

Discussion of
“Commuting Infrastructure in Fragmented Cities”
by Olivia Bordeu

Jessie Handbury

Wharton-UPenn

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This Paper

- Political fragmentation limits interstate flows impeding growth (countries, states, municipalities).
 - Trade solution: international cooperation to reduce barriers to trade
 - Urban solution: centralize decision-making power

Question: How does decentralized infrastructure investment impede city growth?

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- This paper:
 1. Striking spatial patterns of infrastructure around municipal borders within Santiago.
 2. Models municipal investment decisions in Allen-Arkolakis quantitative model of commuting.
→ novel result: establishes optimality of observed network discontinuities
 3. Predicts spatial reallocation in counterfactuals with centralized investment decision.
→ unanticipated result: most gains can be achieved via coordination, without additional investment

Comments

1. What is the main contribution?
2. Where and how to sharpen identification?
3. Are the distributional impacts an artifact of the model? Are they robust to the lens of reality?
(And are they necessary?)

Contribution

- Builds on Loumeau (2020), who quantifies the role of discontinuities in transport networks in dampening commuting flows.
- This paper: layering political economy of infrastructure investments into QSM
 - Why do we see discontinuities at municipal boundaries?
 - What would the central planner do, and to what effect?
 - The answers are not obvious – and impacts extend beyond the boundary!

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- First-order consideration: government objective function
 - Land value seems appropriate target, but model is (necessarily) stylized.
 - What about other public goods?
 - Are there complementarities, e.g., between land use/zoning and commuting infrastructure?

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 - What about other public goods?
 - Are there complementarities, e.g., between land use/zoning and commuting infrastructure?
- Potential extension/reframe: cooperative “trade” solution
 - Directly target optimal commuting infrastructure without forgoing benefits of decentralized government e.g., inter-municipal cooperation with trading scheme and/or tollway/BRT system

Identification Threat #1: Endogenous border locations

- What explains border placement?
 - Note: The paper drops any naturally-existing borders (e.g., rivers).
- Scenario 1: Santiago is a federation of pre-existing towns-turned-municipalities.
 - Do municipality centers have strong fundamentals?
- Scenario 2: Areas of Santiago incorporated as municipalities for zoning (or other) purposes.

Suggestion: Loumeau (2020) uses historical French department plan instrument. Results were “qualitatively” consistent. Check robustness of these results to estimated bias.

Identification Threat #2: Endogenous firm/residential locations

- Commuting disutility (assuming a dispersion of residence-work pair shocks, θ) is identified using cross-sectional commuting flows:

$$\ln L_{ij} = \alpha_i + \beta_j - \theta \kappa \text{Time}_{ij} + \varepsilon_{ij}$$

- How is this biased by firms locating strategically relative to workers?
 - A firm might locate nearer its “loyal” workers, generating upward bias in commuting elasticity.
 - Or a firm may locate nearer marginal workers, “harvesting” willingness-to-travel of loyals.

Suggestion: check “bottom-line” sensitivity to this parameter

Identification: Model Quantification

- Validate choices of calibrated parameters with non-targeted moments/parameters
- Run sensitivity analysis to assess which parameters are the most important, and test these.
 - e.g., the implied value of time (common estimand in transportation literature)

Suggestion: Use the discontinuity in infrastructure to identify more than infrastructure elasticity.

Distributional Impacts

- Paper is refreshingly upfront about inability to speak to distributional effects in full GE (the model assumes homogenous income households).
- Yet hard to ignore correlation in counterfactual impacts with ex-ante income sorting patterns.
 - Constrained counterfactual shifts residents to mixed-income and employment to wealthy.
- So there are implicit distributional effects.

Ex-Ante Sorting Patterns and Counterfactual Adjustments

(b) Socio-economic status

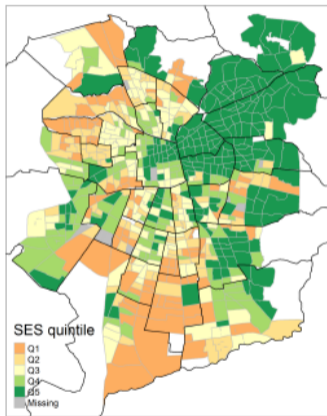
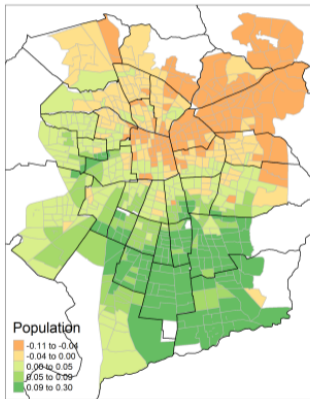
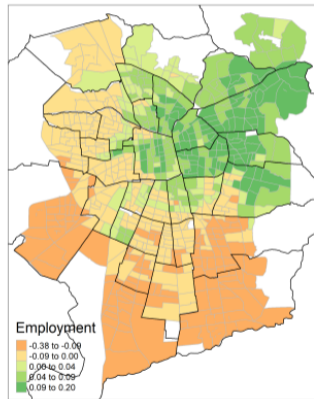


Figure 16: Constrained counterfactual - Changes to the city's population

(a) Residents



(b) Employment



Question: why does are counterfactual shifts correlated with income sorting?

Ex-Ante Sorting Patterns and Spatial Distribution of Fundamentals

(b) Socio-economic status

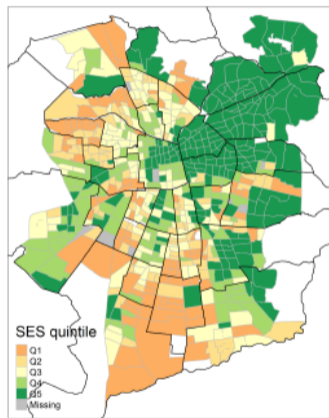
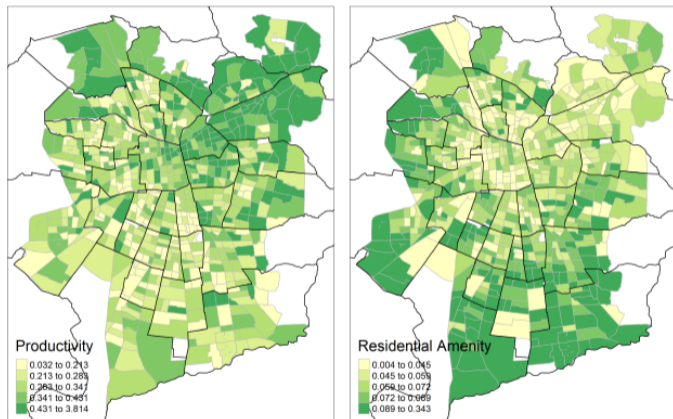


Figure 13: Exogenous amenities and productivity



The poor live in checkerboard high-amenity locations (Harari, 2024), while wealthy live in high-productivity locations.

What explains this spatial redistribution?

This class of models attributes unexplained variation to fundamental amenities and productivity.

- Reality check 1: the residuals contain errors (misspecification, measurement).

- Consider, e.g., amenities and rents

$$\bar{B}_i = \left(\frac{L_{Ri}}{L}\right)^{\frac{1}{\theta}} q_{Ri}^{1-\alpha} \left(\sum_j (w_j/\tau_{ij})^\theta\right)^{-\frac{1}{\theta}}, \quad \text{where } q_{Ri} = (1-\alpha) \frac{L_{Ri}}{H_{Ri}} \sum_j \frac{(w_j/\tau_{ij})^\theta}{\sum_k (w_k/\tau_{ik})^\theta} w_j.$$

- Is measurement error in rents q_{Ri} ? Is demand for housing Cobb-Douglas?
- Reality check 2: amenities and productivity are endogenous (agglomeration)

Endogeneity is likely to (only) impact magnitudes,
but does misspecification/measurement error impact qualitative conclusions?

Final Thoughts

- Elegant combination of new tools to address a real-world issue.
 - Demonstrates downside of the municipal fragmentation that characterizes cities worldwide.
 - Proposes cooperative solution, akin to international environmental and trade policy.
- For submission,
 - Highlight optimal policy contribution that builds on Loumeau (2020).
 - Write/submit carefully to avoid identification hawks and QSM skeptics, or address them directly!

Smaller Questions

1. Are construction costs identical at different parts of the city? Presumably they vary with land costs at least.
2. How are the multiple equilibria of traffic flows determined? (Is this part of the Allen-Arkolakis magic?)
3. Is excluding borders that coincide with geographical faults (e.g., rivers) problematic, since these may need even more infrastructure investment?
4. Is the bilateral commuting cost index (viii) jointly implied by the travel demand (iii) and edge-level commuting costs (ix)?
5. In the optimal equilibrium local to the observed equilibrium, or is it globally optimal? Doesn't the Nash bargaining imply multiple equilibria?
6. Is trip-chaining important in the routing decision? Are route's connected edges or is it a selection of each edge? Also: won't investment create new routes that have zero weights? How is that handled?

Smaller Suggestions

1. Demonstrate how the predictions of the model vary with different distributions of exogenous productivity/amenities; land share of utility and production; elasticity of residential and employment flows.
2. Add some facts up front?
3. Should we weight road density within a neighborhood the same as the density of main arteries? Alternatively, should we calculate road density per resident/employee?
4. Identification: could these facts be reconciled with a different model that would have substantively different predictions for the centralized counterfactual?
5. It seems odd that the 2 parameters you claim are the most important are taken from other papers (floor space share of production housing share in utility).
6. How restrictive is the assumption of fixed residential/commercial land supply (it's fairly realistic in the U.S. - for example).