Aaron Kaye
The University of Michigan,
Department of Economics; and
Ross School of Business,
Department of Business Economics and Public Policy

701 Tappan St. -R3431
Ann Arbor, MI 48109
Phone: (814) 571-3452
Email: apkaye@umich.edu
LinkedIn

November 16, 2020

Dear Professors Goldfarb and Tucker,

I am writing to apply to attend the NBER Economics of Digitization Tutorial. I am currently a fourth-year doctoral candidate in the joint Ph.D. program in Business and Economics at the University of Michigan. My fields of study are Industrial Organization and Business Economics. My interests include IO and Applied Micro, with a focus on issues related to the digital economy. My current research examines issues related to platform design, consumer search, the value of information, and the returns to online reputation. I am excited to pursue the opportunity to participate in the digitization tutorial, and I believe that it would be enormously helpful for my current research and dissertation work.

Below, I have included a summary of my course of graduate study and descriptions of my research in progress.

Thank you for your time and consideration.

Regards,

Aaron Kaye

Course of Graduate Study

The Ph.D. program in Business and Economics is a joint degree offered by the Ross School of Business and the Department of Economics at the University of Michigan. I have completed all coursework, preliminary exam, and field exam requirements for the degree. My primary fields of study are Industrial Organization and Business Economics.

Third-year Paper – Completed Winter 2020
Field Exams (IO) – Completed Summer 2019
Preliminary Exams (Micro and Macro) – Completed Summer 2018
2019-2020: Topics in BE-Causal Inference, Intro to Research I & II, BE Research Seminar II
2018-2019: Industrial Organization I & II, Public Finance I, Topics in BE- Health Insurance, Topics in BE - Regulation, Topics in BE - Investment and Trade, Teaching Practicum I, BE Research Seminar I
2017-2018: Math Economics, Microeconomics I, II, III & IV, Macroeconomics I & II, Econometrics I & II, Topics in BE - Health Econ
Previous Graduate Study (2015): MA in Economics from Boston University

Research work in progress

My interests include IO and applied micro, with a focus on issues related to the digital economy. My current research examines issues related to platform design, consumer search, the value of information, and the returns to online reputation.

"Differential Impacts of Online Reviews in the Restaurant Industry: Evidence from Mobile Location Data" *(with Susan Athey).* For this project, we combine data from two sources: 1) A large online platform that publishes crowd-sourced reviews about restaurants; And 2) mobile location (ping) data collected from smartphones. The general research question is - to whom does online reputation matter? In terms of consumers, we compare locals to non-locals. In terms of restaurants, we compare chains to non-chains. The early results show differential impacts of half-star ratings on consumer demand across nearby (local) and far-away (non-local) consumers and across the chain and non-chain restaurants.

"Estimating the Economic Value of Data for Personalization in Shopping" (*with Susan Athey, Robert Donnelly, Ayush Kanodia, and Mitchell Linegar)*. Our motivation for this project is to help inform the policy debate about the importance of economies of scale in data and AI. This matters for regulating big tech as it relates to economies of scale and data privacy. This project uses data from a large grocery chain in India to evaluate the question, "What is the value of data?". We use a state-of-the-art Bayesian embeddings (BEmb) demand estimation model that relies on advances in computation and techniques from matrix factorization. The BEmb model allows for model complexity to adapt to the amount of training data available. For example, increasing data in terms of the number of weeks of shopper history, shoppers, stores, products, or product categories could allow for a model with increased personalization. We evaluate the value of information (VOI) in terms of counterfactual store profits from improved coupon targeting as well as standard out of sample prediction metrics. We also compare VOI from the BEmb model to benchmark standard demand estimation models from the industrial organization literature.

"Just the Doctor I Ordered: Platform Design and Demand Estimation with Endogenous Search Results" *(Third-year Paper).* In this paper, I propose an optimal sequential search model and two estimation strategies. The search model is ideal for the context of online platforms where consumers do not ex-ant know the features of products in the market; instead, consumers learn about product features as they search. The two estimation strategies relate to the types of data that are typically available to researchers. Click-stream data are ideal but not always available. The proposed clickstream model works in cases where clickstream data are available, and the simulated search model can be used when quantities and features are observed. The simulated search model uses LambdaMART, a machine learning algorithm, to create a mirror of the platform's search engine. The search engine mirror allows me to simulate individual browsing behavior, even though browsing is not observed. In this paper, I demonstrate that LambdaMART can accurately reproduce sophisticated search results even when the researcher does not know which features determine page ranks. An essential feature of the search model is that it allows for counterfactuals to the search design of platforms, such as changing the information visible to consumers during search or changing the order that results appear. Using these models and simulated data, I evaluate the question "how does platform design impact consumer welfare, seller outcomes, and platform profits?".

"Digitizing Doctor Demand: Returns to Online Reputation in the Market for Physician Services" *(with Sonal Vats)* This project focuses on ZocDoc.com – a unique website that integrates physician profiles, patient reviews, and appointment scheduling of physicians onto a single platform. I collected data from the website every day for over a year to construct a novel dataset consisting of profiles, reviews, and ratings for primary care physicians in eight metropolitan divisions. We infer bookings from daily records of appointment availability. ZocDoc displays ratings on a scale of one to five stars, with overall average ratings, rounded to the nearest half star. We use a regression discontinuity framework to identify the causal impact of reviews on patients' choice of physician. Our preliminary results suggest that patients care quite a bit about quality and are willing to wait for it. However, due to physicians' capacity constraints and the level of demand, 4, 4.5, and 5-star doctors find most of their offered appointments are booked. The main distinction is timing, with lower rating physicians' appointments booked once the appointments with higher-rated physicians become scarce.

A draft of this paper won the 2019 Kathy Terrell Best Paper Prize, which is awarded annually for the best Ph.D. paper in Business Economics at Ross. I'm currently extending this paper to look at the heterogeneous returns to reputation using apparent demographic information from the profile photos.

"Who (Else) Benefits When the Government Pays More?" *(With Thomas Buchmueller, William Mandelkorn, and Sarah Miller).* This paper examines whether a portion of Medicare Advantage subsidies is passed through to hospitals in the form of higher prices. For this project, we use data from the Health Care Cost Institute (HCCI). One of this project's empirical challenges is how to properly model bargaining between insurers and providers under different subsidy schedules. While this project is in the IO/Health category, it relates more broadly to my other research as it focuses on changing economies of scale in the bargaining problem between insurers and providers.