Recent Developments in Economic Geography

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Introduction

• In my view, three main developments since Krugman’s Nobel

1 Theoretical developments
2 Data developments
3 Developments at the intersection of theory and data
4 Changes in substantive focus

• Illustrate these points with some examples
• In each area, we have made steps forward, but there remain many limitations and areas where further research is needed
• In my view, there remain exciting challenges ahead
(1) Theoretical Developments

- Initial theoretical work considered stylized settings with a small number of symmetric regions.
- Now theoretical techniques for large numbers and asymmetric regions with realistic geographies of trade costs.
  - Tools for proving the existence and uniqueness of equilibrium in these high-dimensional settings (Allen and Arkolakis 2014).
  - Tools for undertaking counterfactuals and comparative statics in these settings (e.g. Redding 2016).
  - Conditions under which models are or are not isomorphic.
- Rich range of spatial linkages between locations:
  - Trade in goods, commuting and migration (e.g. Monte, Redding and Rossi-Hansberg 2018).
- Dynamics of the spatial distribution of economic activity:
- Path dependence and multiple equilibria.
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(2) Data Developments

- Increasing availability of GIS data
  - Enhanced ability to measure and analysis the spatial distribution of economic activity at a fine spatial scale
  - Within the field of international trade, increasing amount of research uses data within countries
  - “One of the best ways to understand how the international economy works is to start looking at what happens inside nations ... The data will be better and pose fewer problems of compatibility, and the underlying economic forces will be less distorted by government policies.” (Paul Krugman, 1991)
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- Reduction in digitization and computational costs
  - Quantitative analysis of historical data (e.g. Donaldson 2018, Donaldson and Hornbeck 2016, Redding and Sturm 2008)
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- Big data (precise but narrow)
  - Cell phones (e.g. Jonathan Dingel and co-authors)
  - Uber and taxi cab (e.g. Bucholz 2018)
  - Yelp data (e.g. Davis et al. 2019)
(3) Intersection of Theory and Data

• Structural estimation of quantitative economic geography models using spatially-disaggregated data
  – Holmes and Sieg (2015)

• To what extent can our models account for the observed patterns in the data, not only quantitatively but also qualitatively?
  • Structural estimation
  • Model validation (overidentification)
  • Counterfactuals
The Division of Berlin
Qualitative Predictions for Division

- Firms in West Berlin cease to benefit from production externalities from employment centers in East Berlin
  - Reduces productivity, land prices and employment
- Firms in West Berlin lose access to flows of commuters from residential concentrations in East Berlin
  - Increases the wage required to achieve a given effective employment, reducing land prices and employment
- Residents in West Berlin lose access to employment opportunities and consumption externalities from East Berlin
  - Reduces expected worker income, land prices and residents
- The impact is greater for parts of West Berlin closer to employment and residential concentrations in East Berlin
- Employment and residents reallocate within until wages and land prices adjust such that:
  - Firms make zero profits in each location with production
  - Workers are indifferent across all populated locations
  - No-arbitrage between commercial and residential land use
West Berlin 1986
Berlin 2006
Explaining the Data Quantitatively

**TABLE V**

**GENERALIZED METHOD OF MOMENTS (GMM) ESTIMATION RESULTS**

<table>
<thead>
<tr>
<th></th>
<th>(1) Division Efficient GMM</th>
<th>(2) Reunification Efficient GMM</th>
<th>(3) Division and Reunification Efficient GMM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuting Travel Time Elasticity ($\kappa \varepsilon$)</td>
<td>0.0951***</td>
<td>0.1011***</td>
<td>0.0987***</td>
</tr>
<tr>
<td></td>
<td>(0.0016)</td>
<td>(0.0016)</td>
<td>(0.0016)</td>
</tr>
<tr>
<td>Commuting Heterogeneity ($\varepsilon$)</td>
<td>6.6190***</td>
<td>6.7620***</td>
<td>6.6941***</td>
</tr>
<tr>
<td></td>
<td>(0.0939)</td>
<td>(0.1005)</td>
<td>(0.0934)</td>
</tr>
<tr>
<td>Productivity Elasticity ($\lambda$)</td>
<td>0.0793***</td>
<td>0.0496***</td>
<td>0.0710***</td>
</tr>
<tr>
<td></td>
<td>(0.0064)</td>
<td>(0.0079)</td>
<td>(0.0054)</td>
</tr>
<tr>
<td>Productivity Decay ($\delta$)</td>
<td>0.3585***</td>
<td>0.9246***</td>
<td>0.3617***</td>
</tr>
<tr>
<td></td>
<td>(0.1030)</td>
<td>(0.3525)</td>
<td>(0.0782)</td>
</tr>
<tr>
<td>Residential Elasticity ($\eta$)</td>
<td>0.1548***</td>
<td>0.0757**</td>
<td>0.1553***</td>
</tr>
<tr>
<td></td>
<td>(0.0092)</td>
<td>(0.0313)</td>
<td>(0.0083)</td>
</tr>
<tr>
<td>Residential Decay ($\rho$)</td>
<td>0.9094***</td>
<td>0.5531</td>
<td>0.7595***</td>
</tr>
<tr>
<td></td>
<td>(0.2968)</td>
<td>(0.3979)</td>
<td>(0.1741)</td>
</tr>
</tbody>
</table>

*a* Generalized Method of Moments (GMM) estimates. Heteroscedasticity and Autocorrelation Consistent (HAC) standard errors in parentheses (Conley (1999)). * significant at 10%; ** significant at 5%; *** significant at 1%.
(4) Changes in Substantive Focus

• Transportation and the spatial distribution of economic activity
  – Connection between reduced-form findings and spatial general equilibrium models
  – Optimal transport networks (Fajgelbaum and Schaal 2017)

• Local labor market effects of trade
  – Connection between reduced-form findings and spatial general equilibrium model

• Spatial sorting and the geography of jobs
Areas for Further Research

• Spatial dynamics of economic geography
  – Timing of the response to local labor market shocks
  – Path dependence and persistence

• Understanding the mechanisms for agglomeration
  – Agglomeration of services
  – Tasks in urban versus rural areas over time

• Understanding geographic mobility
  – Decline in measured geographical mobility in the U.S.
  – Lack of population response to local labor market shock
  – Substantial historical changes in the population distribution

• Appropriate public policies for lagging regions
  – Rural areas and the left-behind
  – Factory towns and industrial cities
  – Superstar cities and the aggregate economy
  – Political economy implications
Thank You