

# Li Shen, PhD

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## PROFILE

Applied economist and data scientist with a Ph.D. in Economics from Clark University, working at the intersection of causal inference, quantitative spatial modeling, product analytics, and decision systems. Builds large, messy, multi-source datasets and translates them into models, simulations, and public-facing tools, including a live pricing decision engine on 6.6M scanner-data rows and an interactive population-density atlas.

## EDUCATION

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|------------------------------------------------------------------------------------|--------------------------------------|
| <b>Clark University</b><br><i>Ph.D. in Economics</i>                               | <b>Worcester, MA</b><br>2026         |
| <b>The State University of New York at Buffalo</b><br><i>M.A. in Economics</i>     | <b>Buffalo, NY</b><br>May 2019       |
| <b>Valparaiso University</b><br><i>M.S. in International Economics and Finance</i> | <b>Valparaiso, IN</b><br>May 2018    |
| <b>Chongqing University</b><br><i>B.Mgmt. in Accounting</i>                        | <b>Chongqing, China</b><br>June 2014 |

## CORE EXPERTISE

- **Applied economics:** causal inference, panel-data econometrics, difference-in-differences, instrumental variables, event studies, shift-share designs, gravity models.
- **Modeling and simulation:** quantitative spatial modeling, input-output analysis, structural calibration, counterfactual simulation, constrained optimization, time-series forecasting.
- **Product and business analytics:** demand estimation, price and promotion response modeling, A/B test design with power analysis, metric definition, sensitivity analysis.
- **Data and ML:** multi-million-row panel construction, geospatial rasters, mobility data, scanner data, gradient boosting, feature engineering, model stability metrics.
- **Tools:** Python, SQL, R, Stata, MATLAB, SAS, GeoPandas, Polars, pandas, scikit-learn, statsmodels, Tableau, ArcGIS, Streamlit, pytest, Git/GitHub.

## SELECTED RESEARCH AND APPLIED WORK

### Pricing and Promotion Decision Engine 2025–Present

Live app: [pricing-promotion-decision-engine.streamlit.app](https://pricing-promotion-decision-engine.streamlit.app) Code: [GitHub](#)

- Built an end-to-end pricing decision-support application on 6.6M rows of Dominick's Finer Foods scanner data; cleaned to a 4.65M-row panel covering 486 UPCs, 93 stores, and 366 weeks.
- Estimated a log-log fixed-effects demand model with Duan smearing retransformation; implemented counterfactual price and promotion simulations plus constrained profit optimization under cost, inventory, and margin constraints.
- Designed A/B validation plans with power analysis; deployed as a Streamlit app with modular Python code, reproducible requirements, GitHub auto-deployment, and pytest tests.

### The Local Multiplier Effects of Trade Job Market Paper, 2023–Present

With Kensuke Suzuki, Xiaocong Xu, and Junfu Zhang

- Developed a multi-sector quantitative spatial model with inter-provincial input-output linkages, non-tradable production, and labor mobility, calibrated to China's 2017 multi-regional input-output table.
- Recovered structural parameters from MRIO, ICIO, and Chinese Customs micro-data; identified own-trade share, rather than raw export exposure, as a key statistic organizing local multiplier heterogeneity.
- Produced counterfactual simulations with model-implied province-level GDP multipliers ranging from 0.30 to 1.02.

### High-Speed Railway and Market Integration Working Paper, 2021–Present

- Constructed a 3.99M-observation city-pair-month panel from daily Chinese vegetable wholesale prices across ten commodities and 117 prefecture-level cities from 2014 to 2022.
- Merged price data with AutoNavi smartphone-based intercity passenger mobility indices and institutional features affecting passenger and freight channels.
- Documented that HSR-connected city pairs exhibit 2–5% lower intercity price dispersion; used mobility controls and product heterogeneity to distinguish trader-interaction channels from freight substitution.

## China Population Density Atlas

2022–Present

Live app: [pop-density-spatial.streamlit.app](https://pop-density-spatial.streamlit.app)

- Processed 19 years of 5 km-resolution population-density rasters from 2002 to 2020 into a harmonized annual panel for grid-cell and province-level analysis.
- Built metrics tracking spatial agglomeration, dense urban corridors, and province-level convergence; documented rising spatial concentration and expansion of high-density areas by 24%.
- Deployed an interactive Streamlit application for map-based exploration of density, agglomeration, and urban-corridor metrics.

## Applied Machine Learning Competitions

2023–2024

- **Home Credit, Kaggle Silver Medal:** co-developed a Polars lazy-execution ETL pipeline for multi-depth relational borrower data; optimized directly for the Gini Stability metric to reduce performance drift over time.
- **ICR, Kaggle Bronze Medal:** designed stratified resampling for severe class imbalance and co-developed an XGBoost + TabPFN ensemble under a custom Balanced Log Loss metric.

## TEACHING AND PROFESSIONAL EXPERIENCE

### Clark University School of Management and Department of Economics

Worcester, MA

Graduate Teaching Assistant

Fall 2020–Spring 2025

- Supported graduate finance courses in Investments, Computational Finance, Case Studies in Derivatives, and Investment Strategy; led sessions on Monte Carlo methods, stochastic processes, Black-Scholes pricing, equity valuation, DCF modeling, portfolio analysis, and risk management.
- Supported undergraduate economics instruction in Macroeconomic Theory and Economics and the World Economy; built five years of experience translating quantitative material for mixed audiences.

### Datong Jiaye Property Management Co., Ltd.

Financial Data Auditor

2014–2016

- Conducted internal financial audits, reconciled inventory records, and prepared general-ledger journal entries using operational and accounting records.

## RECOGNITION

- **Honors:** Sheftel Award for Research Excellence, Clark University (twice, 2025); Veendorp Best Field Paper Award (2022); Doctoral Fellowship (2019–2026); Kaggle Silver Medal (2024); Kaggle Bronze Medals (2023); Distinguished Student Award, Valparaiso University Alumni Association (2018).
- **Languages:** Mandarin Chinese (native); English (full professional proficiency).