

CO-PIERRE GEORG

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EMPLOYMENT

Frankfurt School of Finance and Management

Professor of Practice in Digital Finance and Technology
(pending approval by the ministry)

09/2024 – today

University of Cape Town

NRF SARChI Dual Research Chair in Blockchain

10/2023 – 09/2024

South African Reserve Bank Research Chair

01/2019 – 10/2022

Associate Professor (with tenure), School of Economics

01/2018 – 09/2022

Senior Lecturer, School of Economics & AIFMRM

11/2014 – 12/2017

Old Mutual Emerging Markets Lecturer, UCT Graduate School of Business

06/2013 – 10/2014

EDHEC Business School

Associate Professor

10-2022 – 12/2023

Deutsche Bundesbank

Research Economist (Part-time since 06/2013)

06/2012 – 06/2021

AFFILIATIONS

Columbia University

Affiliate, Center for Global Legal Transformation

Since 01/2017

Oxford University

Research Associate, Oxford Martin School for the 21st Century (INET)

Since 12/2016

EDUCATION

Universidad Carlos III de Madrid

Postdoctoral Researcher, Department of Mathematics

10/2011 – 06/2012

Friedrich-Schiller-University Jena

PhD in Economics (summa cum laude)

05/2008 – 09/2011

NYU Stern School of Business

Visiting PhD Student

02/2011 – 04/2011

Karlsruhe Institute of Technology

MSc in Physics

10/2000 – 12/2005

VISITING POSITIONS

University of Zurich (Computer Science)

05/2024 – 09/2024

HEC Paris (Finance)

2018 – 2024

EPFL (Finance)

04/2022 – 05/2022

MIT Sloan School of Business (Finance)

09/2018 – 06/2019

Columbia Business School (Decision Risk and Operations)

01/2016 – 02/2016

Princeton University (Bendheim Center for Finance)
Xiamen University (Wang Yanan Insitute)
Oxford University (Saïd Business School)

04/2014 – 05/2014
12/2012 – 01/2013
2012, 2013

PUBLICATIONS

Publications in Economics and Finance

1. “*Social Learning in a Network Model of Covid-19*” (with Allan Davids, Gideon du Rand, Tina Koziol, and Joeri Schasfoort), **Journal of Economic Behaviour and Organization** 213, (2023);
2. “*Exit Spirals in Coupled Networked Markets*” (with Christoph Aymanns and Ben Golub), **Operations Research** 71(5), (2023);
3. “*Discussants*” (with Daniel Opolot and Michael E. Rose), **Research Policy** 50(1), (2022);
4. “*Systemic Risk-Shifting in Financial Networks*” (with Matthew Elliott and Joe Hazell), **Journal of Economic Theory** 191, (2021)
5. “*What 5,000 Acknowledgements Tell Us About Informal Collaboration in Financial Economics*” (with Michael E. Rose), **Research Policy** 50(6), (2021)
6. “*Information Contagion and Systemic Risk*” (with Toni Ahnert), **Journal of Financial Stability**, 35(5), (2018)
7. “*Contagious Herding and Endogenous Network Formation in Financial Networks*” (with Christoph Aymanns)), **Journal of Banking and Finance** 50(1), (2015)
8. “*The Effect of the Interbank Network Structure on Contagion and Common Shocks*”, **Journal of Banking and Finance** 37(7), (2013)

Policy-, Interdisciplinary-, and Other Publications

1. “*Tax Complexity and Transfer Pricing Blueprints, Guidelines, and Manuals*” (with Jean-Edouard Colliard and Lorraine Eden); **Tax Management International Journal**, 5 Feb (2021)
2. “*Revealing Patterns of Local Species Richness Along Environmental Gradients with a Novel Network Tool*” (with Mara Baudena, Angel Sanchez, Paloma Ruiz-Benito, Miguel A. Rodriguez, Miguel A. Zavala, and Max Rietkerk); **Nature Scientific Reports** 5, 11561, (2015)
3. “*A Network View on Interbank Liquidity*” (with Silvia Gabrieli, Banque de France), Banque de France Working Paper 531 / Deutsche Bundesbank Discussion Paper 44 (2014); Available on [SSRN](#);
4. “*Complex Derivatives*” (with Stefano Battiston, Guido Caldarelli, Robert M. May, and Joseph E. Stiglitz); **Nature Physics** Vol. 9, No. 3, (2013)
5. “*Systemic Risk in the Financial Sector*”, with Ian Goldin, Mike Mariathasan, and Tiffany Vogel. In: “*The Butterfly Defect – Globalization and Systemic Risk*”, Ian Goldin and Mike Mariathasan, Princeton University Press (2013)
6. “*Note on Systemic Risk in the South African Interbank Market*” (with Nicola Brink), Special Note in the Financial Stability Review, South African Reserve Bank March 2011, (2011).

Papers Under Revision

1. “*Measuring Regulatory Complexity*” (with Jean-Edouard Colliard, HEC Paris) – Resubmitted, **Journal of Financial Economics**; Available on [SSRN](#);

Working Papers

1. “*Vulnerability Webs: Systemic Risk in Software Networks*” (with Cornelius Fritz, Penn State; Angelo Mele, JHU Carey; and Michael Schweinberger, Penn State) – Available on [SSRN](#);

Abstract: Modern software development is a collaborative effort that re-uses existing code to reduce development and maintenance costs. This practice exposes software to vulnerabilities in the form of undetected bugs in direct and indirect dependencies, as demonstrated by the Crowdstrike and HeartBleed bugs. The economic costs resulting from such vulnerabilities can be staggering. We study a directed network of 52,897 software dependencies across 16,102 Python repositories, guided by a strategic model of network formation that incorporates both observable and unobservable heterogeneity. Using a scalable variational approximation of the conditional distribution of unobserved heterogeneity, we show that outsourcing code to other software packages by creating dependencies generates negative externalities. Modeling the propagation of risk in networks of software packages as an epidemiological process, we show that increasing protection of dependencies based on popular heuristics is ineffective at reducing systemic risk. By contrast, AI-assisted coding enables developers to replace dependencies with in-house code and reduces systemic risk.

2. “*Fake News in Social Networks*” (with Christoph Aymanns, Jakob Foerster, and Matthias Weber) – Available on [OpenReview](#);

Abstract: We develop a practical and flexible computational model of fake news on social networks in which agents act according to learned best response functions. We achieve this by extending an information aggregation game to allow for fake news and by representing agents as recurrent deep Q-networks (DQN) trained by independent Q-learning. In the game, agents repeatedly guess whether a claim is true or false taking into account an informative private signal and observations of actions of their neighbors on the social network in the previous period. We incorporate fake news into the model by adding an adversarial agent, the attacker, that either provides biased private signals to or takes over a subset of agents. The attacker can follow either a hand-tuned or trained policy. Our model allows us to tackle questions that are analytically intractable in fully rational models, while ensuring that agents follow reasonable best response functions. Our results highlight the importance of awareness, privacy and social connectivity in curbing the adverse effects of fake news.

3. “*Contagious Zombies*” (with Christian Bittner, Deutsche Bundesbank; and Falko Fecht, Deutsche Bundesbank) – Available [online](#);

Abstract:

Does banks’ zombie lending induced by unconventional monetary policy also allow zombie firms to leverage their trade credit borrowing? We first provide evidence suggesting that—even in Germany—particularly weak banks used the European Central Bank’s very long-term refinancing operations (VLTROs) to evergreen exposures to zombie firms, which in turn elevated credit risk. Second, we show that zombie firms, which obtained additional funding from banks relying to a

larger extent on VLTRO funding, also increased their accounts payable and advance payments received from downstream and upstream firms. And third, zombie firms that obtained further bank funding and such trade credit after the VLTROs had an elevated expected default probability even compared to average zombie firms. This suggests that suppliers relying on banks' lending decisions as a signal about borrowers' credit quality might be misled by banks' zombie lending to extend more trade credit to zombie firms exposing suppliers to elevated contagion risk.

4. *“Anticipated Financial Contagion”* (with Toni Ahnert, ECB, and Gideon du Rand, Stellenbosch) – Available on [SSRN](#);

Abstract: How likely is financial contagion when banks anticipate an aggregate liquidity shock and what are the consequences for bank choices, welfare, and regulation? We study an economy with two regional banks that insure risk-averse consumers against their idiosyncratic liquidity shocks and hold interbank deposits to co-insure against regional liquidity shocks. An aggregate liquidity shock hits one of the banks with positive probability and can lead to contagion—the mutual default of banks. We numerically characterize the equilibrium and show that contagion is rare: it occurs in approximately 5% of the parameter space and its ex-ante probability is below 1%. For likely aggregate liquidity shocks, the decentralized economy achieves the same expected utility as a global bank benchmark, which we fully characterize analytically. For less likely liquidity shocks, the economy is constrained inefficient. To shield themselves from contagion, banks hold inefficiently low interbank positions (co-insurance) and excessive liquidity (self-insurance). Efficiency is restored via an alternative bank resolution scheme.

5. *“Similar Investors”* (with Diane Pierret, University of Luxembourg; and Sascha Steffen, Frankfurt School of Finance and Management) – Available on [SSRN](#);

Abstract:

With the failure of Silicon Valley Bank in March 2023, the concentration risk in bank liabilities has come under scrutiny. We use detailed security-level holdings of U.S. Money Market Mutual Funds (MMFs) that fund banks to introduce a novel measure of portfolio similarity among investors. Our findings suggest that MMFs actively manage their asset holdings based on the similarity of their portfolios with those of other investors. Specifically, when portfolios are more similar, investors are less likely to roll over investments, anticipating higher expected joint liquidation costs when portfolios are more similar. At the issuer bank level, the average similarity of its investors' portfolios is a reliable predictor of the bank's total funding in the following period. Importantly, banks are unable to fully compensate for the loss of funding when similar investors withdraw.

White papers

1. *“Central Bank Digital Currency Global Interoperability Principles”* (World Economic Forum Whitepaper) (2023) – Available [online](#).
2. *“Issuing Central Bank Digital Currency Using Algorand”* (with Andrea Civelli, Pietro Grassano, and Naveed Ihsanullah, Algorand Inc) – Available on the Algorand [website](#) (2021).
3. *“A Trustless System for Data Ownership”* (with Sabine Bertram, UCT) – Available [online](#) (2020). This white paper is the foundation for our pending patent *“System and Associated Method for Ensuring Data Privacy”* (US 16/811,653; PCT/IB2020/051959).
4. A privacy-preserving system for data ownership using blockchain and distributed databases (with

Sabine Bertram, UCT) – Available on arxiv.org (2018). This white paper is the foundation of our startup registree.io.

AWARDS AND GRANTS

National Research Foundation + Swiss National Fund 2023–2024

South African Research Chair Initiative (ZAR 15,000,000 + CHF 600,000; ~ USD 1,467,000)

The DSI-NRF Dual Research Chair in Blockchain focuses on privacy in blockchain systems, data provenance, and cybersecurity. Original duration until 2028.

Ripple 2021 – 2026

University Blockchain Research Initiative (USD 400,000)

This grant supports our ongoing work on blockchain with a focus on the interoperability of central bank digital currencies and privacy in distributed systems.

Algorand Foundation 2021 – 2026

Algorand-UCT Innovation Hub (USD 1,100,000)

I am the Director of the Algorand-UCT Financial Innovation Hub that will accelerate the university's research on blockchain and financial technology and support students starting their own companies.

South African Reserve Bank 2018 – 2023

Research Chair in Financial Stability Studies (ZAR 14,800,00 ; ~ USD 1,000,000)

I hold the SARB Research Chair in Financial Stability Studies. The Chair focuses in particular on financial interconnectedness and the intersection of financial stability and financial innovation.

Volkswagen Foundation 2015 – 2018

“Quantitative Easing and Financial (In-)Stability” (EUR 138,000 of total EUR 770,000; with Loriana Pelizzon, Goethe University)

As part of a larger research collaboration with NYU, Goethe University Frankfurt, and the University of Tokyo, our group has developed several models of financial interconnectedness.

Institut Louis Bachelier 2015

“Measuring Regulatory Complexity” (EUR 10,000; with Jean-Edouard Colliard, HEC Paris)

European Central Bank 2011

(EUR 10,000; Lamfalussy Fellowship)

7th International Conference on Computing in Economics (CEF2011) 2011

Best Student Paper Prize, finalist

FSU Jena, Graduate School “Global Financial Markets” 2009 – 2011

(ca. EUR 40,000; PhD fellowship)

CONFERENCE AND SEMINAR PRESENTATIONS

Conference Presentations (Past five years; *=scheduled)

2024 EARIE 2024, EC24, Mapping and Governing the Online World 2024, AFA (x2)

2023 WFA; BSE Networks; SAFE LawLab Conference; EPFL DeFi Conference

2022 SFS Cavalcade

2020 Crypto Economic Security Conference (CESC)

2019 FRB Financial Interconnectedness Conference; UMD Short-Term Funding Conference; NY Fed Fintech Conference; SFS Cavalcade; EFA 2019;

Discussions (Past five years; *=scheduled)

- 2024 Digital Economy Workshop 2024, Kaiser and Peukert, *Get Rich or Die Tryin': Concerts and the Digitization of Recorded Music*
- 2023 CEPR-Bocconi Conference on the future of payments and digital assets, Braun and Haeusle, *"Collusion-proof oracles for DAOs"*
Torino Decentralized Finance Conference, Schoenleber, *"Maneuvering and Investing in Yield Farms"*
- 2022 Tilburg Banking Conference, Li, Li, and Sun, *"Bank Credit and Money Creation on Payment Networks: A Structural Analysis of Externalities and Key Players"*
Gerzensee, Schilling, Fernandez-Villaverde, and Uhlig, *"Central Bank Digital Currency: When Price and Bank Stability Collide"*
- 2020 AFA 2020, Jackson and Pernoud *"What Makes Financial Networks Special? Distorted Investment Incentives, Regulation, and Systemic Risk Measurement"*
- 2019 EFA 2019, Biais, Bisière, Bouvard, Casamatta, Albert Menkveld, *"Equilibrium Bitcoin Pricing"*;
CFIC 2019, Das, Mitchener, and Vossmeier, *"Systemic Risk and the Great Depression"*

Seminars (Past five years; *=scheduled)

- 2023 FSU Jena, University of Glasgow; KIT; St. Gallen;
- 2022 Fed Board; Bocconi University; Uni Zurich; EDHEC; Uni Luxembourg;
University of Pretoria;
- 2020 BU Questrom;
- 2019 MIT Sloan School of Management; Duke Fuqua Business School

ACTIVITIES AND MEMBERSHIP

- 01/2020 – 09/2022 Advisor for CBDC Projects, Algorand Inc
- 07/2019 – 09/2022 Economic Advisory Committee, Algorand Foundation
- Since 01/2022 Associate Editor, Journal of Economic Dynamics and Control
- Since 01/2019 Associate Editor, Journal of Financial Stability
- Since 01/2017 Associate Editor, Journal of Network Theory in Finance
- 01/2018 – 06/2019 Managing Editor, ERSA Working Paper Series

Referee for: Journal of Finance, Review of Financial Studies, Review of Finance, Management Science, Operations Research, Journal of Economic Literature, Journal of Financial Intermediation, Journal of Economic Dynamics and Control, Journal of the European Economic Association, Journal of Economic Behavior and Organization, Journal of Financial Stability, Journal of Banking and Finance, International Journal of Central Banking, Journal of Financial Regulation, BE Journal of Macroeconomics, Journal of Economic Interaction and Control, Review of Development Finance, African Finance Journal, South African Journal of Economics, Computational Economics, Economics in Transition, Emerging Markets Review, Journal of Statistical Mechanics, IEEE Transactions on Knowledge and Data Engineering

Also referee for: National Research Foundation (SA), Swiss National Fund, ECB Working Paper Series, Bank of England Working Paper Series, ERSA Working Paper Series; Denmark's Fund

Academic committee: WFA 2024; FIRS 2018–2024; ESRB, RiskLab and BoF Systemic Risk Workshop 2018–2023; Federal Reserve Conference on the Interconnectedness of Financial Systems 2024; CHAIN-SCI 2024;

Conference and Workshop Organization:

1. UCT/ERSA/Imperial/RoF Conference on “*Banking in Emerging Markets*” (Cape Town, **2016**; Mumbai, **2019**)
2. BIS/DNB/Bundesbank/RoF Conference on “*Global Financial Interconnectedness*” (Basle, **2015**)
3. Bundesbank/IMF/INET Workshop “*Interconnectedness: Building Research Into the Policy Agenda*” (Washington, D.C., **2014**)
4. ERSa Financial Economics Workshop (Cape Town, **2013**, Pretoria, **2014**, Pretoria, **2015**)
5. Bundesbank autumn conference “*Supervising Banks in a Complex Financial System*” (Frankfurt, **2013**)
6. Bundesbank/BCBS Workshop “*Supervising Financial Networks*” (Frankfurt, **2013**)

TEACHING

Postdoctoral Students (#: First placement):

1. Marcin Borsuk (PhD Gdansk, 11/2021–11/2023; #: Research Associate, Oxford)
2. Joeri Schasfoort (PhD Groningen, 10/2019–10/2021; #: Lecturer, University of Groningen)
3. Suraj Shekhar (PhD Penn State, 08/2016–06/2019; #: Assistant Professor, Ashoka University)
4. Christine Makanza (PhD UCT, 06/2016–06/2017; #: Senior Lecturer, University of Cape Town)
5. Pawel Fiedor (PhD Krakow, 06/2015–06/2016; #: Research Economist, Bank of Ireland)
6. Hylton Hollander (PhD Stellenbosch, 06/2015–01/2016; #: Lecturer, Stellenbosch University)

PhD Students (#: First placement):

1. Bingle Kruger (MPhil UCT, secondary advisor, since 10/2022)
2. Julian Kanjere (MPhil UCT, main advisor, since 04/2021)
3. Tina Koziol (MBA Jena, main advisor, since 04/2016–04/2020; Postdoc, University of Minnesota)
4. Esti Kemp (MPhil Pretoria, main advisor, since 04/2016, part-time; SARB Financial Stability Department; #: Bank for International Settlements)
5. Gideon du Rand (MCom Stellenbosch, PhD Student Stellenbosch, 04/2015–10/2019; #: Lecturer at Stellenbosch University)
6. Michael Rose (MSc Kiel, main advisor, 04/2015 - 05/2018; #: MPI for Competition and Innovation, Munich)

Masters Level Courses:

1. *“Fintech and Entrepreneurial Finance”* (Masters in Finance), EDHEC, (2023)
2. *“Financial Regulation”* (Masters in Finance), EDHEC, (2023)
3. *“Fintech and Cryptocurrencies”* (MPhil in Financial Technology), University of Cape Town, (2018–2021)
4. *“Introduction to FinTech”* (Executive Master’s in Finance) HEC Paris (2020)
5. *“Fintech”* (MBA Core course; MBA Elective course) HEC Paris (2019–2021)
6. *“Fintech Study Tour”* (Executive Program) HEC Paris in Qatar (2019)
7. *“Financial Software Engineering”* (MPhil in Financial Technology), University of Cape Town, (2018, 2019)
8. *“Financial Regulation”* (MBA Elective) HEC Paris (2019)
9. *“Financial Regulation”* (MCom in Risk Management of Financial Markets), University of Cape Town (2016, 2017)
10. *“Econometrics”* (MCom in Risk Management of Financial Markets), University of Cape Town (2016, 2017)
11. *“Quantitative Methods in Economics”*, BCom, University of Cape Town (2015)
12. *“Economics for MBA Students”*, University of Cape Town Graduate School of Business, (2014)

Online Courses:

1. GetSmarter [Short Course](#) *“Blockchain and Digital Currency: The Future of Money”* (Launched **2021**)
2. GetSmarter [Short Course](#) *“Fintech: Disruption in Finance”* (Launched **2019**, 97.83% of students report expectations met or exceeded; Quality of material rating: 4.38/5.0)
3. Coursera [specialization](#) *“Fintech Startups in Emerging Markets”*, launched **2019** and consisting of four courses:
 - (a) [MOOC](#) *“Financial Regulation in Emerging Markets and the Rise of Fintech Companies”* (4.8/5.0)
 - (b) [MOOC](#) *“How Entrepreneurs in Emerging Markets can master the Blockchain Technology”* (4.9/5.0)
 - (c) [MOOC](#) *“Building Fintech Startups in Emerging Markets”* (4.6/5.0)
 - (d) [MOOC](#) *“Startup Your Fintech Future”* (4.5/5.0)

Other teaching: University of St Gallen, *“Fintech Seminars”* as part of certificate of advanced study (2024); EPFL, several modules in executive education program *“Fintech: Disrupting Finance”* (2022–2024); Hanken School of Economics, short-course on *“Systemic Risk Modelling”* (2018); WEHIA 2016 Summer School, Universitat Jaume I, short course on *“Financial Networks”* (2016); *“Financial Networks in Emerging Countries”*, Bank of Uganda and Banco Central do Brazil, (2013); Complexity Economics Summer School, IMT Lucca, (2012)

MEDIA

TV: CNBC Africa, News24.com, Business Day TV

Radio: Talk702.com, Voice of the Cape FM

Print/Online: Financial Times, Bloomberg, Project Syndicate, CNN, Business Day, Sunday Times

SOFTWARE DEVELOPMENT AND STARTUPS

Much of my code is available at: <https://github.com/cogeorg>

Programming languages: Python, C++, Java, Perl, Fortran, PHP, JavaScript, Solidity

Nautilus Technologies (<https://ntls.io>)

Co-Founder and CTO

06/2021 – 10/2023

Nautilus combines a cloud storage- and computing solution with a licensing platform for code and data. Currently, privacy concerns prevent users from monetizing their data: if a user provides data to a third party, she loses control over their use and the ability to monetize them further. Our patent-pending technology allows groups of users to jointly monetize even private data by licensing it to third parties without loss of privacy. Current status: Discontinued. Associated Patent: US 16/811,653; PCT/IB2020/051959.

Registree Rocks (<https://registree.io>)

Co-Founder and CEO

12/2017 – 07/2021

Registree is a decentralized student database and platform that connects universities, students, and employers. The project is driven by students and staff at the University of Cape Town. The Registree platform provides a number of valuable data services for its stakeholders, entirely without collecting any data from the students or from the universities. Current status: Discontinued.

Software Projects

1. [Central Places](#)—Visualization and analysis website accompanying our projects on social ties in academia, with Michael Rose (MPI for Innovation).
2. [Black Rhino](#)—An open source financial multi-agent simulation toolbox developed in my research group (2013–today).