

# Measuring Informal Work with Digital Traces

## Mobile Payphone Operators in Rwanda

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### The informal sector is important...

- 30-40% of developing country economic activity (La Porta and Shleifer 2014)
- Street vending is 12-24% of employment in African cities (Roever and Skinner 2016)

...but hard to study. Participants churn, may underreport earnings in surveys, and the act of surveying can change later behavior (Zwane et al., 2011)

For mobile payphone operators, digital traces document the most important business decisions:

- the decision to enter the market
- daily: whether to work, where, when to start, when to take breaks, and when to end
- the decision to exit



Tuvugane Payphone operators  
Source: The New Times (newtimes.co.rw)

### Measurement

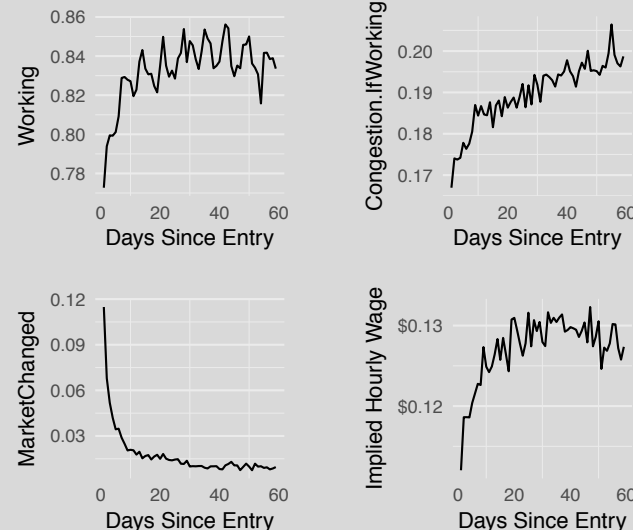
5.3b transactions from Rwanda's dominant telco, 2005-9.

Timestamp	Account (anonymized)	Handset Model	Duration	Charge

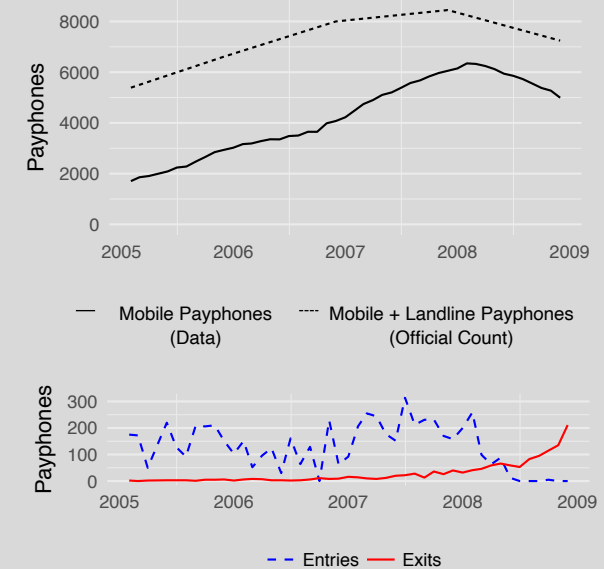
Identify payphones from handset model and pattern of charges. Cluster transactions on each account to identify work spells (using DBSCAN):



### Learning the trade



### A growing, then shrinking industry



### Business stealing?

More workers chasing the same amount of business. Is this the result of overentry? (Berry and Waldfogel 1999)

