

THE COURSE

Over the last years, network analysis has become an active topic of research, with numerous applications in macroeconomics and finance. In a nutshell, network analysis is concerned with representing the interconnections of a large panel as a graph: the vertices of the graph represent the variables in the panel, and the presence of an edge between two vertices denotes the presence of some appropriate measure of dependence between the two variables. Dependence can derive from direct exposures or from indirect or common exposures.

From an economic perspective, the interest on networks has been boosted by the research of, inter alia, Acemoglu et al. (2012), which shows that individual entities can have a nonnegligible effect on the aggregate behavior of the economy when the system has a high degree of interconnectedness. Especially since the 2008 global financial crisis, the interest in analyzing the role of network structure in transmitting – or dissipating – stress has grown significantly. This work is concerned with the theory and practice network analysis techniques for applications in finance and economics.

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Very good course, with one of the best platforms I've experienced!

Participant of the one of the FBF online courses held in 2020



PLACE Online course

KEY INFO

DATES 04 - 19 March 2021

AREA

Statistical and Econometric Methods

LEVEL

Advanced

TARGET

EU Officials (ECB, SSM, SRB, ESRB, EBA, ESM), National Supervisory Authorities, Financial Stability officers, Economics Departments And Forecasting Departments of Central Banks, Ph.D. and Post-doctoral researchers, Research department officers of private banks.

INSTRUCTORS



Christian Brownlees is an Associate Professor in the Department of Economics and Business at the Universitat Pompeu Fabra. Christian received his PhD in Statistics and B.S. in Economics and Quantitative Methods from Universita' di Firenze. He was also a visiting PhD researcher at UCSD and post-doc researcher at NYU. Christian's research lays at the intersection of statistics, econometrics, economics and finance. In particular, his research focuses on volatility and systemic risk. Christian has published in the Journal of Econometrics, the Review of Economics and Statistics, Annals of Statistics and the Review of Financial Studies.



Iman van Lelyveld is a Senior Policy Advisor with DNB's Statistics Division and Professor of Banking and Financial Markets at the Finance Group of the VU Amsterdam. At DNB he is spearheading the Data Science Hub initiative. He has published widely on international banking and financial networks. He has worked for Deutsche Bank, the Bank of England, and the International Data Hub at the Bank for International Settlements (BIS). At the BIS he helped to setup analysis of the exposure network of the largest banks in the world.

WHAT YOU WILL LEARN

After having completed this course, you will be able to:

Understand the basic concepts of network theory, including: vertices, edges, network properties, random graphs, etc.

Derive theoretical results about stability in interbank networks Model contemporaneous dependence in large panels of time series Estimate large dimensional network models (using LASSO estimation) Identify the reasons for contagion via indirect exposures Select the most appropriate tools for the estimation of large network models Distinguish between different network structures Identify network structures such as hubs and communities Use network models in practical policy applications.

TOPICS	

Networks: Basic Concept Direct Exposure Networks Direct Contagion: the Classics Capturing Network Structure Indirect Exposure Networks Crowded Trading What are the Policy Implications? Network Models for Large Panels

GUEST CONTRIBUTORS



Marco D'Errico is a senior financial stability expert in the European Systemic Risk Board Secretariat at the European Central Bank where he works on data analytics, interconnectedness and contagion. During the closing session of the course, Marco will contribute with a talk about the **post-crisis financial network: data, opacity and new challenges**.

His intervention will centre on the role opacity plays in an interconnected financial system, the issues it creates for both policymakers and market participants, and the policy responses developed after the Global Financial Crisis. After reviewing the conceptual and theoretical linkages between opacity and contagion, he will focus on efforts made by global and EU policymakers to collect, process and analyse large scale transaction-level data. Marco will cover how data was key to monitor the EU financial network in the unfolding of the March 2020 crisis, showing how granular information is becoming ever more important to analyse and monitor a complex, interconnected, and adaptive financial system. However, an unexpected source of opacity is emerging: poor data quality.

Adrien Amzallag works on risk analysis and structured finance policy topics at the European Securities and Markets Authority.

Adrien will guide course participants through a recent applied network analysis project that investigates investment **fund portfolios from a climate risk perspective**. By combining information on fund portfolios with climate-relevant data on underlying investments, one can uncover interconnections and joint vulnerabilities of funds to climate shocks. These vulnerabilities are then quantified in a preliminary asset valuation exercise in which the impact of climate-related financial shocks on investment fund assets is assessed.

TEACHING ASSOCIATE



You will be supported by the teaching associate Natalie Kessler, 4th year PhD candidate in economics at the European University Institute (EUI).

Together with the instructors, Natalie will guide you through the online activities during the full length of the course.

COURSE SCHEDULE

04 MARCH

Opening of the course 1:00 – 2:15 PM Kickoff live session (75')

04 - 12 максн

Participants watch video lectures

(total time approximately required: 8 hours)

12 - 19 максн

Live online sessions *(all times CET)*

12/03 First live session (**12:00 – 2:00 PM**) Led by Christian Brownlees

After the live session:

- Office hours (45')
- Quiz 1

17/03 Second live session (**12:00 – 2:00 PM**) Led by Iman van Lelyveld

After the live session:

- Office hours (45')
- Quiz 2

19/03 Closing live session (**1:00 – 2:00 PM**) Policy session

ACTIVITIES

- Watch video lectures, pre-recorded (8h), mandatory
- Participate in the live classes (5h), mandatory
- Complete two exercises, mandatory
- On the platform: access to readings and discussion fora.
- Optional: One-to-one contacts with instructors in 'virtual office hours'

Estimated time to complete all mandatory activities: approx. 15 hours



ABOUT EUI AND RSCAS

The European University Institute (EUI) is a unique international centre for doctorate and post-doctorate studies and research, situated in the Tuscan hills overlooking Florence.

Since its founding in 1972 by the six original members of the then European Communities, the EUI has earned a reputation as a leading international academic institution with a European focus. The four departments – Economics, History and Civilization, Law, and Political and Social Sciences – host scholars from more than 60 countries.

The EUI hosts also the Max Weber Programme, the largest postdoctoral programme in social sciences in Europe, and the School of Transnational Governance (STG), which trains tomorrow's leaders on the concepts, methods and practices of governance beyond the state.

Furthermore, the EUI is the home of the Robert Schuman Centre for Advanced Studies (RSCAS), focused on interdisciplinary, comparative and policy research on the major issues affecting European societies.



FBF will bring the EUI experience on your devices



ABOUT FBF

The Florence School of Banking & Finance (FBF) is a European platform bringing together practitioners and academics from the Banking and Finance sector to develop a common culture of regulation and supervision in the European Union.

Established in January 2016 as part of the EUI's Robert Schuman Centre for Advanced Studies, the FBF organises training and policy dialogue activities, in close interaction with its network of leading academic institutions, both in the residential and online formats.

Together with its partners, the School helps experts and decision-makers to take informed decisions in the medium and long-term, critically accompanying the economically and socially sound functioning of the European banking sector.

Training participants since 2016

75+ courses
2500+ participants
170+ instructors
75+ countries represented
369 organisations of origin

Types of Trained Institutions

National Central Banks **35%** European Central Bank **21%** National Supervisory Authority **12%** Academics **11%** Other EU **5%** European Banking Authority **3%** Single Resolution Board **3%** International Organisation **2%**

FBF ONLINE ACTIVITES

Since 2016 FBF developed online activities attracting +8000 attendees to the online seminars and +750 participants for the online courses.

During the COVID-19 lockdown, we increased the capacity of our online activities, resulting in a growth of +127% in the number of participants.



Collaborations with: European Commission, European Central Bank, European Securities and Markets Authority, Bruegel, Oliver Wyman, Pierre Werner Chair, Center for Economic Policy Research and more.

Prerequisite

A Master's degree in Economics is required to attend the course.

Basic knowledge of coding in Python/R.

ELIGIBILITY

FFFS

AND INFO

1050€ – Private Sector.

950€ – Public Authorities (e.g. National Competent Authorities, Central Banks and European Institutions).

750€ – Academics

(Full-time Professors, full-time PhD Students and full-time Research Associates). Please submit a certificate attesting your status of Professor, PhD Student or Research Associate to <u>fbf@eui.eu</u> before registering. FBF secretariat will provide you with a code to register. *Seats for academics are limited and assigned by the FBF secretariat on a case-by-case basis.

Registration deadline: 21 February 2021

Please note that the payment must be settled one week before the start of the course.

A certificate of attendance will be provided to all participants after the course.



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For more information on this course, see: https://fbf.eui.eu/network-analysis-in-finance-economics/