

Department of Economics
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Citizenship: New Zealand

Education

Stanford University

PhD in Economics

2020–26 (Expected)

Fields: Microeconomic Theory, Behavioral and Experimental Economics

Advisors: Matthew Jackson (co-primary), Arun Chandrasekhar (co-primary), Steven Callander

University of Canterbury

BSc(Hons, 1st class) in Economics and Mathematics

2014–17

Working Papers

[The value of conceptual knowledge](#) (with Anirudh Sankar)

Abstract: We formalize what it means to have conceptual knowledge about a statistical decision-making environment. Such knowledge tells agents about the structural relationships among unknown, payoff-relevant states. It allows agents to represent states as combinations of features. Conceptual knowledge is more valuable when states are more "reducible": when their prior variances are explained by fewer features. Its value is non-monotone in the quantity and quality of available data, and vanishes with infinite data. Agents with deeper knowledge can attain the same welfare with less data. This is especially true when states are highly reducible.

How mechanistic explanations reshape learning and behavior: Evidence from a fertilizer choice experiment in Eastern Uganda (with Anirudh Sankar, Robert Dulin, Vesall Nourani, Jess Rudder, Abraham Salomon, and Godfrey Taulya)

Abstract: Mechanistic explanations—descriptions of a system through the causal interactions of its parts—play a key role in human cognition and scientific progress. Despite their importance, we lack systematic evidence on how mechanistic explanations affect learning and behavior in economic settings. We evaluate the causal impact of including mechanistic explanations in an information intervention: public demonstrations of fertilizer use for small-holder tomato farmers in Eastern Uganda. In all demonstrations, extension officers showcased the impact of a recommended fertilizer recipe. In the treatment group, officers also explained the mechanisms underlying the recipe's effects—introducing the language of macronutrients and the causal processes linking nutrients, soil features, and plant growth. We collect detailed data on beliefs and behaviors from 797 farmers in a lab-in-the-field experiment. Treated farmers are better able to generalize from mechanisms to update beliefs about the returns to fertilizers, substitute and arbitrage among fertilizers based on nutrient content, and exhibit better understanding of the principles of nutrient and soil science. In an incentivized fertilizer application task, they achieved 9% higher simulated profits by selecting more agronomically sound fertilizer recipes, without increasing costs.

[Learning about a changing state](#)

Abstract: A long-lived Bayesian agent observes costly signals of a time-varying state. He chooses the signals' precisions sequentially, balancing their costs and marginal informativeness. I compare the optimal myopic and forward-looking precisions when the state follows a Brownian motion. I also compare the myopic precisions induced by other Gaussian processes.

Publications

Gender sorting among economists: Evidence from the NBER

Economics Letters, 2022

Abstract: I compare the co-authorship patterns of male and female economists, using historical data on National Bureau of Economic Research working papers. Men tended to work in smaller teams than women, but co-authored more papers and so had more co-authors overall. Both men and women had more same-gender co-authors than we would expect if co-authorships were random. This was especially true for men in Macro/Finance.

COVID-19, lockdown and two-sided uncertainty (with Arthur Grimes)

New Zealand Economic Papers, 2022

Abstract: When COVID-19 struck, the New Zealand government had two choices: enter lockdown immediately or delay its decision. Delay would have enabled more information to emerge about health and economic dynamics, while preserving the option to act at a later date. However, delay may have destroyed the option to eradicate COVID-19. We model the government's decision when faced with the uncertainty around health and economic dynamics generated by COVID-19. Our model captures both two-sided uncertainty and the dynamic consequences that flow from the government's initial decision. Our analysis will help guide future policy decisions amid similarly complex uncertainties.

Research funding and collaboration (with Jason Gush, Shaun C. Hendy, and Adam B. Jaffe)

Research Policy, 2022

Abstract: We analyze whether research funding contests promote co-authorship. Our analysis combines Scopus publication records with data on the Marsden Fund, the premier source of funding for basic research in New Zealand. We use fixed-effect models to analyze within-researcher-pair variation in co-authorship. Among pairs who ever co-authored or co-proposed, co-authorship was 13.8 percentage points more likely in a given year if they had co-proposed during the previous ten years than if they had not. This co-authorship rate was not significantly higher among funded pairs. However, when we increase post-proposal publication lags towards the length of a typical award, we find that funding, rather than participation, promotes co-authorship.

Relatedness, complexity and local growth (with David C. Maré)

Regional Studies, 2021

Abstract: We derive a measure of the relatedness between economic activities based on weighted correlations of local employment shares. Our approach recognizes variation in the extent of local specialization and adjusts for differences in data quality between cities. We use our measure to estimate activity and city complexity, and examine the contribution of relatedness and complexity to urban employment growth in New Zealand. Relatedness and complexity are complementary in promoting employment growth in New Zealand's largest cities, but do not contribute to employment growth in its smaller cities.

Technical Notes

Estimating sample paths of Gauss-Markov processes from noisy data

Abstract: I derive the pointwise conditional means and variances of an arbitrary Gauss-Markov process, given noisy observations of points on a sample path. These moments depend on the process's mean and covariance functions, and on the conditional moments of the sampled points. I study the Brownian motion and bridge as special cases.

Delineating functional labour market areas with estimable classification stabilities (with David C. Maré)

Abstract: We describe an unsupervised method for delineating functional labour market areas (LMAs) in national commuting networks. Our method uses the Louvain algorithm, which we extend to support top-down hierarchical LMA classification and estimable classification stabilities. We demonstrate our method using historical Census commuting data from New Zealand.

Awards

William Georgetti Scholarship (for “best brains” in New Zealand)	2020
Seamus Hogan Memorial Prize (for best thesis in economics at Canterbury)	2017
Cook Memorial Prize (for top honors mathematics student at Canterbury)	2017
Sir Frank Holmes Prize (for top undergraduate economics student in New Zealand)	2016

Research and Professional Experience

Stanford University

Research Assistant to Matthew Jackson	2021–22
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Motu Economic and Public Policy Research

Research Analyst	2018–20
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PwC New Zealand

Actuarial Consulting Intern	2015–16
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Teaching Experience

Stanford University

Teaching Assistant for ECON 178 (Behavioral Economics)	2025–
Teaching Assistant for ECON 137 (Decision Modeling and Information)	2025
Teaching Assistant for BUSGEN 143 (Finance, Corporations, and Society)	2025
Teaching Assistant for ECON 43 (Personal Finance)	2023–24
Teaching Assistant for ECON 135 (Foundations of Finance)	2022–24

University of Canterbury

Teaching Assistant for FINC 331 (Financial Economics)	2017
Teaching Assistant for ECON 208 (Intermediate Microeconomics)	2016–17
Teaching Assistant for ECON 321 (Microeconomic Theory)	2016–17

Professional Service

Referee for *Research Policy*

Conference Presentations

Society for Judgment and Decision Making Annual Conference (Poster), San Francisco	2023
NBER Summer Institute (Science of Science Funding)	2021
American Economic Association Annual Meeting	2021
New Zealand Association of Economists Conference, Wellington	2019
New Zealand Association of Economists Conference, Auckland	2018
European Group of Risk and Insurance Economists Annual Seminar, London	2017