Application to NBER Digital Economics and AI Tutorial, 2025

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Course of Graduate Study and Years of Enrollment

As a third-year Ph.D. candidate in the Strategic Management area at the Rotman School of Management, University of Toronto, I have completed two years of doctoral coursework designed to build a robust foundation in economics, econometrics, strategy, and related social sciences. Enrolled from Fall 2022 through Spring 2024, this coursework integrated quantitative methods, formal economic modeling, and empirical research design with theoretical perspectives from strategy, organization theory, and economic sociology.

My training included advanced econometrics (with Victor Aguirregabiria and Adonis Yatchew), microeconomic theory (with Gabriel Carroll and Anne-Katrin Roesler), and empirical microeconomic methods (Kory Kroft and Martin Burda), providing me with the tools necessary for rigorous causal inference and for analyzing complex datasets at the individual and firm levels. Complementing this analytical core, I also pursued courses in industrial organization (with Yanyou Chen), personnel economics (with Mitchell Hoffman), and macroeconomics (with Michelle Alexopoulos), ensuring a well-rounded understanding of economic principles relevant as I now transition into full-time research during my third year, a period free from additional coursework and fully dedicated to independent inquiry.

In parallel, I engaged with doctoral seminar courses bridging digital economics and strategic management (with Alberto Galasso and Kristina McElheran). These courses emphasized the diffusion of information technologies, the adoption and productivity implications of AI and other digital innovations, and the importance of organizational complements and intangible assets in realizing value from technological change. Additional seminar courses in strategic management (with Anita McGahan, Brian Silverman, and Stefan Dimitriadis), economic sociology (with András Tilcsik), and foundational research methods (with Joel Baum) further enriched my perspective, enabling me to consider the broader institutional, social, and behavioral contexts in which digital transformation and innovation unfold.

This combination of advanced economic and methodological training, coupled with integrative seminars at the intersection of technology, management, and organizational change, has equipped me with both the theoretical grounding and empirical skillset necessary to investigate cutting-edge questions in digital economics and AI.

Research Interests and Projects

My research interests center on how advances in digital technologies, including machine intelligence and open-source infrastructures, reshape economic activities, organizational strategies, and broader societal outcomes. I am particularly drawn to understanding the economic value of digital infrastructures and the conditions under which new technologies—such as artificial intelligence (AI) or large language models (LLMs)—promote more efficient, equitable, and innovative practices. By bridging insights from economics, strategy, and technology management, I aim to generate empirically grounded research that speaks to these topics in a deeper sense as I refine my dissertation agenda in the coming years.

Reflecting these interests, my current research projects focus on assessing and contextualizing the impact of digital innovations. In one ongoing project, "The Value of Open Source Software" (with Frank Nagle and Manuel Hoffmann), we leverage global firm-level datasets to quantify both the supply- and demand-side value of widely used open source software.

Traditional measures underestimate this non-pecuniary public good, as open source tools are freely shared, integrated across countless firms, and notoriously difficult to track. By using new data sources to capture actual firm-level OSS usage, we estimate previously elusive demand-side values in the trillions of dollars. Our findings highlight the critical importance of OSS as a form of intangible digital infrastructure and suggest how firms and non-firm-affiliated individual developers play different, albeit pivotal roles in creating and maintaining these digital commons. This work informs ongoing debates on productivity, innovation, and strategic incentives for firms to engage more actively in the OSS ecosystem.

In a second, solo-authored project, "Were Emily and Greg Really More Employable than Lakisha and Jamal? Using LLM-based Agents for Social Science Research", I explore the strengths and pitfalls of employing LLMs as stand-ins for human subjects in experimental research settings ("homo silicus"). Inspired by the landmark field experiment by Bertrand and Mullainathan (2004), I prompt LLMs to serve as hypothetical HR managers choosing which applicants to grant interview callbacks. While the LLM-based approach can replicate established findings for neutral factors like candidate experience, my experiments expose serious limitations when the scenario involves politically sensitive variables such as race and gender. I find that certain fine-tuned LLMs systematically produce unrealistic, politically-corrected outcomes that obscure historical discrimination patterns, whereas other models yield results more in line with human-based evidence. These results, derived from a carefully constructed series of prompts and simulations spanning multiple cities, years, and demographic factors, highlight the need for rigorous model validation, calibration, and methodological caution when integrating AI-driven agents into empirical social science research.

As I move forward, I am eager to identify new promising research directions in digital economics and AI. Participating in the NBER Digital Economics and AI Tutorial would provide invaluable exposure to cutting-edge frameworks, enhance my methodological toolkit, and help crystallize compelling dissertation questions at the intersection of technology, innovation, and organizational strategy.