Qingsong Pan

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Employment

- Assistant Professor, School of Economics, Shandong University, Sep. 2023 – Present

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Education

- Ph.D., Economics, University of Texas at Austin, May 2023
  - Advisor: Daniel Ackerberg
- M.S., Economics, University of Texas at Austin, May 2019
- B.A., Finance, Shanghai Lixin University of Accounting and Finance, September 2016

Teaching and Research Fields

Fields: Empirical Industrial Organization, Structural Econometrics, Applied Econometrics
Subfields: Production Function Estimation, Productivity

Selected Working Papers and Work in Progress

- **Identification of Gross Output Production Functions with Nonseparable Productivity** (**Revision Requested, The Review of Economic Studies**)
  Abstract: We study the nonparametric identification of gross output production functions with a nonseparable productivity shock. Our nonseparable specification relaxes the traditional assumption of Hicks neutrality that has been shown to be inconsistent with a number of data sets. It can thus capture the bias in technical change, which recent research has found relevant to many important economic questions. We first generalize the identification approach of Gandhi et al. [2020] to nonseparable models and show the identification of output elasticities. To identify the entire production function, we then impose a homogeneity assumption, which is supported by the data. Given the fact that our nonseparable models nest Hicks-neutral models, we are able to document the misspecification bias of the latter. Using Chilean and Colombian plant-level data, our estimates suggest that Hicks-neutral models overestimate returns to scale, overestimate output elasticities of labor, and generate biased estimates of capital intensity. Our estimates also indicate that technological change is predominantly biased toward capital over labor and intermediate inputs.

- **Nonparametric Identification Using Timing and Information Set Assumptions with an Application to Non-Hicks Neutral Productivity Shocks**, with Daniel Ackerberg and Jinyong Hahn (**Revision Requested, The RAND Journal of Economics**)
  Abstract: A recent literature addresses endogeneity utilizing assumptions restricting agents' information sets when they chose endogenous variables. We consider using these identifying assumptions to identify a structural function (e.g. a demand or production function) in a fully nonparametric context. Using Imbens and Newey [2009]'s control function framework we show identification and illustrate how our model's structure permits weaker support conditions than used by Imbens and Newey. We apply our results to production function estimation, finding non-Hicks neutral shocks that generate interesting heterogeneity in output elasticities and biased technological change as defined in Acemoglu [2002] and studied in Doraszelski and Jaumandreu [2018].

- **The Identification Power of μ-Strong Concavity Assumptions and Sensitivity Analyses**
  Abstract: This paper derives a set of partial identification results for the mean treatment response and the average treatment effect when the μ-strong concavity assumption is combined with the MTR or the MTR-MTS assumption. μ-strong concavity is a generalization of the usual concavity assumption and the parameter μ can be seen as a measure of the strength of concavity. By tuning the value of the parameter μ, a practitioner can conduct sensitivity analyses with respect to the concavity assumption. I illustrate my findings by reanalyzing the return to schooling example of Manski and Pepper (2000).

- **Tracking Down the Unobserved Prices: A Constrained GMM Approach to Production Function Estimation, with Daniel Ackerberg (New Draft Coming Soon, Slides Available upon Request.)**
  Abstract: We show that the Klette–Griliches (1996) method, developed to consistently estimate returns to scale using financial statement data, is internally consistent only when a CES price index is employed. However, such a CES price index is rarely observed in practice. We propose a constrained generalized method of moments (GMM) estimator that treats the CES price index as an unknown parameter vector to be estimated, imposing the model-implied restrictions required for identification. Applying our approach to Chinese manufacturing data, we find robust evidence of markedly increasing returns to scale, substantially larger than those implied by existing methods.

- **Markups, Returns to Scale, and Marginal Costs from Financial Statements (Draft Available upon Request.)**
  Abstract: I generalize the Klette and Griliches (1996) framework beyond a CES demand system to a nonparametric demand system and beyond a Cobb–Douglas Hicks-neutral production function to a nonparametric, nonseparable production function. My method can be used to identify markups, returns to scale, and marginal costs from financial statements, while allowing for firm-level heterogeneity in all three objects. Applying this method to the Chinese food industry, I find that, relative to private firms, (i) SOEs exhibit lower productivity but also enjoy lower marginal costs; and (ii) SOEs operate under significantly stronger increasing returns to scale and charge higher markups. These findings contribute to a deeper understanding of SOE performance and help inform policies related to SOE reform

- **Shape-Restricted Production Functions: An Application to Allocative Efficiency, with Daniel Ackerberg**
  Abstract: We propose a two-step nonparametric estimator of production functions. In the first step, we estimate the productivity shock from the input demand function using sieve MLE. In the

second step, we estimate the production function using Bernstein polynomials after plugging in the estimated productivity shock. The use of Bernstein polynomials makes it easy to impose theory-based shape restrictions on the production function, such as monotonicity and concavity. With the shape restrictions, our second step is a disciplined convex programming (DCP) problem, which has attractive computational properties. Applying our estimator to commonly used production datasets, we find that, while the concavity restriction does not make much difference, imposing the monotonicity restriction can greatly reduce the dispersion of the estimated marginal productivity across firms, which implies much higher efficiency of resource allocation among firms.

- From Revenue to Production: Identification and Estimation, with Vincent Mastantuno and Lixue Zhou

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Grants, Awards, and Fellowships

- University of Texas Summer Fellowship, 2022–2023
- University of Texas Collaborative Research Fellowship, 2021–2022
- Econometric Society World Congress Financial Award, 2024–2025
- Youth Program of the Shandong Provincial Natural Science Foundation, 2025-2027

Teaching Experience

University of Texas at Austin, as Teaching Assistant

- Econometrics II (PhD): 2019–2022
- Econometrics (MA): 2020
- Probability and Statistics (MA): 2019
- Real Analysis (MA): 2019
- Comparative Economic Systems (UG): 2021
- Structural Econometrics (PhD): 2021
- Micro Theory for Business (UG): 2018
- Introduction to Econometrics (UG): 2018
- International Economics (MA): 2017

Shandong University, as Instructor

- Econometrics I (UG): 2024, 2025
- Econometrics II (UG): 2025

Presentations

Invited Seminars

- Western University (2023), McGill University (2023), University of Manchester (2023), Charles River Associates (2023), Peking University-Guanghua School of Management (2025), Peking University-PHBS (2025), Shanghai University of Economics and Finance (2025), Zhejiang University (2025), Hong Kong University of Science and Technology (2026).

Conferences

- Texas Econometrics Camp (2023), Shandong University Summer Econometrics Conference (2024), Hong Kong University Firm and Industry Dynamics Workshop (2025), Econometric Society World Congress (2025), SUFE IO Conference (2026), EARIE (2026, scheduled).

Referee Service

- *RAND Journal of Economics (x3), International Journal of Industrial Organization.*

Skills

Languages: English (fluent), Chinese (native)
Software: Python, LaTeX, Stata, Matlab, R
