Application to the NBER Digitization Tutorial 2023

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A short description of graduate study

I am currently enrolled as a fourth-year Ph.D. student in Quantitative Marketing at Rotman School of Management, University of Toronto.
Major: Quantitative Marketing
Minor: Industrial Organization

My courses of graduate study mainly fall into the Marketing Department at Rotman School of Management and the Economics Department. So far, in my major field, I have taken *Marketing Theory I–Consumer Behavior, Marketing Theory II–Strategy, Current Topics in Marketing Strategy, Econometric Methods in Marketing, and Special Topics in the Economics of Technology and Innovation* at Rotman.

On the markering side, *Marketing Theory I–Consumer Behavior* introduces me to basic theories of and research in consumer behavior with perspectives of social psychology as well as behavioral decision theory. *Marketing Theory II–Strategy* introduces me to the key questions and most popular methods used in quantitative marketing. Topics include demand estimation, advertising, pricing, CRM, distribution, sales force management, search, learning, loyalty, branding, behavioral marketing, social media and word-of-mouth, digitization, and marketing policy. *Current Topics in Marketing Strategy* has the focus on theoretical work. We examine the key theory papers in advertising, credence goods, salesforce compensation, innovation, non-rational consumers, green marketing, and two-sided media markets. *Econometric Methods in Marketing* focuses on dynamic structural models. Examples include consumer learning models, inventory and stockpiling problems, durable goods adoption, dynamic price competition, and product positioning. We also explore areas on the frontier, such as approaches that incorporate machine learning and large-scale datasets. *Special Topics in the Economics of Technology* and innovation addresses three classic questions in the economics of innovation: the relationship between competition and innovation, the impact of innovation on various economic outcomes, and the role of policy in determining the rate of innovation. Moreover, it discusses the direction of

innovation, who becomes innovators, and the role of innovation (especially artificial intelligence) in shaping labor markets.

On the economic side, I took *Microeconomic Theory I and II*, *Econometrics I and II, Industrial Organization I and II, and Empirical Applications of Economic Theory* from the Econ Department. The IO courses cover important works in demand estimation (eg. BLP), dynamic demand, production functions, market structure (eg. antitrust, horizontal mergers, vertical markets), static models of market entry, spatial competition, and dynamic games of oligopoly competition.

A short description of research

My research interests lie broadly in the economics of digitization, digital privacy and data economy. Data is a brand new form of capital in the production, and is the new fuel of economy. It remains an open question that how we should value data in the consumer market. In this essence, I am interested in how the various forms of digital services impact consumers' preferences and valuation of data? How businesses on the digital platforms build their data strategies under consumers' privacy concerns? And most importantly, how the understandings of the above questions can help us grasp the value of data in the new economy and draw implications for better policy designs?

Current work-in-progress research projects

- "**The Economics of Digital Privacy**", with Avi Goldfarb. *Accepted at Annual Review of Economics*

  This is a review work that goes through recent development in the study of the economics of digital privacy and discuss the future directions. There has been increasing attention to privacy in the media and in regulatory discussions. This is a consequence of the increased usefulness of digital data. The literature has emphasized the benefits and costs of digital data flows to consumers and firms. The benefits arise in the form of data-driven innovation, higher quality products and services that match consumer needs, and increased profits. The costs relate to intrinsic and instrumental values of privacy. Under standard economic assumptions, this framing of a cost-benefit tradeoff might suggest little role for regulation beyond ensuring consumers are appropriately informed in a robust competitive environment. The empirical literature thus far has focused on this direct cost-benefit assessment, examining how privacy regulations have affected various market outcomes. However, an increasing body of theory work emphasizes externalities related to data flows. These externalities, both positive and negative, suggest benefits to the targeted regulation of digital privacy.

- Dissertation: “**Consumer Privacy Concerns and Firm’s Data Strategy**”
  My dissertation is at the early stage of descriptive statistics exploration. Consumer's digital privacy is a central issue on digital platforms. Data flows from consumers generate value to firms, which could in turn bring both benefits and costs to consumers. Consumers face a trade-off in data provision, for better services, and privacy. Firms could over- or under-collect data under the data-privacy trade-off. In this paper, I plan to examine this trade-off empirically on a large digital platform with consumers and third-party firms (apps) on both ends. The apps decide on what data types to request from consumers upfront. Only by accepting the whole bundle of data types can the consumers enjoy the services. This specific data consent rule makes it explicitly the case that consumers trade their data for digital services. Specifically, I use data from firm decisions to request information and consumer decisions to provide it. Following the conceptual framework of dual-privacy preferences, I plan to develop a structural model to accommodate both intrinsic and instrumental preferences in consumer's utility function, and use field data to estimate them. This study aims to provide a clear guide on the heterogeneity of consumer's privacy concerns, and to develop insights for firms to design optimal strategies for data acquisition.

Committee members: Avi Goldfarb (Advisor), Matthew Osborne, Heski Bar-Isaac, Nitin Mehta