Application for NBER Digital Economics and AI Tutorial

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November 2026

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Description of PhD Study

I am a third-year PhD student in Applied Economics and Management at Cornell University (2024–present), advised by Professors Chris Forman and Aija Leiponen. My graduate studies focus on digital economics, innovation, and strategy. My doctoral training includes coursework in econometrics, microeconomic theory, and quantitative methods such as natural language processing, as well as research seminars on innovation and digital economics.

Research Interests

My broad research interests lie in digital economics and innovation strategy. More specifically, I am interested in how digital technologies shape firms' innovation activities, technology adoption decisions, and competitive strategies. My current research focuses on the role of digital infrastructure, artificial intelligence, and intellectual property rights in shaping innovation and competition within digital ecosystems. Through my research, I aim to better understand how the diffusion of emerging digital technologies affects firm performance and market competition.

Research Projects in Progress

1. Cloud Computing Adoption and Firms' AI Technology Choices

This project examines how firms' cloud computing adoption shapes their subsequent adoption of artificial intelligence technologies. Cloud platforms provide the computing infrastructure and complementary services necessary for AI deployment, but firms' initial cloud choices may also create switching costs and technological dependencies that influence their future technology decisions. I am particularly interested in whether early cloud adoption facilitates subsequent AI adoption and whether firms become more likely to adopt AI technologies offered by their existing cloud providers rather than competing providers. Using Microsoft's Azure ecosystem as an empirical setting, I plan to investigate how firms' historical cloud technology choices relate to their subsequent AI adoption and broader technology strategies. The project aims to contribute to our understanding of technological path dependence and platform lock-in in the digital economy, and explore the impact of cloud computing.

2. AI Integration and Competition in Digital Platforms

This project explores how the integration of artificial intelligence into existing software products affects firms' performance and competitive dynamics in digital markets. In particular, I am interested in whether making software products accessible to AI agents creates new opportunities for value creation and customer acquisition, while potentially reshaping competition among software providers. The project aims to understand how emerging AI technologies influence firms' strategic decisions and the evolution of digital platform ecosystems.

3. Patent Invalidation and Innovation in ICT Standards

This project examines how intellectual property rights shape innovation in digital technology ecosystems, focusing on wireless telecommunications standards developed by the Third Generation Partnership Project (3GPP). These standards underpin modern digital infrastructure, including 4G and 5G networks, and enable interoperability across technologies developed by different firms. However, standard-essential patents (SEPs) may restrict follow-on innovation by imposing licensing costs on firms developing complementary technologies.

Using patent review decisions from the U.S. Patent Trial and Appeal Board (PTAB), linked to 3GPP technical specifications and patent filings, we investigate how challenges to SEPs affect subsequent innovation within the standard-development ecosystem. We distinguish between public innovation, measured by enhancements to open technical standards, and private innovation, measured by standard-related patent filings. Our empirical analysis uses a difference-in-differences approach to exploit variation in PTAB decisions to institute or deny patent review trials.

Our findings suggest that weakening patent rights encourages both public and private follow-on innovation, with stronger effects on enhancements to open standards. We also find that firms with weaker technological capabilities benefit disproportionately in terms of subsequent patenting. These results highlight how intellectual property rights shape innovation incentives, technological complementarities, and knowledge spillovers within digital technology ecosystems.

Description of Dissertation

Tentative Title: Innovation and Competition in Digital Ecosystems

Research Overview: My planned dissertation research broadly examines how digital technologies and technological ecosystems shape firms' innovation strategies and competitive outcomes. I am particularly interested in the role of digital infrastructure, technological interoperability, and platform integration in influencing firms' technology adoption and innovation decisions. My ongoing and proposed research explores these questions in the contexts of cloud computing, artificial intelligence, and wireless telecommunications standards. Together, these projects aim to improve our understanding of how firms navigate technological dependencies and competitive dynamics in evolving digital markets.

Committee Members

Chris Forman, Aija Leiponen.