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Fields of Concentration:
Primary: Development Economics and International Trade
Secondary: Urban and Spatial Economics

Desired Teaching:
Development Economics
International Trade
Urban and Spatial Economics
Macroeconomics
Applied Econometrics

Field Courses and Comprehensive Examinations Completed:
Development Economics
International Trade *(comprehensive exam with distinction)*
Macroeconomics *(comprehensive exam)*

Dissertation Title:
Essays on the Provision of Transportation

Committee:
Professor Costas Arkolakis
Professor Michael Peters
Professor Ahmed Mushfiq Mobarak
Professor Orazio Attanasio

Degrees:
Ph.D., Economics, Yale University, 2023 (expected)
M.Phil., Economics, Yale University, 2020
M.A., Economics, Yale University, 2018
B.S., Quantitative Economics, Tufts University, 2016 (*Summa Cum Laude with Highest Thesis Honors, Phi Beta Kappa*)

Fellowships, Honors, and Awards:

Sylff Fellowship, Yale Economic Growth Center	2020–2022
Dissertation Fellowship, Yale University	2022
Doctoral Fellowship, Yale University	2017–2023
Linda Datcher Loury Award, Tufts Department of Economics	2016
Charles G. Bluhdorn Prize, Tufts Department of Economics	2016
Daniel Ounjian Prize, Tufts Department of Economics	2015
German Academic Exchange Service (DAAD) Undergraduate Scholarship	2014
Gilman Scholarship	2014
Neubauer Scholarship, Tufts University	2012–2016

Research Grants:

Sylff Research Award, Yale Economic Growth Center ($20,000)	2022
Ph.D. Dissertation Research Grant, Yale Economic Growth Center ($14,700)	2022
Pre-Dissertation Fellowship, Yale MacMillan Center ($2,500)	2019

Teaching Experience:

Fall 2021, Head Teaching Assistant to Prof. Fabrizio Zilibotti, Intermediate Macroeconomics (Undergraduate), Yale College

Spring 2021, Head Teaching Assistant to Prof. Fabrizio Zilibotti, Intermediate Macroeconomics (Undergraduate), Yale College

Fall 2020, Teaching Assistant to Prof. Marnix Amand and Prof. Ilse Lindenlaub, Intermediate Macroeconomics (Undergraduate), Yale College

Spring 2020, Teaching Assistant to Prof. Peter Schott, International Economics (Undergraduate), Yale College

Fall 2019, Teaching Assistant to Prof. Michael Peters, Intermediate Macroeconomics (Undergraduate), Yale College

Spring 2016, Statistical Assistant (Tutor), Data Lab, Tufts University

Research and Work Experience:

Research Assistant to Prof. Michael Peters, Yale University, 2019

Research Assistant to Prof. Costas Arkolakis, Yale University, 2018

Transport Planning Intern, TransportTechnologie-Consult Karlsruhe GmbH (Germany), 2017

Transport Namibia Intern, Gesellschaft für Internationale Zusammenarbeit (Namibia), 2016

Student Trainee – Economist, Volpe – The National Transportation Systems Center (Cambridge, MA), 2015–2016

Statistical Analysis Intern, Deutsche Bahn (Germany), 2014

Working Papers:

"Are There Too Many Minibuses in Cape Town? Privatized Provision of Public Transit" (October 2022), *Job Market Paper*

"More Roads or Public Transit? Insights from Measuring City-Center Accessibility" with Fabian Eckert and Mushfiq Mobarak (November 2022)

"Schooled by Trade? Retraining and Import Competition" with Trevor Williams (January 2022)

Languages:

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References:

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Dissertation Abstract

Are There Too Many Minibuses in Cape Town? Privatized Provision of Public Transit [Job Market Paper]

Workers in fast-urbanizing low- and middle-income countries waste significant time commuting. In its focus on gaps in government-provided transit, the economics literature neglects the privately-operated minibuses which provide 50–100% of shared transit in many cities. These networks offer broad connectivity at the cost of substantial wait times – up to one-third of the typical commute – and poor personal safety. I study the *privatized shared transit* market in Cape Town and pose two questions: which externalities does private provision generate, and how can policymakers improve the market allocation? I build a model of privatized shared transit subject to externalities in matching between buses and passengers, security provision, and road congestion. I then collect new data in Cape Town to evaluate policy alternatives to expensive transit infrastructure.

Two key features of my model formalize the notion of privatized shared transit. First, minibuses freely enter distinct origin-to-destination routes and match with passengers. Second, commuters with heterogeneous incomes choose a single mode of transport based on commute times and safety. At the heart of the model, a frictional matching market between minibuses and passengers

determines the wait times of each. In particular, passengers first wait in long lines to board buses and subsequently wait on these buses, which depart only when full. Crucially, the number of buses affects these two wait time components in opposite ways. "Off-bus" wait times fall, and "on-bus" wait times rise, with minibus entry due to opposing thick-market and congestion externalities in matching.

To quantify the model, I collected two forms of primary data in Cape Town. First, enumerators tracked passenger and bus queues on a random sample of 44 minibus routes, from which I measure bus loading rates and commuters' wait times. Second, I introduce a stated preference strategy to generate exogenous variation in commute choices. In my survey, 526 respondents chose hypothetical minibus commute options with different travel times, costs, and quality improvements, such as security. Then, I devise an instrumental variables strategy in the queue data to identify the matching elasticities; commuters' stated preferences, in turn, place a dollar value on mode-specific utility costs, time saved, and security provision.

Finally, I employ the estimated model to analyze counterfactual policy strategies to remedy externalities first highlighted by city planners. Cape Town has too few minibuses: a 36% entry subsidy maximizes welfare. Sizable gains accrue to low-skill commuters who travel between far-flung suburbs, where a thick-market matching externality outweighs the additional congestion associated with bus entry. The ensuing wait time reductions eclipse limited losses from increased wait times on the median route. However, government-provided security guards at publicly-owned minibus stations yield even more substantial welfare gains. Even without the resources to build subways or bus rapid transit, policymakers thus benefit from a range of options to improve commutes in developing-country cities like Cape Town.

More Roads or Public Transit? Insights from Measuring City-Center Accessibility, with Fabian Eckert and Mushfiq Mobarak

We propose a theory-inspired measure of the accessibility of a city's center: the size of the surrounding area from which it can be reached within a specific time. Using publicly-available optimal routing software, we compute these "accessibility zones" for the 109 largest American and European cities, separately for cars and public transit commutes. Compared to European cities, US cities are half as accessible via public transit and twice as accessible via cars. Car accessibility zones are always larger than public transit zones, making US cities more accessible overall. However, US cities' car orientation comes at the cost of less green space, more congestion, and worse health and pollution externalities.

Schooled by Trade? Retraining and Import Competition, with Trevor Williams

Retraining is often hailed as a key policy tool to support workers displaced by import competition, yet there is surprisingly little evidence on whether these policies achieve their intended effects. Using administrative data from Germany, a highly open economy with extensive government-

subsidized retraining programs, we provide evidence that workers routinely retrain in response to import competition. To quantify the welfare impact of retraining policies, we propose a search model in which heterogeneous workers may choose to retrain while unemployed. Retraining enables workers to change their job-finding rates and their productivity while employed. We find that retraining increases the gains from trade by 7% in the aggregate. Some worker groups gain five times as much, while others gain virtually nothing.