SHENGMAO CAO

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EDUCATION

Ph.D. in Economics, Stanford University,
Expected Completion: June 2022

B.S. in Economics and Mathematics, Cornell University, 2012 - 2015 (Magna cum Laude)

DISSERTATION COMMITTEE

Prof. Liran Einav (Primary)
Economics Department, Stanford University
(650) 723-3704
leinav@stanford.edu

Prof. Jose Ignacio Cuesta
Economics Department, Stanford University
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Prof. Matthew Gentzkow
Economics Department, Stanford University
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RESEARCH AND TEACHING FIELDS

Primary field: Industrial Organization
Secondary field: Health Economics

JOB MARKET PAPER

"Equilibrium Effects of Pharmaceutical Bundling: Evidence from India", with Chirantan Chatterjee

We study the equilibrium effects of pharmaceutical bundling in the context of the Indian pharmaceutical industry. Fixed-dose combinations (FDCs), which bundle two or more drugs in a single pill, account for over 50% of pharmaceutical revenue in India. Using an equilibrium model of drug demand and supply, we show that the price and welfare impacts of pharmaceutical bundling are theoretically ambiguous and potentially large. Empirically, we find that FDCs on average sell at a 28% discount relative to the sum of their components' prices but increase the prices of component molecules by 4%. To quantify the welfare effects of FDCs, we estimate the model in the context of the market for Alzheimer's drugs and find that FDCs increase consumer

surplus by 21% and firm profits by 13%. The results suggest that US FDA's approach to FDCs may have been too conservative.

PUBLICATIONS

"Local Protectionism, Market Structure, and Social Welfare: China's Automobile Market", with Panle Jia Barwick and Shanjun Li. *American Economic Journal: Economic Policy*, 13 (4): 112-51, November 2021.

WORKING PAPERS

"Redesigning Federal Student Aid in Higher Education", with Luis Armona (Luis' job market paper)

In this paper, we study the equilibrium impact of student aid in the Unites States market for sub-baccalaureate higher education and consider the implications of alternative aid policies. We document that the current federal aid system, by subsidizing marginal price increases, incentivizes private for-profit colleges to charge high tuition prices. We also present new descriptive evidence on the importance of advertising in the demand for higher education. Using these facts, we estimate a structural model of supply and demand in this market. We then derive an optimal voucher policy that maximizes educational quality, holding the quality of schools fixed. We measure quality by estimating the value-added in earnings generated by each sub-baccalaureate college. Counterfactual results show that the optimal voucher system improves the overall quality provided by 12%. Our optimal voucher policy highlights the fact that for-profit colleges, despite being lower quality on average, are more effective at increasing enrollment than public community colleges. Consequently, these schools are an important factor for improving the educational outcomes of students.

"Competitive Bidding in Drug Procurement: Evidence from China", with Lisa Xuejie Yi and Chuan Yu (submitted)

We study the impact of competitive bidding in the procurement of off-patent drugs. In 2019, China introduced competitive bidding with a quantity guarantee for thirty-one molecules in nine provinces. Using a difference-in-difference design, we show that the program reduced drug prices by 47.4%. Generic drug companies won the majority of the bids and on average cut prices by 59.4%. Losing branded drug companies cut prices by 7.5%. We develop a model of demand and supply to quantify the trade-off between lower prices and choice distortions. We find that competitive bidding increases consumer welfare if policymakers consider brand preferences welfare irrelevant.

"Quid Pro Quo, Knowledge Spillover, and Industrial Quality Upgrades: Evidence from the Chinese Auto Industry", with Jie Bai, Panle Jia Barwick, and Shanjun Li, NBER working paper No. 27644

While there is a vast body of research on the benefits of FDI in developing countries, whether and how the form of FDI matters has received limited attention. This paper studies the impact of FDI via quid pro quo (technology for market access) in facilitating knowledge spillover and quality upgrades. Our context is the Chinese automobile industry, where foreign automakers are required to set up joint ventures (the quid) with domestic automakers in return for market access (the quo). The identification strategy exploits a unique dataset of detailed vehicle quality measures along

multiple dimensions and relies on within-product quality variation across dimensions. We show that the quality strengths adopted by affiliated domestic automakers are more similar to the strengths of their joint ventures than to those of their nonaffiliated counterparts. The results suggest that quid pro quo generates knowledge spillover to affiliated domestic automakers in addition to any industry-wide spillover. We rule out alternative explanations involving endogenous joint venture network formation, overlapping customer bases, or direct technology transfer via market transactions. Analyses leveraging additional micro datasets on worker flows and shared upstream suppliers among automakers demonstrate that labor mobility and supplier networks are important channels mediating knowledge spillover. On the other hand, while quid pro quo facilitates learning, it is not a prerequisite for knowledge spillover. Counterfactual exercises show that quid pro quo is not the primary driver of the overall quality improvement experienced by domestic automakers.

TEACHING EXPERIENCE

2018-2019 Teaching Assistant for Prof. C. Makler, Stanford University, Econ 50 (Economic Analysis I)

2019-2020 Teaching Assistant for Prof. C. Makler, Stanford University, Econ 50 (Economic Analysis I)

2020-2021 Teaching Assistant for Prof. M. Gentzkow, Stanford University, Econ 47 (Media Market and Social Good)
Teaching Assistant for Prof. H. Li and S. Rozelle Stanford University, Econ 131 (The Chinese Economy)

RELEVANT POSITIONS

2015-2016 Research Assistant for Panle Jia Barwick, Cornell University

SCHOLARSHIPS, HONORS AND AWARDS

2018-2021 Outstanding Teaching Assistant Award (x3)

2019-2020 George P. Shultz Dissertation Fund
Graduate Research Opportunity (GRO) funding

2020-2021 SIEPR Program in Regulatory Policy Fellowship
SIEPR Graduate Fellowship

PROFESSIONAL ACTIVITIES

Referee for *American Economic Review, Energy Economics, Journal of Development Economics*

Seminar presenter, China Economics Summer Institute, 2017, 2018