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Dear Professors Goldfarb and Tucker,

I am writing to apply to attend the NBER Digitization Tutorial. I am a sixth-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 industrial organization and applied micro, with a focus on issues related to the digital economy. My current research examines platform design, consumer search, the value of information, and the returns to online reputation.

I attended the 2021 and 2022 Digitization Tutorials and found them enormously helpful for research and dissertation work. The Tutorial was also a tremendous opportunity to meet graduate students and faculty in the field. I am excited to pursue the opportunity to participate in the Tutorial on the Economics of Privacy. I believe that the Tutorial would be enormously helpful in this phase of research and dissertation work.

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.

Dissertation committee

Francine LaFontaine (co-chair), Ying Fan (co-chair), Susan Athey, Zach Brown

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

Select Research Work in Progress

Navigation Pain: Drip Pricing and Personalization in Two-Sided Digital Markets (Job market paper) This paper considers two critical issues of platform design: personalized recommendations and drip pricing. In many online markets, consumers often have little ex-ante knowledge of product features. In these markets, how does platform design impact consumer welfare, seller outcomes, and platform profits? I answer this question in the context of the online market for hotel rooms using data from Expedia Group, an online travel agency (OTA). I present evidence that in this market, consumers do not ex-ante know product features, including price. On the demand side, this paper proposes an optimal sequential search model where consumers have rational expectations of the joint distribution of product features, form consideration sets through page turns and clicks, and make a final purchase decision from their consideration set. As for the platform, I use LambdaMART, a machine learning algorithm, to create a mirror of the platform's recommendation system. The search engine mirror allows for the supply side model where profit-maximizing firms consider how changes in price impact position on the page in search results. The proposed model and estimation strategies allow for platform design counterfactuals, including changes to the order of search results and feature emphasis. The paper concludes by evaluating the welfare effects of personalized recommendations and drip pricing.

Differential Impacts of Online Reviews in the Restaurant Industry: Evidence from Mobile Location Data *(with Susan Athey).* We ask: To whom does online reputation matter? To analyze this question, we combine two large-scale data sets from novel sources: 1) A large online platform that publishes crowd-sourced reviews about restaurants; And 2) mobile location (ping) data collected from smartphones. We compare locals to non-locals and repeat to new customers. In terms of restaurants, we compare chains to non-chains. Our setup allows us to uncover the heterogeneity in treatment

effects that shed light on the mechanisms behind the impact of star ratings on restaurant visits. To uncover the impact of rating on demand, we take advantage of the fact that the platform rounds ratings to the nearest "half-star." As a result, two restaurants with nearly identical ratings that straddle the cutoff to have 4.5 versus 5-stars displayed may be viewed as very different by consumers, even if the underlying quality is quite similar. We take advantage of this natural experiment to estimate the causal impact of ratings. We find positive and significant effects of half-star ratings on foot traffic of substantially larger magnitudes than have previously been documented in Luca (2016) and Anderson and Magruder (2012). The effect is greatest at the extremes; going from 4.5-stars to 5-stars increases foot traffic by over 30-50 percent. We also find that the effect of a half star increase is largest for new customers, non-locals, and non-chain restaurants.

The Value of Data for Price Targeting (*with Susan Athey, Robert Donnelly, Ayush Kanodia, and Mitchell Linegar)*. This paper analyzes the value of information for targeting price discounts in shopping applications. It applies methods that combine standard consumer choice models from marketing and economics with matrix factorization techniques from machine learning, whereby users have latent preferences and products have latent attributes, and these are learned from data about consumer choice in a setting where prices vary over time. The paper applies the model to individual panel data from supermarket shopping for a large retailer. The paper analyzes the value of data for increasing profits through personalized price targeting, assessing the relative importance of enriching the model (adding more latent factors) versus more precisely estimating parameters of a fixed model, finding that enriching the model as data grows is an important contributor to improved performance. The paper shows that increasing the length of the history of data used for given set of individuals is substantially more valuable for targeting to those users than adding data about more products or additional users. The results have implications for privacy policy and competition policy.

Differential Impacts of Online Ratings in the Market for Medical Services *(with Michael Luca and 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.