

Sayantana Roy

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Economics PhD candidate with expertise in causal inference, structural and computational modeling, and machine learning. Spent two years building and validating production credit-risk models on large-scale transaction data as a data scientist at American Express. Skilled at turning large, messy data into decision-ready insight; proficient in Python, JAX, SQL, and Stata.

EDUCATION

Purdue University, Ph.D. & M.S. in Economics Aug 2021 – May 2027 (expected)
Fields: Macroeconomics and Spatial Economics

Madras School of Economics, M.A. in Economics 2017 – 2019

R.K.M.R. College, University of Calcutta, B.S. in Economics 2014 – 2017

SKILLS

Programming: Python (pandas, scikit-learn, XGBoost), JAX, Julia, SQL, PySpark, MATLAB, Stata
Methods: Causal inference (IV, RD, diff-in-diff), structural & DSGE modeling, time-series & dynamic factor models, machine learning

EXPERIENCE

Data Scientist, Credit and Fraud Risk Division, American Express — Gurugram, India July 2019 – June 2021

- Developed point-in-time revenue prediction models using gradient boosting (XGBoost) for commercial customers
- Built arbitration logic to assign the best SIC code to commercial customers, improving classification accuracy
- Engineered new features that enhanced the in-house classification model predicting risk of default

SELECTED RESEARCH

[1] **The Spatial Allocation of Fiscal Stimulus: County Size and the Gains from Reallocation**
(Job Market Paper)

- Estimated the causal employment effects of stimulus with an instrumental-variables design on county-level ARRA spending, then quantified the gains from reallocating funds across places using a calibrated multi-region structural model.

[2] **Common Shocks, Local Exposure: Sectoral Wage Dynamics Across U.S. Counties**

- Built a Bayesian dynamic factor model with autoregressive components on county-sector wage panels to decompose recession exposure into aggregate, sectoral, and local risk.

[3] **Gender Gaps in Employment Seasonality: The Role of Unemployment Insurance**

- Analyzed Unemployment Insurance claims by gender, using a split-sample design across states with differing school-calendar timing to isolate caregiving-driven seasonality.

AWARDS & FELLOWSHIPS

- Krannert Doctoral Students' Research Symposium Winner, Purdue University (2024)
- Novshek-Watts Scholarship, Purdue University (2021)