College-to-work migration of technology graduates and holders of doctorates within the United States

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Introduction

- What is the destination choice of technology graduates in the U.S. without government incentives?

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Research questions

- Are the economic opportunities more important than amenities and lifestyle factors in the migration decision of technology graduates?

- What is the technology doctorate migration behavior?

- What is the affinity-grouping behavior of international technology students?
Model

\[ \text{Max} U_{ij} = \beta' x_{ij} + \varepsilon_{ij} \quad i, j \quad \text{Individual, destination} \]

Probability i chooses destination j

\[ P(Y_i = j) = L_{ij}(\beta) = \frac{\exp(x'_{ij}\beta)}{\sum_j \exp(x'_{ij}\beta)} \]

Logit

\[ U_{ij} = \beta' x_{ij} + \eta_i' z_{ij} + \varepsilon_{ij} \]

\[ P(Y_i = j \mid \eta_i) = L_{ij}(\beta, \eta_i) = \frac{\exp(x'_{ij}\beta + z'_{ij}\eta_i)}{\sum_j \exp(x'_{ij}\beta + z'_{ij}\eta_i)} \]

Logit with Random Effects

\[ \eta_i \sim f(\eta_i \mid \theta) \]

Unobserved heterogeneity

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Data

- U.S. residents (PhD, MS, BSc in science or engineering) or work in science/engineering
- Metropolitan scale

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<th>Origins</th>
<th>Destinations</th>
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Data

Independent variables

- **Place characteristics**: amenities (e.g. climate, recreational), crime, cost of living, unemployment, employment growth, poverty, population, educational attainment, R&D/employee, nationality and origin, distance origin to destination;

- **Personal characteristics**: Demography (e.g. age, sex, marital status, salary), occupation (e.g. degree in life science, IT, physical science, engineering, social science)

Add random effects to parameters of place (educational attainment, R&D, poverty, crime, climate score, unemployment rate).
Results

- Distance, city size: repellent/attractor to in-migration

- Willingness to work farther the higher the wage

- Place of birth affinity; smaller cities attraction for TECH grads

- Place attributes
  - in-migration deterents: poverty, cost of living, R& D spending
  - in-migration drivers: climate, employment growth, human capital, unemployment rate at destination

- internationals attracted towards same ethnicity places (exception Chinese PhDs, Arab & Latin BS/MSc grads)
- Silicon Valley argument holds

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Results

- **Quality of life vs. economic factors**
  - Amenities (recreation, climate) secondary importance
    - crime paradox: only PhDs negative response
  - Economic conditions (unemployment) & San Francisco, NY primary importance
- **PhDs vs BS/MS**
  - PhDs stronger response to amenities (climate, crime), weaker response to economic growth
  - Puzzle: PhD and BS/MS equal response to unemployment rate
  - PhDs less likely to avoid NY
- **“Home” affinity**
  - Internationals: BS/MS 75%; PhD 41% stayed
  - Domestic born: BS/MS 67%; PhD 52% stayed
  - Intl’s (MS/BS)/(PhD) more/less probable to stay than domestic

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Questions?