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Graduate Study

I am a second-year PhD student at Haas School of Business, UC Berkeley, and my primary fields are IO and microeconomic theory. Through my first three semesters at Berkeley, I have taken two graduate IO courses (primarily covering demand estimation and applications), two graduate theory courses (game theory and matching theory), and I will be taking two more IO courses this spring. In addition to my primary coursework, I have also taken graduate courses in political economics and public economics.

Prior to my PhD, I obtained a master's degree in Mathematical Statistics at the University of Cambridge, where I completed coursework in probability theory and combinatorics. As an undergrad at Harvard University, I also took a graduate course in market design. These degrees and dates of attendance are listed below.

- Haas School of Business, UC Berkeley, PhD in Business and Public Policy, 2021–present
- University of Cambridge, MASt in Mathematical Statistics, 2017–2018
- Harvard University, AB in Applied Mathematics, 2013–2017

Research Interests

My research interests fall primarily into two related categories. First, I am interested in understanding the ways in which competition in digital industries differs from those traditionally studied by IO economists, and how regulatory policy should adapt to these differences. Secondly, I am interested in studying the broader impact of digital technologies, especially machine learning, on society. As a second-year student, I have only just begun working on projects in these areas, but I will describe these briefly, starting with two topics in the first category.

The first project is about the impact of acquisitions on ex ante investment in startups. This is motivated by an increasingly common phenomenon in which the exit for VC-backed startups, especially technology companies, is acquisition by one of the large incumbent firms. Prominent examples include Facebook's purchases of Instagram and Whatsapp, Google's purchase of Waze, and Amazon's purchase of the streaming service Twitch. As the size of these acquisitions has grown, they have become more viable exits for VCs and have simultaneously drawn greater regulatory scrutiny, which raises an interesting question: how does the potential for downstream acquisition affect the decisions of founders and VCs regarding entry, product design, and investment in quality, and how would stricter regulatory policy impact welfare within this context? I am currently working on a theoretical exploration of this question, with a focus on the importance of competition among incumbents for acquisition of a startup. I am particularly interested in industries involving digital products because

these acquisitions often involve high price tags for relatively small teams. Such acquisitions are unlikely to be "killer acquisitions" because if the product is acquired and then discontinued, it can be reproduced by another small team seeking a similar payout. If, as is more often the case in these industries, startups are purchased by incumbents seeking to expand their operations into new areas or technologies, the dynamics of competition between these incumbents should be central to the decision to acquire and hence to the entry and investment incentives of startups. While I am still in the process of developing my model, some very preliminary results suggest that regulation of acquisition is unnecessary when there is sufficient competition for acquisition among incumbents, but may be efficiency-enhancing when the potential acquirer is a monopolist. I hope that a clearer understanding of these dynamics will help inform regulatory policy for acquisitions in the tech industry.

Another topic I am interested in is the interaction between primary and secondary markets. With the rise of digital communication, resale of products has become easier and much of it has moved online to marketplaces like eBay, Amazon, or Craigslist. The increased ease of resale has obvious implications for production and pricing decisions in the primary market, but it has also led some primary sellers to engage more actively in their own resale or other aftermarkets. For example, Ticketmaster operates both as a primary seller and resale platform for live event tickets, Mercedes-Benz operates a service allowing its customers to easily rent out their cars to other drivers in Germany, and the toymaker Lego recently purchased the largest online Lego-specific resale market. Digitization has increased the potential scale of resale, but there is relatively little work seeking to understand the implications for competition and total welfare of primary sellers' engagement with their products' secondary markets. Although I have not yet started a project in this area, I am hoping to find a setting in which I can use empirical IO tools to understand how the potential for resale affects primary seller behavior, and how the primary and secondary market behavior would differ if they were integrated or jointly operated.

As mentioned above, I am also interested in the ways that digital technologies affect society, in particular technologies like open-source collaboration tools, blockchains and distributed ledgers, and machine learning algorithms. I am currently working on a project with a coauthor in computer science in which we seek to understand the impact of the machine learning tools used for a variety of social programs. For example, many school districts use "early warning systems" to identify at-risk students, increasingly making use of machine learning tools to do so. Physicians and insurance companies are making use of similar tools to improve "predictive medicine." Some cash-transfer programs in developing countries have made use of predictive algorithms trained on satellite and mobile phone data to target aid to those most in need. In our ongoing work, we develop a model in which these prediction tasks proxy for the estimation of heterogeneous treatment effects, which are the crucial inputs to a targeted intervention. We then compare prediction-based treatment to random treatment in various settings and identify the conditions under which predictive algorithms do and don't increase the efficacy of an intervention.

The above projects are an incomplete description of my interests, but almost all of the topics I am exploring are related to the economics of digitization. I believe I could benefit from and contribute to this workshop and would be grateful for the opportunity to participate.