

# The Geography of Talent in Cities

Santiago Truffa

28/02/2016

# Motivation: Talent Sorting

- ▶ Why are workers more productive in cities?
  - ▶ 1. Cities make workers more productive (Agglomeration Externalities AE)
  - ▶ 2. More productive workers decide to live in cities (Sorting)
  - ▶ 3. both of the above
- ▶ Difficult to disentangle
  - ▶ Endogenous externalities
- ▶ What is the relative importance of sorting when accounting for productivity divergences between cities?

# Motivation: Talent Sorting

- ▶ Why do workers sort?
  - ▶ 1. Amenities (consumption city)
  - ▶ 2. Housing market restriction (Super Star Cities)
  - ▶ 3. Productivity differences (AE)
- ▶ Problems with (3)
  - ▶ Assumes worker's (movers) capture a substantial fraction of productivity gains
  - ▶ Most TFP gains accrue to landowners (Hornbeck Moretti 2015)
  - ▶ Practical concerns

# What I do

- ▶ Build a GE model of sorting of heterogeneous agents across a system of cities
- ▶ Link housing supply and amenities to talent composition
- ▶ Allows for AE to interact with the skill composition.. but does not need AE to generate sorting
- ▶ Uniquely solve a functional problem: skill distributions, wage schedule, task-talent matching function
- ▶ Calibrate with US data

# Production in the City

- ▶ Builds on Costinot Vogel (2010) CV
  - ▶ System of cities connected through labor mobility
  - ▶ Heterogenous agents with a continuum of skills can freely choose where to live
  - ▶ Assignment model: continuum of skills can be allocated to a continuum of tasks
  - ▶ Markets are perfectly competitive

# Housing Market

- ▶ Follow Albrecht, Gautier and Vroman (AGV) 2009
  - ▶ Workers need to consume 1 unit of housing
  - ▶ Exogenous houses for sale
  - ▶ Endogenous potential buyers arrive (ala Poisson) to a house and compete for it in an auction
  - ▶ High skill workers can bid out low skill workers on tight housing markets

# Equilibrium and Appologies

- ▶ The expected value that a Buyer would get from moving to city  $i$
- ▶  $U(w(s)) = (w(s) - v(w(s)))e^{\beta*a^i} e^{-\theta(1-F(w(s)))} + ru(s)$
- ▶ Where  $v(w(s))$  is the optimal bid
- ▶  $e^{\beta*a^i}$  amenity value of living in the city
- ▶  $ru(s)$  is the reservation utility
- ▶  $e^{-\theta(1-F(w(s)))}$  is the probability wining auction
- ▶ Given optimal bid in a first price auction
- ▶  $U(s) = \frac{1-V(s)}{v(s)} e^{\beta*a^i} e^{-\theta(1-V(s))}$
- ▶ Spatial Equilibrium for every  $s$ 
  - ▶ solve for  $V()$  and  $dV/ds$  (ODE)

# Analytical Results

- ▶ Existence and Uniqueness
- ▶ Monotone Likelihood Ratio Property (MLRP)
  - ▶ Cities with more restricted housing supply will feature in equilibrium a higher fraction of high skill workers to low skill workers
- ▶ Skill Upgrading
  - ▶ In cities with more restricted housing supply the same jobs will be performed by more skilled workers
- ▶ Model allows for endogenous productivity differences originating "only" from sorting



# Calibration

- ▶ We use data from a large online neuroscience research company to generate distributions of cognitive abilities
- ▶ We want to recover 3 parameters
  - ▶ Taste for amenities: Matching empirical to theoretical moments of talent distribution
  - ▶ Agglomeration externalities: From between cities differences in wages
  - ▶ Skilled biased (complementarity) technological shifter: From within cities differences in wages

# Policy Analysis

- ▶ Quantify relative importance of different mechanisms when accounting for wage and talent dispersion
- ▶ City fundamentals (Amenities and Housing) can have important effects in productivity through the spatial distribution (and composition) of the population
- ▶ Housing Policy requires a GE framework that can account for the intricacies of spatial equilibrium

# The Geography of Talent in Cities

Santiago Truffa

28/02/2016