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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
PhD 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*

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

Work In Progress:

"Should US Cities Invest in Public Transit or European Cities in Roads?" with Fabian Eckert and Mushfiq Mobarak (October 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 large amounts of time commuting, partly due to gaps in government-provided public transit. In many African cities, privately-operated minibuses instead provide 50–100% of urban transit. These networks offer anywhere-to-anywhere connectivity, but private provision of transit gives rise to long and unpredictable wait times – up to a third of total commute time – and poor personal safety. I study a quintessential case of such privatized shared transit, namely minibuses in Cape Town, South Africa. In particular, I pose two questions: which externalities exist in the minibus market, and how can policymakers intervene to correct them? I build a micro-founded model of privatized shared transit subject to externalities in matching, security provision, and road congestion and 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 and match with passengers, and second, commuters with heterogeneous income

optimally choose a mode of transport based on commute times as well as safety. At the heart of the model, a frictional matching market between minibuses and passengers determines how long the latter wait, for two reasons. Passengers first wait in long lines to board buses. Subsequently, they wait further on the bus, which typically departs only when full. Crucially, the number of buses affects these wait times in opposite ways: "off-bus" wait times fall, and "on-bus" wait times rise, with the entry of minibuses due to opposing *boarding* and *filling* externalities.

To quantify the model, I collect two forms of primary data in Cape Town. First, I track passenger and bus queues on a random sample of 44 minibus routes, from which I measure bus loading rates as well as commuters' wait times off and on the bus. Second, I conduct stated preference surveys where commuters choose among hypothetical minibus options with different travel times and costs as well as quality improvements, such as security. In the queue data, I devise an instrumental variables strategy to identify the matching elasticities, and from commuters' stated preferences for exogenously-varied attributes, I place a dollar value on mode-specific utility costs and time saved. Notably, high-skill commuters dislike and thus avoid minibuses due to security risk.

Finally, I use the estimated model to analyze counterfactual policy strategies to improve upon the existing minibus provision and correct externalities highlighted by city planners. I find that there are in fact too few minibuses in Cape Town: a 36% subsidy on minibus entry maximizes welfare and benefits low-skilled workers in particular. Large gains accrue to commuters between far-flung suburbs, where the boarding externality previously fostered under-provision of minibuses, and more than outweigh increases in wait time on the median route. Government actions to improve security at publicly-owned minibus stations would yield even larger welfare gains. Improved privatized transit might offer similar net gains, relative to large-scale subway or rapid bus lines, in a host of equally sprawling, resource-poor cities.

Should US Cities Invest in Public Transit or European Cities in Roads?, with Fabian Eckert and Mushfiq Mobarak

We propose a new way to measure the accessibility of cities' central business districts (CBDs) via car or public transit: the size of the surrounding area from which the CBD is accessible within X minutes using either mode. We construct this measure for the 100 largest US and European cities using publicly available optimal routing software. Relative to Europe, US CBDs are about half as accessible via public transit and twice as accessible via car. We document the far-reaching implications of US cities' car orientation for land use, traffic congestion, walking and biking choices, air pollution, obesity, cardiovascular diseases, and life expectancy.

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.