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November 10, 2019

I am a fourth-year Ph.D. student in Quantitative Marketing at the Kellogg School of Management, Northwestern University. I am writing to apply for the NBER Digitization Tutorial 2020. My research interests are in sellers' response to platforms' mechanisms and its impact on consumer welfare. As digitization and its economic consequences has been a key theme of my ongoing research, I am excited to interact with fellow researchers with common interests as well as develop relevant and meaningful research ideas. The rest of my application is structured as follows: (1) course of study, and (2) two research projects. Contact information and a list of committee members are attached at the end the document.

Course of study

I have completed all core requirements of my department and have been admitted to candidacy. I passed preliminary exams for both Economics and Marketing Departments, which covered *Microeconomic Theory* (taught by Eddie Dekel, Marciano Siniscalchi and Alessandro Pavan), *Econometrics* (taught by Charles Manski, Joel Horowitz and Ivan Canay) and *Quantitative Marketing* (taught by Brett Gordon, Eric Anderson, Anna Tuchman, and Blake McShane). In addition to the core courses, I took a three-quarter sequence course for *Industrial Organization* (taught by William Rogerson, Robert Porter, Gaston Illanes and Vivek Bhattacharya), as well as a sequence for *Economics of Innovation* (taught by Benjamin Jones, Bryony Reich and Daniel Spulber). Most recently, I took a seminar on recent innovations in statistical methods such as Causal Forest and Deep IV.

Relevant research projects

My research focuses on mechanisms that platforms utilize to resolve information asymmetry between consumers and sellers (e.g., sales rankings). These mechanisms, however, do not always align the behavior of sellers with the interests of platforms, as they are likely to induce behavior distortions form sellers. In particular, I pay attention to an empirical setting in which sellers artificially inflate sales figures of their own products to climb up sales rankings by buying their own items from platforms, which I call *ranking manipulation*. I will briefly discuss two interrelated working papers on the topic of seller cheating.

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In the first paper, I study empirically whether and when seller's cheating can be rationalized. In my empirical setting, sellers face penalty, conditional on getting caught inflating sales. However, sellers' ranking manipulation has consistently become more prevalent, even when they always have the option of "legal" marketing tools (e.g., advertising). I aim to understand whether these illegal practices can be rationalized by measuring cheating ROI and comparing it to advertising ROI. I also explore heterogeneity in cheating ROIs across cheating instances.

In the second paper, I propose and evaluate alternative ranking designs to effectively deter ranking manipulation, using the same data used in the first paper. The intuition is that ranking designs will affect how consumers evaluate information conveyed in rankings, and therefore, sellers' gains to cheating. Specifically, I focus on two key aspects of ranking designs: (1) the degree of pooling and (2) the number of items ranked. To this end, I develop a model of consumer purchases and a model of sellers' cheating decisions based on which I can simulate changes in sellers' returns to cheating and corresponding changes in sellers' cheating decisions.

I believe that the NBER Digitization Tutorial 2019 would provide me a unique opportunity to interact with researchers with whom I share research interests most, as well as to widen my understanding of the literature on the economics of digitization. Thank you for your consideration.

Sincerely,

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