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EDUCATION

Ph.D. in Economics, Stanford University,
Expected Completion: June 2026

M.S. in Mathematics and Statistics, University of Melbourne, 2019

Diploma. In Mathematical Science, University of Melbourne, 2017

B.Com. in Economics and Finance, University of Melbourne, 2017

DISSERTATION COMMITTEE

Prof. Paul Milgrom
Economics Department, Stanford University
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Prof. Ilya Segal
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Prof. Ravi Jagadeesan
Economics Department, Stanford University
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Prof. Alvin Roth
Economics Department, Stanford University
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RESEARCH AND TEACHING FIELDS

Primary field: Microeconomic theory.

Secondary fields: Market design.

TEACHING EXPERIENCE

- 2022-25 Teaching Assistant, Stanford University
Undergraduate level first year economics: Econ 1,
Undergraduate level intermediate microeconomics: Econ 50,
PhD first year microeconomics sequence: Econ 202, Econ 204, MGTECON 601
- 2016-20 Teaching Assistant, University of Melbourne
PhD first year microeconomics: Microeconomics
Undergraduate level first year economics: Introductory *Macroeconomics*

RELEVANT POSITIONS

2025-Present Student Researcher, Google.
2021-22 Research Assistant for Prof. Ilya Segal, Stanford University.
Research Assistant for Prof. Lawrence H. Goulder, Stanford University.
2020-21 Research Assistant for Prof. Daniel Garrett, Toulouse School of economics.
2018-20 Research Assistant for Prof. Simon Loertscher, University of Melbourne.

SCHOLARSHIPS, HONORS AND AWARDS

2019 Professor Wilson Prize (Awarded to the student submitting the best thesis in Pure or Applied Mathematics).
2018-19 Melbourne Graduate Scholarship.
2017-18 Australian Mathematical Sciences Institute Vacation Research Scholarship
2015-17 Dean's Honours List.
2016 Economic Society of Australia Prize for Microeconomics

PROFESSIONAL ACTIVITIES

Referee: *American Economic Review: Insight, Journal of Economic Theory, International Journal of Game Theory.*

Conference Presentation:

2025 The Canadian Economic Theory Conference
2024 European Association for Research in Industrial Economics Conference
Conference on Mechanism and Institution Design in Budapest
2023 The Asian School in Economic Theory Keio University in Tokyo
The Connections Workshop: Mathematics and Computer Science of Market and Mechanism Design at UC Berkeley
2019 Australasian Economic Theory Workshop, University of Technology Sydney
Melbourne Industrial Organization and Theory Day, University of Melbourne
Organizational Economics Workshop, Australian National University

PUBLICATIONS

Liu, Bing, Simon Loertscher, and Leslie M. Marx. "[Efficient consignment auctions](#)." Review of Economics and Statistics (2023): 1-45.

RESEARCH PAPERS

[*Non-linear Pricing with Maximum Demand*](#) (**Job Market Paper**)

We revisit non-linear pricing with a parsimonious yet empirically grounded departure: each consumer has a maximum demand, a finite quantity beyond which marginal utility is zero. This addresses two major limitations in the literature. First, the standard prediction of strictly positive marginal prices with quantity discounts explains neither the prevalence of all-you-can-eat pricing (zero marginal price) in subscription models and unlimited passes, nor the quantity premiums commonly used in utility markets, parcel shipping, and cloud storage. In our model, both can arise as optimal. Second, the ubiquitous single-crossing assumption, which precludes any rank change in marginal utilities across types as quantity changes, is restrictive. Consumer preferences in our model go beyond this assumption and we provide a method to solve the problem. The optimal mechanism can feature full consumer surplus extraction, all-

you-can-eat pricing and non-monotonic allocation. These features persist for broader preferences that violate single-crossing, beyond the maximum demand specification. In particular, monopoly may over-provide, overturning standard intuition. Finally, we show that a quantity premium (discount) is optimal under perfect positive (negative) correlation and this result extends to more general forms of stochastic dependence.

[The Optimal Design of Countervailing Incentives](#)

Countervailing incentives – like the incentives faced by a shareholder to name a price that acts both as the selling price of their existing stocks and the purchase price of other shareholders’ stocks – are pervasive in mechanism and market design. Leveraging these countervailing incentives can make the truthful elicitation of a market participant’ valuations easier. We develop a unified framework for optimal mechanism design that explicitly accounts for countervailing incentives and provide a constructive algorithm to compute the optimal mechanism. The algorithm also enables empirical estimation of the designer’s welfare weight by matching model-implied allocations to observed outcomes. The framework yields new insights: the optimal mechanism features a quantity premium; cooperative production generates higher designer surplus than in standard exchange platform models; and optimal credible threats (uniformly worse outside options) can raise some market participants’ worst-case payoffs.

RESEARCH IN PROGRESS

Control a Conversation (with Martino Banchio, Andrés Perloth).[Draft coming soon]

Product Differentiation and Competition (with Gagan Aggarwal, Andrés Perloth).

Subscription vs Advertising (with Gagan Aggarwal, Martino Banchio).

The Biggar DWL (with Simon Loertscher). [Draft available upon request]

Analysing otherwise standard monopoly and oligopoly models in which consumers’ investments improve product quality, we show that the effects of market power on consumer and social surplus easily dwarf those in models without investments. Pro-hibiting mergers that are profitable once investments are sunk can be Pareto improving because, under Cournot oligopoly, industry and per-firm profit before investment need not be maximized at monopoly. Price ceilings inhibiting profit maximization ex post can increase everyone’s welfare by creating commitment firms with market power lack. Accounting for consumers’ investment incentives also opens scope for socially deficient free entry and, thereby, for industrial policy.

Externalities, efficiency, and partitioned VCG mechanisms (with Simon Loertscher). [Draft available upon request]

Externalities, while relevant in the real world, are, according to common practice, not accounted for in market design. This paper shows when the common practice is justified even though externalities matter for the efficient allocation of resources and derives the direct mechanisms that allocate efficiently, endow the agents with dominant strategies, respect their individual rationality constraint and minimize their communicative requirements. These mechanisms and standard auction formats like the second-price auction are part of a family of mechanisms that we call partitioned VCG mechanism. In such a mechanism, each agent bids on all elements in a partition of a subset of the feasible allocations. The coarsest partitioned VCG consistent with efficiency minimizes the agents’ communicative requirements. It can be implemented in undominated

strategies with a two-stage mechanism in which in the first stage each agent selects the partition it wants to bid on. Consequently, the designer does not need to know the agents' preference structure to allocate efficiently in the presence of externalities.

SOFTWARE SKILLS Python, R, Matlab, Mathematica

LANGUAGES English (fluent), Chinese (native), French (intermediate), German (basic)