Curriculum Vitae – Goutham Gopalakrishna

Personal Information

Goutham Gopalakrishna
EPFL CDM SFI EXTRA 128 (Extranef UNIL),
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Academic career

PhD in Finance
École polytechnique fédérale de Lausanne (Swiss Finance Institute) *Sep 2017-Current*
Supervisor : Prof. Pierre Collin-Dufresne.

Visiting Student Research Collaborator *Sep 2022-Current*
Princeton University, NJ, USA
Host : Prof. Markus Brunnermeier

Distinguished Affiliate *July 2021-Current*
The Center for Economic Studies, Munich, Germany
Macro, Money, and International Finance Area

Research Areas **Macro-Finance, Machine Learning, Banking.**

Job Market Paper

A Macro-Finance model with Realistic Crisis Dynamics (*SSRN*)
CESifo Distinguished Affiliate Award 2021
Runner up for European Systemic Risk Board 2021 Ieke van den Burg Prize

What causes deep recessions and slow recovery ? I revisit this question and develop a macro-finance model that quantitatively matches the salient empirical features of financial crises such as a large drop in the output, a high risk premium, reduced financial intermediation, and a long duration of economic distress. The model has leveraged intermediaries featuring stochastic productivity and regime-dependent exit rate that governs the transition in and out of crises. A model without these two features suffers from a trade-off between the amplification and persistence of crises. I show that my model resolves this tension and generates realistic crisis dynamics.

*Presentations (*in-person) : AFA poster (2022), CESifo conference on Macro, Money, and International Finance (2021), RiskLab/BoF/ESRB Conference (2021), Paris December Meetings (2021), DGF German Finance Association Innsbruck* (2021), Econometric Society Meetings (2021 ; North America, Europe, Asia, Australia), AFFI PhD session (2021), AEFIN Ph.D. Mentoring Day (2021), Day-Ahead Workshop on Financial Regulation poster Zurich* (2021), Workshop on Macroeconomic Research Carcow (2021), Money Macro and Finance Society Conference (2021), Miami Winter Research Conference on Machine Learning and Business (2021), New Zeland Finance Conference (2021), SFI Gerzensee Research Days (2021), UNIL/EPFL Brown Bag (2020).*

Other Papers

ALIENs and Continuous Time Economies (*SSRN*)

I develop a new computational framework called Actively Learned and Informed Equilibrium Nets (ALIENs) to solve continuous time economic models with endogenous state variables and highly non-linear policy functions. I employ neural networks that are trained to solve supervised learning problems that respect the laws governed by the economic system in the form of general parabolic partial differential equations. The economic information is encoded as regularizers that disciplines the deep neural network in the learning process. The sub-domain of the high dimensional state space that carries the most economic information is learned actively in an iterative loop, enforcing the random training points to be sampled from areas that matter the most to ensure convergence. I utilize a state-of-the art distributed framework to train the network that speeds up computation time significantly. The method is applied to successfully solve a model of macro-finance that is notoriously difficult to handle using traditional finite difference schemes.

*Presentations (*in-person) : SFI-UZH Computational Finance seminar (2021), EUI Artificial Intelligence seminar* (2021).*

Intermediaries with something to lose : On the origins and consequences of bank failures

This paper builds a macro-finance model with endogenous bankruptcy of intermediaries to analyze the dynamics of financial crises. The model features leveraged intermediaries who face stochastic costs to intermediate assets, and possess franchise value that they lose upon bankruptcy, trapping the economy in states of economic distress with slow recovery. The model quantitatively predicts a large risk premium, low GDP growth, and high bank failures during financial crisis. Analyzing a panel of Bank Holding Companies, I offer empirical evidence for the franchise value to be associated with a higher probability of failure. The results indicate that the changing scope of banking industry with declining franchise value compared to the pre-crisis period is worrisome, despite strong capital ratios.

Presentations : 20th Macro Finance Society PhD session (2022), CESifo Conference on Macro, Money, and International Finance (2022), EPFL-UNIL PhD seminar (2022), SFI-UZH Computational Finance seminar (2022).

Awards

CESifo Distinguished Affiliate Award, 2021, worth EUR 1,000
Swiss Finance Institute PhD Fellowship, 2017-2018, worth CHF 30,000
University of Bologna Merit Scholarship, 2015-2017, worth EUR 22,000

Certification

CFA Level 3 Passed *June 2014*
Eligible for charter upon completion of work experience.

Teaching Experience

Visiting Instructor for MBA in Financial Engineering, IFMR GSB, India
- Taught Computational Finance for MBA students (virtual) *Fall 2021*

Academic Supervisor, for Executive MBA, EPFL *Spring 2020-Present*

Teaching Assistant, EPFL
- Game theory and strategic decisions (Undergraduate), Prof. Elena Perazzi *Fall 2021*
- Optimization methods, MFE (Graudate), Prof. Elena Perazzi *Fall 2021*
- Financial Big Data, MFE (Graduate), Prof. Damien Challet *Fall 2018-2020*
- Financial applications of Blockchain, MFE (Graduate), Dr. Jiahua Xu *Fall 2019-2020*

Teaching Assistant, University of Bologna
- Mathematics, CLABE (Undergraduate), Prof. Carlo Alberto Bosello *Fall 2016*
- Corporate Finance, CLABE (Undergraduate), Prof. Massimiliano Barbi *Fall 2016*
- Corporate Finance, CLAMDA (Graduate), Prof. Emanuele Bajo *Fall 2016*
- Asset Pricing, LMEC (Graduate), Prof. Massimiliano Marzo *Spring 2017*
- Computational Tools, CLABE (Undergraduate), Prof. Antonio Puglisi *Spring 2017*
- Mathematical Economics (Graduate), Prof. Luca Ballestra *Spring 2017*

Business Experience

Moody's Analytics Knowledge Services
Quantitative Research Associate *July 2013-Aug 2015*
Quantitative Research Analyst *May 2012-June2013*

Hospira healthcare India Pvt Limited
Quant Executive- Finance and Supply Chain *Sep 2011-May 2012*

Computer Skills

Coding : Python, R, MATLAB, S-PLUS, Stata, SAS, Gretl, Visual Basic, C, C++, Advanced MS Excel, MS Access, MS SQL

Data : Time Series Analysis, Panel Methods, Machine Learning (PyTorch, TensorFlow, Keras, Horovod)

Education

Master of Science in Economics
University of Bologna, Italy *Sep 2015-July 2017*
Grade : 30 cum laude

Bachelor of Engineering, Computer Science
Govt. College of Engineering, Anna University, India *Aug 2005-May 2009*
Grade : First Class

Hobbies

Basketball and Handball (University level long time back), Weight training, Running, and Solving Math/Algorithmic puzzles.