CO-PIERRE GEORG

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EMPLOYMENT

University of Cape Town
South African Reserve Bank Research Chair	*Since 01/2019*
Associate Professor (with tenure), School of Economics & AIFMRM	*Since 01/2018*
Senior Lecturer, School of Economics & AIFMRM	*11/2014 – 12/2017*
Old Mutual Emerging Markets Lecturer, UCT Graduate School of Business	*06/2013 – 10/2014*

Deutsche Bundesbank
Research Economist (Part-time since 06/2013)	*06/2012–06/2021*

ACADEMIC POSITIONS

Imperial College Business School *Since 12/2018*
Affiliate, Centre for Financial Technology

Columbia University *Since 01/2017*
Affiliate, Center for Global Legal Transformation

Oxford University *Since 12/2016*
Research Associate, Oxford Martin School for the 21st Century (INET)

EDUCATION

Universidad Carlos III de Madrid *10/2011 – 06/2012*
Postdoctoral Researcher, Department of Mathematics

Friedrich-Schiller-University Jena *05/2008 - 09/2011*
PhD in Economics (summa cum laude)
Dissertation title: *"Systemic Risk in Interbank Markets"* Advisor: Dr. Markus Pasche, Prof Andreas Freytag

NYU Stern School of Business *02/2011 - 04/2011*
Visiting PhD Student (Prof Viral V. Acharya)

Karlsruhe Institute of Technology *10/2000 - 12/2005*
MSc in Physics
Dissertation title: *"Interference Effects in Vector-Boson Fusion"* Advisor: Prof Dieter Zeppenfeld

VISITING POSITIONS

HEC Paris (Finance)	*2018, 2019*
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)	*04/2014 – 05/2014*
Federal Reserve Bank of New York (Financial Institutions Function)	*1/2014*
Xiamen University (Wang Yanan Insitute)	*12/2012 – 01/2013*
Oxford University (Saïd Business School)	*2012,2013*

PUBLICATIONS

Publications in Economics and Finance

1. *"Systemic Risk-Shifting in Financial Networks"* (with Matthew Elliott, Cambridge; and Joe Hazell, LSE), Journal of Economic Theory (forthcoming)

2. *"What 5,000 Acknowledgements Tell Us About Informal Collaboration in Financial Economics"* (with Michael Rose, MPI for Innovation and Competition), Research Policy (forthcoming)

3. *"Information Contagion and Systemic Risk"* (with Toni Ahnert, Bank of Canada), Journal of Financial Stability, 35(5),159-171, (**2018**)

4. *"Contagious Herding and Endogenous Network Formation in Financial Networks"* (with Christoph Aymanns, Oxford)), Journal of Banking and Finance 50(1), 273-285, (**2015**)

5. *"The Effect of the Interbank Network Structure on Contagion and Common Shocks"*, Journal of Banking and Finance 37(7), 2216-2228 (**2013**)

Policy-, Interdisciplinary-, and Other Publications

1. *"Tax Complexity and Transfer Pricing Blueprints, Guidelines, and Manuals"* (with Jean-Edouard Colliard, HEC Paris, and Lorraine Eden, Texas A&M University); Tax Management International Journal, 5 Feb (**2021**)

2. *"Fake News in Social Networks"* (with Christoph Aymanns, St Gallen; and Jakob Foerster, Facebook) – Available on SSRN;

3. *"Revealing Patterns of Local Species Richness Along Environmental Gradients with a Novel Network Tool"* (with Mara Baudena, Utrecht; Angel Sanchez, UC3M; Paloma Ruiz-Benito, Stirling; Miguel A. Rodriguez Alcala, Miguel A. Zavala, Alcala; and Max Rietkerk, Utrecht); Nature Scientific Reports 5, 11561, (**2015**)

4. *"Complex Derivatives"* (with Stefano Battiston, Zurich; Guido Caldarelli, IMT Lucca; Robert M. May, Oxford University; and Joseph E. Stiglitz, Columbia University); Nature Physics Vol. 9, No. 3, (**2013**)

5. *"Systemic Risk in the Financial Sector"*, with Ian Goldin, Oxford University, Mike Mariathasan, KU Leuven, and Tiffany Vogel, University of Oxford. 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, SARB), Special Note in the Financial Stability Review, South African Reserve Bank March 2011, (**2011**).

Papers Under Revision

1. *"Discussants"* (with Daniel Opolot, University of Cape Town, and Michael E. Rose, MPI for Innovation and Competition) – Revision requested, Research Policy; Available on SSRN;

2. *"Illiquidity Spirals in Coupled Over-the-Counter Markets* (with Christoph Aymanns, QuantCo; and Ben Golub, Northwestern University) – Revision requested, Operations Research; Available on SSRN

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**) – Revision requested, Journal of Banking and Finance; Available on SSRN;

Working Papers

1. *"Social Learning in a Network Model of Covid-19"* (with Allan Davids, UCT, Gideon du Rand, Stellenbosch, Tina Koziol, UCT, and Joeri Schasfoort, UCT) – Available on SSRN;

   Abstract:
   This paper studies the effects of social learning on the transmission of Covid-19 in a network model. We calibrate our model to detailed data for Cape Town, South Africa and show that the inclusion of social learning improves the prediction of excess fatalities, reducingthe best-fit squared difference from 20.06 to 11.28. The inclusion of social learning both flattens and shortens the curves for infections, hospitalizations, and excess fatalities. This result is qualitatively different from flattening the curve by reducing transmission probability through non-pharmaceutical interventions. While social learning reduces infections, this alone is not sufficient to curb the spread of the virus because learning is slower than the disease spreads. We use our model to study the efficacy of different vaccination strategies and find that a risk-based vaccination strategy–vaccinating vulnerable groups first–leads to a 50% reduction in fatalities and 5% increase in total infections compared to a random-order benchmark. By contrast, using a contact-based vaccination strategy reduces infections by 9% but results in 64% more fatalities relative to the benchmark.

2. *"Measuring Regulatory Complexity"* (with Jean-Edouard Colliard, HEC Paris) – Available on SSRN;

   Abstract:
   Despite a heated debate on the perceived increasing complexity of financial regulation, there is no available measure of regulatory complexity other than the mere length of regulatory documents. To fill this gap, we propose to apply simple measures from the computer science literature by treating regulation like an algorithm - a fixed set of rules that determine how an input (e.g., a bank balance sheet) leads to an output (a regulatory decision). We apply our measures to the regulation of a bank in a theoretical model, to an algorithm computing capital requirements based on Basel I, and to actual regulatory texts. Our measures capture dimensions of complexity beyond the mere length of a regulation. In particular, shorter regulations are not necessarily less complex, as they can also use more "high-level" language and concepts. Finally, we propose an experimental protocol to validate measures of regulatory complexity.

3. *"Similar Investors"* (with Diane Pierret, University of Luxembourg; and Sascha Steffen, Frankfurt School of Finance and Management) – Available on SSRN;

   Abstract:
   We study the effect of strategic complementarities among investors on their decisions to continue to invest in a security issuer. Using detailed security level holdings of U.S. Money Market Mutual Funds (MMFs), we construct a novel measure of portfolio similarity among institutional investors (i.e. MMFs) who are exposed to the same security issuer. Consistent with correlated liquidity needs of more similar investors, the similarity of a fund to other investors in an issuer induces a correlation between the default states of the issuer and the states where the fund's liquidity demand is high. Among funds investing in the same issuer at the same time, we find that the funds reducing their exposure to the issuer are the most similar funds. At the issuer level, the

average similarity of the funds investing in an issuer predicts the issuer's total funding flows in the next period. In other words, issuers cannot substitute this loss in funds from similar investors, particularly during crises, and are thus exposed to greater funding liquidity risk.

4. *"Contagious Zombies"* (with Christian Bittner, Deutsche Bundesbank; and Falko Fecht, Frankfurt School of Finance and Management) – 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.

White papers

1. *"Issuing Central Bank Digital Currency Using Algorand"* (with Andrea Civelli, Pietro Grassano, and Naveed Ihsanullah, Algorand Inc) – Available on the Algorand website (**2021**).

2. *"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).

3. 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.

Work in Progress

1. *"Anticipated Financial Contagion"* (with Toni Ahnert, Bank of Canada; and Gideon du Rand, University of Stellenbosch)

2. *"Bugs! Contagion in Software Dependency Networks"*

AWARDS AND GRANTS

Algorand Foundation *2021 – 2026*
Algorand Innovation Hub
(USD 2,650,000)

Ripple *2021 – 2026*
University Blockchain Research Initiative
(USD 100,000)

South African Reserve Bank *2018 – 2023*
Research Chair in Financial Stability Studies
(ZAR 14,800,000 ($\sim$ USD 1,000,000))

Volkswagen Foundation *2015 – 2018*
"Quantitative Easing and Financial (In-)Stability"
(EUR 138,000 of total EUR 770,000; with Loriana Pelizzon, Goethe University)

Institut Louis Bachelier *2015*
"Measuring Regulatory Complexity"
(EUR 10,000; with Jean-Edouard Colliard, HEC Paris)

Center for Excellence SAFE, Goethe University *2012*
"Interconnectedness in the German Interbank Market"
(ca. EUR 20,000; with Jan-Pieter Krahnen, Goethe University; and Marcel Bluhm, Xiamen University)

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)

2019	FRB Financial Interconnectedness Conference, Washington, D.C.; UMD Short-Term Funding Conference, Bethesda, MD; NY Fed Fintech Conference, New York, NY; SFS Cavalcade, Pittsburgh, PA; EFA 2019, Lisbon
2018	FIRS 2018, Barcelona; IWH-FIN-FIRE 2018, Halle a.d. Saale; EFA 2018, Warsaw
2017	German Economists Abroad, Frankfurt; Bundesbank Big Data Conference, Frankfurt; Society for Economic Measurement conference 2017, Cambridge, MA; Central Bank Research Association Boston Policy Workshop, Boston, MA; CEPR Spring Symposium in Financial Economics, Imperial College, London
2016	Bank of England CCBS Workshop, London, MIT Center for Finance and Policy 3rd Annual Conference: "Causes of and Policy Responses to the U.S. Financial Crisis: What Do We Know Now that the Dust Has Settled?", Boston, MA, Riksbank conference on "Challenges in Interconnected Financial Systems", Stockholm, European Economic Association Meetings, Geneva, GRI Fields Conference "The Stability of Financial Systems", Toronto, Federal Reserve "Day Ahead Conference", San Francisco
2015	Society for the Advancement of Economic Theory 2015, Cambridge, 2nd Annual Society for Economic Measurement Annual Conference, Paris, 24th UMichigan Mitsui Finance/RFS Symposium, Traverse City, FIRS 2015, Reykjavik, 10th Tinbergen Institute Conference, Amsterdam, INET Annual Conference 2015, Paris

Discussions (Past five years; *=scheduled)

2020	AFA 2020, Matthew O. Jackson and Agathe Pernoud *"What Makes Financial Networks Special? Distorted Investment Incentives, Regulation, and Systemic Risk Measurement"*
2019	EFA 2019, Bruno Biais, Christophe Bisière, Matthieu Bouvard, Catherine Casamatta, Albert Menkveld, *"Equilibrium Bitcoin Pricing"*;
	CFIC 2019, Das, Mitchener, and Vossmeyer, *"Systemic Risk and the Great Depression"*
2018	EuroFIT 2018, Fahad Saleh, *"Volatility and Welfare in a Crypto Economy"*
	EFA 2018, Christoph Frei and Agostino Capponi, *"Counterparty Risk and Network Formation in Over-the-Counter Markets"*
	FIRS 2018, Elena Carletti, Filippo De Marco, Vasso Ioannidou, and Enrico Sette *"Banks as Patient Lenders: Evidence from a Tax Reform"*
2017	FIRS, Jessie Wang, Mark Paddrik, and Haelim Park, *"Bank Networks and Systemic Risk: Evidence from the National Banking Acts"*
2015	EBC-DNB Conference, Amsterdam, Sujit Kapadia et al., *"Taking uncertainty seriously: Simplicity versus complexity in financial regulation"*

Seminars (Past five years; *=scheduled)

2020	BU Questrom;
2019	MIT Sloan School of Management; Duke Fuqua Business School
2018	HEC Lausanne, Frankfurt School of Finance and Management, University of St Gallen, European Bank for Reconstruction and Development
2017	Goethe University Frankfurt, Banque de France, Columbia University (Law), UC3M, Copenhagen Business School, University of Zurich, Imperial College Business School
2016	London School of Economics (SRC), HEC Paris, Columbia Business School, University of Wisconsin Business School, Georgia Institute of Technology Scheller College of Business, IMF, GMU, Bank of Canada

ACTIVITIES AND MEMBERSHIP

Since 01/2020	Advisor for CBDC Projects, Algorand Inc
Since 07/2019	Economic Advisory Committee, Algorand Foundation
Since 08/2018	Member of the Intergovernmental Fintech Working Group, South Africa
06/2013-06/2017	Member of the euro area expert group on payment systems (TARGET2)
Since 05/2021	Associate Editor, Journal of Economic Interaction 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 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; Denmarks Fund

Academic committee: FIRS 2018-2021;

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. Joeri Schasfoort (PhD Groningen, since 10/2019)

2. Suraj Shekhar (PhD Penn State, 08/2016-06/2019; #: Assistant Professor, Ashoka University, New Delhi)

3. Christine Makanza (PhD UCT, 06/2016 – 06/2017; #: Senior Lecturer, University of Cape Town)

4. Pawel Fiedor (PhD Krakow, 06/2015 – 06/2016; #: Research Economist, Bank of Ireland)

5. Hylton Hollander (PhD Stellenbosch, 06/2015 – 01/2016; #: Lecturer at Stellenbosch University)

PhD Students (#: First placement):

1. Julian Kanjere (MPhil UCT, main advisor, since 04/2021)

2. Allan Davids (MPhil Stellenbosch, main advisor, since 08/2016)

3. Tina Koziol (MBusSc 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 Cryptocurrencies"* (MPhil in Financial Technology), University of Cape Town, (**2018–2021**)

2. *"Introduction to FinTech"* (Executive Master's in Finance) HEC Paris (**2020**)

3. *"Fintech"* (MBA Core course; MBA Elective course) HEC Paris (**2019–2021**)

4. *"Fintech Study Tour"* (Executive Program) HEC Paris in Qatar (**2019**)

5. *"Financial Software Engineering"* (MPhil in Financial Technology), University of Cape Town, (**2018**, **2019**)

6. *"Financial Regulation"* (MBA Elective) HEC Paris (**2019**)

7. *"Financial Regulation"* (MCom in Risk Management of Financial Markets), University of Cape Town (**2016**, **2017**)

8. *"Econometrics"* (MCom in Risk Management of Financial Markets), University of Cape Town (**2016**, **2017**)

9. *"Quantitative Methods in Economics"*, University of Cape Town (**2015**)

10. *"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: Hanken School of Economics, short-course on *"Systemic Risk Modelling"* (**2018**), WEHIA 2016 Summer School, Universitat Jaume I, (**2016**), *"Financial Networks in Emerging Countries"*, Bank of Uganda, 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 CEO   *Since 3/2019*
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: Pre-revenue, no funding raised.
Associated Patent (pending): US 16/811,653; PCT/IB2020/051959.

Registree Rocks (https://registree.io)
Co-Founder and CEO   *Since 12/2017*
Registree is a decentralized and cryptographically secured 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: Post-revenue; 8 Employees; Raised >USD 200,000.

Software Projects

1. Central Places—Visualization and analysis website accompanying our projects on social ties in academia, with Michael Rose (MPI for Innovation).

2. NetGen—An open source financial networks cleaning and analysis tool (2014), with Tarik Roukny (ULB).

3. Black Rhino—An open source financial multi-agent simulation toolbox developed in my research group (**2013**–today).

REFERENCES

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