

Li Shen, PhD

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SUMMARY

Ph.D.-trained applied economist focused on demand estimation, pricing, and market analysis. Builds multi-million-row market panels to estimate how prices, promotions, and market conditions relate to demand and market outcomes, then translates the evidence into forecasts, scenarios, and decision-support tools. Brings complementary training in panel econometrics, causal-inference design, and structural counterfactual analysis; strong programming skills in Python, SQL, Stata, MATLAB, R, and SAS.

EDUCATION

Clark University

Ph.D. in Economics

Worcester, MA

August 2026

The State University of New York at Buffalo

M.A. in Economics

Buffalo, NY

May 2019

Valparaiso University

M.S. in International Economics and Finance

Valparaiso, IN

May 2018

Chongqing University

B.Mgmt. in Accounting

Chongqing, China

June 2014

TECHNICAL SKILLS

- **Demand, pricing, and market analysis:** Price-demand estimation, elasticity measurement, price and promotion scenarios, high-frequency market panels, price-dispersion analysis, gravity models, and market-integration measurement.
- **Panel econometrics and causal-inference design:** Fixed effects, difference-in-differences, staggered-adoption designs, event studies, shift-share IV, identification and pre-trend diagnostics, and claim calibration.
- **Structural and counterfactual modeling:** Quantitative spatial equilibrium, quantitative trade, multi-region input-output networks, calibration, structural inversion, labor mobility, and counterfactual simulation.
- **Decision and forecasting methods:** Constrained optimization, A/B-test design and power analysis, seasonal ARIMA, rolling-origin forecasting, risk classification, validation, and model governance.
- **Programming:** Python, SQL, Stata, MATLAB, R, SAS.

SELECTED EMPIRICAL MARKET ANALYSIS

High-Speed Rail and Market Integration — Price Dispersion and Mobility

2021–Present

- Built a 3.99M-observation city-pair-month panel from daily wholesale prices for 10 vegetables across 117 Chinese cities (2014–2022), merged with AutoNavi intercity passenger-mobility indices.
- Used the Green Passage highway-toll exemption and prohibitive HSR freight tariffs for bulk produce to distinguish passenger-mobility and freight-cost explanations for spatial price dispersion.
- Applied pre-trend and identification diagnostics to calibrate the interpretation, retaining descriptive and comparative evidence when a causal claim was not supported.
- Documented that HSR-connected city pairs exhibit 2–5% lower price dispersion; mobility controls and cross-product heterogeneity are consistent with passenger mobility and trader interaction rather than freight substitution.

Trade Shock Propagation — Structural Spatial Equilibrium and Quantitative Trade (Job Market Paper)

2023–Present

- Co-developed a multi-sector, 31-province structural spatial-equilibrium model with inter-provincial input-output networks, non-tradable production, and labor mobility; contributed quantitative model development, calibration-data work, and counterfactual analysis using China's 2017 MRIO, ICIO, and Customs data.
- Derived and implemented alternative labor-mobility formulations, comparing simultaneous location-sector choice with sequential location-then-sector choice through equilibrium allocations and model-implied multipliers.
- Solved province-sector counterfactual equilibria to separate direct export losses from indirect propagation through supplier linkages, non-tradable demand, and worker relocation.
- Counterfactual simulations yield model-implied GDP multipliers from 0.30 to 1.02 across provinces, with local production structure and own-trade share organizing heterogeneity.

APPLIED PROJECTS

Pricing and Promotion Decision Engine — Demand Estimation, Optimization, and A/B Design

2025–Present

Live app: pricing-promotion-decision-engine.streamlit.app Code: github.com/Li-Shen-Clark/pricing-promotion-decision-engine

- 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 price-response model with Duan smearing retransformation to measure historical demand responses to price and promotion changes; the estimates are observational rather than causal.
- Implemented scenario simulations and constrained profit optimization under cost, inventory, and margin constraints; designed A/B validation plans with power analysis for raise-and-test candidates.
- Deployed the workflow as a Streamlit app with modular Python code, reproducible requirements, GitHub auto-deployment, and pytest tests.

Vegetable Price Intelligence — Forecasting, Risk, and Model Governance

2026–Present

Portfolio case study: [Case Study](#) Code: [GitHub](#)

- Built an economics-informed price intelligence system from 8.68M historical wholesale-market records across 117 cities and 30 vegetables, producing 7.36M auditable city-day facts with versioned mapping, quality flags, and coverage tiers.
- Developed rolling-origin 7/14/28-day forecasts and validation-frozen 14-day spike-risk signals; on a sealed final test, reduced WAPE from 18.72% to 17.54% and routed weak product-horizon groups to explicit baseline fallbacks.

China Population Density Atlas — Interactive Geospatial Visualization

2022–Present

Live app: pop-density-spatial.streamlit.app

- Processed 19 years of 5 km-resolution population-density rasters (2002–2020) covering China into a harmonized annual panel for grid-cell and province-level analysis.
- Built the underlying density, agglomeration, and urban-corridor metrics and deployed an interactive Streamlit application for map-based exploration.

ADDITIONAL ECONOMICS AND PROFESSIONAL EXPERIENCE

Applied Econometric Research and Forecasting

2017–2019

- Forecasted international passenger demand with seasonal ARIMA models in SAS and estimated GDP-demand elasticities for capacity planning.
- Modeled determinants of corporate revenue using regression analysis on time-series and accounting data.

Financial Auditor, Datong Jiaye Property Management Co., Ltd.

2014–2016

- Conducted internal audits, reconciled inventory records, and prepared general-ledger journal entries.

ADDITIONAL QUANTITATIVE EXPERIENCE

Home Credit — Credit Risk Model Stability (Kaggle Silver Medal)

Feb–May 2024

Stack: Python, Polars, scikit-learn, LightGBM, CatBoost

- Co-developed a Polars lazy-execution ETL pipeline for multi-depth relational data; designed aggregation features (max, last, mean) capturing borrower behavioral trends; optimized directly for the headline Gini Stability metric to prevent performance drift over time.
- Implemented correlation-based feature grouping (Pearson > 0.8) for multicollinearity control and type-downcasting memory optimization (>50% reduction).

ICR — Identifying Age-Related Conditions (Kaggle Bronze Medal)

May–Aug 2023

Stack: Python, TabPFN, XGBoost, imbalanced-learn

- Designed a stratified resampling strategy using auxiliary Greek metadata (RandomOverSampler on Alpha-defined latent subgroups) to preserve population structure under severe class imbalance.
- Co-developed a voting ensemble combining parametric (XGBoost) and non-parametric (TabPFN) models under a custom Balanced Log Loss metric; calibrated decision thresholds to reduce false negatives.

TEACHING AND HONORS

- **Teaching Assistant, Clark University** (2020–2025): Led graduate finance and computational sessions for *Investments*, *Computational Finance* (Monte Carlo methods, stochastic processes, Black-Scholes pricing), *Case Studies in Derivatives*, and *Investment Strategy*; supported undergraduate *Macroeconomic Theory* and *Economics and the World Economy*.
- **Honors:** Sheftel Award for Research Excellence (two-time recipient, 2025); Veendorp Best Field Paper Award (2022); Doctoral Fellowship (2019–2026).