Application for the NBER Digital Economics and AI Tutorial

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Education

Northeastern University, Boston, MA, USA

Ph.D. Economics 2023–Present
Primary Fields: Behavioral and Experimental Economics; Labor Economics;
Digital Economics; Development Economics
Secondary Field: Industrial Organization
Committee Members: Bilge Erten (Chair), b.erten@northeastern.edu;
Shantanu Khanna, s.khanna@northeastern.edu

M.S. Economics 2024

Lahore University of Management Sciences (LUMS), Lahore, Pakistan

BSc (Hons) Economics and Mathematics (with Distinction) 2022

Research Interests

I am a third-year Economics PhD student at Northeastern University. My research explores how labor market outcomes are shaped by gender dynamics and climate-related shocks, with a particular focus on the role of digital platforms, market design, and algorithmic systems. I use field experiments, quasi-experimental methods, and digital trace data to study discrimination, bargaining behavior, and broader economic interactions across both formal and informal markets.

I am especially interested in how the design of digital platforms influences economic interactions. This includes how information frictions and behavioral biases affect bargaining and pricing in digital markets, how gender norms manifest in algorithm-driven environments, and how emerging AI tools influence labor supply, entrepreneurship, and market participation. One of my projects compares negotiation-based and algorithmic ride-hailing platforms to identify how platform design influences gender disparities in pricing, safety, and service quality for female riders. Another examines algorithmic and customer-driven gender discrimination on social commerce platforms, investigating whether women entrepreneurs face penalties including fewer inquiries, lower price offers, reduced transaction completion, and exposure to unsolicited advances.

Beyond digital markets, I am also interested in how climate change reshapes labor market participation, particularly through shifts in migration, informal work, and the emergence of digital forms of labor in climate-vulnerable settings. More broadly, my work seeks to understand how gender, climate shocks, and technology interact to influence economic opportunities and to identify market and policy designs that can help reduce persistent inequities.

Expression of Interest

The NBER Digital Economics and AI tutorial aligns closely with my research, which investigates how digital platforms and algorithmic systems shape economic behavior, labor market outcomes, and gender-based disparities. Much of my work uses large language models and image-generation tools for experiment design,

data structuring, and analysis, so gaining deeper exposure to the AI-based methods currently used in digital economics would be extremely valuable. I hope to learn from researchers whose work intersects with my own and to engage with a community of researchers working on digital economics. The tutorial would provide valuable feedback on my ongoing work and strengthen the methodological tools I bring to the study of digital markets and discrimination.

I am also very enthusiastic about the opportunity to attend the associated NBER Digital Economics and AI meetings. Participating in presentations and discussions would be an invaluable experience. I would look forward to connect with researchers working in related areas, both for feedback on my dissertation and for potential collaborations.

Grants

CEPR–PEDL	GBP 39,240	2025	Gender Discrimination in Digital Marketplaces
LUMS	PKR 1,500,000	2025	Gender Discrimination in Digital Marketplaces

Select Work in Progress

Gender Discrimination in Digital Marketplaces

with Sher Afghan Asad - Data collection in progress

Abstract: Digital marketplaces are often seen as a promising avenue for empowering entrepreneurs in developing countries. By lowering search costs, expanding access to geographically dispersed buyers, and reducing reliance on face-to-face interactions, online commerce can help overcome traditional barriers that have long constrained firm growth. These features are particularly valuable for women, who often face mobility restrictions, safety concerns, and social norms that limit participation in brick-and-mortar markets. Yet despite this promise, evidence remains limited on whether digital marketplaces truly expand opportunities for women entrepreneurs or instead replicate existing gender disparities in new forms. This project examines whether digital marketplaces serve as engines of inclusion or reinforce existing inequalities by focusing on gender-based discrimination in Pakistan's largest online commerce platform, Facebook Marketplace. It combines two complementary components. First, a nationwide empirical analysis of Marketplace data will document gender gaps in participation, pricing, product mix, and reputation signals, using text and image data extracted with large language models (LLMs). Second, a randomized audit experiment will causally identify customer- and algorithm-driven discrimination by comparing buyer and algorithm responses to identical product listings posted under experimentally controlled male and female seller profiles. The study measures gender differences in both pecuniary outcomes—such as buyer interest, offers, and transaction completion—and non-pecuniary outcomes, including unsolicited advances and harassment. Comparing minimal- and full-information listings allows us to distinguish belief-based discrimination, driven by misperceptions, from taste-based discrimination, rooted in preferences. In addition, differences in listing visibility and engagement will capture potential algorithmic bias in the placement of male and female sellers' posts. Together, these components provide comprehensive evidence on the demand-side barriers female entrepreneurs face in digital markets and the mechanisms—belief-based, taste-based, and algorithmic—through which such discrimination operates.

Bargaining Dynamics and Gender Discrimination in Ride-Hailing Services

Abstract: Ride-hailing platforms have transformed urban mobility by expanding access to flexible, on-demand transport. For women, these platforms offer more than convenience—they provide pathways to greater independence and expanded social and economic opportunities in contexts where mobility constraints

have historically limited them. Yet pricing disparities, negotiation frictions, and safety risks continue to shape women's travel behavior and economic participation. This study investigates how platform design shapes gender gaps in pricing, safety, and service quality in Pakistan's ride-hailing market by comparing two contrasting models: Yango, which sets fares algorithmically, and InDrive, a negotiation-based platform where riders propose fares and drivers can counter in real time. I will conduct a randomized audit experiment across multiple urban routes in Lahore, using controlled male and female rider profiles that follow identical protocols. This design allows for the causal identification of gender differences in fares, wait times, cancellations, ride duration, ratings, and exposure to unsolicited advances under both platforms. Data will be collected during peak and off-peak hours to examine whether gender discrimination varies with market thickness. By directly comparing negotiation-based and algorithmic pricing, the study will deepen our understanding on how platform design and market conditions interact to shape discrimination in digital transportation markets. The findings will provide evidence to guide the design of more inclusive mobility systems that support women's economic empowerment.

Experience

Northeastern University — Graduate Teaching Assistant 2023–Present
Applied Econometrics; Public Finance; Microeconomic Theory; Macroeconomic Theory; Statistics for Economists; Healthcare and Medical Economics; Economics of Sustainability

Pakistan Institute of Development Economics (PIDE) — Research Associate 2023
What happens when women suddenly stop receiving cash transfers?
Collecting Accurate Data on Intimate Partner Violence: Learnings from Pakistan

LUMS, Department of Economics — Research Assistant 2022
Price and prejudice: Gender discrimination in online marketplaces
Climate and Environmental Crisis: A Ray of Hope Through Uptake of Electric Bikes

LUMS, Department of Economics — Teaching Assistant 2020–2022
Applied Statistics for Humanities; Intermediate Microeconomics; Game Theory; Economics of Climate Change

Shahid Javed Burki Institute of Public Policy at NetSol — Research Intern 2021

Awards and Honors

Distinction in PhD Qualifying Examination, Northeastern University 2024
Graduate Fellowship, Northeastern University 2023–Present
Award of Distinction, Lahore University of Management Sciences (LUMS) 2022
Dean's Honor List, Lahore University of Management Sciences (LUMS) 2019–2022