When You Can't Afford to Wait for a Job:

The Role of Time Discounting for Own-Account Workers (OAWs) in Developing Countries

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working paper link

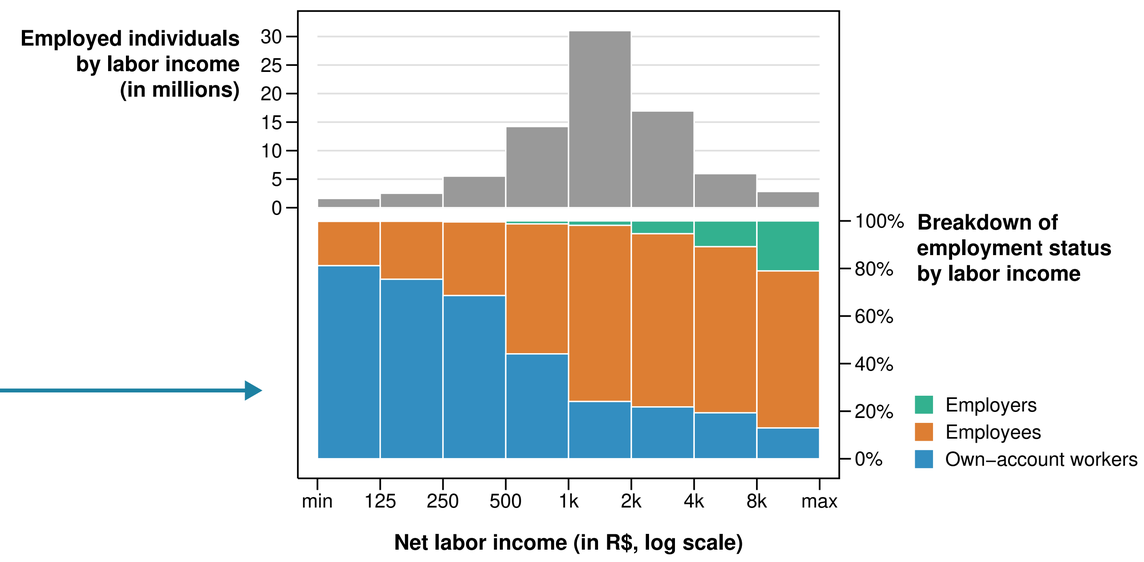
1. Question

Motivation: there are links between own-account work (OAW) and poverty.
OAWs often make up the bulk of the poorest workers, as we can see here for Brazil

Question: can we say those own-account workers are constrained?
Why does someone work as OAW if similar people are earning more as wage employees?

Hypothesis: the need for immediate income can affect the occupational choice.
Poorly paid OAW today can be preferable to looking for a better job that starts in the future.

Summary: This paper (a) proposes a simple framework for the intertemporal trade-off in the choice between own-account work and a wage job; (b) estimates the counterpart of this model using data from Brazil; and (c) discusses what we can learn from this intertemporal parameter.



2. Theory

The standard job search framework defines the **value of employment** (or unemployment) as the discounted income flow associated to that state, accounting for the probability of a state change.

Similarly, we define the **value of own-account work** as the discounted flow of its income; the key distinction is that OAWs do not need to spend time searching for an employer to start working.

In this context, OAW is preferable to looking for a wage job when:

$$y > b + \lambda \cdot \int_{w_r}^{\infty} \frac{w - w_r}{\rho + \delta} \, dF(w)$$

- y: earnings as own-account worker
- b: earnings while unemployed
- λ: rate at which I find wage job opportunities
- w_r: range of acceptable wages
- $dF(w)$: distribution of potential wages
- δ: rate at which I could lose a wage job
- ρ: rate at which I discount my future earnings

Reorganizing it, the occupational choice is expressed as a condition on the time discount rate:

$$\rho > \frac{\lambda}{y - b} \cdot \int_{w_r}^{\infty} (w - w_r) \, dF(w) - \delta$$

ρ: a sufficiently high discount rate makes OAW preferable to unemployment

3. Empirical estimation

The theoretical condition for choosing OAW has a direct **empirical counterpart**:

$$\hat{\rho}_i > \frac{\mathbb{E}(\lambda \mid X_i)}{y_i - \mathbb{E}(b \mid X_i)} \cdot \Big[\mathbb{E}(w \mid w > w_r, X_i) - \mathbb{E}(w_r \mid X_i) \cdot \mathbb{P}(w \geq w_r)\Big] - \mathbb{E}(\delta \mid X_i)$$

Intuitively, the pieces of the model are the answers to: *how long would I take to find a wage job? How much could I earn? How long would this job last?* **Technically**, they are estimated as follows:

y_i is directly reported by own-account workers;
$\mathbb{E}(\lambda \mid X_i)$ is fit with an unemployment duration model and with $\mathbb{P}(w \geq w_r)$;
$\mathbb{E}(b \mid X_i)$ is assumed to be zero, the most frequent value in the data;
$\mathbb{E}(w \mid w > w_r, X_i)$ is fit with a Heckman selection model;
$\mathbb{E}(w_r \mid X_i)$ is fit with a quantile regression at the 10th centile;
$\mathbb{P}(w \geq w_r)$ is calculated for a normal distribution of wages;
$\mathbb{E}(\delta \mid X_i)$ is fit with a wage job duration model.

4. Data

Data source A: Brazilian Household Budget Survey (POF 2017-18)
Cross-section survey (178 thousand individuals);
Rich set of income, personal finance, and material living conditions.

Data source B: Brazilian Labor Force Survey (PNAD 2017Q1 to 2018Q4)
Rotating panel, 5 consecutive quarters (560 thousand individuals per quarter).

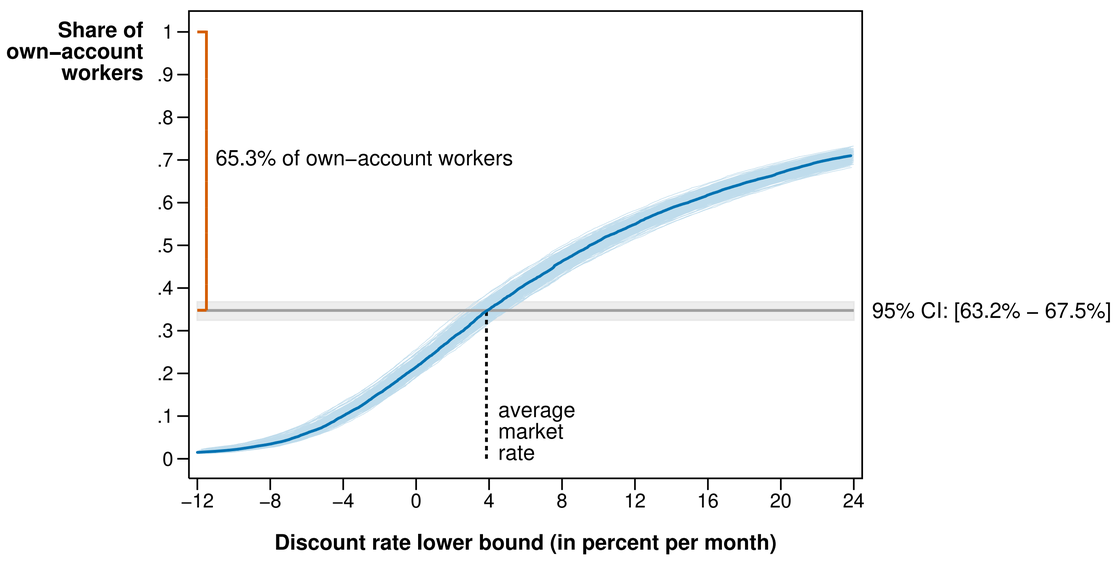
Population of interest:
125 million working-age individuals (14 to 64 years) who were living Brazil's urban areas in 2017-18.

5. Results

(a) About 2 in every 3 urban own-account workers in Brazil are financially constrained

Most of the OAWs appear to discount future income at rates superior to those available in the credit market, which we interpret as evidence of a financially constrained occupational choice.

Empirical Cumulative Distribution Function (CDF) of the estimated discount rate lower bound for OAWs



Notes: The dark blue curve shows the CDF at the baseline specification, and the light blue curves represent each one of the 400 replications of such estimation, leading to the bootstrapped confidence interval. The dashed reference line marks the average consumer credit rate for individuals in 2017-18.

(b) The estimated time discount parameter is associated with measures of deprivation

We conclude that individuals under severe deprivation (correspondingly, a very high discount rate) could be more likely to take up low-paid OAW, engaging in a potential poverty trap mechanism.