Kieran Marray

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Citizenship: Britain, Ireland

Interests

Primary: Economics of Networks, Applied Econometrics
Secondary: Machine Learning for Economics

Education

PhD Economics, Vrije Universiteit Amsterdam and Tinbergen Institute 2022–present
Supervised by Dr Michael König, and Prof. Ozan Candogan (University of Chicago).
Thesis: Essays in econometrics of networks.

MPhil Economics and Econometrics, Tinbergen Institute 2020-2022
Major: Econometrics. *GPA:* 8.42 (summa cum laude).

BA Philosophy, Politics, and Economics, University of Oxford 2016-2019

References

Dr Michael König
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Prof. Ozan Candogan
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University of Chicago
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Prof. Gordon Phillips
Tuck School of Business
Dartmouth College
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Dr François Lafond
INET Oxford
Manor Road Building, Manor Road,
Oxford OX1 3UQ
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Employment

Predoctoral researcher, Mathematical Institute, University of Oxford 2018-2020
Supervised by Prof. J. Doyne Farmer and Dr François Lafond

Academic affiliations

Fellow, Institute for Advanced Studies, University of Amsterdam 2022-present
Visitor, INET Oxford, University of Oxford 2023

Working papers

Estimating spillover effects from sampled connections
Job market paper, ArXiv pre-print 2410.17154.
Abstract: *We develop a new bias-corrected estimator for spillover effects when a researcher observes only sampled – rather than complete – links between individuals. Examples include when links are collected through surveys, when links are inferred from group membership, or when only important links are disclosed to preserve privacy. Standard estimators are often biased due to dependence between spillovers on sampled and unobserved links induced by the sampling process. Our correction rescales the estimated spillover effects based on this dependence, which can be done using only average numbers of missing links. We apply the method to estimate the propagation of climate shocks between U.S. public firms through supply links, addressing the upwards bias induced by self-reporting only large customers.*

Network rewiring and spatial targeting: optimal disease mitigation in multilayer networks with Ozan Candogan, Michael König, and Frank Takes.
Resubmission invited, American Economic Review: Insights

Abstract: *We study disease spread on a multi-layered social network where susceptible individuals rewire contacts away from the infectious. Rewiring complements mitigation policy by allowing more intergroup contact as the rewiring rate increases. We then show how to formulate the planner's problem of targeting lockdowns to prevent disease becoming endemic at minimum cost with rewiring as a semidefinite program that is tractable with many groups and layers. As an application, we compute counterfactual optimal spatially-targeted lockdowns for the Netherlands during Covid-19, building a population-level contact network and estimating the rewiring rate from epidemiological data to do so.*

Estimating unobserved networks with heterogeneous characteristics, and an application to the Swing Riots
SSRN pre-print 5338970.

Abstract: *Often, researchers do not observe interactions between individuals that mediate outcomes but do observe rich individual-level characteristics. We present an estimator for unobserved networks from individual outcomes and characteristics that determine who links with whom. The estimator recovers the network by decomposing the covariance matrix of outcomes, penalising possible links differently based on pairwise individual characteristics. We provide theoretical bounds on estimation error, and a fast coordinate descent algorithm that makes estimation tractable for large networks. As an application, we estimate which parishes, distributed in space, rose together during the Swing Riots of 1830–1831. We find evidence of a small core of connected uprisings centered on known radical parishes amongst otherwise sporadic unrest. Exposure to different types of uprising polarises elite preferences to expand the right to vote.*

Research in progress

Global competitor networks
with François Lafond, Gordon Phillips, and Michael König

Place-based policy in endogenous production networks
with Xianglong Kong, Katie MacDonald, Peter Ohlinger, and Ruochen Dai.

Awards, grants, and scholarships

Alfred P. Sloan Foundation Minor Grant in Mesoeconomics 2024
(with Xianglong Kong, Katie MacDonald, Peter Ohlinger, and Ruochen Dai)

Scholarships: Full scholarship and tuition waiver, Tinbergen Institute (2020-2022); Laidlaw research and leadership scholarship, value of £10,000 (2018)

Studentships: Sloan Foundation studentship in Mesoeconomics, University of Cambridge (2024); 'Optimisation-Conscious Econometrics', University of Chicago (2023).

External travel grants: Workshop on Firm-Level Supply Networks, University of Oxford (2025); 12th Warwick Phd Conference, University of Warwick (2024); Workshop on Firm-Level Supply Networks, University of Cambridge (2023).

Invited talks (selected)

Network Science in Economics conference (poster), **Stanford University** 2025
10th **Monash-Paris-Warwick-Zurich-CEPR** Text-as-Data Workshop
Workshop on Firm-Level Supply Networks, **University of Oxford** 2025
European Economic Association summer meeting 2024
European summer meeting of the Econometric Society
12th Warwick Phd conference, **University of Warwick**
Complexity Economics Seminar, **Oxford Martin School, University of Oxford**
Workshop on Firm-Level Supply Networks, **University of Cambridge** 2023

1st International Workshop on Population-Scale Social Network Analysis,
Institute for Advanced Studies, University of Amsterdam

Refereeing *Journal of Economic Behaviour and Organisation*, *Applied Network Science*

Teaching

Urban economics: challenges and policies (Msc), TA 2023-present

Interactive lecture notes. Lecture on nonparametric/semiparametric estimation.

Applied econometrics (Msc), TA 2023-present

Econometrics I (MPhil), TA 2021

Introductory R lecture notes

Programming Proficient: **Julia** (preferred), **R**, and **Python**; HPC and AWS environments.

Unprofessional Activities Rock-climbing, squash