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Macroeconomics, Spatial Economics, International Trade

Desired Teaching:
Macroeconomics, International Trade, Urban Economics

Comprehensive Examinations Completed:
2020 (Oral): Macroeconomics (*with distinction),* International Trade (*with distinction)*
2019 (Written): Macroeconomics, Microeconomics

Dissertation Title: *Essays on Spatial Sorting and Labor Markets*

Committee:
Professor Giuseppe Moscarini (Chair)
Professor Ilse Lindenlaub
Professor Costas Arkolakis

Degrees:
Ph.D., Economics, Yale University, 2024 (expected)
M.A., Economics, Yale University, 2020
B.A., Economics, Seoul National University, Summa cum laude, 2015

Fellowships, Honors and Awards:
Slyff Fellowship, Yale Economic Growth Center, 2023-2024
Dissertation Fellowship, Yale University, 2023
Best Student Paper, the Urban Economic Association, 2022
Cowles Foundation Carl Arvid Anderson Prize, Yale University, 2021
Slyff Fellowship, Yale Economic Growth Center, 2020-2021
Doctoral Fellowship, Yale University, 2018-2023
Doctoral Study Abroad Scholarship, Korea Foundation for Advanced Studies, 2018-2023

Research Grants:
Sylff Research Award, Yale Economic Growth Center ($5,000), 2022

Teaching Experience:

Fall 2020, Teaching Assistant to Prof. Zhen Huo and Prof. Fabrizio Zilibotti, Macroeconomics (PhD), Yale University

Spring 2021, Teaching Assistant to Prof. Zhen Huo, Macroeconomic Theory (undergraduate), Yale University

Fall 2021, Fall 2022, Teaching Assistant to Prof. Costas Arkolakis, The Economics of Space (undergraduate), Yale University

Research and Work Experience:

Research Assistant to Prof. Eduardo Davila, Yale University, 2019
Research Assistant to Prof. Jihong Lee, Seoul National University, 2014-2016
Research Assistant to Prof. Simon Lee, Seoul National University, 2014-2015

Working Papers:

"Spatial Sorting of Workers and Firms" November 2023, *Job Market Paper*

"Firm Sorting and Spatial Inequality" with Ilse Lindenlaub and Michael Peters, October 2023 (submitted)

"What Causes Agglomeration in Services? Theory and Evidence from Seoul" with Jaeeun Seo, October 2023 (submitted), *Best Student Paper Prize (2022) by the Urban Economics Association*

"Sectoral Shocks and Labor Market Dynamics: A Sufficient Statistics Approach" with Jaeeun Seo, November 2023

Seminar and Conference Presentations:

2023: Society of Economic Dynamics Annual Meeting, NBER Summer Institute Urban, North American Meeting of the Urban Economic Association

2022: European Meeting of the Urban Economic Association, Society of Economic Dynamics Annual Meeting, European Economic Association Congress, Conference on Urban and Regional Economics in Philadelphia of Wharton School and the Federal Reserve Bank of Philadelphia

Referee Service:

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References:

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Dissertation Abstract

Spatial Sorting of Workers and Firms *(Job Market Paper)*

Why do productive workers and firms locate together in dense cities, and thereby generate differences in income and population density across regions? In this paper, I argue that coordination between workers and firms, who sort across space, can account for these spatial disparities, and this explanation provides distinct normative implications for policy.

I develop a parsimonious two-sided sorting model in which heterogeneous workers and firms sort across homogeneous locations. These location decisions are intertwined through two local markets. On the one hand, in the local labor market, workers and firms randomly match subject to search frictions. Thus, locations chosen by more productive workers and firms offer higher expected earnings and profits, and become denser. Complementarity between worker and firm productivity leads to more pronounced gains for productive agents. On the other hand, congestion in local real estate markets raises the cost of living and operating a business, limiting the density of locations. As a result, two-sided sorting endogenously generates dense cities inhabited by more productive workers and firms.

I then show that the decentralized equilibrium exhibits excessive concentration of workers and firms. The key feature of the model is that productivity is embodied in workers and firms, not in locations. Thus, dispersing residents and businesses from dense locations mitigates congestion costs without reducing output. However, less productive workers ignore their own negative effects on the workforce that firms encounter in denser areas. The same is true for firms.

Next, I provide direct empirical evidence of two-sided sorting from German administrative microdata. Using the model, I first recover the productivity of workers and firms from estimated two-way wage fixed effects. To address endogeneity concerns arising from local TFP shocks, I instrument changes in worker productivity using changes in internal migrants' productivity, driven by shocks to their origin locations. I further control for productivity changes of existing jobs to isolate the impact of sorting from that of agglomeration forces. The estimates indicate that an exogenous increase in the quality of the local workforce in a location attracts more productive firms to the same location.

Finally, I estimate the model using U.S. regional data, to assess quantitatively the impact of government policies on the spatial allocation of workers and firms. Despite its simplicity, the model successfully replicates economic outcomes across regions, such as wages and population density (namely, the urban wage premium), as well as housing costs. I then show that the Tax Cuts and Jobs Act of 2017 decreases welfare by 0.35%. The less progressive tax structure, levied on nominal incomes, amplifies workers' preferences for high-income and dense cities, exacerbating congestion costs without increasing output. Conversely, if I ignore firm sorting and instead attribute productivity to locations, as in canonical spatial models, the same policy increases welfare due to substantial gains from local TFP.

Firm Sorting and Spatial Inequality, with Ilse Lindenlaub and Michael Peters

We study the importance of spatial firm sorting for wage inequality both between and within local labor markets. We develop a novel model in which heterogeneous firms first choose a location and

then hire workers in a frictional local labor market. Firms' location choices are guided by a fundamental trade-off: Operating in productive locations increases output per worker, but sharing a labor market with other productive firms makes it hard to poach and retain workers, thereby limiting firm size. Positive firm sorting—with more productive firms settling in more productive locations—emerges as the unique equilibrium if firm and location productivity are sufficient complements or labor market frictions are sufficiently large. We show that positive firm sorting increases both the mean and the dispersion of wages in productive markets relative to less productive ones. The main mechanism is that firm sorting steepens the job ladder in productive places. We estimate our model using administrative data from Germany and identify firm sorting from a novel fact: Average local labor shares are lower in productive locations, which indicates a higher concentration of top firms with strong monopsony power. Quantitatively, positive firm sorting can account for at least 15% of the spatial variation in average wages and at least 40% of the spatial variation in within-location wage dispersion.

What Causes Agglomeration in Services? Theory and Evidence from Seoul, with Jaeeun Seo

Why are economic activities concentrated in space? What are the policy implications of this concentration? And how do we expect it to change in the future? We revisit these classic questions in the context of non-tradable services, such as restaurants and retail, in Seoul. To understand the spatial concentration of services, we first causally identify positive spillovers across services stores. We microfound these spillovers by incorporating the trip-chaining mechanism—whereby consumers make multiple purchases during their services travel—into a quantitative spatial model that endogenizes the spatial distribution of services. When calibrated to an original survey on trip chaining, this mechanism explains about one-third of the observed concentration. However, unlike standard agglomeration mechanisms, it does not lead to inefficiency nor it exacerbates welfare inequality. Finally, we show that spatial linkages of services consumption play a crucial role in shaping the impact of the rise of work from home and of delivery services on the distribution of services.

Sectoral Shocks and Labor Market Dynamics: A Sufficient Statistics Approach, with Jaeeun Seo

In this paper, we develop a sufficient statistics approach to evaluate the impact of sectoral shocks on labor market dynamics and welfare. Within a broad class of dynamic discrete choice models that allows for arbitrary persistent heterogeneity across workers, we show that knowledge of steady-state worker flows across sectors over different time horizons is sufficient to construct counterfactual predictions on labor reallocation and welfare changes, up to a first-order approximation. We also establish analytically that assuming away persistent worker heterogeneity, a common practice in existing literature, necessarily leads to overestimation of steady-state worker flows, resulting in systematic biases in counterfactual predictions. As an illustration of our sufficient statistics approach, we revisit the consequences of the rise of import competition from China. Using US panel data to measure steady-state worker flows prior to the shock, we conclude that the labor reallocation away from manufacturing is significantly slower, and the negative welfare effects on manufacturing workers are much more severe than those predicted by earlier models that abstract from persistent worker heterogeneity.