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Mapping Out Mobility: The Interregional Labor Supply Elasticity and its Determinants

This project constructs a novel measure of interregional mobility and studies its determinants, such as transportation infrastructure.

The mobility elasticity—i.e., the ease with which workers move across places—plays the central role in the determination of the spatial equilibrium in urban economics models. In those models, individuals choose their location of work among the menu of all locations in a given country, comparing costs and benefits in the form of place-specific moving costs and non-monetary benefits, as well as interregional differentials in housing costs, price indices and—crucially—the wage. As a result, analogously to a given employer or an aggregate economy, a place faces an — interregional — labor supply curve: how many workers choose to locate and work in it, as a function of, e.g., the local wage.

The shape of this place-specific labor supply curve is the crucial factor in regional evolutions: when labor supply to a location is elastic, a place can easily expand when its firms do well, leading the economy to grow; by contrast, shrinking locations quickly shed their workers, rather than keeping workers stuck in the location and increasing local unemployment. Hence, the interregional labor supply elasticity determines the growth of the economy, local wage growth, and ultimately local congestion and house prices.

Yet, to date, there exists no dedicated meta-analysis of empirical estimates of this elasticity, and its determinants. For instances, by reducing mobility frictions, improved interregional transportation infrastructure would be predicted to increase those elasticities, and thereby affect spatial equilibrium dynamics and reduce spatial misallocation. In our project, we aim to (1) provide the first dedicated systematic analysis of regional mobility elasticities, (2) provide our own new estimate of this elasticity, (3) generate a place-specific mobility index (elasticity) and leverage this novel measure to test for determinants of the elasticity, with a particular focus of the role of transportation infrastructure, and (4) provide a simple model of inter-regional mobility that fits the aforementioned facts.

Existing Literature. Despite the fundamental theoretical role of the interregional labor supply curve, it has received relatively little systematic empirical research.

Canonical models in urban economics in fact implicitly impose *infinite* labor supply elasticities—by *assuming* perfect mobility of individuals across places.[1] At the other end of the spectrum, a literature in labor economics (Autor Dorn Hanson (2016), Yagan

[1] This assumption of perfect mobility traditionally differentiates urban economics (perfect mobility) from international economics (zero labor mobility), two fields that otherwise study similar questions with similar tools and methods.

(2019)) has found very limited internal migration adjustments (if any) to adverse local conditions.

In the last decade, a burgeoning literature in quantitative spatial economics (Redding and Rossi-Hansberg (2017)) has been developing much richer models of economic geography that permit intermediate degrees of interregional labor supply elasticity, building on advances in the discrete choice econometrics literature.[2] In this class of model, spatial labor supply is generally summarized by a single reduced-form parameter giving the corresponding elasticity. Existing studies that feature such an elasticity parameter usually estimate it as one parameter among many, or calibrate it from existing estimates. It is typically estimated cross-sectionally rather than using migration data. There is surprisingly little work focusing on disciplining this parameter with direct empirical evidence and an empirical design tailored to the question.

Given the key role played by migration patterns in mitigating spatial shocks, it is important to establish empirically credible values for the migration elasticity parameter. Going a step further, it is also important to open the black box of this migration elasticity and study how heterogeneous these elasticities may be: demographic composition, different geographies, and how they depend on factors such as transportation infrastructure.

Our Project. To date, there exists no dedicated study of the level, heterogeneity and determinants of the finitely elastic interregional labor supply curve. In this project, we aim to make four contributions to fill this gap, specifically, we aim to:

1. provide a comprehensive analysis of existing empirical estimates of the elasticity (direct or indirect), including how estimates systematically differ depending on empirical contexts and empirical strategies used by researchers,
2. provide a dedicated empirical identification of the elasticity using interregional migration data,
3. investigate heterogeneity (correlates or determinants) of spatial labor supply elasticity, between locations, groups or types of shocks—and in particular, construct a location-specific mobility index, and
4. develop and study a model rationalizing these findings on interregional labor supply elasticities.

Additional Details:

Part 1: Meta Analysis of Existing Estimates. First, we will provide a comprehensive analysis of existing empirical estimates of the spatial labor supply elasticity. The review will consider in particular structural estimates of the elasticity parameter conducted in industrial organization and structural labor (e.g., Kennan and Walker (2011), Diamond

[2] Specifically, urban economists have drawn on product-market discrete choice models, in which customers choose one product from a menu of options, differentiated by price as well as the idiosyncratic taste the consumer puts on the different products; the variance of these tastes determine the substitutability of the products and hence the elasticity of product demand to the taste for a given good, and hence market shares. Analogously, urban economics have modeled tastes for locations, with the variance of those tastes giving the elasticity of interregional labor supply.

(2016)) as well as related reduced-form estimates based on quasi-natural experiments conducted in public finance and labor (translating reduced-form estimates into implied labor supply estimates), with the caveat that these studies are typically focused on very specific segments of the population (e.g., Moretti and Wilson (2017)). We will finally review the direct or indirect estimates used in the quantitative spatial literature (e.g., Fajgelbaum et al. (2018), Allen and Donaldson (2023)).

We also hope to detect suggestive heterogeneity in the existing estimates and hints for those differences being traced back to, e.g., demographics or transportation infrastructure—motivating our subsequent analysis below.

Part 2: Own Estimates of the "Average" Elasticity. In the second part of our paper, we conduct our own estimation of the elasticity. The scope this specific section will occupy depends partially on the overall quantity and quality of the meta analysis from part 1. We currently plan to base as our main empirical strategy on Borusyak at al. (2023), applied to migration data, in the United States. They propose a robust method to estimate employment effects of a shock in a spatial setting; we want to apply the method to the accompanying wage effects to back out the implied labor supply elasticities, potentially in various empirical contexts and for various groups. However, our main additional empirical work will be to investigate heterogeneity in elasticities across locations, our second focus described below.

Our current data in this step has relied on Census and American Community Survey Data, as well as IRS SOI migration data.

Part 3: Heterogeneity and Determinants: The Mobility Index. Third, we will revisit a restriction present in theoretical as well as econometric modeling of the labor supply elasticity: that all places share one homogenous labor supply curve and hence elasticity. While this assumption is a useful starting point, it strikes us as particularly unrealistic in ligh of the heterogeneity that differentiates places in the real spatial economy: transportation infrastructure, demographic composition of the labor supply pools, and geographic location. Those differences plausibly translate into differences in labor supply elasticities to a specific place.

Our strategy is to adopt the method described in Part 2, namely to estimate elasticities—but do so to back out location-specific elasticities. We then plan to trace the heterogeneity in estimated elasticities back to the set of plausible observable drivers of the heterogeneity, and thereby isolate determinants (or correlates) of interregional labor supply elasticities with a particular focus on how transportation infrastructure mediates those mobility elasticities.

Depending on the precision of our estimates as well as the richness of the heterogeneity we will document, we hope to construct a "mobility index" that can be studied by other researchers. While aspirational, a simple theoretical model suggests that a location-specific labor supply elasticity plays a similarly important role as the existing commonly used index of the housing supply elasticity (proposed in Saiz (2010)). In that sense, an

ideal outcome of Part 3 would be to provide the spatial labor supply analog of this existing index.

The data we plan to use for this step are the aforementioned Census/ACS/IRS SOI data for the population flows and migration data. But to understand determinants of the mobility elasticities, we plan to centrally merge on transportation infrastructure data from the US Department of Transportation (DOT) described here: https://www.nber.org/research/data/transportation-economics-21st-century-us-department-transportation-dot-data
In addition, we naturally hope to draw on the rich mobility and transportation data of the NBER Transportation Economics in the 21st Century group, provided here: https://www.nber.org/research/data/transportation-economics-21st-century-data-resources

In this step, we also hope to use Difference-in-Differences (DiD) designs to check how *changes* in transportation infrastructure quality and quantity causally affect mobility elasticities.

Part 4: Developing an Augmented Model with Place-Specific Heterogeneity in the Elasticity. We propose to augment the workhorse quantitative spatial model with specific features aimed at rationalizing and accommodating heterogeneous labor supply elasticities to a location. The model will dialogue with the empirical analysis of Part 3—providing predictions that can be tested, and/or being tailored to rationalizing empirical findings. This exercise is similar in spirit to Monte et al. (2018), who use the predictions of a structural model of commuting to augment the estimation of employment responses to local shocks, or to Monras (2015) that builds on its findings that one's own place of residence is less substitutable to another location than any two other locations.

Besides providing a more realistic description of labor supply elasticities as well as providing a new theoretical model for the toolkit of labor and urban economists, we will use the model to trace out the consequences of heterogeneous labor supply elasticities. Preliminary analysis suggests that a quantitative model disciplined to matching heterogeneous labor supply elasticities can provide new and potentially important empirical predictions such as heterogeneous incidence of tax shocks on migration, wages or house prices. Building on Fajgelbaum and Gaubert (2019) and Gaubert, Kline, Vergara and Yagan (2022), such novel heterogeneity is also likely to have an impact on the design of optimal spatial policies. By establishing a link with transportation infrastructure quality as a determinant of mobility, this additional step permits us to provide a more comprehensive assessment of the consequences of these mobility effects.

Conflicts of interest:
The investigators do not have any financial or other interest that may bear on the proposed work, and have no financial or other ties with the transportation industry.

Summary statement explaining benefits to DOT research and policy:

We hope that our research will, first, provide additional ingredients that help researchers and policy advisors build more realistic models of the key outcome of transportation infrastructure: mobility of people across places. Such use may involve the simulation of policies such as transportation infrastructure investments. Second, our mobility index measure will, we hope, enable researchers to conduct empirical evaluations of the causal effects of transportation infrastructure projects.

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