Our Spatial Paper

Your Name

January 30, 2025

Abstract

Please be concise.

1 Project Plan

- Idea Formation and Lit Review Jan 13-17 [together]
- Theory - Coming up with a Model/Try to meet with Esteban to get feedback? Jan 20-22 [together]
- Theory - Solving the Model Jan 23-24 [Key Person = Henrique]
- Coding (data, estimation, counterfactual, and results) - Jan 27 - Jan 31 [Key Person =]
  - Inputs are fairly divisible
  - Outputs are less divisible
  - Writing - Feb 4 - 7 (KeyPerson)

2 Meeting Notes

1. Could have teams of (2) for various things.
2. There are some tasks that are independent.
3. Decide to break stuff up once we actually have an idea.
4. Henrique: Likes Lit Review / Idea Formation / Likes Writing [let us simplify model if possible]. Prefers the equilibrium part of coding to the early / data cleaning part Less good at Geodata. Very good at polishing and visual details.
5. Jeffrey: Likes Coding / Likes Writing
6. Yulia: Interested in counterfactuals part of coding. Curious about theory. Experience about writing / likes writing.

2.1 for next meeting, Jan 17

1. Read model / counterfactuals of Monte et al in detail enough
2. In the Esteban choose your model
3. Map Monte et al to Esteban's choose your model.
4. Look at Jeffrey's ideas.

2.2 During next meeting

1. pick idea
2. assign data

3 Introduction

What is the question or policy you want to examine? Although we encourage creativity, our main goal is to make you more familiar with quantitative spatial models and give you some practice. If you have hard time coming up with an implementable idea, you can choose from the following list of topics

paste in jeffrey's motivation from erh meeting We are going to examine the impact of the introduction of autonomous vehicles (AVs) on the spatial distribution of economic activity, and welfare.

While there is substantial uncertainty as to where AVs will be most adopted, and their costs, states are currently making decisions about how to regulate AVs (citation XYZ); this exercise will be useful to those deciding how to form regulations.

4 Background and Diagnostic

Prompt:Why is the question or policy you want to examine important? Why is a quantitative spatial model the right tool to answer the question? Are there any particular features of the policy/economic environment that are impor- tant for the analysis? Feel free to focus on one or a few aspects that you want to study in depth and identify the underlying mechanisms, which will inform you about the key elements to be included in your model.

Once widely adopted, AVs simply represent a decline in commute costs.

But when we view AVs as not only a change in commute costs, but as a substitute for certain types of labor (e.g. taxi drivers, truck drivers),

cost of housing near work or near home?

The gain from substituting to AVs should be especially large where rents are high, since there are places where (i) wages must be high for low-skill workers, (ii) commuting is relatively more attractive.

We thus note this technology will have varied impacts (i) on low-skill and high-skill agents, and in (ii) areas where the cost of housing is relatively high vs.

low. This intuition is well-illustrated by the following 2x2 table: does it need to be 2x2 or would 1x2 be enough

	High Skill	
High Rent	Unambig. Benefit, Declining Commute Costs	Ambig.: Wage
Low Rent	Unambig. Benefit, Declining Commute Costs (but smaller than for high rent)	Ambig.: Wage

Table 1: Impact of AVs on different skill levels and places

The key question we hope to begin answering is **how varied benefits, across skill-levels and space, will determine the winners and losers of this technology, and the spatial distribution of economic activity**.

For tractability, we will start by capturing this intuition of the 2x2 table in a reduced-form way, **by reducing bilateral commute costs proportionally to the population-weighted mean college-educated share of the pair.**

5 Model

We begin with the model of [Monte et al., 2018].

5.0.1 Simplifications and Tweaks

In a future draft, we may consider the following simplifications:

1. removing trade

In a future draft, we may consider the following extensions:

1. (i) heterogeneity: explicitly model high and low skill types
2. (ii) endogenize low-types' wages.
3. (iii) consider the forward-looking decision of a household to purchase an A.V.

6 Data and Estimation

We use data on wages (based on place of work), commuting flows, distances, etc.

Estimating ψ
Estimating ϕ
Estimating ϵ
Calculating productivity vector A_i
Calcualting aggregate bilateral amenities matrix $\mathcal{B}_{in}$

7 Counterfactual

We take as our base economy the one with no AV adoption, and commuting costs are calibrated using existing flows.

We then shock the economy by introducing varied adoption, based on the aggregate skill-level of the county pair.

8 Appendix

Painful proofs go here.

References

Ferdinando Monte, Stephen J Redding, and Esteban Rossi-Hansberg. Commuting, migration, and local employment elasticities. *American Economic Review*, 108(12):3855–3890, 2018. doi: 10.1257/aer.20151507.