Kartik Anand

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FIELDS OF INTEREST

Artificial Intelligence, Cybersecurity, Financial intermediation, Political economy

EDUCATION

University of London, Ph.D in Applied Mathematics, 2009

King's College, London, M.Sc in Information Processing and Neural Networks, 2005

Johns Hopkins University, B.A in Mathematics, 2004

PROFESSIONAL CERTIFICATIONS

INSEAD, ECB - The Innovation and Artificial Intelligence Training, 2024

CURRENT EMPLOYMENT

Senior Economist, Research Centre, Deutsche Bundesbank, Dec 2020 - Present

- Planned and organised training events, including: (i) Generative AI for Economic Research, (ii) Mini-Workshop on AI and AI-agents, (iii) Conducting Surveys and Experiments with AI-Agents using ESDL by Expected Parrot, (iv) AI-Assisted Research with Claude Code for Economists.
- Led Research Task Groups on (i) AI and (ii) identifying topics for the Research Program that are likely to be at the frontier of academic and policy debates in the medium-term.
- Managed the preparation of the regular Research Centre "Jour Fixe" meetings with the President and other board members, encompassing selecting presentation topics and providing presenters with detailed feedback to improve their messaging.

PROFESSIONAL EXPERIENCE

Economist, Research Centre, Deutsche Bundesbank, Sept 2015 - Dec 2020

- Prepared Research Centre Presentations for the President and senior stakeholders on topics ranging from Cybersecurity, Central Bank Digital Currencies, sovereign debt crises and covered bonds.
- Organised academic programs for the Bundesbank Fall 2020 Conference on `Digitalization in Banking and Payments' and session on `Sovereign Risk and Financial Crises' in the Central Bank Research Association (CEBRA) 2019 Annual Conference.

Research Manager, Financial Market Infrastructure Directorate, Bank of England, Feb - Sept 2015

- Managed a team of four full-time staff working on policy-relevant research.
- Participated in preparing the research priorities for the directorate.
- Led the Research Policy Committee meetings in the directorate to discuss and new research proposal and evaluate the progress of on-going projects.

Principle Researcher, Financial Stability Department, Bank of Canada, Feb 2013 - Feb 2015

- Took a lead role in developing extensions to the Macro Financial Risk Assessment Framework (MFRAF) top-down bank stress-testing model, including dynamic balance sheets, foreign banks in the interbank network module and information contagion.
- Participated in calibrating and using MFRAF to simulate systemic risk effects for the 2013 Financial System Assessment Program (FSAP) for Canada conducted by the International Monetary Fund (IMF).
- Represented the Bank of Canada in the Basel Research Task Force (RTF) sub-committee on Liquidity Stress Testing.

Senior Analyst, Financial Stability Department, Bank of Canada, Nov 2012 - Feb 2013

- Introduced a best coding practice for greater computational efficiency to MFRAF.
- Participated in simulating systemic effects of the 2012 macro stress test exercises using MFRAF.

Postdoctoral Fellow, Chair of Macroeconomics, Technische Universität Berlin, Aug 2010 - Nov 2012

- Contributed to the chair's grant applications by providing written executive summaries of works on financial networks and stress testing and presenting results to a panel of evaluators.

Postdoctoral Fellow, Condensed Matter and Statistical Physics Group, Abdus Salam International Centre for Theoretical Physics, Mar 2009 - Aug 2010

- Conducted research on financial networks and information theory.

Ph.D Research Intern, Financial Stability Department, Bank of England, July - Dec 2007

- Developed and implemented reduced form stress testing models using techniques from network sciences and information theory.

Program Coordinator, Council for Emerging National Security Affairs, May 2002 - April 2011

- Managed a team of three web developers to redesign and overhaul the organisation's website (www.censa.net).
- Briefed and advised the Board of Directors on key initiatives.

WORK IN PROGRESS

Algorithms, Limit Order Books and Liquidity, with Jean-Edouard Colliard and Philipp J. König

The market for vulnerabilities, with Chanelle Duley, Prasanna Gai and Philipp König

Deposits as junior claims: Bank advantages in stablecoin issuance, with Chanelle Duley and Prasanna Gai

WORKING PAPERS

Sovereign risk and financial fragility, with Jochen Mankart

Ex Machina: Financial stability in the age of Artificial Intelligence, with Sophia Kazzinik, Agnese Leonello and Ettore Panetti

Bank fragility, lender of last resort, and liquidity regulation, with Toni Ahnert and Guillem Ordõnez-Calafi

Banking in the presence of climate risk, with Natalya Martynova

PUBLISHED PAPERS

Cybersecurity and financial stability, with Chanelle Duley and Prasanna Gai, *Review of Finance, forthcoming*

Multiple equilibria? Don't panic! – A hitchhiker's guide to global games, with Philipp König, in: *The Research Handbook of Macroprudential Policy* (editors: David Aikman and Prasanna Gai), *forthcoming*

Real interest rates, bank borrowing and fragility, with Toni Ahnert and Philipp König, ***Journal of Money, Credit and Banking,*** vol 56, pages 1545-1571, 2024

Leaping into the dark: A model of policy gambles, with Prasanna Gai and Philipp König, ***Journal of Comparative Economics,*** vol 51, pages 457-476, 2023

The value of data privacy during the COVID-19 pandemic: a new set of survey questions, with Susanne Helmschrott, Sophie Zhou and Tobias Schmidt, ***Measurement Instruments for the Social Sciences***, vol 4, pages 1-11, 2022

Asset encumbrance, bank funding, and financial fragility with Toni Ahnert, Prasanna Gai and James Chapman, ***Review of Financial Studies***, vol 32, pages 2422-2455 2019

Holdout creditors and sovereign debt litigation with Prasanna Gai, ***Oxford Economic Papers***, vol 71, pages 364-381, 2019

Missing links: A global study on uncovering financial network structure from partial data with Iman van Lelyveld, Adam Banai, Soeren Friedrich, Rodney Garratt, Gregorz Halaj, Bradley Howell, Ib Hansen, Serafin Martinez Jaramillo, Hwayun Lee, Jose Luis Molina-Borboa, Stefano Nobili, Sriram Rajan, Dilyara Salakhova, Thiago Christiano Silva, Laura Silvestri and Sergio Rubens Stancatode Souza, ***Journal of Financial Stability***, vol 35, pages 107-119, 2018

Filling in the blanks: network structure and interbank contagion with Ben Craig and Goetz von Peter, ***Quantitative Finance***, vol 15, pp 625-636, 2015

Guarantees, transparency and the interdependency between sovereign and bank default risk with Philipp König and Frank Heinemann, ***Journal of Banking and Finance***, vol 45, pp 321-337, 2014

Epidemics of rules, rational negligence and market crashes with Alan Kirman and Matteo Marsili, ***European Journal of Finance***, vol 19, pp 438-447, 2013

A network model of financial system resilience with Prasanna Gai, Sujit Kapadia, Matthew Wilison and Sim Brennan, ***Journal of Economic Behavior and Organization***, vol 85, pp 219-235, 2013

Rollover risk, network structure and systemic financial crises with Prasanna Gai and Matteo Marsili, ***Journal of Economic Dynamics and Control***, vol 36, pp 1088-1100, 2012

Financial complexity and systemic stability in trading markets with Matteo Marsili, in: *Lessons from the Credit Crisis* (editor: Arthur Berd), pp 335-372, Risk Books, London, 2010

Rise and fall of trust networks with Prasanna Gai and Matteo Marsili, in: *Lecture Notes in Economics and Mathematical Systems: Progress in Artificial Economics*, vol 645, pp 7788, Springer Verlag, Berlin, 2010

POLICY PUBLICATIONS

Making supervisory stress tests more macroprudential: Considering liquidity and solvency interactions and systemic risk ***Basel Committee on Banking Supervision Working Paper 29***, 2015

Stress testing the Canadian banking system: A system-wide approach,with Guillaume Bédard-Pagé and Virginie Traclet, ***Bank of Canada Financial System Review***, June, pp 21-28, 2014

PUBLISHED PAPERS IN MATHEMATICS AND PHYSICS

A structural model for fluctuations in financial markets with Jonathan Khedair and Reimer Kühn, ***Physical Review E,*** vol 97, pp 052312, 2018

Entropy distribution and condensation in random networks with a given degree distribution with Dmitri Krioukov and Ginestra Bianconi, ***Physical Review E***, vol 89, pp 062807, 2014

Shannon and von Neumann entropy of random networks with heterogeneous expected degree,with Ginestra Bianconi and Simone Severini, ***Physical Review E***, vol 83, pp 036109, 2011

Gibbs entropy of network ensembles by cavity methods with Ginestra Bianconi, ***Physical Review E***, vol 82, pp 011116, 2010

Entropy measures for networks: toward an information theory of complex topologies with Ginestra Bianconi, ***Physical Review E***, vol 80, pp 045102(R), 2009

Stability and dynamical properties of material flow systems on random networks with Tobias Galla, ***European Physical Journal B***, vol 68, pp 587600, 2009

Phase transition in operational risk with Reimer Kühn, ***Physical Review E***, vol 75, pp 016111, 2007

TEACHING

Networks in Economics and Finance (Masters level, TU Berlin 2011 - 2012)

Linear methods, Calculus, Introduction to dynamical systems and Introduction to mathematical programming with Maple (Undergraduate level, KCL 2005 - 2007)

GRANTS AND AWARDS

Institute of New Economic Thinking grant with Prasanna Gai and Matteo Marsili on "*Safe Assets and the Evolution of Financial Information*", 2014 - 2015

Centre for International Finance and Regulation grant with Prasanna Gai and Dryna Grechyna on "*The Safe Asset Problem*", 2013 - 2014

Engineering and Physical Science Research Council doctoral studentship, 2005 - 2009

King's College, London, Best Overall Performance in M.Sc Information Processing and Neural Networks, 2005

ACADEMIC ACTIVITIES

Referee for *Journal of Money, Credit and Banking, Management Science, European Economic Review, Journal of Banking and Finance, International Journal of Theoretical and Applied Finance, Journal of Economic Dynamics and Control, Journal of Money, Credit and Banking, Journal of Economic Behavior and Organization, Journal of Financial Stability, Journal of Simulations*

CONFERENCES AND SEMINARS (*=Forthcoming)

2026: Indian Institute of Management, Bangalore, BSE Summer Forum: Information Exchange and Trading in the Age of AI and Social Media: Theory and Experiments, Barcelona, 2026 ESIF Economics and AI+ML Meeting, Ithaca

2025: 9th Annual Workshop of the European System of Central Banks (ESCB) – Research Cluster 3, Frankfurt*, 4th Bonn/Frankfurt/Mannheim Workshop on Digital Finance, Frankfurt, Annual ECB Banking Supervision Research Conference, Frankfurt

2024: HEC Paris - Natixis Banking Conference 2024 - Banking in the Age of Challenges, Paris, Financial Intermediation Research Society Meeting, Berlin, 2024 Annual ECB Banking Supervision Research Conference, Frankfurt

2023: ESRB TFST Annual Workshop: Stress testing at times of stress, Luxembourg, The Research Handbook of Macroprudential Policy Conference, London

2022: CAFRAL Webinar, ESRB Workshop on Cyber Risks, 8th IWH-FIN-FIRE Workshop on Challenges to Financial Stability, Halle, Cyber Monitoring Community of Interest (CMCI) Webinar, Qatar Centre for Global Banking & Finance Virtual Seminar, CEMLA / Dallas Fed Financial Stability Workshop, Mexico City

2021: European Banking Theory Brown Bag Webinar, 2021 IFABS Conference, Oxford, 2021 Ridge Virtual Forum Workshop on Financial Stability, The 2021 European Winter Meeting of the Econometric Society

2020: Day-Ahead Conference on Financial Markets and Institutions, San Diego

2019: European Finance Association 2019 Annual Meeting, Lisbon, German Finance Association 26th Annual Meeting, Essen, AFI seminar at KU Leuven, RIDGE 2019 Financial Stability Workshop, Montevideo

2018-2015: University of Zurich, ADEMU Conference on Sovereign debt in the 21st century, Toulouse, Lisbon Meetings in Game Theory and Applications, Lisbon, 3rd IWH-FIN-FIRE Workshop on Challenges to Financial Stability, Halle, European Finance Association 2017 Annual Meeting, Mannheim, Financial Intermediation Research Society Meeting, Hong Kong, American Finance Association Annual Meeting, Chicago, Sovereign Debt Restructuring Conference, Glasgow; GRI-Fields Conference and Workshop on the Stability of Financial Systems: Modelling, Regulation and Stress Testing, Toronto; The Political Economy of Financial Regulation, Hong Kong; 2016 Annual Conference of the Royal Economic Society, Brighton; Aix-Marseille School of Economics, Marseille; Banca d'Italia, Rome; Durham University Business School, Durham; Annual Meeting of the American Economic Association, San Fransisco, The Role of Liquidity in the Financial System, Atlanta; Network Models, Stress Testing, and other Tools for Financial Stability Monitoring and Macroprudential Policy Design and Implementation, Mexico City; Stress Testing and Macro-prudential Regulation: A Trans-Atlantic Assessment, London; Norges Bank, Oslo; Oesterreichische Nationalbank, Vienna; Global Financial Interconnectedness, Basel; 15th FDIC-JSFR Fall Banking Research Conference, Arlington; 2nd Annual Conference of the Journal of Network Theory in Finance, Cambridge; Endogenous Financial Networks and Equilibrium Dynamics: Addressing Challenges of Financial Stability and Monetary Policy, Paris; Dansmark NationalBank, Copenhagen; Deutsche Bundesbank, Frankfurt am Main

2014-2011: Network Analysis and Financial Stability Topics, Mexico City; Humboldt-Universität Berlin; Monitoring Systemic Risk: Data, Models and Metrics, Cambridge; Queen's University, Kingston; Office of the Comptroller of the Currency, Washington, DC; 7th Financial Risks International Forum: Big Data in Finance and Insurance, Paris; University of Auckland; Norwegian Business School, Oslo; Norges Bank, Oslo; 2nd Workshop on Supervising Financial Networks, Frankfurt am Main; 2nd Conference on Global Financial Stability and Prosperity - "Systemic Risk: Liquidity Risk, Governance and Financial Stability", Sydney; 5th International Banking and Finance Society Conference, Nottingham; 47th Annual Conference of the Canadian Economic Association, Montreal; Financial Stability Analysis: Using the Tools, Finding the Data, Washington, DC; Supervising Financial Networks, Frankfurt am Main, Financial Intermediation and Vulnerabilities, Ottawa; University of Auckland; TU Berlin; Deutsche Bundesbank, Frankfurt am Main; Federal Reserve Bank of Cleveland; Bank of Canada, Ottawa; Convergence, Interconnectedness, and Crises: Insurance and Banking, Philadelphia; U.S. Department of the Treasury, Washington, DC; Conference on Financial Sector Performance (Post Crisis), Bangor; 16th Australasian Macroeconomics Workshop, Hobart; University of Auckland

2010-2006: World Congress of the Econometric Society, Shanghai; Sixth World Congress of the Bachelier Finance Society, Toronto; International School and Conference on Network Science, Boston; TU Berlin; Bank of England, Credit Risk Evaluation Designed for Institutional Targeting in Finance Conference, Venice; ICTP, Trieste; KCL, London, European Conference on Complex

Systems, Jerusalem; Annual Meeting of the German Physics Society Condensed Matter, Berlin, Germany, European Conference on Complex Systems, Dresden; Workshop on Statistical Physics and Financial Markets, Trieste, European Conference on Complex Systems, Oxford

REFERRALS

Available on request