their consumption levels using the increased opportunities in casual employment.

10. Role of Agricultural Seasons

The uptake of casual employment in rural areas are affected by the prevailing agricultural season. Indian agriculture is heavily dependent on monsoon thereby provisioning of public works by the government is begun at the first half of the year well before the start of the monsoon. This means that casual employment opportunities increase in the dry season i.e., during the first six months of the year compared to the last six months of the year when agricultural work increases after the monsoon. Hence, we expect to observe an increase in the uptake of casual work from the waiver beneficiaries during the dry season compared to rainy season when agricultural operations are undertaken. The main results are shown in

Table 10 using the interaction term for dry season, where we find that during the dry season the shift from agriculture to casual employment is more pronounced compared to the rainy season. Their consumption pattern also increases during dry season indicating an increase in their income from engaging in casual employment.

11. Role of Agricultural Distress

We do not have exclusive details about households that are in distress during the time of debt waiver, hence we make use of rainfall shocks as a proxy to measure agricultural distress in rural areas. We denote a district as agriculturally distressed if it has received below average rainfall during the year 2007-2008. We expect to find that the eligible waiver beneficiaries (those who own land up to 2 hectares) in distressed districts would shift more towards casual and wage employment compared to non-eligible beneficiaries and experience in their share of income compared to the beneficiaries in other non-distressed districts. From the results in Table 11, we can observe that in distressed districts there is more uptake of casual employment compared to other districts. Although insignificant, the consumption levels are maintained in these districts and when combined with the employment outcomes, we can find that the employment shifts helped to maintain them.

12. Role of Agricultural Yield

Yield of agriculture plays a major role in determining the labor market in rural areas. Yield in agriculture depends on many factors like soil fertility, fertilizer usage, water availability, irrigation facilities and quality of labor apart from seasonal shocks like rain, pestilence, natural disasters etc. Farmers in districts with historically high yield of crops deploy enough labor to maintain their productivity thereby increasing their probability of higher yield compared to farmers in lower yield districts. The higher profitability from high yield farming can act as a buffer to incur the required labor cost thereby making farmers more engaged in agriculture. Hence, in historically lower yield districts we find the waiver beneficiaries move away from agriculture to casual labor and other professions. We use the International Crops Research Institute for the Semi-Arid Tropics data (ICRISAT) on district-wise crop yields from 2000 onwards to find the overall agricultural yield of districts. From the ten-year average yield across all crops, we classify the bottom tercile districts as low yield districts. We find that debt waiver beneficiaries experienced a shift away from agriculture to casual employment in lower yield districts compared to higher yield districts from Table 12.

13. Impact on Marginalized Population

Marginalized population in the rural districts are traditionally poor and have low rates of technology adoption, social networks and social mobility. Using the cast data provided in NSSO data we observe their shift towards casual employment compared to others. From the results in Table 13, we find that scheduled caste households show increased shift towards casual employment compared to other groups. Such an increased effect shows that these groups experience more stress in terms of consumption, credit and liquidity due to debt waiver compared to others.

14. Falsification Tests

We conduct falsification tests to rule out alternative explanations for our results. First, we conduct false cut-off tests by assuming that the debt waiver program had set the eligibility cut-off to 3 hectare compared to the original 2 hectare cut-off for eligibility of debt waiver. We find no effects when the cut-off value is changed at 3 hectares as seen from Table 14. Secondly, we estimate the regression by changing the year of debt waiver implementation and expect to find no treatment effect. We use the 62nd round of NSSO survey round data corresponding to the year 2005-06 and we choose this round as it is the latest survey before 2008 which does not overlap with the timeline of debt waiver implementation and also containing “thick” round data on employment and unemployment details. We don’t find any effect for false year of 2005 as evident from Table 15. Finally, we estimate the results for non-agricultural households like those working in construction (as construction being the largest employer in rural areas after agriculture) and observe no treatment effects as evident from Table 16.

15. Discussion

Our results show that the credit constraints induced by debt waiver program implementation shifts the beneficiary’s employment from agriculture to casual labor. Though the argument that debt waiver helps in reducing the debt overhang and restarting the credit cycle may have some currency empirical evidence points otherwise (Kanz (2016)). The negative externality created by the waiver program leads to imperfect credit markets and induces strategic credit default leading to credit reallocation to non-beneficiaries (Gine and Kanz (2017)). In such a scenario, the credit constrained waiver beneficiary looks to casual employment to smoothen consumption and other investment needs. It is during this period that the guaranteed employment scheme, the NREGA too, was implemented. In a way, an increase in the casual employment participation provided via NREGA scheme by the waiver beneficiaries can be viewed as a window of opportunity to maintain (or) improve their living standards. On the other hand, farmers taking up unskilled low productivity employment to mitigate credit shocks induced by debt waiver can be viewed as an opportunity gone waste.

16. Conclusion

Debt waivers provided to farmers can have unintended consequences leading to negative outcomes not only in the credit market but also in the labor market. Though farmers may make use of available casual employment to make up for agricultural activities, it may not be sustainable in the long run leading to permanent shift away from agriculture. Providing further training to upskill from casual to skilled wage employment incurs cost that will provide low returns to investment compared to that invested in agricultural technology. Policy alternatives that keep the waiver beneficiaries engaged in agriculture without inducing strategic default and moral hazard should be explored. For example, a waiver provided on the condition of agricultural output and productivity in the immediate season could serve as a starting point which can potentially remove moral hazard thereby removing their credit constraints.

References

*** To be completed ***

Tables and Figures

Table 1: Summary Statistics

Following table shows the descriptive statistics of the variables from Round 66 of NSSO survey. Panel A considers all the household in the rural areas covered across all the states in India who have cultivable land. The values are expenditures of households in INR corresponding to the year 2009-10.

Panel A

Household-level expenditure	Observations	Mean	SD	Minimum	Maximum
Monthly Per Capita Expenditure	33,814	1226.852	2753.922	144.71	405618.5
Basic Food	33,801	2074.274	1269.368	15	33299
Luxury Food	33,814	926.384	843.684	15	57059
Intoxicants	24,181	180.882	259.638	1	15500
Durable Goods	33,791	276.828	324.111	7	33000
Non-Durable Goods	33,814	1466.093	1495.016	63	58086
Household-level employment					
Self-Employed	33,814	1.234	1.224	0	21
Wage/Salary Employed	33,814	0.221	0.496	0	7
Casual Employment	33,814	0.348	0.252	0	8
Other Employment	33,814	1.352	1.156	0	10
Proportion in Self-Employment	33,814	0.256	0.247	0	1
Proportion in Wage/Salary Employment	33,814	0.051	0.128	0	1
Proportion in Casual Employment	33,814	0.086	0.192	0	1
Proportion in Other Employment	33,814	0.279	0.222	0	1
Household-level days spent					
Self-Employed	33,814	8.26038	8.132546	0	147
Wage/Salary Employed	33,814	1.542261	3.448443	0	49
Casual Employment	33,814	1.948838	4.261908	0	56
Other Employment	33,814	10.34549	8.067102	0	70
Proportion in Self-Employment	33,814	0.3670429	0.3098123	0	1
Proportion in Wage/Salary Employment	33,814	0.0751027	0.177036	0	1
Proportion in Casual Employment	33,814	0.1041475	0.2233691	0	1
Proportion in Other Employment	33,814	0.4537068	0.2593982	0	1
Household-level wage					
Wage/Salary Employed	33,814	500.228	1482.847	0	38000
Casual Employment	33,814	198.920	473.723	0	7000
Other Employment	33,814	12.875	121.986	0	5122
Proportion in Wage/Salary Employment	33,814	0.178	0.376	0	1
Proportion in Casual Employment	33,814	0.215	0.406	0	1
Proportion in Other Employment	33,814	0.011	0.098	0	1

Daily wages

Wage/Salary Employed	33,814	62.025	171.038	0	2857.143
Casual Employment	33,814	24.671	54.051	0	1500
Other Employment	33,814	1.206	12.933	0	667

Panel B

Here, we show the descriptive statistics of all rural households who have cultivable land and engaged in the agricultural industry as described in the 2004 National Industrial Classification. The values are expenditures of households in INR corresponding to the year 2009-10.

Household-level expenditure	Observations	Mean	SD	Minimum	Maximum
Monthly Per Capita Expenditure	16,104	1140.443	3379.515	144.71	405618.5
Basic Food	16,097	2001.834	1199.381	15	33299
Luxury Food	16,104	830.038	738.521	15	53888
Intoxicants	11,665	161.264	208.807	2	4862
Durable Goods	16,089	254.819	184.318	10	4720
Non-Durable Goods	16,104	1278.472	1258.184	63	58086

Household-level employment

Self-Employed	16,104	1.377	1.233	0	15
Wage/Salary Employed	16,104	0.119	0.385	0	4
Casual Employment	16,104	0.360	0.783	0	8
Other Employment	16,104	1.303	1.144	0	10
Proportion in Self-Employment	16,104	0.292	0.256	0	1
Proportion in Wage/Salary Employment	16,104	0.025	0.091	0	1
Proportion in Casual Employment	16,104	0.091	0.207	0	1
Proportion in Other Employment	16,104	0.266	0.218	0	1

Household-level days spent

Self-Employed	16,104	9.159	8.171	0	98
Wage/Salary Employed	16,104	0.837	2.681	0	28
Casual Employment	16,104	2.041	4.539	0	56
Other Employment	16,104	10.083	8.030	0	70
Proportion in Self-Employment	16,104	0.412	0.312	0	1
Proportion in Wage/Salary Employment	16,104	0.037	0.126	0	1
Proportion in Casual Employment	16,104	0.109	0.236	0	1
Proportion in Other Employment	16,104	0.445	0.2619	0	1

Household-level wage

Wage/Salary Employed	16,104	252.388	1108.035	0	38000
Casual Employment	16,104	183.525	436.554	0	7000
Other Employment	16,104	10.353	98.626	0	4215
Proportion in Wage/Salary Employment	16,104	0.094	0.288	0	1
Proportion in Casual Employment	16,104	0.218	0.411	0	1

Proportion in Other Employment	16,104	0.012	0.108	0	1
Daily wages					
Wage/Salary Employed	16,104	30.465	124.162	0	2857.143
Casual Employment	16,104	21.684	47.712	0	1500
Other Employment	16,104	0.917	9.186	0	480

Table 2: Impact of Debt Waiver on Employment

Following table shows the regression discontinuity results for the impact of debt waiver program on the shift in beneficiaries' activities profile who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. Panel A shows the results for the total number of members engaged in self-employment, casual, wage employment and other employment activities for the week ending on the date of survey. Panel B shows the results where the dependent variables are the proportion of household members engaged in the above said employment categories for the week ending on the date of survey. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Number of HH members in Self-Employment	Number of HH members in Wage Employment	Number of HH members in Casual Employment	Number of HH members Seeking/Available for Employment	Number of HH members in Other Employment
treat	-0.566*** (0.069)	-0.049*** (0.015)	0.438*** (0.059)	0.000 (0.008)	-0.061 (0.041)
Observations	16,104	16,104	16,104	16,104	16,104
R-squared	0.209	0.099	0.260	0.087	0.317
Control mean	1.681	0.149	0.244	0.024	0.600

Panel B

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of HH members in Self-Employment	Proportion of HH members in Wage Employment	Proportion of HH members in Casual Employment	Proportion of HH members Seeking/Available for Employment	Proportion of HH members in Other Employment
treat	-0.114*** (0.017)	-0.008*** (0.003)	0.126*** (0.016)	0.000 (0.002)	-0.005 (0.010)
Observations	16,104	16,104	16,104	16,104	16,104
R-squared	0.188	0.108	0.272	0.087	0.297
Control mean	0.321	0.029	0.058	0.004	0.105

Table 3: Impact of Debt Waiver on Days Spent for Employment

Following table shows the regression discontinuity results for the impact of debt waiver program on the shift in beneficiaries' intensity of activities who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. We calculate the number of days that the household spends over a week in each employment category and their corresponding proportion on the overall household activities thereby obtaining the intensity on each activity. Panel A shows the results for the total number of days engaged in self-employment, casual, wage employment, seeking employment (unemployed) and other employment activities for the week ending on the date of survey. Panel B shows the results where the dependent variables are the proportion of household days engaged in the above said employment categories for the week ending on the date of survey. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A

	(1)	(2)	(3)	(4)	(5)
VARIABLES	No. of days in Self- employment	No. of days in Wage employment	No. of days in Casual employment	No. of days Seeking/Available for Employment	No. of days in Other employment
treat	-3.507*** (0.429)	-0.361*** (0.103)	2.346*** (0.342)	0.356** (0.139)	-0.500* (0.282)
Observations	16,104	16,104	16,104	16,104	16,104
R-squared	0.206	0.097	0.241	0.154	0.284
Control mean	11.310	1.044	1.476	0.294	4.192

Panel B

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of days in Self- Employment	Proportion of days in Wage Employment	Proportion of days in Casual Employment	Proportion of days Seeking/Available for Employment	Proportion of days in Other Employment
treat	-0.137*** (0.020)	-0.013** (0.005)	0.142*** (0.019)	0.022*** (0.006)	-0.007 (0.014)
Observations	16,104	16,104	16,104	16,104	16,104
R-squared	0.225	0.099	0.276	0.146	0.316
Control mean	0.453	0.044	0.076	0.011	0.161

Table 4: Impact of Debt Waiver on Income

Following table shows the regression discontinuity results for the impact of debt waiver program on the income in beneficiary households which are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. We calculate the wages earned by individual household members from each type of

employment and obtain their corresponding proportion in total household income. Panel A shows the results for the wages earned from self-employment, casual, wage employment and other employment activities for the week ending on the date of survey. Panel B shows the results where the dependent variables are the proportion of income earned each type of employment for the week ending on the date of survey. Please note that we are reporting weekly earnings from different activities and do not report wages from self-employment as it does not provide weekly wages. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A			
	(1)	(2)	(3)
VARIABLES	Income from Wage Employment	Income from Casual Employment	Income from Other Employment
treat	-132.143*** (20.428)	193.124*** (28.254)	-1.202 (3.592)
Observations	16,104	16,104	16,104
R-squared	0.057	0.203	0.134
Control mean	347.374	132.089	0.000

Panel B			
	(1)	(2)	(3)
VARIABLES	Proportion of Income from Wage Employment	Proportion of Income from Casual Employment	Proportion of Income from Other Employment
treat	-0.042*** (0.012)	0.252*** (0.029)	-0.003 (0.005)
Observations	16,104	16,104	16,104
R-squared	0.093	0.243	0.166
Control mean	0.011	0.145	0.000

Table 5: Impact of Debt Waiver on Daily Earnings

Following table shows the regression discontinuity results for the impact of debt waiver program on the daily wages in beneficiary households which are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level for the week ending on the date of survey. We calculate the daily wages earned by individual household members from each type of employment and use them as dependent variable for the week ending on the date of survey. Please note that we are reporting daily wages from weekly earnings from different activities and do not report wages from self-employment as it does not provide weekly wages. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

VARIABLES	(1) Daily Earnings from Wage Employment	(2) Daily Earnings from Casual Employment	(3) Daily Earnings from Other Employment
treat	-14.991*** (2.655)	21.899*** (2.644)	-0.186 (0.303)
Observations	16,104	16,104	16,104
R-squared	0.064	0.208	0.129
Control mean	41.352	14.674	0.000

Table 6: Impact of Debt Waiver on Vocational Training

Following table shows the regression discontinuity results for the impact of debt waiver program on the vocational training activities of households which are engaged in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. We calculate the number of members taking part in training activities and their proportion in the household. We also use whether a member does not engage in training activities and find their number and proportion in the household. We also use a binary variable which is 1 when we have at least one member in a household engaging in training activities and 0 otherwise. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

VARIABLES	(1) Took Vocational Training (==1)	(2) Number Took Vocational Training	(3) Number Didn't Take Vocational Training	(4) Proportion Took Vocational Training	(5) Proportion Didn't Take Vocational Training
treat	-0.002 (0.016)	0.018 (0.027)	-0.330*** (0.078)	0.003 (0.009)	-0.016 (0.018)
Observations	16,104	16,104	16,104	16,104	16,104
R-squared	0.233	0.260	0.146	0.269	0.175
Control mean	0.104	0.162	2.878	0.045	0.822

Table 7: Impact of Debt Waiver on Consumption

Following table shows the regression discontinuity results for the impact of debt waiver program on household consumption on different categories for those who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. We calculate the monthly household consumption expenditure from the 66th round of survey consumer expenditure module. We report the log values for all consumption expenditure variables with the last column being the monthly per capita expenditure. The first column is the total value of basic food consisting of cereals, pulses, milk & milk products, sugar, salt and vegetables. The second column is the total value of luxury food items consisting of oil, egg, fish & meat, fruits (fresh & dry), spices and beverages. The third column is the total value of intoxicants consisting of pan, tobacco and other intoxicants. The fourth column is the total value of fuel and light which are used to daily

activities. The fifth column is the total value of durable goods consisting of minor durable goods, toilet articles and other household consumables. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

VARIABLES	(1) Log Basic Food	(2) Log Luxury Food	(3) Log Intoxicants	(4) Log Fuel & Light	(5) Log Durable Goods	(6) Log Monthly Per Capita Expenditure
treat	0.050 (0.044)	-0.390*** (0.041)	-0.209*** (0.073)	-0.140*** (0.049)	-0.855*** (0.056)	-0.359*** (0.027)
Observations	16,096	16,101	11,663	16,089	16,100	16,104
R-squared	0.325	0.346	0.364	0.329	0.309	0.433
Control mean	6.789	6.560	4.726	5.696	6.808	6.997

Table 8: Impact of Debt Waiver on Credit Outcomes

Following table shows the results of the regression discontinuity results for the impact of debt waiver program on households' credit outcomes. In column (1) & (2), the dependent variable is the categorical variable for credit availed or not and column (3) is the no. of loans taken in the past 3 years corresponding to the 3 years after the 2008 debt waiver program. Similarly, in column (4) we observe the log value of the largest loan taken. Other details of loans taken like loan source and interest rates are available for the largest loan taken and are reported in Panel B (C) and Panel D. We use the IHDS II survey data conducted in the year 2011-12 which is a nationally representative survey across India with detailed information on demographics, education, employment, income, expenditure and assets. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A: Credit Availability

VARIABLES	(1) Any loan last 5 years (==1)	(2) No. of loans in past 3 years	(3) Log value of largest loan in past 3 years	(4) Monthly Interest rate of largest loan
treat	-0.150*** (0.036)	-0.586** (0.242)	-1.353*** (0.139)	1.070*** (0.353)
Observations	7,948	4,040	4,040	3,818
R-squared	0.280	0.300	0.411	0.163
Control mean	0.727	3.747	11.012	1.354

Panel B: Source of largest loan (Linear Probability Estimation)

VARIABLES	(1) Obtained largest loan from Bank	(2) Obtained largest loan from Money Lenders	(3) Obtained largest loan from Individuals	(4) Obtained largest loan from Other institutions
treat	-0.308*** (0.050)	0.089** (0.040)	0.202*** (0.045)	0.058** (0.025)
Observations	4,041	4,041	4,041	4,041
R-squared	0.270	0.256	0.280	0.243
Control mean	0.568	0.120	0.161	0.051

Table 9: Impact of Debt Waiver in NREGA star states

Following table shows the regression discontinuity results for the impact of debt waiver program on households which are in the star states in India. Star states are Andhra Pradesh, Chhattisgarh, Himachal Pradesh, Madhya Pradesh, Tamil Nadu, Rajasthan and Uttarakhand and they provide the bulk of the employment under the NREGA which provides casual unskilled employment for the rural population as documented by Imbert and Papp (2015). In star states, the shift from agriculture to casual labor for the debt waiver beneficiaries is higher due to higher casual employment opportunities due to NREGA implementation. We run the regression for those households who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household level. Robust standard errors are reported in the parentheses and ***, ** and * represent the significance at the 1%, 5% and 10% levels respectively.

Panel A: Activity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of HH members in Self-Employment	Proportion of HH members in Wage Employment	Proportion of HH members in Casual Employment	Proportion of HH members Seeking/Available for Employment	Proportion of HH members in Other Employment
treat	-0.089*** (0.019)	-0.010** (0.004)	0.109*** (0.018)	0.002 (0.001)	-0.003 (0.010)
treat x star state	-0.069*** (0.025)	0.006 (0.004)	0.048** (0.022)	-0.004 (0.003)	-0.006 (0.013)
Observations	16,104	16,104	16,104	16,104	16,104
R-squared	0.189	0.108	0.273	0.087	0.297
Control mean	0.365	0.026	0.067	0.003	0.077

Panel B: Intensity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of days in Self-Employment	Proportion of days in Wage Employment	Proportion of days in Casual Employment	Proportion of days Seeking/Available for Employment	Proportion of days in Other Employment
treat	-0.104*** (0.021)	-0.014** (0.006)	0.121*** (0.021)	0.019*** (0.007)	-0.006 (0.015)
treat x star state	-0.086*** (0.031)	0.004 (0.007)	0.056* (0.030)	0.008 (0.009)	-0.003 (0.018)
Observations	16,104	16,104	16,104	16,104	16,104
R-squared	0.227	0.099	0.277	0.146	0.316
Control mean	0.497	0.039	0.092	0.010	0.122

Panel C: Income

(1)	(2)	(3)
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VARIABLES	Proportion of Income from Wage Employment	Proportion of Income from Casual Employment	Proportion of Income from Other Employment
treat	-0.050*** (0.015)	0.218*** (0.032)	-0.002 (0.004)
treat x star state	0.020 (0.017)	0.091* (0.047)	-0.000 (0.011)
Observations	16,104	16,104	16,104
R-squared	0.093	0.244	0.166
Control mean	0.100	0.171	0.000

Panel D: Daily Earnings

VARIABLES	(1) Daily Earnings from Wage Employment	(2) Daily Earnings from Casual Employment	(3) Daily Earnings from Other Employment
treat	-18.735*** (3.515)	18.333*** (2.844)	-0.338 (0.354)
treat x star state	9.941** (3.907)	9.469** (3.826)	0.405 (0.632)
Observations	16,104	16,104	16,104
R-squared	0.065	0.209	0.129
Control mean	28.382	16.507	0.000

Panel E: Household Consumption

VARIABLES	(1) Log Basic Food	(2) Log Luxury Food	(3) Log Intoxicants	(4) Log Fuel & Light	(5) Log Durable Goods	(6) Log Monthly Per Capita Expenditure
treat	0.066 (0.047)	-0.391*** (0.044)	-0.212** (0.082)	-0.098* (0.052)	-0.836*** (0.062)	-0.351*** (0.029)
treat x star state	-0.043 (0.055)	0.004 (0.053)	0.006 (0.098)	-0.111* (0.060)	-0.048 (0.079)	-0.022 (0.041)
Observations	16,096	16,101	11,663	16,098	16,100	16,104
R-squared	0.325	0.346	0.364	0.303	0.309	0.433
Control mean	6.721	6.418	4.779	5.647	6.618	6.925

Table 10: Impact of Debt Waiver in Dry Season

Following table shows the regression discontinuity results for the impact of debt waiver program on households during the dry season in India. Dry season consists of first six months of the season when there is less agricultural activity in rural India. Hence, dry season accelerates the shift to casual employment for the waiver beneficiaries. We run the regression for those households who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A: Activity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of HH members in Self-Employment	Proportion of HH members in Wage Employment	Proportion of HH members in Casual Employment	Proportion of HH members Seeking/Available for Employment	Proportion of HH members in Other Employment
treat	-0.114*** (0.017)	-0.007** (0.003)	0.126*** (0.017)	-0.000 (0.002)	-0.003 (0.010)
treat x dry	-0.001 (0.008)	-0.003 (0.002)	0.002 (0.008)	0.000 (0.001)	-0.005 (0.005)
Observations	16,102	16,102	16,102	16,102	16,102
R-squared	0.188	0.108	0.273	0.087	0.297
Control mean	0.312	0.030	0.058	0.005	0.113

Panel B: Intensity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of days in Self-Employment	Proportion of days in Wage Employment	Proportion of days in Casual Employment	Proportion of days Seeking/Available for Employment	Proportion of days in Other Employment
treat	-0.128*** (0.020)	-0.010** (0.005)	0.138*** (0.019)	0.021*** (0.006)	-0.011 (0.014)
treat x dry	-0.019** (0.009)	-0.006* (0.003)	0.008 (0.009)	0.002 (0.004)	0.011 (0.007)
Observations	16,102	16,102	16,102	16,102	16,102
R-squared	0.226	0.100	0.276	0.146	0.316
Control mean	0.441	0.044	0.076	0.012	0.175

Panel C: Income

	(1)	(2)	(3)
VARIABLES	Proportion of Income from Wage Employment	Proportion of Income from Casual Employment	Proportion of Income from Other Employment
treat	-0.038*** (0.012)	0.252*** (0.030)	-0.008 (0.005)
treat x dry	-0.010* (0.006)	0.000 (0.014)	0.013*** (0.004)
Observations	16,102	16,102	16,102
R-squared	0.093	0.243	0.169
Control mean	0.111	0.134	0.000

Panel D: Daily Earnings

	(1)	(2)	(3)
VARIABLES	Daily Earnings from Wage Employment	Daily Earnings from Casual Employment	Daily Earnings from Other Employment

treat	-14.214*** (2.687)	20.316*** (2.713)	-0.469 (0.322)
treat x dry	-1.798 (1.103)	3.658*** (1.407)	0.653*** (0.231)
Observations	16,102	16,102	16,102
R-squared	0.064	0.210	0.130
Control mean	43.792	14.843	0.000

Panel E: Household Consumption

VARIABLES	(1) Log Basic Food	(2) Log Luxury Food	(3) Log Intoxicants	(4) Log Fuel & Light	(5) Log Durable Goods	(6) Log Monthly Per Capita Expenditure
treat	0.075* (0.045)	-0.401*** (0.042)	-0.246*** (0.075)	-0.175*** (0.050)	-0.894*** (0.059)	-0.370*** (0.028)
treat x dry	-0.059*** (0.022)	0.027 (0.021)	0.089** (0.034)	0.082*** (0.028)	0.092*** (0.030)	0.025** (0.012)
Observations	16,094	16,099	11,661	16,096	16,098	16,102
R-squared	0.326	0.346	0.366	0.305	0.311	0.433
Control mean	6.774	6.553	4.740	5.717	6.867	6.997

Table 11: Impact of Debt Waiver in Distressed Districts

Following table shows the regression discontinuity results for the impact of debt waiver program on households in the distressed districts of India. We define a district as a distressed district if had received less than the previous 5-year average rainfall during the year 2008. We obtain the district-wise rainfall data from ICRISAT data for districts which provides annual district-level rainfall data. Agriculture distress caused by rainfall shock accelerates the shift from agriculture to casual employment for the waiver beneficiaries. We run the regression for those households who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A: Activity

VARIABLES	(1) Proportion of HH members in Self- Employment	(2) Proportion of HH members in Wage Employment	(3) Proportion of HH members in Casual Employment	(4) Proportion of HH members Seeking/Available for Employment	(5) Proportion of HH members in Other Employment
treat	-0.094*** (0.017)	-0.017** (0.003)	0.105*** (0.017)	0.015* (0.009)	-0.010 (0.015)
treat x distressed	-0.001** (0.003)	-0.003 (0.002)	0.002*** (0.015)	0.011* (0.008)	-0.009 (0.008)
Observations	16,102	16,102	16,102	16,102	16,102
R-squared	0.188	0.108	0.273	0.265	0.216

Control mean	0.208	0.011	0.039	0.011	0.200
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Panel B: Intensity

VARIABLES	(1) Proportion of days in Self- Employment	(2) Proportion of days in Wage Employment	(3) Proportion of days in Casual Employment	(4) Proportion of days Seeking/Available for Employment	(5) Proportion of days in Other Employment
treat	-0.108*** (0.020)	-0.080** (0.005)	0.098*** (0.019)	0.021* (0.009)	0.000 (0.017)
treat x distressed	-0.019** (0.009)	-0.006* (0.003)	0.008** (0.003)	0.001* (0.008)	0.010* (0.009)
Observations	16,102	16,102	16,102	16,102	16,102
R-squared	0.226	0.100	0.276	0.254	0.242
Control mean	0.401	0.024	0.061	0.009	0.105

Panel C: Income

VARIABLES	(1) Proportion of Income from Wage Employment	(2) Proportion of Income from Casual Employment	(3) Proportion of Income from Other Employment
treat	-0.014*** (0.012)	0.142*** (0.030)	-0.008 (0.005)
treat x distressed	-0.009* (0.006)	0.000 (0.014)	0.011*** (0.004)
Observations	16,102	16,102	16,102
R-squared	0.093	0.243	0.169
Control mean	0.151	0.128	0.000

Panel D: Daily Earnings

VARIABLES	(1) Daily Earnings from Wage Employment	(2) Daily Earnings from Casual Employment	(3) Daily Earnings from Other Employment
treat	-11.114*** (2.687)	19.231*** (2.713)	-0.469 (0.322)
treat x distressed	-1.798 (1.103)	5.432*** (1.407)	0.443*** (0.231)
Observations	16,102	16,102	16,102
R-squared	0.064	0.210	0.130
Control mean	36.767	11.012	0.000

Panel E: Household consumption

VARIABLES	(1) Log Basic Food	(2) Log Luxury Food	(3) Log Intoxicants	(4) Log Fuel & Light	(5) Log Durable Goods	(6) Log Monthly Per Capita Expenditure
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treat	0.056 (0.047)	-0.017*** (0.044)	-0.107** (0.082)	-0.081* (0.052)	-0.756*** (0.062)	-0.322*** (0.029)
treat x distressed	-0.043 (0.055)	0.001 (0.053)	0.079 (0.098)	-0.31* (0.060)	-0.034 (0.079)	-0.087 (0.041)
Observations	16,096	16,101	11,663	16,089	16,100	16,104
R-squared	0.325	0.346	0.364	0.329	0.309	0.400
Control mean	6.711	6.401	4.566	5.601	6.701	6.833

Table 12: Impact of Debt Waiver in Low Yield Districts

Following table shows the regression discontinuity results for the impact of debt waiver program on households in the low yield districts of India. We define a district as a low yield district if it falls on the bottom tercile of the average of the sum of yield of all crops in the district for the past ten years. We are using the yield of all crops as different crops are grown in different districts in India. We obtain the data for yields from the ICRISAT dataset which provides district-wise yield for different crops annually. We run the regression for those households who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A: Activity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of HH members in Self-Employment	Proportion of HH members in Wage Employment	Proportion of HH members in Casual Employment	Proportion of HH members Seeking/Available for Employment	Proportion of HH members in Other Employment
treat	-0.066*** (0.017)	-0.015** (0.003)	0.005*** (0.017)	0.005* (0.009)	-0.010 (0.015)
treat x low yield	-0.001** (0.003)	-0.003 (0.002)	0.015*** (0.015)	0.001* (0.008)	-0.009 (0.008)
Observations	16,102	16,102	16,102	16,102	16,102
R-squared	0.188	0.108	0.273	0.265	0.216
Control mean	0.301	0.021	0.044	0.004	0.096

Panel B: Intensity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of days in Self-Employment	Proportion of days in Wage Employment	Proportion of days in Casual Employment	Proportion of days Seeking/Available for Employment	Proportion of days in Other Employment
treat	-0.121*** (0.020)	-0.055** (0.005)	0.071*** (0.019)	0.011* (0.009)	0.000 (0.017)
treat x low yield	-0.021** (0.009)	-0.001* (0.003)	0.010** (0.003)	0.001* (0.008)	0.011* (0.009)

Observations	16,102	16,102	16,102	16,102	16,102
R-squared	0.226	0.100	0.276	0.254	0.242
Control mean	0.381	0.101	0.107	0.091	0.201

Panel C: Income

	(1)	(2)	(3)
VARIABLES	Proportion of Income from Wage Employment	Proportion of Income from Casual Employment	Proportion of Income from Other Employment
treat	-0.020*** (0.012)	0.111*** (0.030)	-0.008 (0.005)
treat x low yield	-0.011* (0.006)	0.000 (0.014)	0.008*** (0.004)
Observations	16,102	16,102	16,102
R-squared	0.093	0.243	0.169
Control mean	0.201	0.111	0.000

Panel D: Daily Earnings

	(1)	(2)	(3)
VARIABLES	Daily Earnings from Wage Employment	Daily Earnings from Casual Employment	Daily Earnings from Other Employment
treat	-21.012*** (2.767)	13.101*** (2.563)	-0.411 (0.322)
treat x low yield	-1.121 (1.103)	3.015*** (1.307)	0.303*** (0.231)
Observations	16,102	16,102	16,102
R-squared	0.064	0.210	0.130
Control mean	39.121	14.299	0.000

Panel E: Household Consumption

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Log Basic Food	Log Luxury Food	Log Intoxicants	Log Fuel & Light	Log Durable Goods	Log Monthly Per Capita Expenditure
treat	0.046 (0.047)	-0.020*** (0.044)	-0.111** (0.082)	-0.601* (0.052)	-0.501*** (0.062)	-0.217*** (0.029)
treat x dry	-0.039 (0.055)	0.002 (0.053)	0.031 (0.098)	-0.229* (0.060)	-0.025 (0.079)	-0.018 (0.041)
Observations	16,094	16,099	11,661	16,096	16,098	16,102
R-squared	0.326	0.346	0.366	0.305	0.311	0.433
Control mean	6.155	6.101	4.388	5.398	6.704	6.801

Table 13: Impact of Debt Waiver on Marginalized Population

Following table shows the regression discontinuity results for the impact of debt waiver program on households belonging to the scheduled castes. Scheduled Castes have been considered part of marginal communities in India and one can expect them to shift to casual employment when faced with credit constraints caused by debt waiver. We run the regression for those households who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A: Activity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of HH members in Self-Employment	Proportion of HH members in Wage Employment	Proportion of HH members in Casual Employment	Proportion of HH members Seeking/Available for Employment	Proportion of HH members in Other Employment
treat	-0.106*** (0.017)	-0.009*** (0.003)	0.117*** (0.016)	-0.000 (0.002)	-0.002 (0.010)
treat x SC	-0.028** (0.011)	0.003 (0.003)	0.032*** (0.011)	0.000 (0.001)	-0.009 (0.006)
Observations	16,104	16,104	16,104	16,103	16,103
R-squared	0.189	0.108	0.274	0.087	0.297
Control mean	0.285	0.030	0.075	0.002	0.111

Panel B: Intensity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of days in Self-Employment	Proportion of days in Wage Employment	Proportion of days in Casual Employment	Proportion of days Seeking/Available for Employment	Proportion of days in Other Employment
treat	-0.129*** (0.020)	-0.013** (0.005)	0.132*** (0.019)	0.019*** (0.006)	-0.004 (0.014)
treat x SC	-0.025* (0.014)	0.001 (0.004)	0.036*** (0.012)	0.010* (0.005)	-0.009 (0.009)
Observations	16,104	16,104	16,104	16,103	16,103
R-squared	0.226	0.099	0.278	0.147	0.316
Control mean	0.415	0.048	0.095	0.005	0.172

Panel C: Income

	(1)	(2)	(3)
VARIABLES	Proportion of Income from Wage Employment	Proportion of Income from Casual Employment	Proportion of Income from Other Employment
treat	-0.044*** (0.012)	0.237*** (0.030)	-0.005 (0.005)

treat x SC	0.007 (0.010)	0.052*** (0.020)	0.009 (0.006)
Observations	16,104	16,104	16,104
R-squared	0.093	0.244	0.167
Control mean	0.109	0.166	0.000

Panel D: Daily Earnings

VARIABLES	(1) Daily Earnings from Wage Employment	(2) Daily Earnings from Casual Employment	(3) Daily Earnings from Other Employment
treat	-15.982*** (2.662)	20.727*** (2.642)	-0.319 (0.304)
treat x SC	3.400 (2.411)	4.023** (1.870)	0.459 (0.305)
Observations	16,104	16,104	16,104
R-squared	0.065	0.209	0.129
Control mean	34.476	15.610	0.000

Panel E: Household Consumption

VARIABLES	(1) Log Basic Food	(2) Log Luxury Food	(3) Log Intoxicants	(4) Log Fuel & Light	(5) Log Durable Goods	(6) Log Monthly Per Capita Expenditure
treat	0.056 (0.044)	-0.386*** (0.042)	-0.222*** (0.074)	-0.145*** (0.050)	-0.841*** (0.055)	-0.342*** (0.028)
treat x sc	-0.020 (0.026)	-0.015 (0.029)	0.042 (0.047)	0.017 (0.035)	-0.048 (0.039)	-0.059*** (0.017)
Observations	16,095	16,100	11,662	16,097	16,099	16,103
R-squared	0.325	0.346	0.365	0.303	0.309	0.434
Control mean	6.716	6.489	4.751	5.632	6.597	6.902

Table 14: Impact of Debt Waiver for False Cut-Off

Following table shows the regression discontinuity results for the impact of debt waiver program on agricultural households. Here, we take the cut-off values for debt waiver eligibility to be 3 hectares instead of the mandated 2 hectares landholding. We take observations of 2 hectares around the false cut-off value i.e., from 1 hectare to 5 hectares. We do not observe any significant shift in employment type in our regression results using the 3 hectare false cut-off value. We run the regression for those households who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A: Activity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of HH members in Self-Employment	Proportion of HH members in Wage Employment	Proportion of HH members in Casual Employment	Proportion of HH members Seeking/Available for Employment	Proportion of HH members in Other Employment
treat	-0.001 (0.017)	-0.000 (0.003)	-0.000 (0.017)	-0.001 (0.002)	0.001 (0.008)
Observations	7,563	7,563	7,563	7,563	7,563
R-squared	0.261	0.180	0.339	0.169	0.375
Control mean	0.342	0.027	0.045	0.004	0.107

Panel B: Intensity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of days in Self-Employment	Proportion of days in Wage Employment	Proportion of days in Casual Employment	Proportion of days Seeking/Available for Employment	Proportion of days in Other Employment
treat	0.008 (0.020)	-0.003 (0.005)	0.005 (0.021)	-0.001 (0.006)	0.005 (0.013)
Observations	7,563	7,563	7,563	7,563	7,563
R-squared	0.286	0.162	0.327	0.203	0.408
Control mean	0.478	0.041	0.059	0.010	0.157

Panel C: Income

	(1)	(2)	(3)
VARIABLES	Proportion of Income from Wage Employment	Proportion of Income from Casual Employment	Proportion of Income from Other Employment
treat	-0.011 (0.107)	0.037 (0.137)	-0.017 (0.047)
Observations	16,104	16,104	16,104
R-squared	0.307	0.330	0.336
Control mean	0.111	0.109	0.000

Panel D: Daily wage

	(1)	(2)	(3)
VARIABLES	Daily Earnings from Wage Employment	Daily Earnings from Casual Employment	Daily Earnings from Other Employment
treat	1.457 (24.980)	0.092 (26.172)	-3.435 (5.728)
Observations	16,104	16,104	16,104
R-squared	0.284	0.286	0.235
Control mean	41.975	11.239	0.000

Panel E: Household Consumption

VARIABLES	(1) Log Basic Food	(2) Log Luxury Food	(3) Log Intoxicants	(4) Log Fuel & Light	(5) Log Durable Goods	(6) Log Monthly Per Capita Expenditure
treat	-0.059 (0.039)	-0.059 (0.037)	0.072 (0.075)	-0.052 (0.049)	-0.138** (0.056)	-0.044 (0.033)
Observations	7,561	7,562	5,483	7,560	7,561	7,563
R-squared	0.439	0.432	0.461	0.423	0.366	0.496
Control mean	6.833	6.594	4.773	5.737	6.916	7.056

Table 15: Impact of Debt Waiver for False Year

Following table shows the regression discontinuity results for the impact of debt waiver program on agricultural households. Here, we assume the year for debt waiver implementation to be 2005 three years before the actual year of implementation. We take the 61st round of NSSO data for this purpose as it has “thick” round of data having a large sample size comparable to the 66th round of data. We do not observe any significant shift in employment type, days spent in different employment and income among the treated and untreated households. We run the regression for those households who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A: Activity

VARIABLES	(1) Proportion of HH members in Self- Employment	(2) Proportion of HH members in Wage Employment	(3) Proportion of HH members in Casual Employment	(4) Proportion of HH members Seeking/Available for Employment	(5) Proportion of HH members in Other Employment
treat	-0.005 (0.017)	-0.010 (0.003)	-0.020 (0.017)	-0.001 (0.002)	0.003 (0.008)
Observations	14,563	14,563	14,563	14,563	14,563
R-squared	0.261	0.180	0.339	0.169	0.375
Control mean	0.312	0.018	0.033	0.020	0.117

Panel B: Intensity

VARIABLES	(1) Proportion of days in Self- Employment	(2) Proportion of days in Wage Employment	(3) Proportion of days in Casual Employment	(4) Proportion of days Seeking/Available for Employment	(5) Proportion of days in Other Employment
treat	0.007 (0.020)	-0.113 (0.005)	0.125 (0.021)	-0.311 (0.006)	0.915 (0.013)
Observations	14,563	14,563	14,563	14,563	14,563
R-squared	0.286	0.162	0.327	0.203	0.408
Control mean	0.377	0.031	0.047	0.011	0.138

Panel C: Income

	(1)	(2)	(3)
VARIABLES	Proportion of Income from Wage Employment	Proportion of Income from Casual Employment	Proportion of Income from Other Employment
treat	-0.033 (0.107)	0.049 (0.137)	-0.201 (0.041)
Observations	14,563	14,563	14,563
R-squared	0.307	0.330	0.336
Control mean	0.107	0.118	0.000

Panel D: Daily wage

	(1)	(2)	(3)
VARIABLES	Daily Earnings from Wage Employment	Daily Earnings from Casual Employment	Daily Earnings from Other Employment
treat	1.034 (14.980)	0.081 (17.172)	-2.231 (15.328)
Observations	14,563	14,563	14,563
R-squared	0.284	0.286	0.235
Control mean	47.781	17.201	0.000

Panel E: Household Consumption

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Log Basic Food	Log Luxury Food	Log Intoxicants	Log Fuel & Light	Log Durable Goods	Log Monthly Per Capita Expenditure
treat	-0.075 (0.075)	0.101* (0.175)	-0.117 (0.344)	0.033* (0.171)	-0.655* (0.321)	-0.041 (0.032)
Observations	14,563	14,563	14,563	14,563	14,563	14,563
R-squared	0.214	0.233	0.242	0.244	0.223	0.228
Control mean	6.801	6.330	4.717	5.017	6.781	7.101

Table 16: Impact of Debt Waiver for Non-Agricultural Households

Following table shows the regression discontinuity results for the impact of debt waiver program on non-agricultural households. Here, we take the households who are working in the construction industry which is the biggest employer in rural areas after agriculture. We don't expect a significant shift towards casual employment for this group in rural areas as we observed for the agricultural households who received debt waiver. We run the regression for those households who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically. The data is organized at the household-level. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

Panel A: Activity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of HH members in Self-Employment	Proportion of HH members in Wage Employment	Proportion of HH members in Casual Employment	Proportion of HH members Seeking/Available for Employment	Proportion of HH members in Other Employment
treat	-0.041 (0.051)	0.007 (0.019)	0.044 (0.051)	0.001 (0.004)	0.023 (0.031)
Observations	3,016	3,016	3,016	3,016	3,016
R-squared	0.334	0.283	0.353	0.191	0.339
Control mean	0.170	0.057	0.112	0.015	0.135

Panel B: Intensity

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Proportion of days in Self-Employment	Proportion of days in Wage Employment	Proportion of days in Casual Employment	Proportion of days Seeking/Available for Employment	Proportion of days in Other Employment
treat	-0.050 (0.055)	-0.001 (0.030)	0.120* (0.068)	-0.003 (0.030)	0.053 (0.038)
Observations	3,016	3,016	3,016	3,016	3,016
R-squared	0.357	0.280	0.400	0.298	0.415
Control mean	0.289	0.100	0.139	0.033	0.165

Panel C: Income

	(1)	(2)	(3)
VARIABLES	Proportion of Income from Wage Employment	Proportion of Income from Casual Employment	Proportion of Income from Other Employment
treat	-0.013 (0.107)	0.047 (0.137)	-0.021 (0.047)
Observations	3,016	3,016	3,016
R-squared	0.307	0.330	0.336
Control mean	0.244	0.303	0.000

Panel D: Daily wage

	(1)	(2)	(3)
VARIABLES	Daily Earnings from Wage Employment	Daily Earnings from Casual Employment	Daily Earnings from Other Employment
treat	3.784 (24.980)	0.012 (26.172)	-1.465 (5.728)
Observations	3,016	3,016	3,016
R-squared	0.284	0.286	0.235
Control mean	115.656	38.768	0.000

Panel E: Household Consumption

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Log Basic Food	Log Luxury Food	Log Intoxicants	Log Fuel & Light	Log Durable Goods	Log Monthly Per Capita Expenditure
treat	-0.082 (0.075)	-0.411*** (0.117)	-0.148 (0.388)	0.331* (0.175)	-0.631*** (0.111)	-0.070 (0.072)
Observations	3,016	3,016	2,399	3,016	3,016	3,016
R-squared	0.414	0.526	0.549	0.434	0.417	0.569
Control mean	7.025	6.714	5.211	5.661	6.671	6.928

Regression discontinuity plots

Below, we show the discontinuity plots for the outcome variables used in the above regressions. We have the cut-off of 2 hectares landholding and the treated group are present in the left-hand side of the plot. We limit the sample size to all households owning up to 4 hectares thereby maintaining 2 hectares of landholding on both sides of the cut-off value of 2 hectares. We use polynomial of order 2 and the bins are created using Calonico et al. (2015) approach. We show both the plots with bins created using evenly-spaced method.

Figure 1: Log Per capita household expenditure

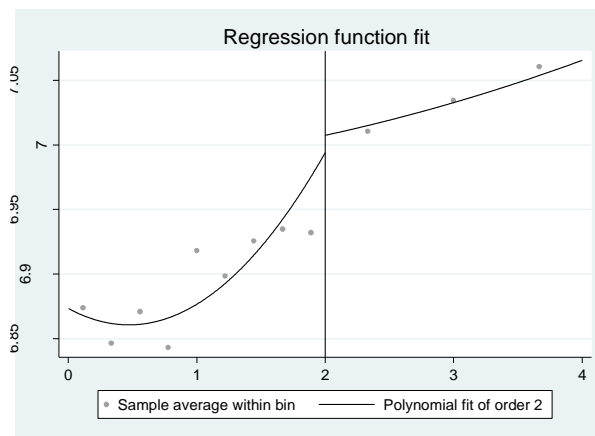


Figure 2: Proportion of individuals in a household in self-employment

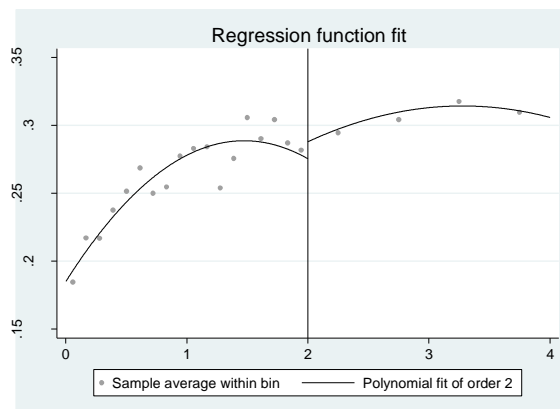


Figure 3: Proportion of individuals in a household in casual labor

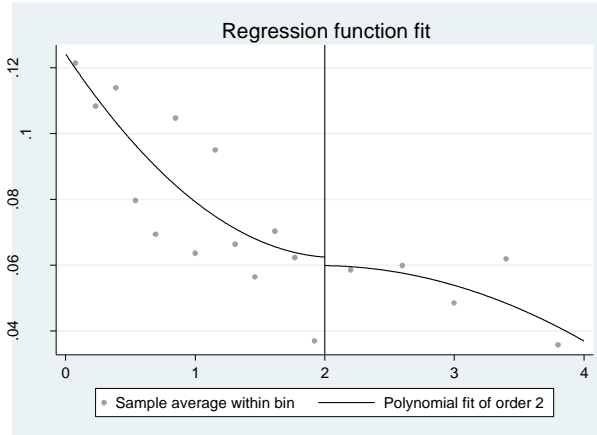


Figure 4: Proportion of time spent in self-employment by a household

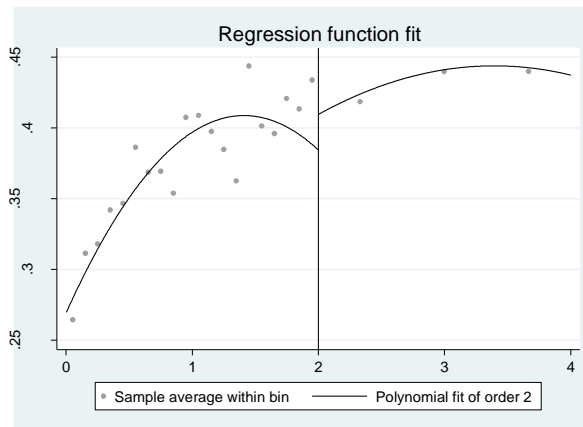


Figure 5: Proportion of time spent in casual labor by a household

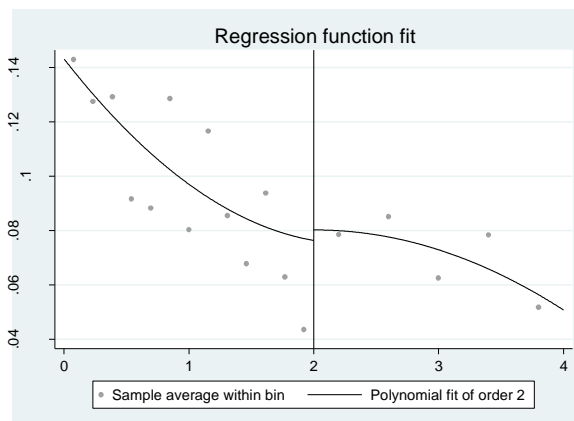


Figure 6: Proportion of income from wage employment for a household

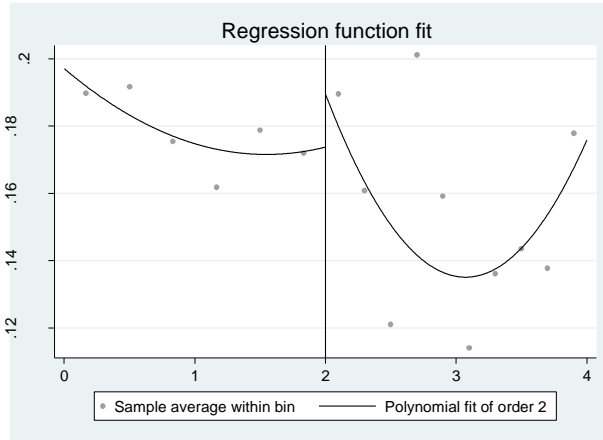


Figure 7: Proportion of income from casual employment for a household

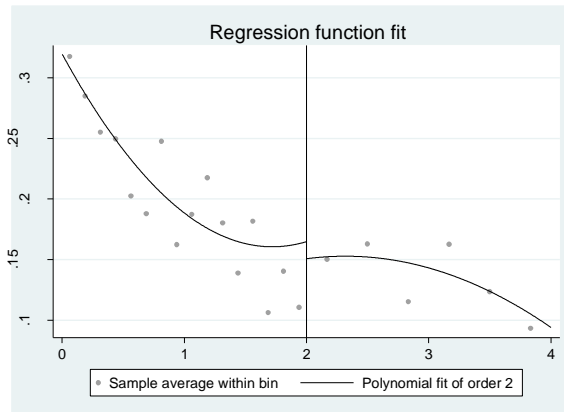


Figure 8: Daily wage from wage employment for a household

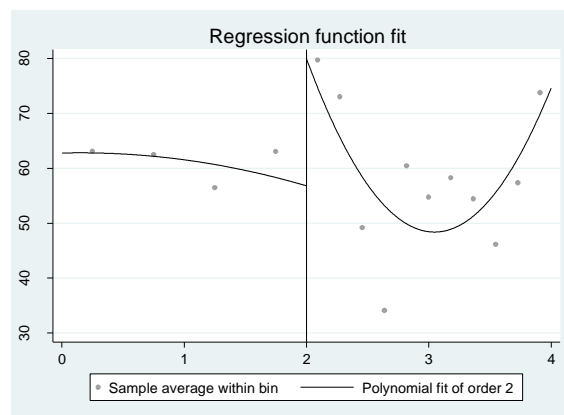
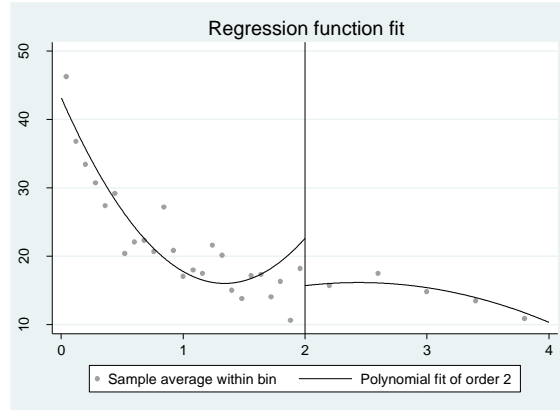


Figure 9: Daily wage from casual labor for a household



Appendix

Table 1: Impact of Debt Waiver: Alternative Specification

Following table shows the regression discontinuity results for the impact of debt waiver program on beneficiary households. We run the regression for those households who are in the agricultural industry as described in the 2004 National Industrial Classification. Here, we use the following linear and quadratic parametric model with the running variable allowed to change on both sides of the cut-off both linearly and quadratically using the equation (2) below. The data is organized at the household-level. Robust standard errors are reported in the parentheses and ***, ** and * represents the significance at the 1%, 5% and 10% levels respectively.

$$Y_{id} = \alpha + \beta_1 treat_i + \beta_2 x_i + \beta_3 treat_i \times x_i + \beta_4 treat_i \times x_i^2 + \gamma_d + \epsilon_i \quad - (2)$$

Panel A: Activity

VARIABLES	(1) Proportion of HH members in Self- Employment	(2) Proportion of HH members in Wage Employment	(3) Proportion of HH members in Casual Employment	(4) Proportion of HH members in Other Employment
treat	-0.091** (0.043)	-0.013 (0.008)	0.144*** (0.046)	-0.037 (0.034)
Observations	16,104	16,104	16,104	16,104
R-squared	0.188	0.108	0.273	0.215
Control mean	0.301	0.019	0.033	0.003

Panel B: Days Spent

VARIABLES	(1) Proportion of days in Self-Employment	(2) Proportion of days in Wage Employment	(3) Proportion of days in Casual Employment	(4) Proportion of days in Other Employment
treat	-0.135*** (0.052)	-0.018 (0.014)	0.151*** (0.057)	0.003 (0.045)

Observations	16,104	16,104	16,104	16,104
R-squared	0.225	0.099	0.276	0.241
Control mean	0.249	0.038	0.057	0.017

Panel C: Income

	(1)	(2)	(3)
VARIABLES	Proportion of Income from Wage Employment	Proportion of Income from Casual Employment	Proportion of Income from Other Employment
treat	-0.044 (0.033)	0.249*** (0.077)	0.008 (0.014)
Observations	16,104	16,104	16,104
R-squared	0.093	0.243	0.166
Control mean			

Panel D: Daily Earnings

	(1)	(2)	(3)
VARIABLES	Daily Earnings from Wage Employment	Daily Earnings from Casual Employment	Daily Earnings from Other Employment
treat	-2.162 (8.887)	16.663** (7.653)	0.112 (0.992)
Observations	16,104	16,104	16,104
R-squared	0.065	0.209	0.129
Control mean	0.017	0.125	0.000