



Food and Agriculture Organization
of the United Nations

Social Protection

From Protection to Production

A dose-response function approach for labour supply and cash transfers:

The case of Zambia

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Background and motivation

- Growing relevance of **UCTs as a Social Protection tool** for protecting lives & livelihoods
- UCTs in Africa increased ten-fold between 2000 - 2012, **spread in 41 countries**
- UCTs aim primarily at **reducing poverty** by improving nutrition and human capital
- Governments also interested in **productive impacts** or the lack thereof
- UCTs can help HHs boost market participation and productive activities.
- On the downside, increasing concerns among policy-makers of the possible incidence of UCT on **work incentives** and **dependency**

What does economic theory say?

- Several ways of how **unconditional CTs** might affect adult **labor supply** in recipient households
- **Income effect**: leisure more attractive than work
- **Ease labor market imperfections**
 - Eg reduction of fixed costs to work can translate into increased labor supply
- **Overcome credit market failures**
 - have increased access to productive assets.
- **Investment in livelihood activities**
 - Participate in non farm businesses, increase volume of on-farm work
- The interplay of these channels makes this an empirical issue

Literature review

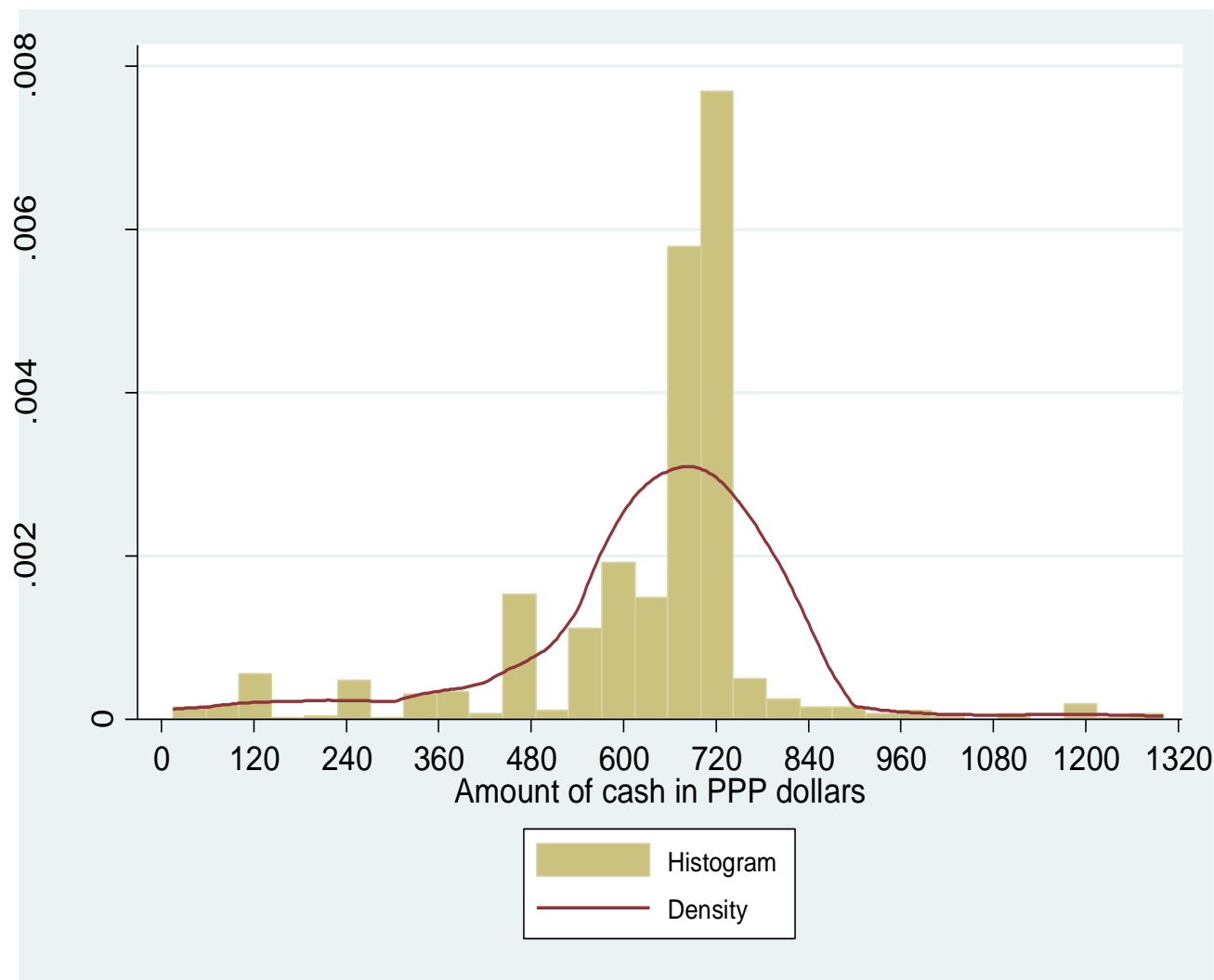
- Empirical studies on the effects of transfer payments on labor supply in developed countries **widely document disincentives** among recipient HHs (Moffit 1979, 2005; Blundell and Hoynes 2004)
- In **Latin America**, conditional CTs do not appear to have much impact on work incentives and adult labour supply. (Brazil: Ribas and Soares, 2011; Mexico: Skoufias et al., 2008; Nicaragua: Maluccio and Flores, 2005)
- Some evidence shows that CCTs may modestly reduce the time spent working, for males in Nicaragua (Maluccio and Flores, 2005) and females in Brazil (Teixeira, 2010)
- Studies focusing on labor outcomes of CTs in sub-Saharan Africa **do not show consistent evidence** in this regard (Daidone et al., 2017). If any, a reduction in casual wage labor (by-day, ganyu, maricho, etc.)



The Child Grant Program in Zambia

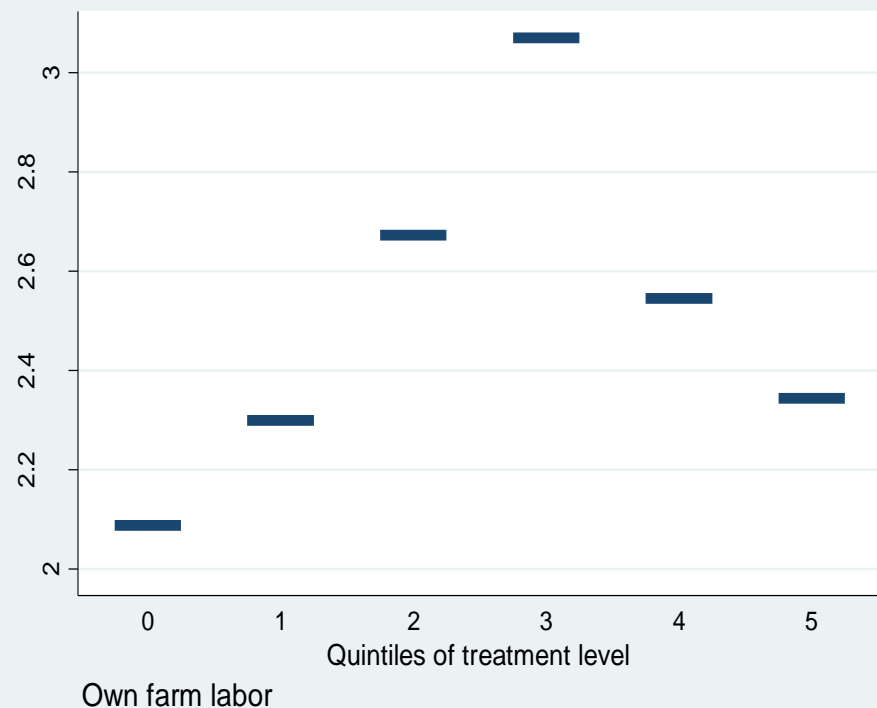
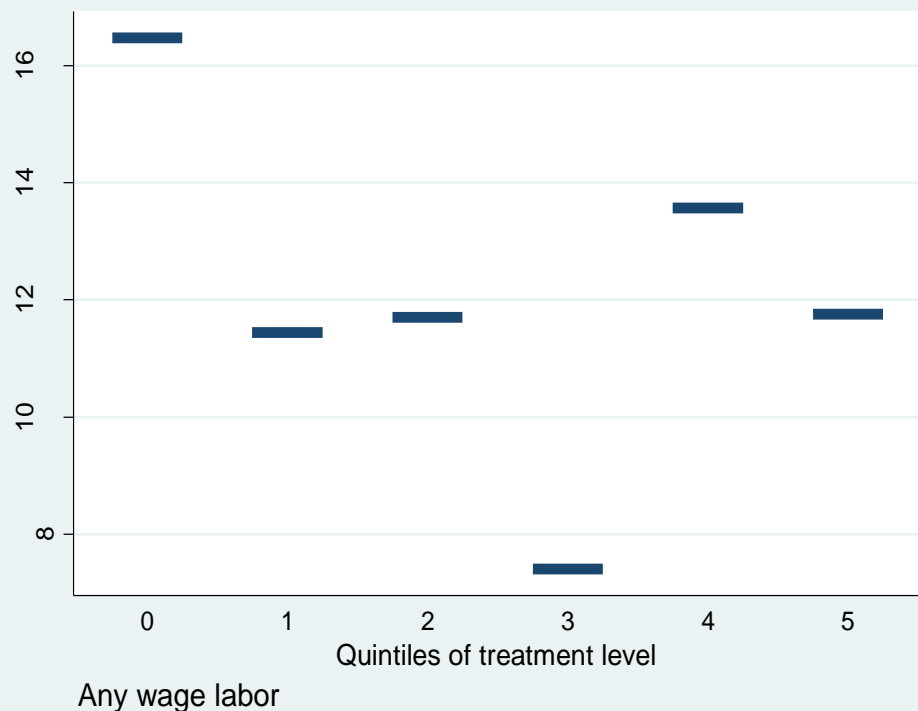
- **Child Grant Program (CGP)**: started in 2010 to alleviate poverty among the poorest and block its intergenerational transmission
- **Pilot evaluation** implemented in 3 districts with highest rates of mortality and morbidity among children under 5
- Categorical **targeting mechanism**, reaching any household with a child under 5
- Impact evaluation designed as a **longitudinal RCT** with two levels of random selection of participants, at the Community (CWAC) and household level. Randomization successful .
- Beneficiary households received **60 ZMK a month**, equivalent to 21 PPP dollars), around 28 % of a HHs monthly consumption expenditure
- **Transfer size supposed to be flat** regardless of HH size but some variability in the amount of cash received during 12 months through follow-up survey

Average yearly amount of self-reported transfer



- $\mu \approx 640$ ZMK
- $\sigma \approx 170$ ZMK

Labor supply by treatment levels



- **Any wage labor:** number of days per week worked by adult household members
- **Own farm labor:** Total number of days per week worked by all adult HH members in crop and livestock activities

Dose Response Function

- Parameter of interest (Dose response function)
 - $ATT(t) = E[Y_i(j) - Y_i(j) | t=j]$
- Identifying assumption – Conditional Mean Independence (CMI)
- Estimating equation – Linearity (Cerulli, 2014)
 - $$Y_i = \delta_0 X_i + (\delta \bar{X} + \bar{h})w + \delta(X_i - \bar{X})w_i + (h(t_i) - \bar{h})w_i + \varepsilon_i$$
- Estimates
 - $\beta_{OLS} = (XX)^{-1}X'y$
- HHs not randomly assigned to the different levels $t \in J$
 - \Rightarrow assume CMI .. but not clear how to gauge its validity

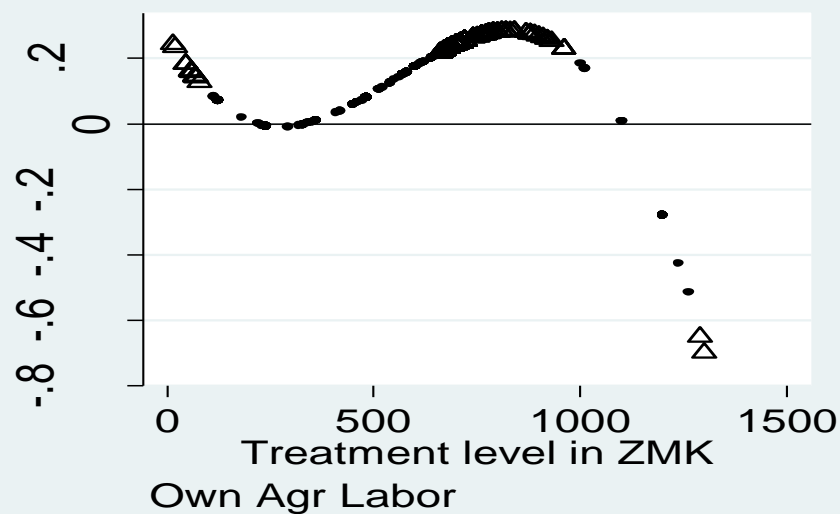
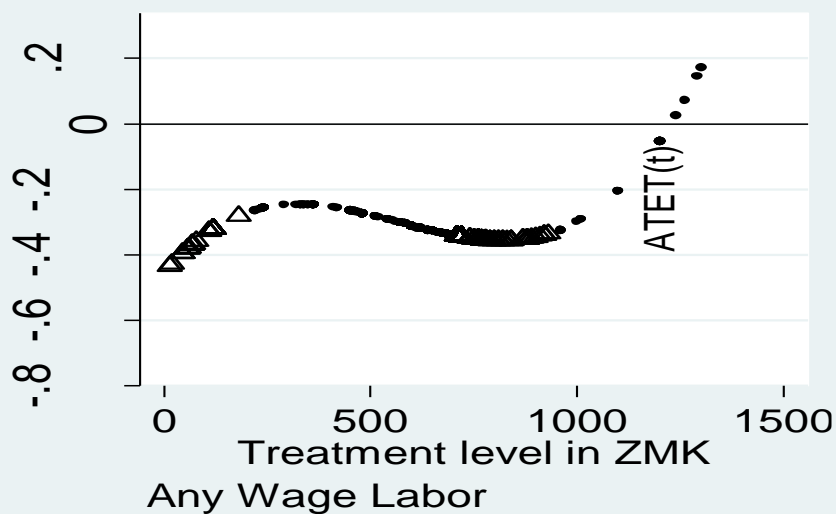
Selection on observables

- ❑ **Doubly robust (DR)** estimators may mitigate selection bias from non-random treatment assignment
- ❑ DR requires an **outcome model** and a model relating the probability of treatment t to X , i.e. the **GPS**: $P(t|X)$ (Uysal, 2015)
- ❑ Weighted estimation of the outcome equation with stabilized weights $S\omega = \frac{P(t)}{P(t|X)}$
 - $\beta_{WLS} = (X\Delta X)^{-1}X'\Delta y$ where $\text{diag } \Delta = \{S\omega_i\}$

Selection on unobservables

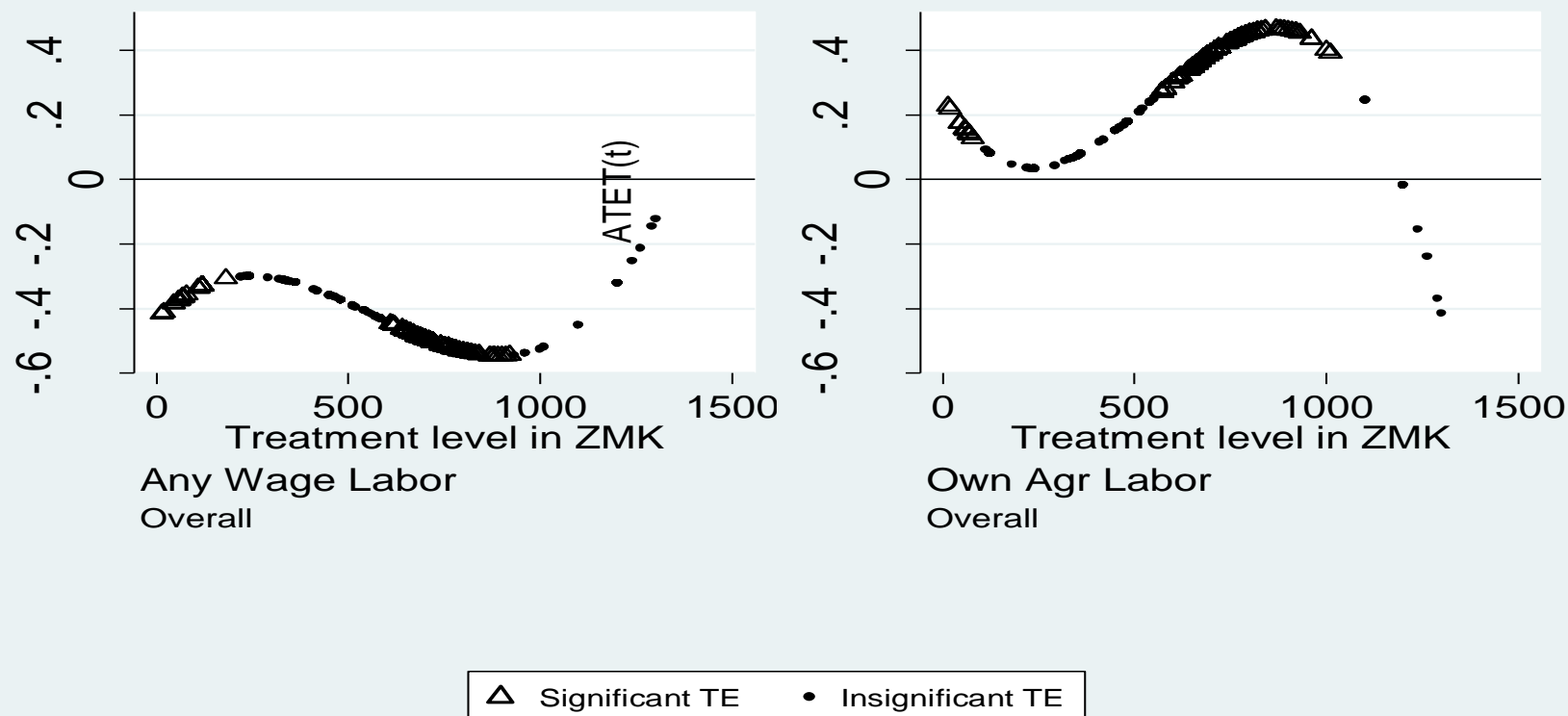
- ☐ Endogeneity bias addressed with instrumental variables
- ☐ Two separate instruments in a two-stage residuals inclusion model (Fichera et al., 2016)
- ☐ First stage: $t = \theta W + e$
- ☐ Second stage: Estimating equation as in Cerulli (2014) with the addition of the estimated residual \hat{e} from the first stage (bootstrapped standard errors)
- ☐ Instruments: 1) the time needed to collect the transfer; 2) the average transfer size at the community level
- ☐ Valid instruments!!!! (But obviously there will be people in the room disagreeing)

Labor supply DRF to non-labor income: mostly negative for wage labor, mostly positive for own farm labor

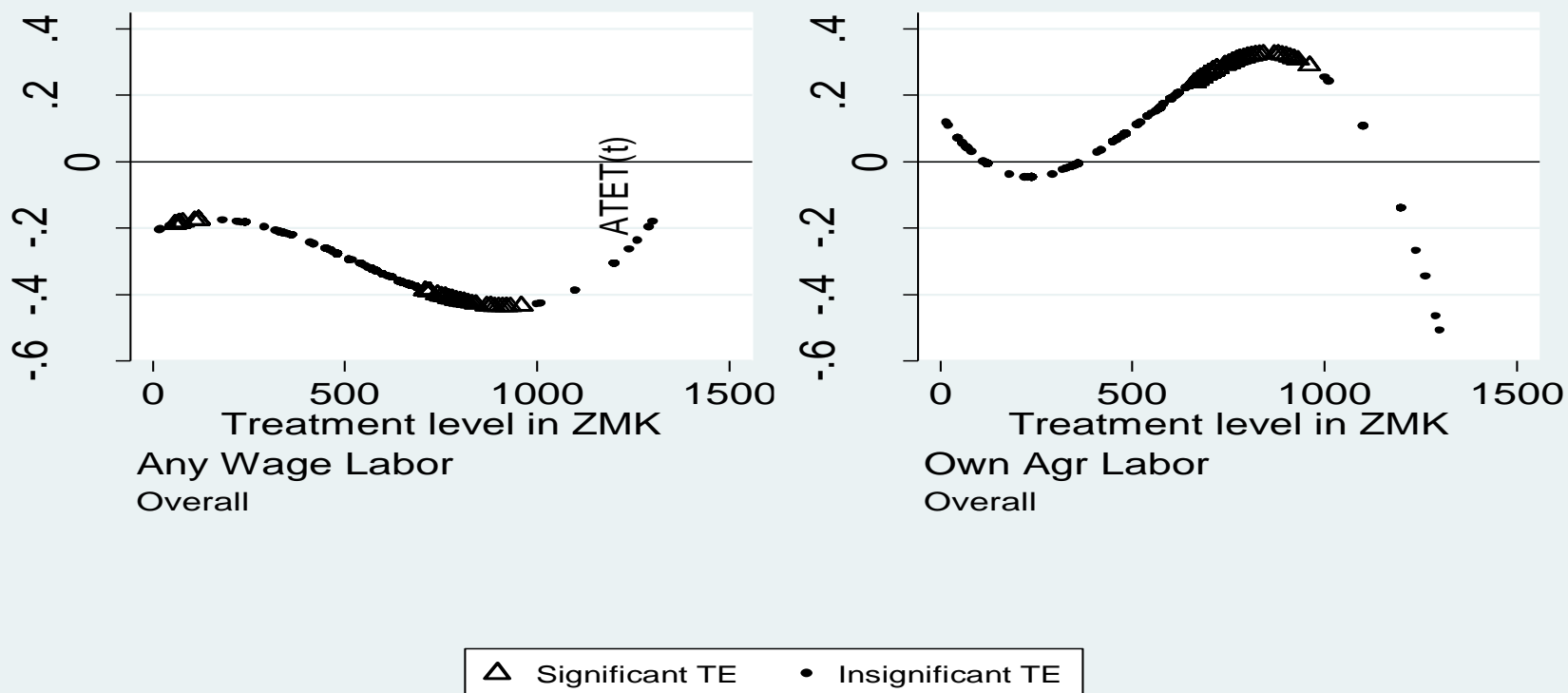


△ Significant TE • Insignificant TE

Response of labor supplied by HHs to changes in non-labor income: IV estimates, time needed to collect the transfer



Response of labor supplied by HHs to changes in non-labor income: IV estimates, average transfer size at community level



Conclusions

- CGP led to a reduction in the supply of beneficiary household labor to wage work regardless of the level of CT, though the effect is significant for relatively lower levels of the transfer
- CGP led to a increase in the labor supply to own farm labor activities, though significant only at relatively higher levels of transfers
- The effect of the CGP on own farm labor becomes negative only above 1250 ZMK. Possible existence of an optimal transfer level (in terms of labor incentives) greater than the average amount currently received by HHs
- Possible disincentive effects are well beyond the current transfer level (over 50 percent greater than the theoretical maximum)

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Thank you!!!

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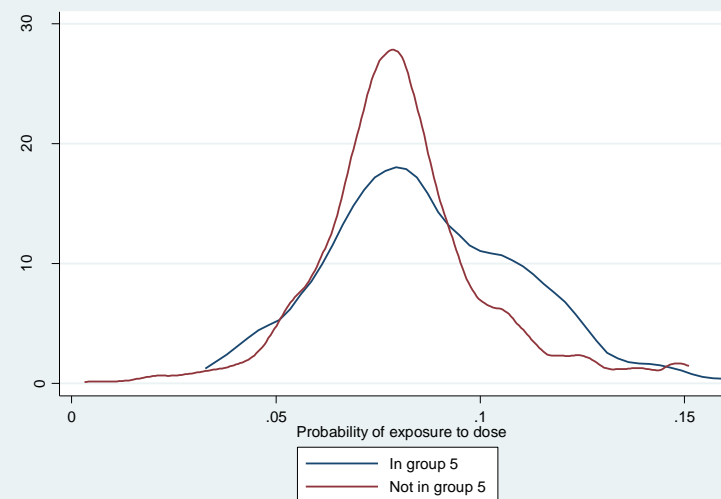
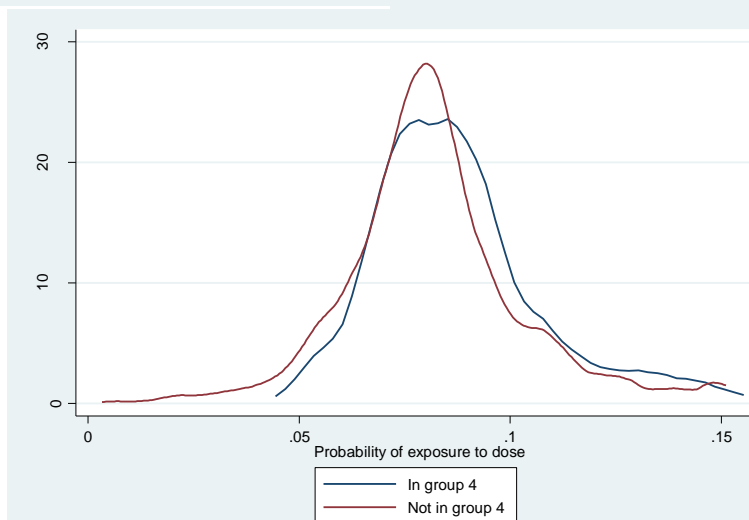
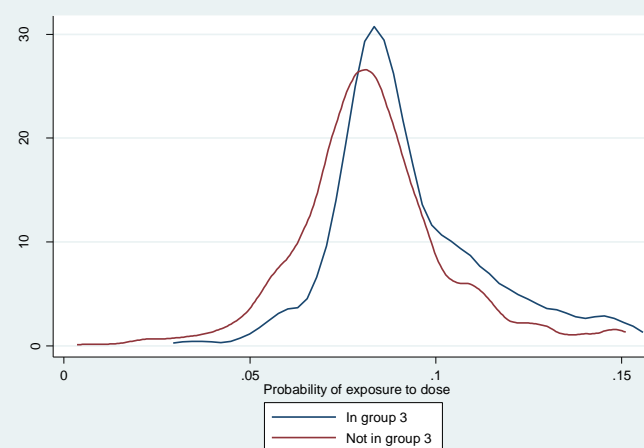
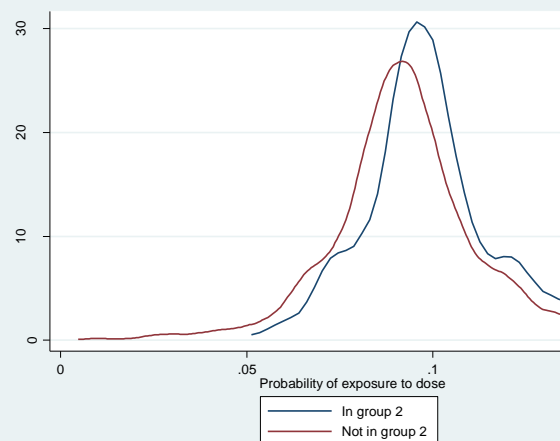
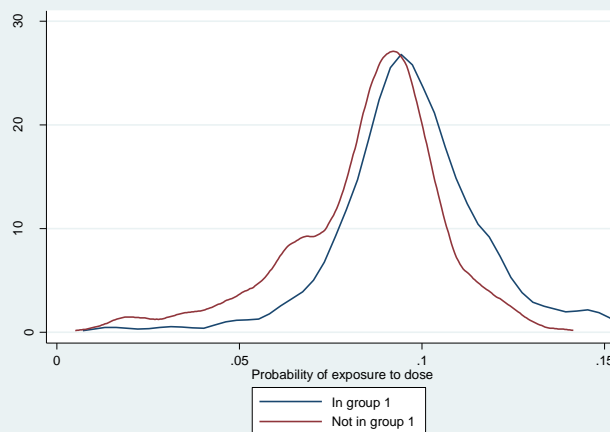
Transfer Project: [> link](#)

From Protection to Production: [> link](#)

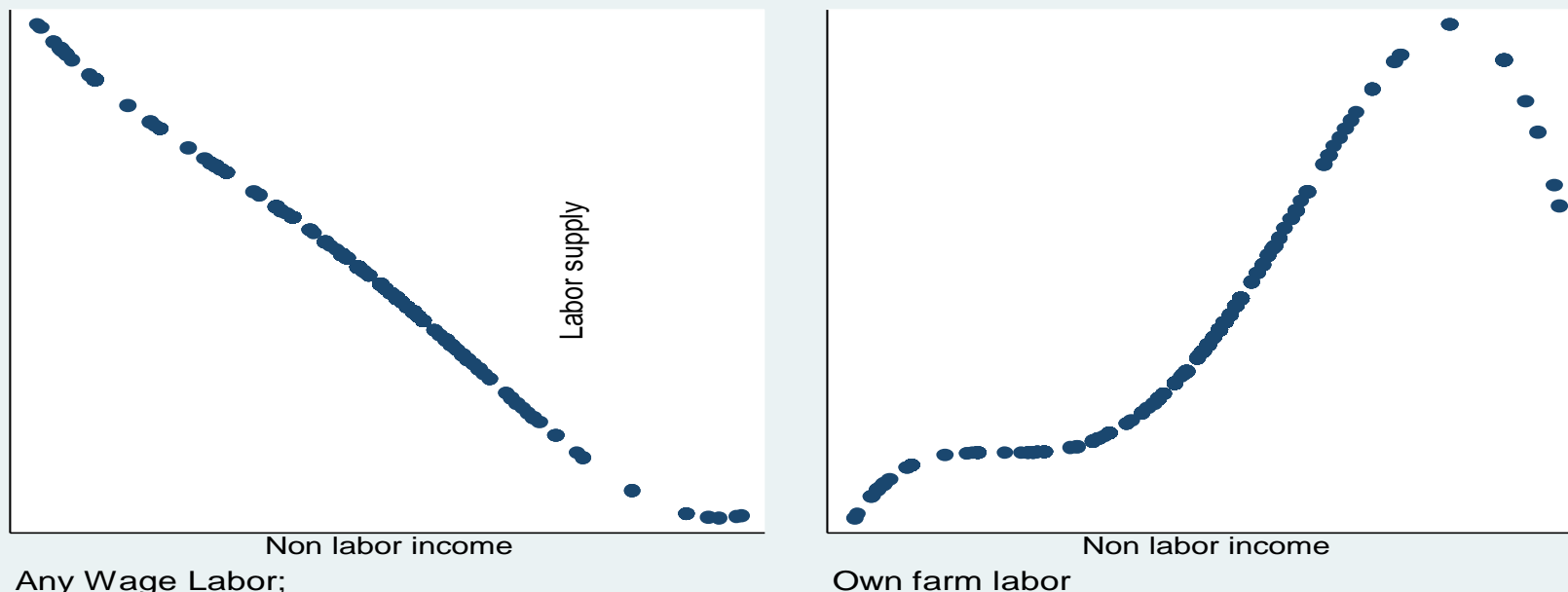
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Common support check for the GPS



Estimated relationship between supplied labor and non-labor income



Derived by numerical integration