Application for Digitalization Tutorial

Ruiqi Sun
Ph.D. in Economics, PBC School of Finance, Tsinghua University
Postdoctoral Fellow, Rotman School of Management, University of Toronto

January 5, 2023

Contact information

Email: sunrq.17@pbcsf.tsinghua.edu.cn
Address: 105 St. George Street, M5S3E6, Room 8001
Phone: +01 (437)-989-0196
Personal Website: www.ruiqisun.com

Research interests International Trade, Macro Development, Digital Economics

Employment

University of Toronto	Toronto, Canada
Postdoctoral Fellow	2023 – 2024

Education

Tsinghua University	Beijing, China
Ph.D. in Economics	2017 – 2022
University of Toronto	Toronto, Canada
Visiting Ph.D. student	2020, 2021 – 2022
Central University of Finance and Economics	Beijing, China
Victoria University	Melbourne, Australia
B.A. in Economics and B.Bus., joint degree	2013 – 2017

I am a post-doctoral fellow in the Rotman School of Management at the University of Toronto since January 2023. Before joining Rotman, I was enrolled as a full-time Ph.D. student in the PBC School of Finance at Tsinghua University from 2017 to 2022 and obtained my Ph.D. in Economics in December 2022. I visited the Department of Economics from January 2020 to June 2020, and the Rotman School of Management from September 2021 to September 2022 at the University of Toronto. My research focuses on international trade and macro development, with a particular focus on how digitalization affects international trade, growth and economic welfare from a global view. I use empirical methodology, quantitative models and machine learning tools throughout my research.

Research Statement

Hal Varian, the chief economist at Google, said "[A] billion hours ago, modern homo sapiens emerged. A billion minutes ago, Christianity began. A billion seconds ago, the IBM PC was released. A billion Google searches ago was this morning." Online activities have created tremendous microdata and offer researchers unprecedented opportunities to study the economic impact of digitalization. My research agenda is to combine rich micro online data with macro theory to shed some light on how digitalization affects trade, growth and economic welfare from a global view. One set of digital services that can be tracked resides in the palm of our hands: the mobile Apps used by half the world's population. In my dissertation, "**Digital Economy, Artificial Intelligence and International Trade**", I take the advantage of the tremendous amount of digital services embedded in smartphone Apps to study how digitalization shapes the comparative advantage, trade costs and economics welfare in App services. My dissertation consists of three main projects.

In "**AI, Trade, and Creative Destruction**" (with Daniel Trefler) [1][1], we examine the impact of AI deployment on App services. We adopt an NLP tool (BERT) to predict AI deployment by mobile apps based on the app descriptions and the abstracts of AI patents. To relieve the concern of endogeneity, we construct a Heckscher-Ohlin-type instrument that captures exogenous shocks to the cost of AI deployment. Based on our IV estimations, we find that AI deployment increases the number of monthly active users and the number of new Apps. Motivated by the empirical findings, we build a general equilibrium trade model in which firms can endogenously choose AI deployment, the number of products and exporting. We calibrate the model and quantify the welfare from AI deployment.

In "**Culture, Trust and Digital Service Trade**" (with Daniel Trefler) [3], we study the impact of cultural frictions between countries on digital service trade. The development of information technology defies the impact of distances. However, many shreds of evidence show that distances still matter in digital trade. We introduce a set of dyadic culture measures along with the standard gravity covariates from CEPII in a gravity model to understand the frictions in digital service trade. We find that the culture measures can explain 23% of the impact from distance. Moreover, App users will reduce their use of digital services if they are less trustful of the internet or more concerned about privacy.

In my ongoing project "**Optimal Product Diversity in Digital Era**" (job market paper)[4], I document the fact that mobile Apps with larger network externality have larger market shares and fewer competitors. Motivated by this fact, I build a general equilibrium model with network externality. In the digital sector, the network externalities provide natural protection to the incumbents and prevent the business stealing effect from foreign competitors. When network externality is sufficiently large, market integration is anti-competitive and the entry is insufficient. Therefore, superstar firms like Google grow through global expansions. The antitrust policies targeting superstar firms can increase firm entry and improve economic welfare.

[1]This paper is closely related and built on my previous work "AI, Trade, and Creative Destruction: A First Look " (with Daniel Trefler)[2] published on *Robots and AI: A New Economic Era*.

Committee and references

Daniel Trefler (co-supervisor)
Rotmot School of Management
University of Toronto
dtrefler@rotman.utoronto.ca
+1-(416) 946-7945

Xiaodong Zhu (co-supervisor)
Faculty of Business and Economics
The University of Hong Kong
xdzhu@hku.hk
+852-(3917)-7488

Fudong Zhang
PBC School of Finance
Tsinghua University
zhangfd@pbcsf.tsinghua.edu.cn
+86-(10) 6279-7064

References

[1] Ruiqi Sun and Daniel Trefler. AI, trade and creative destruction. Working paper, National Bureau of Economic Research, 2022.

[2] Ruiqi Sun and Daniel Trefler. Ai, trade and creative destruction: A first look. In Gene Grossman and Lili Yan Ing, editors, *Robots and AI: A New Economic Era*. Oxon and NY: Routledge, 2022.

[3] Ruiqi Sun and Daniel Trefler. Culture, trust and digital service trade. Working paper, 2023.

[4] Ruiqi Sun. Optimal product diversity in digital era. Working paper, 2023.