Research Statement

I am an applied microeconomist with interests in urban economics and transportation. To investigate what makes some regions, cities, or neighborhoods more successful than others, my recent work exploits new big data sources from various technology firms (2), (3), (4), (5), (6), (7). Methodologically, my empirical strategies are varied - from randomized control trials (4) to model calibration (2) - but grounded in strong theoretical foundations. I have three research agendas:

A. Neighborhood choice, gentrification, and segregation in the United States (1) provides the first and most comprehensive study of urban revival in America. The rapid urbanization of young college graduates that we document in that paper is now the focus of a growing literature and policy debate around urban gentrification. (2) builds on (1) to explore the welfare implications of gentrification, and analyze possible policy responses. We develop a quantitative spatial model, and show that gentrification originates in the rising income of the rich, and contributes to reinforcing inequality between rich and poor. Our estimation of that model is the first to use smartphone GPS data. (3) introduces that smartphone data to study social interactions within consumption venues and the origin of urban segregation.

(1) Urban Revival in America, with Jessie Handbury (Wharton), Working Paper

(2) Income Growth and the Distributional Effect of Urban Spatial Sorting, with Cecile Gaubert (Berkeley), Jessie Handbury (Wharton), and Erik Hurst (Chicago), Working Paper

(3) Quantifying Social Interactions Using Smartphone Data, with Jonathan Dingel (Chicago), Allison Green (Princeton), and Jessie Handbury (Wharton), Work in Progress (slides available upon request)

B. E-commerce, internet, and trade in China (4) is a collaboration with a large e-commerce firm to investigate the impact of the first nationwide e-commerce expansion program on rural households. The modest impact that we find challenges the idea that e-commerce transforms rural markets, and helps reset policy expectations. In ongoing work (5), we develop a quantitative spatial model to investigate the impact of advanced internet technologies on China’s economic geography. To calibrate this model, we gained access to e-commerce trade flow data, digitized data on broadband and mobile internet use, and are constructing a database on county level economic outcomes that we intend to make public.

(4) Connecting the Countryside via E-Commerce: Evidence from China, with Ben Faber (Berkeley), Yizhen Gu (Jinan), and Lizhi Liu (Georgetown), Conditionally Accepted, American Economic Review: Insights.
(5) Estimating the Gains from Online Integration: Evidence from a County-Level Panel Data in China, with Ben Faber (Berkeley) and Yizhen Gu (Jinan), Work in Progress

C. Urban mobility, congestion, and accessibility in India (6) is the first systematic empirical investigation of mobility and congestion across cities in a developing country. We use Google Maps to generate information for millions of counterfactual trip instances in 154 large Indian cities. We find that poor cities are slow at all times, not just peak times. This challenges the conventional wisdom that cities are slow or fast mostly because of traffic congestion, and implies that standard policy recommendations like congestion pricing are unlikely to be effective. In (7), we exploit data from Google Place to study the determinants of accessibility to destinations.

(6) Mobility and Congestion in Urban India, with Prottoy Akbar (Pittsburgh), Gilles Duranton (Wharton), and Adam Storeygard (Tufts), October 2018, Revise and Resubmit, American Economic Review

(7) Accessibility in Urban India, with Prottoy Akbar (Pittsburgh), Gilles Duranton (Wharton) and Adam Storeygard (Tufts), Work in Progress.

Summary of research output: I currently have 7 papers published or submitted (3 published or conditionally accepted, 2 revise/reject and resubmit, 2 papers at submission stage), and a rich pipeline of works in progress, described below. I have 283 citations on Google Scholar, most of them obtained over the last two years.

My research has reached a broad audience, and I have presented it in seminars and conferences around the world. My papers received “trade”, “public”, “development”, “productivity, and “growth” tags at the NBER and CEPR. Since 2016 I have had papers presented - either by me or by a co-author - in eight different NBER programs (including a plenary session and two joint sessions). I have had multiple papers presented in all the top universities in the US (e.g., Harvard (x2), MIT (x2), Chicago (x3), Stanford (x3), Yale (x3), etc.). My research received significant media coverage (e.g., The Wall Street Journal, The Washington Post, The Atlantic’s CityLab, Forbes, Bloomberg, Vox, Times of India, USA Today, etc) and major grants and awards (e.g., Bill and Melinda Gates Foundation, Hellman Faculty Award).

Detailed project description: I first describe my projects in urban economics in the United States, second my projects on the internet and trade in China, and third my projects on urban transportation in India. I describe all my existing papers, plus one work-in-progress within each research agenda, for a total of 10 projects in total.

A. Projects in urban economics: My projects in urban economics study what makes some areas desirable places to live and work for different groups of individuals. I first describe my three thesis papers. Then I describe three new projects started at Berkeley. The number of Google Scholar citations is in parenthesis.

1) Knowledge Spillovers in Cities: An Auction Approach (11 citations), Journal of Economic Theory, May 2015, Vol. 157, Elsevier. This applied theory paper—all my other papers mix theory and empirics—is about how cities are a good place to network and learn from others. In the paper, I use auction theory to explain why and how knowledge transfers make workers in urban areas more productive.

2) Speed (56 citations), with my thesis advisors Gilles Duranton (Professor at the University of Pennsylvania) and Matt Turner (Professor at Brown University). Forthcoming at The Review of Economics and Statistics, MIT Press. The paper is about measuring the efficiency of transportation networks in US cities. We measure the welfare losses from congestion, and the optimal congestion tax to alleviate these losses.

3) Valuing the Consumption Benefits of Urban Density (63 citations) Reject and Resubmit at American Economic Journal – Economic Policy. This was my job market paper in 2013. This paper estimates the consumption value of
urban density by combining travel microdata with Google’s local business data. I find that in high density areas, consumers enjoy large benefits from visiting places that they prefer, and relatively smaller gains from shorter trip time. These results demonstrate how consumers benefit from living in urban areas, and highlight the importance of the service sector in explaining the value of cities. As the focus of urban economists moves from considering downtowns as places of production to recognizing their value to consumers, the consumption value of cities has become an active area of research, especially for young scholars. My work on urban revival that I describe next builds on these findings, and also highlights the importance of non-tradable services to explain the benefits of dense cities.

4) **Urban Revival in America, 2000 to 2010 (104 citations)**, with Jessie Handbury (Assistant Professor at the University of Pennsylvania.) Submitted. In this paper, we document and explain the rapid growth of the young and college educated in the downtowns of almost all large US cities. This is a striking reversal of fortunes from decades of college-educated and high-income suburbanization. Using data at fine spatial scale, we investigate many competing explanations for urban revival (changes in job or amenity locations, house prices, crime, schools, family formation, etc.) and find that changing preferences for urban consumption amenities, in particular non-tradable services, are the key part of the story. We further relate these changing preferences to delayed family formation and top income growth. This paper relies on merges of numerous large datasets on establishments, individual location choices, commute behavior, house prices, crime, transit performance, and more. Since we started presenting our stylized facts on the scale and scope of America’s urban revival in late 2014, other academics have produced similar evidence and there is now widespread agreement that our facts are correct. Regarding what is driving these new trends, we are thrilled to be in the middle of an important debate taking place within the academic, planning and real estate communities.

5) **Income Growth and the Distributional Effects of Urban Spatial Sorting (13 citations)**, with Cecile Gaubert (Assistant Professor at UC Berkeley), Jessie Handbury (Assistant Professor at the University of Pennsylvania), and Erik Hurst (Professor at the University of Chicago.) Submission stage. This project builds on my urban revival work with Handbury, and focuses on the welfare impact of urban revival on the rich and the poor, and its origin in rising income inequality. For this investigation, we develop and quantify a spatial model of a city with heterogeneous agents and nonhomothetic preferences for locations with different amenities of endogenous quality. We show that as the rich get richer, their increased demand for luxury amenities available downtown drives housing prices up in downtown areas. The poor are made worse off, either being displaced or paying higher rents for amenities that they do not value as much. In other words, we find that welfare estimates of increased income inequality are understated if spatial sorting responses are ignored.

6) **Quantifying Social Interactions Using Smartphone Data** (work-in-progress, slides available on request), with Jonathan Dingel (Associate Professor at the University of Chicago), Allison Green (PhD Student at Princeton), and Jessie Handbury (Assistant Professor at the University of Pennsylvania). In this project, we introduce a new data source to urban economics: high-frequency smartphone data on the movements of 87 million individuals/devices across the United States. This data allows us to study the geography of social interactions in unprecedented detail. We will use these data to quantify willingness to pay for social interactions and exposure to people of the same or different education, income, and race. The segregation of social interactions has been posited to have important consequences for outcomes ranging from health to earnings.

B. Projects on e-commerce and internet penetration in China: I now describe my two projects on e-commerce, trade, and internet penetration in China.

7) **Connecting the Countryside via E-Commerce: Evidence from China** (24 citations), with Benjamin Faber (Assistant Professor at UC Berkeley), Yizhen Gu (Assistant Professor at Jinan University) and Lizi Liu (Assistant Professor at Georgetown University). Conditionally accepted at American Economic Review: Insights. This paper
provides the first rigorous empirical estimates of how e-commerce access benefits rural households. To achieve this, we conducted a large-scaled randomized controlled trial (RCT) in collaboration with a large e-commerce firm. Our RCT randomly provided e-commerce access to some villages, and not to others. We find that the gains from e-commerce trading are sizable, but only accrue to a minority of rural households who tend to be younger and richer. In contrast to the existing case study evidence that motivate e-commerce policies in the developing world, we find little evidence for significant income gains to the average rural producer or worker. Instead, the gains are driven by the consumption side, through a significant reduction in household cost of living that is most pronounced in more remote rural markets. Our findings are timely, as e-commerce markets are rapidly growing in the developing world. Our findings can inform policy makers in countries such as China, India, Vietnam and Egypt that are planning large investments to expand e-commerce access.

8) The Gains from Online Integration: Evidence from County-Level Panel Data in China (Work in progress,) with Benjamin Faber (Assistant Professor at UC Berkeley), Yizhen Gu (Assistant Professor at Jinan University). Our objective is to learn about the impact of internet penetration on China’s spatial economic development, regional integration, and growth. Our project is in the context of very rapid growth in internet and smartphone use across the developing world, but limited empirical evidence on the economic consequences of online integration. For this paper, we orchestrated a large data collection effort to assemble a unique panel on the number of internet and smartphone users in Chinese counties. We also collaborated with a large e-commerce firm to assemble a new county-to-county e-commerce trade flows.

C. Projects on urban transportation in India: These projects build on my thesis work in transportation. They contribute to a new literature on urban transportation in developing countries that is made possible by the availability of new data sources.

(9) Mobility and congestion in urban India (12 citations), with Pratoy A. Akbar (PhD student at Pittsburgh University), Gilles Duranton (Professor at the University of Pennsylvania), Adam Storeygard (Associate Professor at Tufts University.) R&R at American Economics Review. In this paper, we use Google Maps to generate information for more than 22 million counterfactual trip instances in 154 large Indian cities. We then use this information to estimate a number of indices of mobility (speed) and congestion of motorized vehicle travel in these cities. Our project is the first systematic empirical investigation of mobility and congestion across cities in a developing country, so many of our findings are new. Our most surprising finding is that variation in mobility across Indian cities is mostly due to uncongested mobility, not to congestion. That is, poor cities are slow at all times, not just peak times. This finding has important policy implications, because it challenges the conventional wisdom that traffic congestion is the main reason why some cities are slow and some are fast. As a result, standard policy recommendations like congestion pricing and HOV lanes are unlikely to be effective. With the same team, we are now working on a new paper that extends our methodology to the entire world.

(10) Accessibility in urban India (work-in-progress), Pratoy A. Akbar (PhD student at Pittsburgh University), Gilles Duranton (Professor at the University of Pennsylvania), Adam Storeygard (Associate Professor at Tufts University.) This project was initially the last few chapters of the previous paper. The starting point for the project is the idea that while mobility is important, what ultimately matters is accessibility—i.e., how long it takes to accomplish a given trip purpose, like going to a restaurant. One hypothesis is that the largest cities, which are dense but slow, nevertheless offer the best accessibility, at least for some types of destinations. To investigate this, we collected data on the location and characteristics of all places in Google for urban India.