NBER Digitization Workshop Application – Zheng Gong

Part 1: Contact Information

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Part 2: Courseworks

I am a fourth year PhD student in Rotman School, University of Toronto. Prior joining Rotman for my PhD study, I graduate from CEMFI Master in Economics program with distinction in 2016, and I earned my two bachelor degree in Economics and Astronomy from Peking University in 2014. I am in the Economic Analysis and Policy group and co-supervised by Prof. Heski Bar-Isaac and Prof. Matt Mitchell. Prof. Ignatius Horstmann is also in my committee. My major fields of study is industrial organization and applied microeconomic theory, and I am particularly interested in marketing topics like promotion, price tracking, search platform, etc. I have taken and audited many courses in both the economics department and Rotman School of Management. Below is the course list (audit courses marked by *, grades for courses taken are in the bracket.)

Economics Department: Microeconomic Theory 1 and 2 (A+, A+), Macroeconomic Theory 1 and 2 (A+, A), Econometrics 1 and 2 (A+, A+), Industrial Organization 1 and 2 (A, A+), Topics in Microeconomic Theory (A), Empirical Applications of Economic Theory (A)

Rotman: Advanced Topics in the Theory of Industrial Organization (A), Advanced Topics in Strategy and Economics (A), Marketing Theory 2: Strategy*, Current Topics in Marketing Strategy*, Empirical Methods in Marketing*, Workshop in Marketing*, Advanced Topics in Urban and Real Estate Economics*

Part 3: Research

My research interests are mainly in applied economic theory and industrial organizations. There are two lines of my research projects: on the more applied side, I study how the era of digitization brings new tools for consumer to acquire information, and how firms grant promotions more efficiently to manipulate consumers search behavior. On the more theoretical side, I am interest in Bayesian persuasion and information design problems. Below I will introduce these two part of my works.

On the applied side, I have two working paper theoretically investigates how digitization changes the firms' incentives on promotions. The first working paper is "What the Past Tells

about the Future: Historical Prices in the Durable Good Markets", coauthored with Jin Huang and Yuxin Chen (both from NYU Shanghai Marketing). We notice some third party wensites[1] come to the market in recent years, which provide consumers the historical prices of items on online platforms like Amazon or Taobao. This paper studies the informational role of price trackers. We write a monopolist dynamic pricing framework where price tracker users can observe the past prices of one product and use it to infer the dynamics of future prices, and thus make an intertemporal purchase decision. Our model shows that when more consumers are informed about the historical prices, the market equilibrium price is lower and sales are more frequent, which benefits even non-price tracker users. The second working paper is "Limited Time Offer as an Invitation to Search", coauthored with Jin Huang. With the development of big data and machine learning, it becomes easier for the firms to discover a consumer's demand and provide her a promotion offer. Many of these offers valid for a very short time span (several hours to one day), which we call "limited time offers". We investigate how this sales tactic influences consumers' purchase intent, the order in which consumers consider options, and firms' profits in search markets. We consider a model in which a consumer engages in sequential search based on advertised prices. We show a novel mechanism that firms does not only earn consumer's early attention through a low early price, but also by high later prices. Under mild conditions, applying limited-time offer to invite consumers' early searching is the ubiquitously optimal pricing strategy.

On the more theoretical side of my work, I have a working paper "Optimal Experiment Design with Secret Repetitions" coauthored with Qianjun Lyu (Hong Kong University). We study a persuasion game with limited commitment in which a biased sender designs and conducts costly experiments to acquire information which he can conceal or reveal. A sender commits to a particular experiment design, but he can secretly repeat experiments and selectively report the outcomes. The lack of commitment of truthfully report leads to credibility problem of the sender, and we geometrically characterize the optimal credible experiment design of the sender in this paper. Though this paper is very theoretical and abstract, the question we study has a lot of real world implications. One among such that is related to digitization is self-media influencers. For a Youtuber who aims to convince her audiences to purchase a make-up product, she has to show a convincing enough experiment of using that product. However, even if the experiment outcome is not ideal, she can film the experiment again until she gets a good enough one. Her audiences may well realize that and such approach becomes incredible. We show that, counter-intuitively, that when the cost of repeating the experiment is lower (and thus cheaper to cheat her audience), the Youtuber has to design an even more convincing experiment to persuade her audiences, which actually benefits the audiences.

My recent preliminary project with Hojat Alah Abdolanezhad (Rotman, Operation Management), "Information Design on Search Platforms", marries my interests in Bayesian persuasion and search markets. We observe that platforms like Ebay or Google plays two roles in the market. First, they are two-sided platforms that brings sellers and buyers together, where buyers sequentially search their ideal products among buyers. Second, they controls what information consumers observe when they investigate a product. Amazon or Ebay have "top

[1] An example among many is https://camelcamelcamel.com. Camelcamelcamel is one of the earliest price tracker of Amazon and it has more than 1 million users by the end of 2016.

reviews" at default to selectively show consumer some reviews, and they regulate the product description on their platform. Especially with the assistance of big data, those platforms can better tailor the information a consumer sees to manipulate the consumer's search and purchase behavior. We aim to build a theoretical framework to understand how platforms designs information that is shown to consumers, and how it endogenously changes the competition environment among sellers.

I have attended the digitization workshop this year and I have learnt a lot from the courses and interacting with instructors and classmates. It was a very enjoyable and fruitful experience to me and it drives me to apply again this year. I look forward to learn more this year and gain sparks to my further researches. Thank you very much for your time and consideration.