Ruizhi Zhu

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Research Interests: Information Transmission and Privacy, Platform Economy, Digital Marketing, Competitive Marketing Strategy

Teaching Interests: Data Analytics, Digital Marketing, Marketing Research, Marketing Strategy, Pricing

Employment

Postdoctoral Research Associate, **Northeastern University** 2023 -

Research Member, **Simons Laufer Mathematical Sciences Institute** 2023

Education

PhD in Economics, **University of Toronto** 2023

MA in Economics, **University of British Columbia** 2015

Bachelor of Economics and Finance, **University of Hong Kong** 2014

Major in Economics and Finance, **Tsinghua University** 2010 - 2011

Working Papers

Virtual Brands and Platform Intermediation with Yakov Bart and Shubhranshu Singh
(Job Market Paper)

Advertising Platforms and Privacy with Sridhar Moorthy and Xianwen Shi
Revise and resubmit at ***Marketing Science***

Dynamic Personalized Offers while Learning Changing Tastes

Targeted Media Bias and Voting

Work in Progress

Brand Image and Marketing Employee Turnover *(Draft available soon)*
with Yakov Bart, Anatoli Colicev and Samsun Knight

Privacy and Product Variety
with Sridhar Moorthy and Xianwen Shi

Ad Targeting and Obtrusiveness: Evidence from Real-Time Bidding
with Jasmine Hao and Yiran Hao

Coauthorship and Credit Allocation
with Yoram Halevy, Yiran Hao and Ron Siegel

Awards and Grants

ISMS Doctoral Consortium Fellow	2022
Doctoral Completion Award	2022
Economics Graduate Program Award	2020, 2021
Arts & Science Program-Level Fellowship	2019 - 2021
SGS Conference Travel Grant	2019
Research Fellowship	2018
Samuel Hollander Graduate Award	2017
University of Toronto Fellowship	2016 - 2021
International Student Award	2014 - 2015
Dean's Honours List	2014
HKU Foundation Scholarships for Outstanding Mainland Students (Full Scholarship)	2011 - 2014

Conference Presentations and Invited Talks

2024: Interactive Marketing Research Conference (Boston), International Industrial Organization Conference (Boston), Boston Area Marketing Scholars Research Conference (Boston), Production and Operations Management Conference (Minneapolis), UT Dallas FORMS Conference (Dallas)

2023: Xi'an Jiaotong University (virtual), Erasmus School of Economics (Rotterdam), University of Manitoba (Winnipeg)

2022: Shanghai University of Finance and Economics (virtual), Conference on AI, Machine Learning, and Business Analytics (Harvard), Chinese University of Hong Kong (virtual), Shanghai Jiaotong University (virtual), EARIE Annual Conference (cancelled), Young Economist Symposium (Yale), International Conference on Game Theory (Stony Brook), Asian Meeting of Econometric Society (virtual), ISMS Marketing Science Conference (virtual), Annual Canadian Economics Association Conference (Ottawa)

2019: Summer School of Econometric Society (Sapporo), Asian Meeting of Econometric Society (Xiamen), Annual Canadian Economics Association Conference (Banff), Trans-Atlantic Doctoral Conference (London), International Industrial Organization Conference (Boston)

Professional Experience

Course Instructor (University of Toronto)

- ECO 206: Microeconomic Theory 2020 - 2021
- ECO 316: Applied Game Theory 2019

Teaching Assistant (University of Toronto) 2016 - 2022

- ECO 2010: Mathematics and Statistics for PhD Students (PhD, with tutorial)
- ECO 2200: Microeconomic Theory I (PhD, with tutorial)
- ECO 2201: Microeconomic Theory II (PhD, with tutorial)
- ECO 1200: Economic Theory - Micro (Master, with tutorial)
- ECO 421: Economics of Information
- ECO 311: Pricing Strategies
- ECO 316: Applied Game Theory
- ECO 349: Money, Banking and Financial Markets
- ECO 380: Managerial Economics I: Competitive Strategy
- ECO 381: Managerial Economics II: Personnel Economics
- ECO 385: Economics of Information
- ECO 200: Microeconomic Theory
- ECO 220: Introduction to Data Analysis and Applied Econometrics (tutorial)
- ECO 101: Principles of Microeconomics

Teaching Assistant (University of British Columbia) 2015

- ECON 311: Principles of Macroeconomics
- ECON 326: Methods of Empirical Research in Economics (tutorial)

Research Assistant

- Xianwen Shi: proof-read papers and worked out proofs 2017 - 2022
- Kory Kroft: developed models and checked proofs 2018 - 2019
- Gustavo Bobonis: built models of conflict and divorce 2018
- Sandro Ambuehl & Colin Stewart: derived proofs and ran simulations 2017 - 2018
- Ronald Wolthoff: worked out proofs for sequential job search model 2017
- Yoram Halevy: held experiment sessions and analyzed data 2015, 2018
- Wing Suen: extended models of delay in teams 2014

Conference Participation

- Hopkins Conference on Societal Impact Driven Marketing (Washington, D.C.) 2024
- China India Insights Conference (Stanford) 2023
- NBER Privacy Tutorial (Boston) 2022
- Summer Institute in Competitive Strategy (Berkeley) 2022
- NBER Economics of Artificial Intelligence Conference (Toronto) 2018 & 2022
- NBER Economics of AI Young Scholars Workshop (Toronto) 2018
- Canadian Economic Theory Conference (Toronto) 2018

Languages

Chinese (native), English (fluent)
Programming: Python, R, Stata, MATLAB, C++

References

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Abstracts

Virtual Brands and Platform Intermediation

(Job Market Paper) with Yakov Bart and Shubhranshu Singh

Virtual brands, established by firms beyond their original brands to sell their existing products on online platforms, are gaining prominence on various food-delivery platforms. This paper studies a firm's decision to create multiple brands on an online platform and the platform's decision to recommend them to consumers who make their purchase decisions after searching recommended brands on the platform. We find a multi-product firm can utilize multiple identical-menu brands with different leading products to communicate information about its product variety, enticing more consumers to search its brands on the platform. Surprisingly, such information transmission by a multi-product firm raises not only consumer surplus but also the profit of the single-product firm. We find that when the platform does not have access to consumer-preference information, it facilitates this information transmission by consistently recommending all brands to all consumers. By contrast, when the platform knows consumer types, it uses different brands to target different consumer segments, which essentially restricts the information-transmission channel. Interestingly, however, the profits of both the platform and the virtual-brand-offering firm increase as a result. Finally, we show banning identical-menu virtual brands can further benefit both the multi-product firm and consumers when the ban pushes the multi-product firm to create multiple virtual brands specializing in distinct products. However, when the ban leads the multi-product firm to keep only one brand with all its products, the ban can hurt consumers and all firm types.

Advertising Platforms and Privacy

with Sridhar Moorthy and Xianwen Shi

We develop a general equilibrium model of informative advertising to examine the implications of privacy-motivated targeting restrictions on consumer welfare, advertisers' customer acquisition costs, and platform revenue. In our model, competitive product firms reach consumers by placing ads on a monopoly advertising platform. The platform takes the prevailing ad targeting restrictions into account when setting ad prices. On the demand side, consumers are horizontally differentiated in their product preferences and in their willingness to pay for a non-preferred product, but they don't have any intrinsic privacy preferences nor an aversion to advertising *per se*.

In this setting we show that all consumers would prefer to give up their privacy if ad prices were exogenous to the privacy regime. However, in the more realistic situation of endogenous ad prices, different consumer types may develop different privacy preferences. In particular, consumers with flexible product preferences are likely be better off under privacy.

These results show the importance of a general equilibrium analysis for finding an instrumental preference for privacy in competitive product markets; a partial equilibrium analysis that ignores the impact of privacy restrictions on ad prices cannot do so. Substantively, our observation that consumers may prefer privacy even in competitive product markets will serve as an antidote to the prevailing wisdom that privacy regulations can be defended only by appealing to the "market thickening" effects of privacy. Our model suggests instead that the market power of the ad platform may be a more important determinant of consumers' privacy preferences than product market competitiveness itself.

Dynamic Personalized Offers while Learning Changing Tastes

Firms selling products to consumers realize that it takes time to learn consumers' preferences (say, by tracking their online behavior). What makes it even more challenging is that consumers' preferences may change over time, depreciating the value of acquired information. How should the firm personalize its offers and change them dynamically to learn as well as adapt to changing tastes? How should consumers behave in light of these dynamic offers? I build a continuous-time bargaining model with one-sided incomplete information where a buyer's binary type is publicly revealed through Brownian motion and the binary type changes via a Poisson process. In equilibrium, firms will start with high prices which will only be accepted by high-type consumers with positive probability and as belief drifts below a certain threshold, the firm will offer the lowest price that will be accepted by both types immediately. Changing tastes have two effects: a level effect that leaves low value consumers less likely to accept a given offer and a slope effect so that the firm screens high value consumers faster. Hence type change benefits both types of consumers at a cost to the firm. If the firm is restricted to constant prices and can use the acquired information to select consumers, it is better off than under dynamic prices. The continuation bargaining process gets resolved slower under fixed prices than under flexible prices, which makes consumers more willing to accept a given offer quicker.

Targeted Media Bias and Voting

This paper investigates the effect of a tailored news report and its targeted release by an ideologically biased firm. Targeted media strategies include selective information disclosure and audience targeting, with audience targeting being a novel method of distorting information to voters. When the media firm cannot commit to either strategy, targeted media provides are less biased than traditional media. With full commitment in both strategies, however, targeted media do not necessarily generate more bias because selective audience targeting may be more effective in channeling the bias.

Brand Image and Marketing Employee Turnover

with Yakov Bart, Anatoli Colicev and Samsun Knight

We merge a workforce dataset with the YouGov brand index dataset to study the impact of marketing-related executive turnover on brand health metrics. Using variations of difference-in-difference models and instrumental variable models, we find that marketing-related executive turnover has a large and significantly negative effect on brand buzz and brand equity. This effect is even stronger for higher-level executive turnover compared to mid-level manager turnover.