



€ABCN

Euro Area Business Cycle Network

2025 ANNUAL REPORT

1 OCTOBER 2024 – 30 SEPTEMBER 2025

EURO-AREA BUSINESS CYCLE NETWORK
CEPR, 187 Boulevard Saint-Germain,
1er étage, 75007 Paris, France

For the Annual Steering Committee Meeting 2025

Hosted by the Centre for Economic Policy Research, Online

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1. INTRODUCTION

The Euro Area Business Cycle Network (EABCN) provides a forum for the better understanding of the business cycle in the euro area by linking academics and researchers in central banks and other policy institutions involved in its empirical analysis. The Network was launched officially on 1 April 2002. The first EABCN Steering Committee meeting, hosted by Banca d'Italia in September 2002, ratified the Network's organisational structure and approved its ability to spend network funds. EABCN currently consists of 25 institutional members.

Its organisational structure consists of an Executive Group, a Scientific Committee and a Steering Committee.

EXECUTIVE GROUP

The Executive Group consists of the Chair of the Steering Committee, the Chair of the Scientific Committee and a senior representative of CEPR. The Executive Committee reports to the Steering Committee and approves deviations from the budget during the year. Significant changes to the budget are communicated to the Steering Committee and approved by written procedure. The CEPR President is its representative on the Executive Group; the CEPR CEO stands in for the President when they are not available.

THE SCIENTIFIC COMMITTEE

The Scientific Committee consists of the Chair, Vice-Chair and the EABCN Network Co-ordinator.

Barbara Rossi is Chair of the Scientific Committee. Barbara is a Professor at the European University Institute and an ICREA Professor of Economics at Pompeu Fabra University, a Research Professor at the Barcelona School of Economics and Associate researcher at CREI. She has previously been an Associate Professor with tenure at the Department of Economics at Duke University, after earning her Ph.D. from Princeton. She is a Fellow of the International Association of Applied Econometrics, a Fellow of the Econometric Society, a CEPR Research Fellow, and currently serves as a Director of the International Association of Applied Econometrics.

Along with her teaching and research responsibilities, Professor Rossi holds various other professional positions. She serves as the Editor of the Journal of Applied Econometrics; has served as a co-editor of the International Journal of Central Banking, and associate editor of Quantitative Economics, an associate editor for the Journal of Business and Economic Statistics and of the Journal of Economic Dynamics and Control.

Refet Gürkaynak is Vice-Chair of the Scientific Committee. Refet is a Professor of Economics at Bilkent University and a CEPR Research Fellow where he is the Director of the Monetary Economic and Fluctuations Programme. He has a BA from Bilkent and a PhD from Princeton, both in Economics. Prior to his current position, he was an Economist at the Monetary Affairs Division of the Federal Reserve Board. His research has been published in journals such as Journal of Monetary Economics, Review of Economics and Statistics and the American Economic Review. Gürkaynak has been the recipient of awards from the Central Bank of Turkey, the European Central Bank and the Turkish Academy of Sciences as well as having been awarded an ERC Grant.

The Network Coordinator, **Eleonora Granziera**, works in collaboration with the Chair and Vice-Chair of the Scientific Committee and the relevant CEPR staff to facilitate planned network activities. The Network Co-ordinator works to ensure activities occur on schedule and to a high scientific standard.

Dr Granziera is a Senior Research Economist in the Research Unit of the Norges Bank. Her research focuses on applied time series econometrics and applied macroeconomics with particular interest in the transmission mechanism of monetary policy and forecasting. Prior to joining the Norges Bank, she worked as a senior economist at the Bank of Finland from 2016 to 2019 and at the Bank of Canada from 2010 to 2016. She holds a PhD in economics from the University of Southern California.

THE STEERING COMMITTEE

The Steering Committee consists of representatives of all 25 institutional members and meets annually to approve the EABCN budget, plan EABCN events and to discuss the annual report.

Luc Laeven is the Chair of the Steering Committee. Dr Laeven is Director-General of the Directorate General Research of the European Central Bank. Previously, he was Lead Economist in the Research Department of the International Monetary Fund. Prior to this, he was a Senior Financial Economist in the Financial Sector Department of the World Bank and worked at ABN Amro Bank. His fields of interest are Macro-Finance, International Finance, Corporate Finance and Financial Intermediation.

EABCN INSTITUTIONAL MEMBERS

EABCN currently has **25** institutional members. Each member has a single representative on the EABCN Steering Committee. In 2025, two new institutions joined the EABCN – the Bank of Greece and the Central Bank of Bosnia and Herzegovina.

The EABCN is pleased to welcome George Hondroyiannis as the Bank of Greece’s Steering Committee Representative, and Belma Colakovic as the Central Bank of Bosnia and Herzegovina’s Steering Committee Representative. We look forward to the banks’ participation in the network.

Banca d’Italia

Fabio Busetti

Denmark’s Nationalbank

Renato Marco Faccini

Banca de Espana

Ernesto Villanueva

De Nederlandsche Bank

Peter van Els

Banco de Portugal

António Antunes

Deutsche Bundesbank

Falko Fecht

Bank of England

Simon Lloyd

DG ECFIN

Björn Doehring

Bank of Greece

George Hondroyiannis

European Central Bank

Luc Laeven

Bank of Finland

Adam Gulan

Narodowy Bank Polski

Krzysztof Makarski

Banque Centrale du Luxembourg

Paolo Guarda

National Bank of Ukraine

Oleksandr Faryna

Banque de France

Vladimir Borgy

Norges Bank

Knut Are Aastveit

Banque Nationale de Belgique

Rafael Wouters

Oesterreichische Nationalbank

Thomas Zorner

Central Bank of Bosnia and Herzegovina

Belma Colakovic

South African Reserve Bank

Mathias Manguzvane

Central Bank & FSA of Ireland

Fiona Farrelly

Sveriges Riksbank

Ulf Söderström

Central Bank of Iceland

Lúðvík Elíasson

Swiss National Bank

Marc-Antoine Ramelet

Czech National Bank

Simona Malovana

CENTRE FOR ECONOMIC POLICY RESEARCH (CEPR)

The Centre for Economic Policy Research acts as the Network's secretariat by handling administrative tasks such as receiving and dispersing funds, organising meetings, processing expense claims and maintaining the website. Some of these tasks are done in cooperation with the Network Co-ordinator. CEPR also produces the Annual Report, which is circulated in advance of the annual Steering Committee Meeting. It reports on events, members, finances, the website and feedback.

The point of contact at CEPR for EABCN inquiries is **Julia Stembridge**, Senior Projects Officer (jstembridge@cepr.org) unless stated otherwise (for example, concerning a specific conference or training school).

2. RECENT EVENTS

This report covers activities that took place in the period of 1 October 2024 through 30 September 2025.

The EABCN Network successfully organised three training schools - two online and one in-person - as well as two in-person conferences.

The online training schools took place on Zoom. CEPR's events team managed all logistical aspects of the meetings, from the concept stage to pre-event marketing and hosting of the meeting, to post-event communications.

Participants gave positive feedback on the meetings hosted online as well as on the in-person events, and this feedback will be considered when organising future events. A summary of the evaluation forms can be found in Section 7, and the programmes of all events are available at the end of this report.

TRAINING SCHOOLS

NEW DEVELOPMENTS IN THEORETICAL MODELS OF CRYPTOCURRENCIES, MONETARY POLICY AND INFLATION DETERMINATION

ONLINE, 27,28 AND 31 MARCH 2025

This training school was taught by Professor **Pierpaolo Benigno**, Professor of Monetary Macroeconomics and Deputy Head of the Department of Economics at the University of Bern.

The course covered foundations of modern currency systems, focusing on intrinsically worthless currencies and their applications, whether in government-issued currencies or private currencies like cryptocurrencies. It analysed competition among different forms of currency and compared cryptocurrency frameworks with other payment methods. The course also delved into the determinants of currency value, with a specific focus on the recent surge in inflation. Subsequently, the course explored recent developments in the New Keynesian Phillips Curve, introducing an "Inverse-L" New Keynesian Phillips Curve grounded in search-and-matching labour market models. It integrated the Phillips Curve

and Beveridge Curve to examine the implications for a soft or hard landing during disinflationary processes.

The course attracted 63 applications, of which all participants were selected.

LARGE DIMENSIONAL VARS AND BAYESIAN METHODS

ISPRA, ITALY

5-7 MAY 2025

This training school was taught by **Todd Clark** of the Research Department of the Federal Reserve Bank of Cleveland. Clark is also a fellow at the Center for Financial Economics of Johns Hopkins University.

The course taught Bayesian methods for the use of large vector autoregressions (VARs) in macroeconomic forecasting and structural analysis. The lectures focused on models and estimation methods, while the practice sessions focused on hands-on illustrations with Matlab code. From the starting point of Bayesian methods and vector autoregressions, the course focused on methods that have been developed for large models, along with their applications.

The training school had 60 applications for participation, of which 42 were accepted.

THE BOOTSTRAPS AND ITS APPLICATIONS TO PANEL AND FACTOR MODELS

ONLINE, 3-5 JUNE 2025

This training school was taught by Professor **Silvia Goncalves** of McGill University.

The main goal of this school was to provide students with an overview of the bootstrap and its applications in different contexts in economics allowing for both cross sectional and serial dependence. The course covered pure time series applications as well as panel data models and factor models. The emphasis was on discussing the conditions that the bootstrap needs to meet to be valid in each application.

The training school had 40 applications for participation, of which all accepted.

CONFERENCES

ADVANCES IN MONETARY POLICY AND THE NATURAL RATE OF INTEREST

EABCN – EUI JOINT CONFERENCE

FIESOLE, ITALY, SEPTEMBER 12, 2025

This one-day conference hosted jointly with the European University Institute in Fiesole, Italy covered a variety of topics and themes around empirical methods for estimating the natural rate of interest as well as theoretical models. The conference brought together recent contributions in this area of research and covered topics such as long-run inflation and unemployment, the economic determinants of the natural rate of interest in the long-run, and empirical estimates of the natural rate of interest. **Ricardo Reis** of the London School of Economics and CEPR delivered the keynote speech.

CAN HETEROGENEOUS AGENT MODELS BE USEFUL FOR CENTRAL BANKERS? HOW?

EABCN – BANK OF ENGLAND JOINT CONFERENCE

BANK OF ENGLAND, LONDON, UK 22 SEPTEMBER 2025

This one-day conference hosted jointly with the Bank of England covered the use of heterogeneous agent models in central banking. In particular, the focus was on how, if at all, explicitly modelling heterogeneity can assist central bankers in pursuing their core mandates related to macroeconomic aggregates and financial stability. The conference explicitly focused on the use of heterogeneous agent models in the analysis of aggregates, rather than distributions. **Adrien Auclert** of Stanford University and CEPR delivered the keynote speech.

3. FUTURE EVENTS

The Network is planning two conferences and three training schools in 2025/2026, with one of the training schools being online and two being in person. One of the online training schools took place already in mid-November 2025.

Further details on future events are given below and will be available on the EABCN website in due course.

CONFERENCES

ADVANCES IN CAUSAL INFERENCE FOR MACROECONOMIC POLICIES

PARIS, FRANCE

16-17 APRIL 2026

This two-day conference will be jointly hosted by the Banque de France in Paris and will cover topics including but not limited to new methods for reliable causal inference, high-frequency identification, estimation of structural parameters in policy evaluation, and more.

The keynote speaker will be **Regis Barnichon** of the San Francisco Fed and CEPR.

CONFERENCE ON STABLE COINS

ROME, ITALY

4 MAY 2026

This conference will be organised by Refet Gürkaynak and Carlo Altavilla (ECB) and will be part funded by the ECB. More details about this conference will be available soon on the EABCN website.

TRAINING SCHOOLS

CAUSAL INFERENCE WITH VARS

ONLINE

10- 12 NOVEMBER 2025

This training school, taught by **Giovanni Ricco** of CREST-Ecole Polytechnique and CEPR, took place in mid-November 2025 on Zoom.

This course provided a comprehensive introduction to causal inference in Vector Autoregressions (VARs), with a focus on structural identification approaches widely used in empirical macroeconomics. The course developed the theoretical underpinnings of VAR models, reviewed leading identification techniques, and discussed recent advances in the use of statistical restrictions, and instrumental variables for structural analysis. The training school had 166 applications for participation, of which all accepted. Feedback from participants will be shared in next year's annual report.

NEW DEVELOPMENTS IN ENERGY ECONOMICS AND COMMODITY PRICES

TIME AND LOCATION TO BE DETERMIEND

Hilde Bjornland of BI Norwegian Business School will teach a course on New Developments in Energy Economics and Commodity prices. More details about this training school will be available soon.

INFLATION COSTS AND OPTIMAL INFLATION

MANNHEIM, GERMANY

2-4 SEPTEMBER 2026

Klaus Adam of University College London will teach this course on Inflation Costs in person at Mannheim University. More details about this training school will be available soon.

OTHER EVENTS

ANNUAL EABCN STEERING COMMITTEE MEETING

ONLINE, 25 NOVEMBER 2025

The annual Steering Committee for the EABCN network will be organised by CEPR online via Zoom. Institutional members will discuss the previous year's activities and how to move forward in the next year.

5. EURO AREA BUSINESS CYCLE DATING COMMITTEE (EABCDC)

The Centre for Economic Policy Research (CEPR) and the Euro Area Business Cycle Network (EABCN) have partnered to jointly support and expand the activities of the Euro Area Business Cycle Dating Committee (EABCDC). The Committee continues to fulfil its mandate of identifying the peaks and troughs of euro area business cycles.

In addition, it has advanced several research initiatives aimed at monitoring and improving the understanding of aggregate economic developments in the euro area. As part of this effort, the Committee regularly publishes on the EABCN website two key datasets: the CEPR–EABCN Euro Area Business Cycle dates and a comprehensive set of euro area output gap estimates derived from the Area-Wide Model (AWM).

EABCDC, which is composed of five CEPR researchers, establishes the chronology of recessions and expansions of the eleven-original euro-area member countries plus Greece for 1970-1998 and the entire euro area from 1999 onwards.

CURRENT COMMITTEE MEMBERS

At the beginning of 2025, Evi Pappa, who was previously an EABCDC member since 2019 and served as Vice Chair in 2024, took over as the Chair of the Dating Committee in place of Refet Gürkaynak. Additionally, John Fernald became the new Vice Chair at the beginning of 2025 and the EABCDC also welcomed a new member, Giovanni Ricco. The current members of the Dating Committee are:

- Evi Pappa (Chair 2025-Present) Universidad Carlos III de Madrid and CEPR
- John Fernald (Vice Chair 2025-Present) INSEAD, Federal Reserve Bank of San Francisco and CEPR
- Silvana Tenreyro, 2023-Present, London School of Economics and CEPR
- Giovanni Ricco, 2024-Present, Ecole Polytechnique, Warwick University and CEPR
- Benjamin Born, 2025-Present, University of Bonn and Research Director at the IFO Institute's Center for Macroeconomic and Surveys and CEPR

At the end of December 2025, the term of John Fernald, the current EABCDC Vice Chair will come to an end. John has served as the EABCDC Chair since 2019, and the EABCN thanks him greatly for his dedication and commitment to the Dating Committee. Giovanni Ricco will become the new Vice Chair. Also, at the end of December 2026, the term of Evi Pappa will come to end.

On 1st January 2025 the EABCN Dating Committee will welcome a new member, Frank Smets, Bank of International Settlements and Ghent University.

REPORT ON ACTIVITIES

The Euro Area Business Cycle Dating Committee convened twice in 2025—on 10 March (online) and 12 September (in person). Following each meeting, the Committee released a report summarizing its assessment of recent economic developments. Year-on-year real GDP growth remained subdued, while employment continued to expand.

In its most recent report, the Committee underscored the significant influence of Ireland on the measurement of the euro area business cycle. Volatility in Ireland’s national accounts, often disconnected from underlying domestic economic activity, can distort aggregate euro area indicators. Excluding Ireland from the aggregate reduces measured volatility but also lowers average growth.

The Committee also continues to publish on the EABCN website the official CEPR–EABCN Euro Area Business Cycle dates, as well as euro area output gap estimates derived from the Area-Wide Model (AWM).

6. EABCN WEBSITE

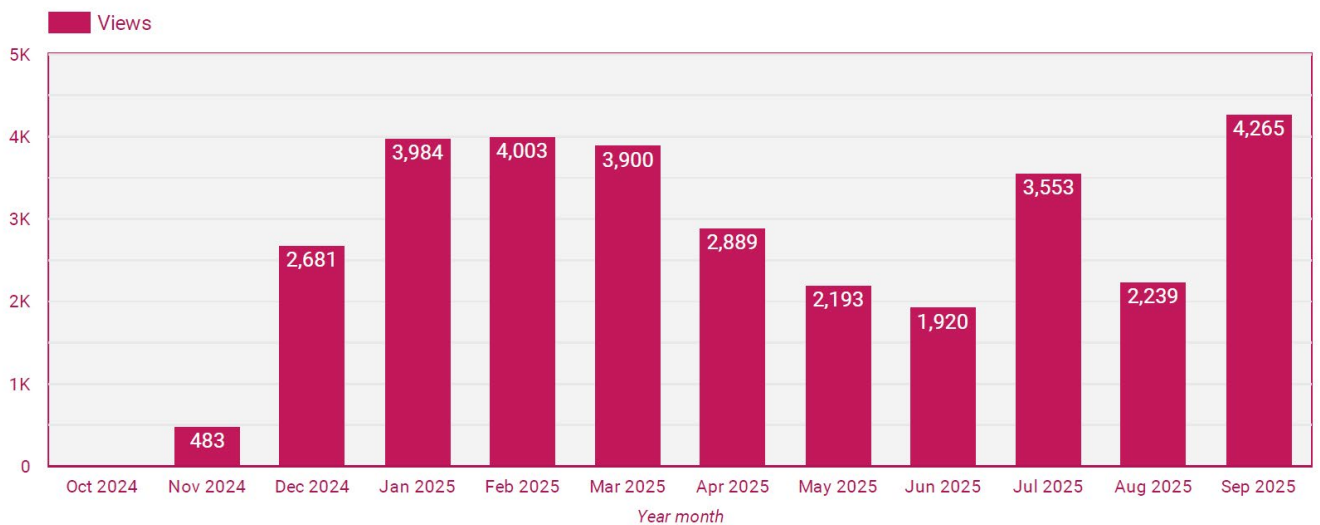
Data on the number and length of visits to the EABCN website is provided below. Please note that the data covers the period 1 October 2024 to 30 September 2025 and is gathered from Google Analytics. Both the total views and average visit length have gone up from last year since the new website launched, which saw 23,454 sessions with an average visit length of 1 minute and 15 seconds.

Total Views	32,110
Average visit length	2 minutes and 32 seconds
Average pages per visit	1.95

The top sources for website visits were as follows:

1. LinkedIn
2. Twitter
3. Chat GPT
4. CEPR's website
5. Bilkent University

The traffic flows throughout the year can be seen on the graph below:



7. FEEDBACK ON EVENTS

NEW DEVELOPMENTS IN THEORETICAL MODELS OF CRYPTOCURRENCIES, MONETARY POLICY AND INFLATION

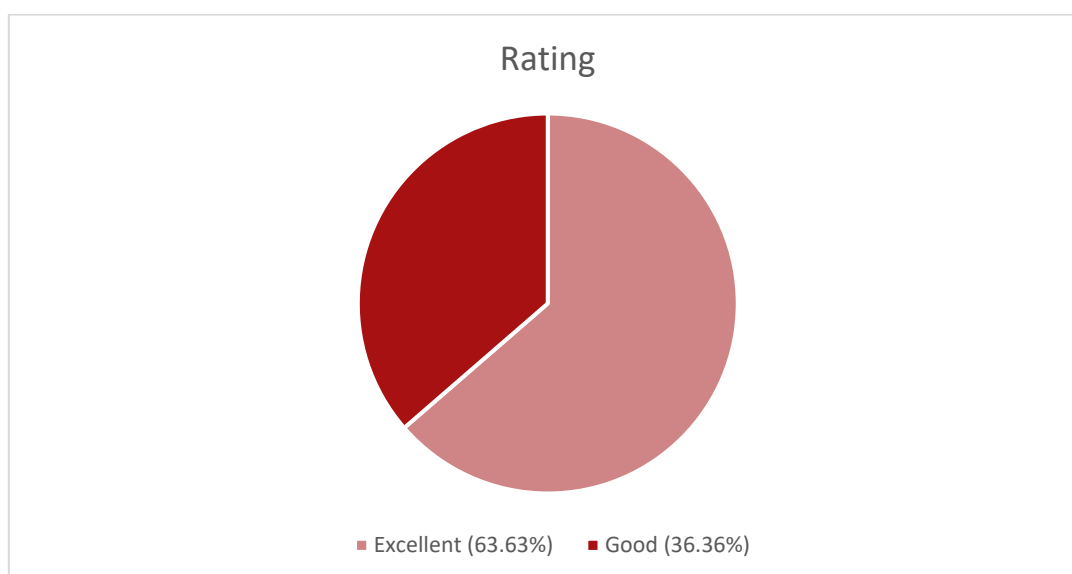
ONLINE, 27, 28 AND 31 MARCH 2025

ORGANISATION OF TRAINING SCHOOL

The training school took place online.

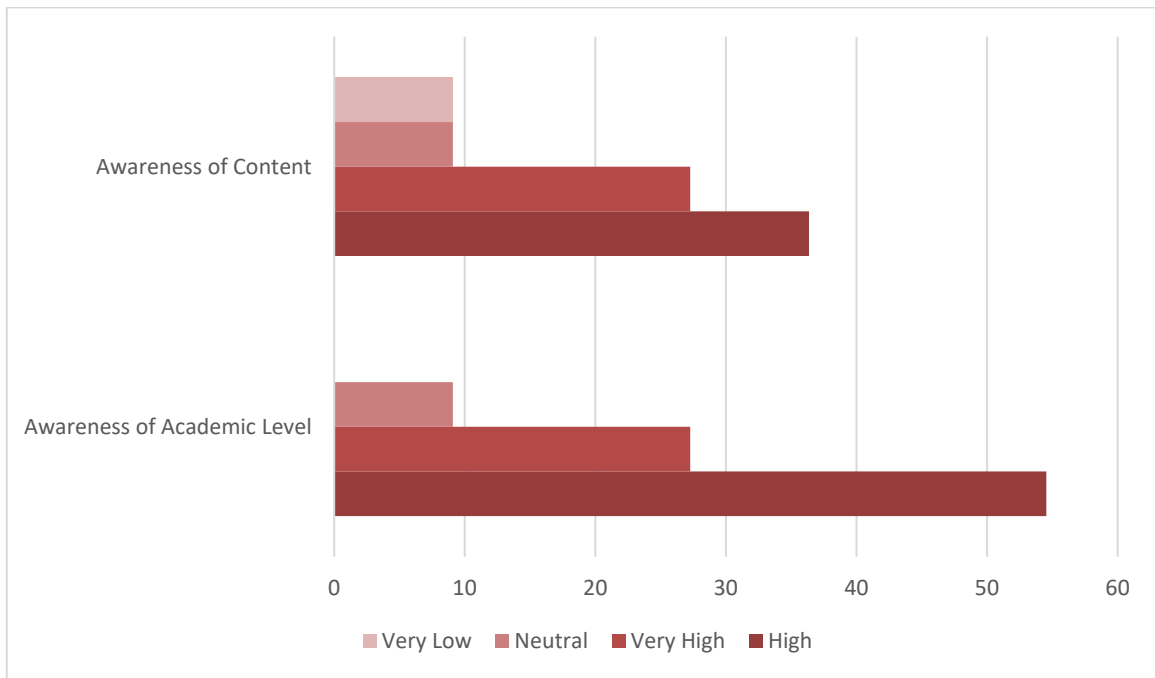
- Participants rated the pre-meeting organisation highly, with a majority selecting Excellent (54.54%) and the remainder choosing Good (36.36%) or Fair (9.1%).
- The majority of participants rated the ease of using the online platform Zoom as Excellent (90.9%), with the remaining selecting Fair (9.1%).
- The majority of participants also rated the organisation during the classes highly, with a majority selecting Excellent (63.63%) and the remainder choosing Good (36.37%).
- Participants rated the quality of the sound and video as either Excellent (81.81%) or Good (18.19%).

Despite the organisational challenges of hosting the training school online, participants rated the overall organisation of the school very highly:



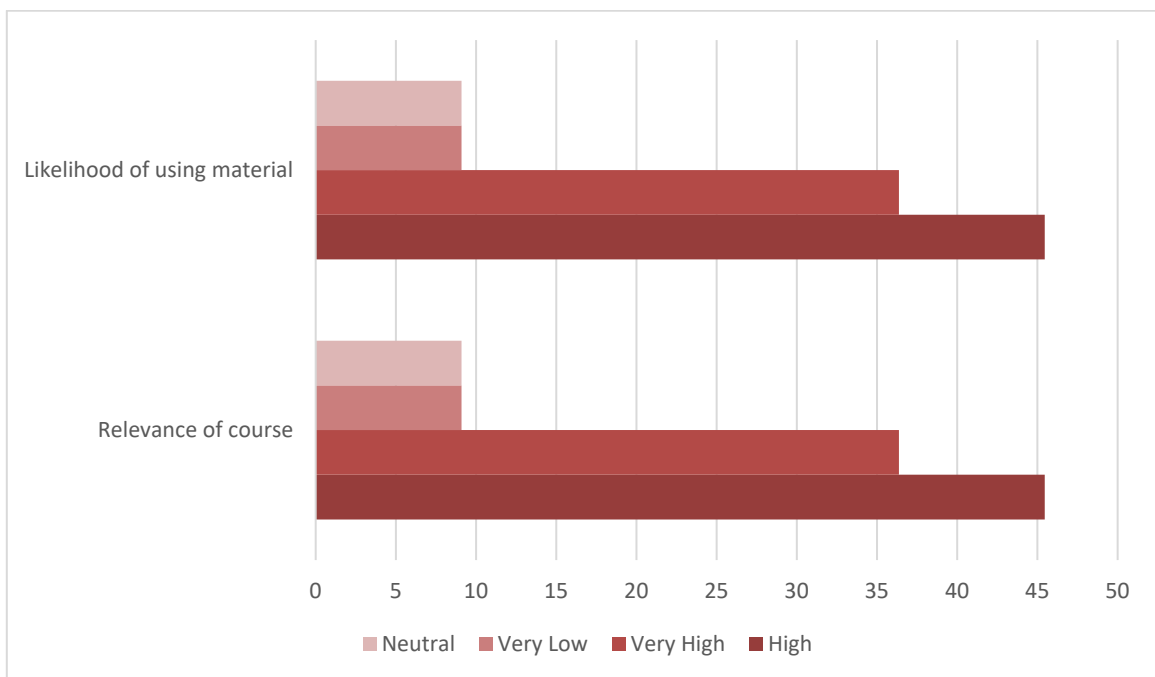
PARTICIPANT EXPECTATIONS

Participant feedback on the information provided online about the training school, including its academic level and content, suggests that most participants' expectations were fulfilled. The feedback on participant awareness of academic level and content is as follows:



PARTICIPANT EXPERIENCE

While the feedback form does not include a specific rating for the overall experience of the training school, other feedback results indicate that the participants had a positive experience. Notably, most participants rated the training school as relevant to their personal needs, and the rating for their likelihood of using the school materials in the future was also high.



When asked to rank how useful the course materials, skill development, and knowledge exchange with peers and lecturers were, 55.55% of the participants rated the course materials as the most beneficial aspect. Knowledge exchange with peers and skill development were ranked equally in second place, with 22.22% of respondents ranking them as the second most useful element of the school.

The participants' experience of the teaching on the training school was very positive, with 72.72% of participants rating the lecturers' expertise as Very High and the remaining 27.28% selecting High.

In another positive indicator of participant experience of the training school, the participants rated the likelihood of attending:

- Other training schools as Very High (72.72%) and High (27.28%).
- Other EABCN events as Very High (45.45%), High (45.45%) or Very Low (9.1%).

PARTICIPANT RECOMMENDATIONS

The main pieces of feedback participants provided for future iterations of this training school were:

- To discuss criteria to assign turning points of the business cycles of the euro area.
- To focus more on cryptocurrency in macroeconomics.
- To give a better understanding of what the course contents will be ahead of time.

In their feedback, participants suggested the following topics as future focuses of EABCN training schools:

- Solution Methods for Macro Models
- Cryptocurrencies and their role in monetary policy
- Business Cycles: methods to develop cyclical indexes
- The econometrics of Macro and Micro Interactions

LARGE DIMENSIONAL VARS AND BAYESIAN METHODS

ISPRA, ITALY, 5-7 May 2025

ORGANISATION OF TRAINING SCHOOL

The training school took place in person.

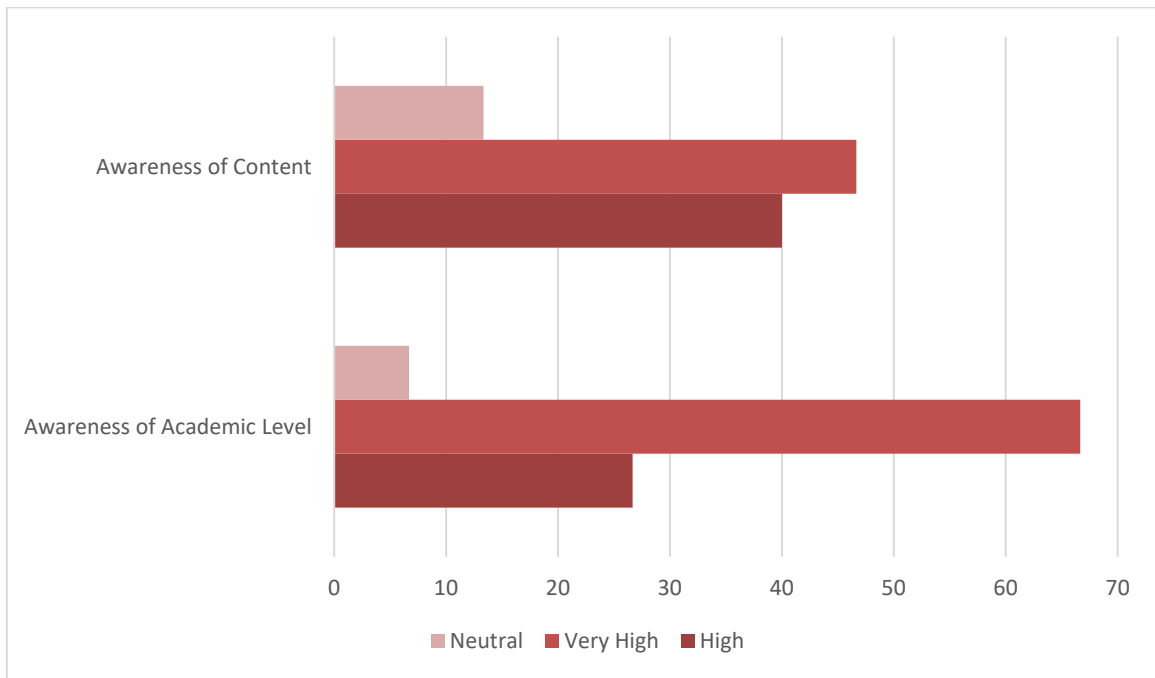
- Participants rated the pre-meeting organisation highly, with a majority selecting Excellent (80%), Good (13.33%) or Fair (6.67%).
- The majority of participants also rated the organisation during the classes highly, with all participants selecting Excellent.

Overall, participants rated the school very highly:



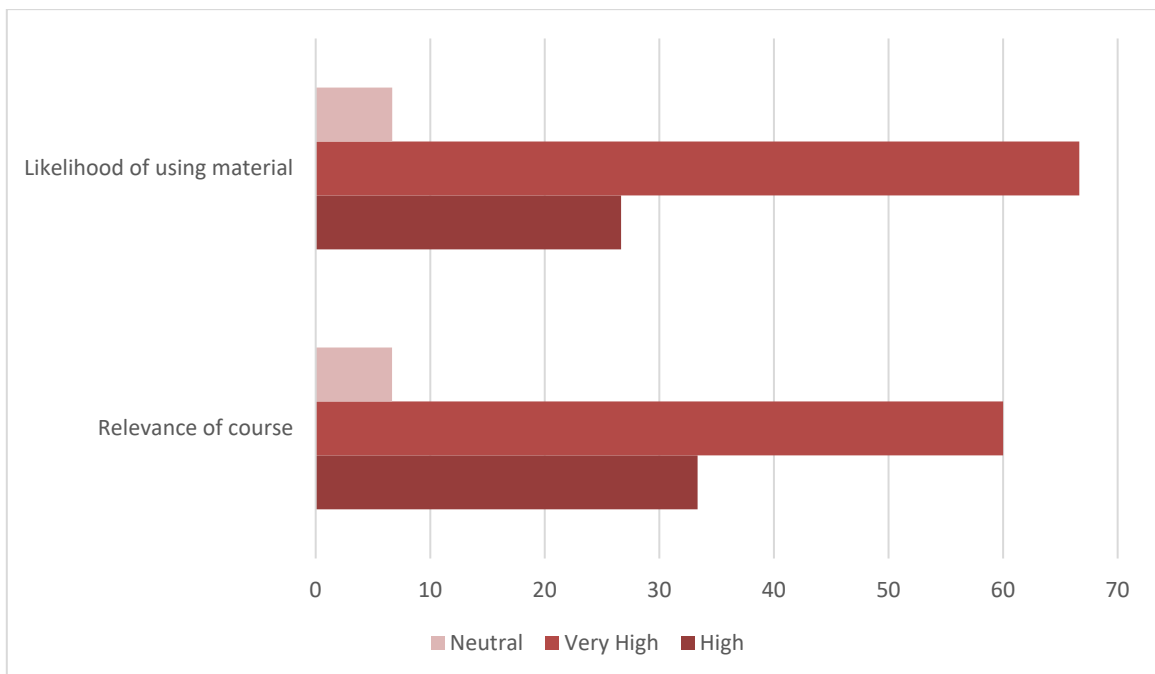
PARTICIPANT EXPECTATIONS

Participant feedback on the information provided online about the training school, including its academic level and content, suggests that most participants' expectations of the training school were fulfilled. The feedback on participant awareness of academic level and content is as follows:



PARTICIPANT EXPERIENCE

Feedback results indicate that the participants had a positive experience. Notably, most participants rated the training school as relevant to their personal needs, and the rating for their likelihood of using the school materials in the future was also high.



When asked to rank how useful the course materials, networking, and knowledge exchange with peers and lecturers were, 76.92% of the participants rated the course materials as the most beneficial aspect.

Knowledge exchange with peers and lecturers was most commonly ranked second (15.38% of responses), and networking was most commonly ranked third (7.69% of responses).

The participants' experience of the teaching on the training school was extremely positive, with 100% of participants rating the lecturers' expertise as Very High.

In another positive indicator of participant experience of the training school, the participants rated the likelihood of attending:

- Other training schools as Very High (73.33%) or High (26.67%).
- Other EABCN events as Very High (60%) or High (40%).

PARTICIPANT RECOMMENDATIONS

The main pieces of feedback participants provided for future iterations of this training school were:

- To include more time for networking and extra activities outside of going through code.
- To include some discussion on small open economy considerations.

In their feedback, participants suggested the following topics as future focuses of EABCN training schools:

- Monetary policy shock identification, central bank information effects.
- More empirical applications on some relevant and timely topics, in addition to very good offering of different econometric methods.

THE BOOTSTRAPS AND ITS APPLICATIONS TO PANEL AND FACTOR MODELS

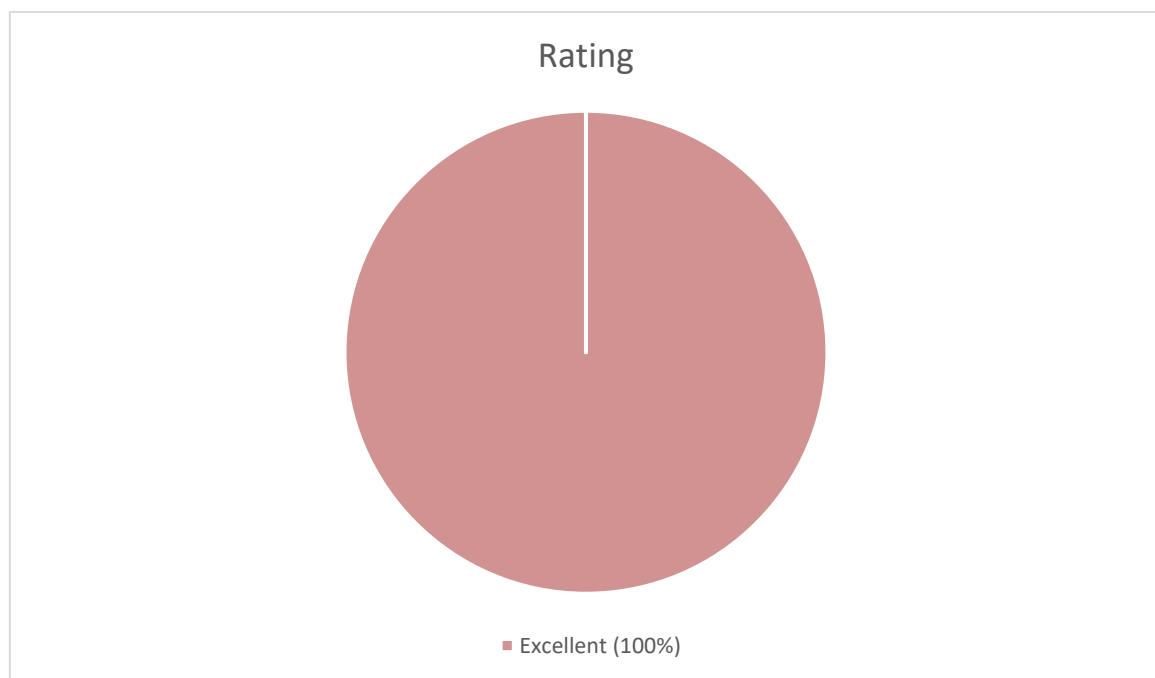
ONLINE, 3-5 JUNE 2025

ORGANISATION OF TRAINING SCHOOL

The training school took place online.

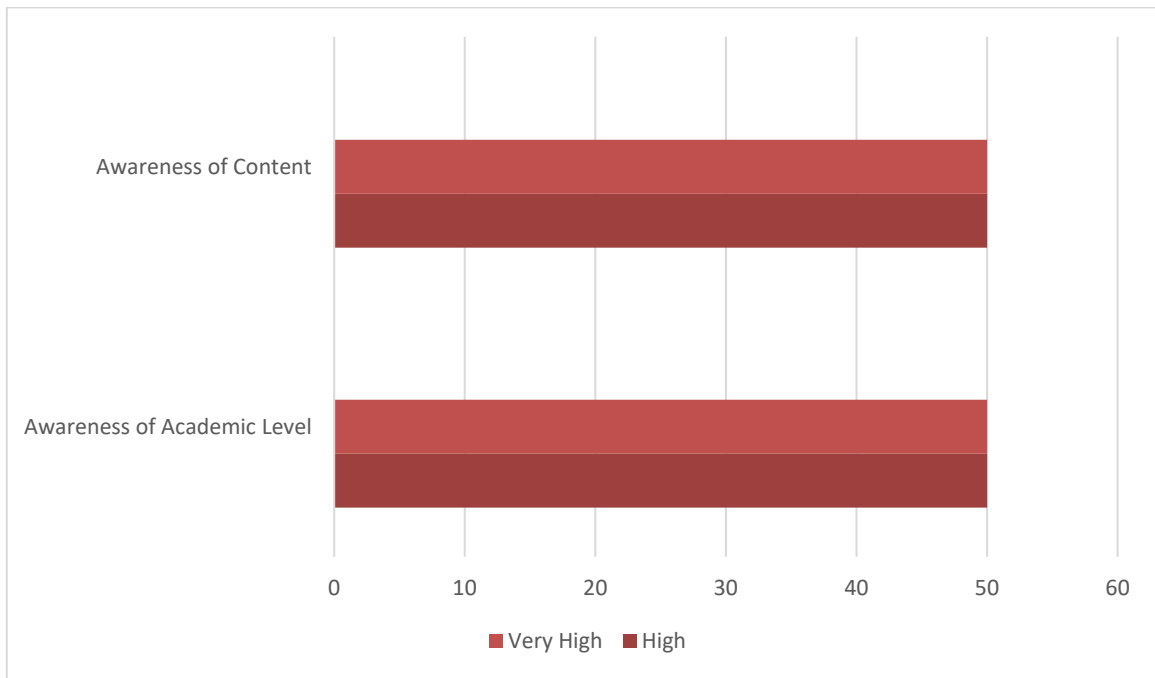
- Participants rated the pre-meeting organisation highly, with a majority selecting Excellent (90%) and the remainder choosing Good (10%).
- All participants rated the ease of using the online platform Zoom as Excellent.
- All participants also rated the organisation during the classes highly, with all participants selecting Excellent.
- Participants rated the quality of the sound and video as either Excellent (90%) or Good (10%).

Despite the organisational challenges of hosting the training school online, participants rated the overall organisation of the school very highly:



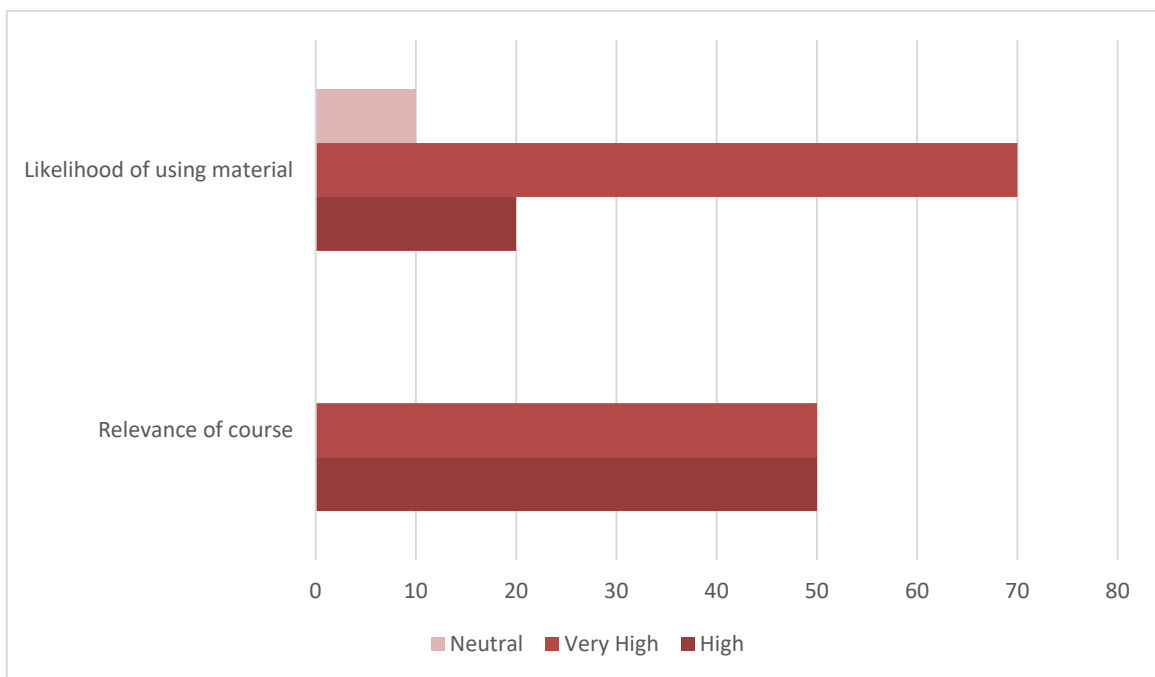
PARTICIPANT EXPECTATIONS

Participant feedback on the information provided online about the training school, including its academic level and content, suggests that most participants' expectations were fulfilled. The feedback on participant awareness of academic level and content is as follows:



PARTICIPANT EXPERIENCE

While the feedback form does not include a specific rating for the overall experience of the training school, other feedback results indicate that the participants had a positive experience. Notably, most participants rated the training school as relevant to their personal needs, and the rating for their likelihood of using the school materials in the future was also high.



When asked to rank how useful the course materials, skill development, and knowledge exchange with peers and lecturers were, 66.66% of the participants rated the course materials as the most beneficial aspect. Knowledge exchange with peers was ranked in second place, with 33.33% of respondents ranking them as the second most useful element of the school. Skill Development was consistently rated as last.

The participants' experience of the teaching on the training school was very positive, with 100% of participants rating the lecturers' expertise as Very High.

In another positive indicator of participant experience of the training school, the participants rated the likelihood of attending:

- Other training schools as Very High (90%) and High (10%).
- Other EABCN events as Very High (60%) and High (40%).

PARTICIPANT RECOMMENDATIONS

In their feedback, participants suggested the following topics as future focuses of EABCN training schools:

- Methodology for Time Series Analysis
- Macro/monetary, fiscal policy, macro-labor
- Bayesian estimation of panel data and modelling on distribution i.e. functional VAR.
- Nonlinear DSGE (particle filters)
- Difference-in-Differences (DiD)
- Machine Learning applied to Econometrics, Panel VAR, TANK and HANK models
- The future of the Central Bank at the virtual currencies era

8. EVENT PROGRAMMES

EABCN

New Developments on Theoretical Models of Cryptocurrencies, Monetary Policy and Inflation Determination

Lecturer: Pierpaolo Benigno

March 27, 2025

Lecture Session: 09:00 – 12:00 CET

Session 1: Introduction and Overview

- Definition of Currency and Money
- Cryptocurrency and Blockchain

Reference:

Benigno, Pierpaolo. 2025. [*Monetary Economics and Policy*](#), Princeton University Press, Chapter 1.

Session 2: Currency Competition

- Currency as a Medium of Exchange
- Commodity Money vs. Fiduciary Currency vs. Cryptocurrency

Reference:

Benigno, Pierpaolo. 2025. [*Monetary Economics and Policy*](#), Princeton University Press, Chapter 2.

Practical Session: 14:30 – 16:30 CET (Python)

Lecturer: Wjera Yell Leutenegger (University of Bern)

Machine Learning and Cryptocurrencies

- Predicting Cryptocurrency Exchange Rates using Machine Learning Methods

Reference:

Goodfellow, I., Bengio, Y., Courville, A. and Bengio, Y. 2016. *Deep learning*. Vol. 1, No. 2, Cambridge: MIT press.

Géron, Aurélien, (2022), *Hands-on machine learning with Scikit-Learn, Keras, and TensorFlow: Concepts, tools, and techniques to build intelligent systems*. O'Reilly Media, Inc.

Wu, Jingyang, Xinyi Zhang, Fangyixuan Huang, Haochen Zhou, and Rohtiash Chandra. 2024. Review of deep learning models for crypto price prediction: implementation and evaluation. *arXiv preprint arXiv:2405.11431*.

March 28, 2025

Lecture Session: 09:00 – 12:00 CET

Session 3: Inv-L New Keynesian Phillips Curve

- History of Phillips Curve
- Inv-L New-Keynesian Phillips Curve and the Data.

Session 4: Inv-L New Keynesian Phillips Curve

- Theoretical Modeling
- Policy Implications

Reference:

Benigno, Pierpaolo and Gauti Eggertsson. 2025. [It's Baaack: The Surge in Inflation in the 2020s and the Return of the Non-Linear Phillips Curve.](#)

Practical Session: 14:30 – 16:30 CET (Matlab)

Estimating Inv-L New Philipps Curve

- OLS estimates, IV, Kalman Filter.

March 31, 2025

Lecture Session: 09:00 – 12:00 CET

Session 5: Beveridge Curve

- Beveridge curve in U.S. data
- Comparison of alternative models of the Beveridge curve.

Session 6: Beveridge Curve

- Generalized Beveridge curve
- Beveridge-threshold unemployment rate

References:

Benigno, Pierpaolo, and Gauti B. Eggertsson. 2024. [Revisiting the Phillips and Beveridge Curves: Insights from the 2020s Inflation Surge.](#)

Blanchard, Olivier, Alex Domash, and Lawrence Summers. 2022. [Bad News for the Fed from the Beveridge Space.](#) Peterson Institute for International Economics Policy, Policy Brief 22--7.

Figura, Andrew and Chris Waller. 2022. [What Does the Beveridge Curve Tell Us About the Likelihood of a Soft Landing?](#) FEDS Notes, July 29, 2022.

Practical Session: 14:30 – 16:30 CET (Matlab)

Beveridge curve in the data

- Alternative models of the Beveridge curve in the data.

Euro Area Business Cycle Network Training School **Large Dimensional VARs and Bayesian Methods**

5-7 May 2025

European Commission - Joint Research Centre, Ispra (Italy)

Lecture sessions by **Todd Clark (Johns Hopkins University and Federal Reserve Bank of Cleveland)**

Practical sessions by **Tommaso Tornese (Bocconi University)**

Monday 5 May 2025

08:30-09:10 **Security check, Registration, Welcome coffee**

09:10-09:30 **Welcome & presentation by the JRC**

09:30-10:20 **Lecture session 1: Large Homoskedastic BVARs**

- Preliminaries: VARs, Bayesian basics, Bayesian VARs
- Large homoskedastic BVARs
 - Baseline BVAR priors
 - Triangular approach

10:50-11:10 **Break**

11:10-12:30 **Lecture session 2: Large BVARs with Stochastic Volatility**

- Adding stochastic volatility: Most common specification and alternatives
- Bayesian estimation
- BVARs with both stochastic volatility and time-varying parameters

12:30-14:30 **Lunch**

14:00-16:30 **Practical Session**

Tuesday 6 May 2025

08:30-09:30 **Security check, Registration, Welcome coffee**

09:30-10:20 **Lecture session 3: Out-of-Sample Forecasting with Large BVARs**

- Unconditional forecasting
- Overview of common forecast evaluation metrics
- Conditional forecasting (reduced form)

10:50-11:10 **Break**

11:10-12:30 **Lecture session 4: Structural Analysis with Large BVARs**

- Recursive identification of shocks and impacts
- Sign restrictions
- Identification through heteroskedasticity
- Structural scenario analysis

12:30-14:30 **Lunch**

14:00-16:30 **Practical Session**

Wednesday 7 May 2025

08:30-09:30 **Security check, Registration, Welcome coffee**

09:30-10:20 **Lecture session 5: Options for Improving Priors and Computation**

- Additions to priors
- Making priors data-dependent
- Precision sampler for speeding some computations
- Structural representations to speed computations
- New methods to speed conditional forecasting

10:50-11:10 **Break**

11:10-12:30 **Lecture session 6: Other Improvements or Extensions of Large BVARs**

- Order-invariant BVAR with stochastic volatility
- Extensions of BVARs to accommodate outliers
- Shadow-rate VAR
- Large BVAR models of mixed frequency data

12:30-14:30 **Lunch**

14:00-16:30 **Practical Session**



Euro Area Business Cycle Network Training School

The Bootstrap and its Applications to Panel and Factor Models

by

Silvia Gonçalves (McGill University)

Online via Zoom

3-5 June 2025

Deadline: 6pm GMT (UK time), Sunday 27 April 2025

General Description

We are pleased to announce the latest EABCN Training School; a three-day course entitled “The Bootstrap and its Applications to Panel and Factor Models” taught by Professor Silvia Gonçalves (McGill University). It is primarily aimed at participants in the Euro Area Business Cycle Network, but applications will also be considered from doctoral students, post-doctoral researchers and economists working in central banks and government institutions outside of the network, as well as commercial organisations (fees are applicable for non-network non-academic organisations).

The main goal of this class is to provide students with an overview of the bootstrap and its applications in different contexts in economics allowing for both cross sectional and serial dependence. We will cover pure time series applications as well as panel data models and factor models. The emphasis will be on discussing the conditions that the bootstrap needs to meet to be valid in each application.

Tentative Course Outline

There will be about a 15-minute break between the lecture sessions on each day.

1. Bootstrap basics
 - (a) Inference for the mean of i.i.d. data.
 - (b) Failure of the i.i.d. bootstrap under time series dependence.
2. Bootstrap methods for time series data
 - (a) Block bootstrap methods
 - (b) Residual-based bootstrap methods.

3. Bootstrap methods for panel data models
 - (a) Linear panel regressions with cross sectional independence.
 - (b) Linear panel regressions with cross sectional and time series dependence.
 - (c) Dynamic panel data models.
 - (d) Extension to nonlinear panel data models.
4. Bootstrap methods for factor models
 - (a) Factor-augmented regressions.
 - (b) Group factor models.

Administrative Information

We ask that you send a current version of your CV. PhD students must also specify in which way the school will be useful for their current research (max 300 words).

The course will take place online via Zoom. More details will be circulated closer to the date to successful applicants.

Participants from non-academic institutions where the employer is not a member of the EABCN network are charged a course fee of EUR1000.

How to Apply:

Candidates who are CEPR affiliated or already have a CEPR profile should apply by submitting their CV online:

1. Log in on the CEPR hub online at <https://hub.cepr.org/>
2. Go to <https://hub.cepr.org/event/4584>
3. Click on "Step 1: Apply"
Members of the MEF programme area, click on "Change registration details"
4. Complete the requested information and upload the required documentation:
Applications without the required documents will not be considered.
 - a. **All applicants must submit a CV.** PDF or word document is preferred but the option to provide a link to CV is available.
 - b. **PhD Students must include a supporting statement (max 300 words)** specifying how the school will be useful for their current research.
 - i. To do so click 'Would you like to submit additional files?'
 - ii. Upload PDF or Word Document.
 - iii. **The Supporting Statement must be in a document separate from the CV file.**
5. Click "Submit Information".

Candidates who are not CEPR affiliated or do not have a CEPR profile should apply by submitting their CV online:

1. Create an online profile at <https://hub.cepr.org/user/register>
2. Log in on the CEPR hub online at <https://hub.cepr.org/>
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 - ii. Upload PDF or Word Document.
 - iii. **The Supporting Statement must be in a document separate from the CV file.**
6. Click "Submit Information".

If you have any difficulty in applying, please contact, Jemila Benchikh, CEPR Events Officer at jbenchikh@cepr.org for assistance, with the subject line '4584- EABCN Online Training School -Gonçalves'

About the Instructor:

[Silvia Gonçalves](#) is a Professor of Economics at McGill University. She received her Ph.D. in 2000 from the University of California, San Diego. Before joining the Department of Economics at McGill University in 2017, she was a Professor of Economics at the University of Western Ontario (2015-2017) and at the Université de Montréal (2000-2015). Her work in econometric theory has focused on developing bootstrap methods that apply computing power to allow accurate inference for a range of statistical problems in economics, with a focus on dependent data, including financial data, panel data, and spatial data. This work has been cited extensively and published in *Econometrica*, *JASA* as well as in the top field journals in econometrics.

She received the first CWEN prize for research by a young woman researcher in a Canadian University in 2010 and currently serves as an Associate Editor of the *Journal of Econometrics*, *Journal of Business Economic & Statistics*, and *Journal of Applied Econometrics*.



Advances in monetary policy and the natural rate interest

12 September 2025

Department of Economics of the European University Institute, Fiesole, Italy

Organisers: **Barbara Rossi** (EUI, UPF and CEPR), **Eleonora Granziera** (Norges Bank)

08:30-08:40	Welcome and registration
08:40-08:45	Welcome remarks Barbara Rossi (EUI, UPF and CEPR)
08:45-09:30	Keynote <i>The Four R-stars: From Interest Rates to Inflation and Back</i> Ricardo Reis (London School of Economics and CEPR)
09:30-11:00	International perspectives on r^* Chair: Enrique Sentana (CEMFI and CEPR)
	<i>How important is global r^* for open economies</i> Benjamin Wong (Monash University), James Morley
	<i>Global r^*</i> Paul Ho (Federal Reserve Bank of Richmond), Thomas Lubik, Christian Matthes
	<i>Unobservable no more: estimating the natural rate of interest under flat IS and Phillips curve</i> Enrique Sentana (CEMFI and CEPR), Gabriele Fiorentini, Alessandro Galessi, Rodrigo Peña, Gabriel Perez-Quiros
11:00-11:30	Coffee break
11:30-13:00	Monetary Policy and r^* Chair: Rodrigo Sekkel (Bank of Canada)
	<i>What Was the Fed Thinking?</i> Diego Comin (Dartmouth College and CEPR), Robert Johnson, Callum Jones

	<p><i>The Slope of the Phillips Curve and the Mandate of the Central Bank</i> Gregory Phelan (Williams College), Jean-Paul L'Huillier, William R. Zame</p>
	<p><i>Do Monetary Policy Shocks Affect the Neutral Rate of Interest?</i> Rodrigo Sekkel (Bank of Canada)</p>
13:00-14:30	Lunch and Poster session
	<p>Poster presentations</p>
	<p><i>A Theory of Public Debt as a Macro-Financial Stability Tool</i> Jacopo Bonchi (Alma Mater University of Bologna), Guido Ascari, Andrea Ferrero</p>
	<p><i>When does Monetary Policy Matter? The Life-Cycle of Policy Expectations</i> Sylvérie Herbert (Banque de France), Paul Hubert, Mathias Lé</p>
	<p><i>Forward guidance and fiscal rules in HANK</i> Ansgar Rannenberg (European Central Bank and National Bank of Belgium)</p>
14:30-16:30	<p>Estimating r^* Chair: Daniel Buncic (Stockholm University)</p>
	<p><i>The Natural Rate of Interest in the Euro Area: Evidence from Inflation-Indexed Bonds</i> Sarah Mouabbi (Banque de France), Jens Christensen</p>
	<p><i>Estimating the Natural Rate of Interest in a Macro-Finance Yield Curve Model</i> Wolfgang Lemke (European Central Bank), Claus Brand, Gavin Goy</p>
	<p><i>Recovering Stars in Macroeconomics</i> Daniel Buncic (Stockholm University), Adrian Pagan, Tim Robinson</p>
	<p><i>Gibson's paradox and the natural rate of interest</i> Luca Benati (University of Bern) and Pierpaolo Benigno</p>



16:30-17:00	Coffee break
17:00-18:00	Theoretical aspects of r^* Chair: Christopher Cotton (Federal Reserve Bank of Boston)
	<i>Fiscal Requirements for Price Stability when Households are not Ricardian</i> <u>Stephane Dupraz</u> (Banque de France), Anna Rogantini Picco
	<i>The Inflation Target and the Equilibrium Real Rate</i> <u>Christopher Cotton</u> (Federal Reserve Bank of Boston)

Can Heterogeneous Agent Models Be Useful for Central Bankers? How?

22 September 2025

Bank of England, London, UK

Organisers: **Ambrogio Cesa-Bianchi** (Bank of England and CEPR), **Refet Gürkaynak** (Bilkent University, CEPR, and EABCN), and **Alberto Polo** (Bank of England)

08:30-09:00	Welcome and registration
09:00-09:50	<p>Beyond Averages: Heterogeneous Effects of Monetary Policy in a HANK Model for the Euro Area</p> <p>Rodolfo Rigato (European Central Bank), with Hanno Kase</p> <p>Discussant: Mathis Maehlum (Norges Bank)</p>
09:50-10:10	Break
10:10-11:00	<p>Monetary transmission through the housing sector</p> <p>Jamie Lenney (Bank of England), with Daniel Albuquerque and Thomas Lazarowicz</p> <p>Discussant: Edouard Challe (Paris School of Economics and CEPR)</p>
11:00-11:20	Break
11:20-12:10	<p>The Macroeconomic Effects of Excess Savings</p> <p>Andreas Tischbirek (Federal Reserve Board), with Bence Bardoczy and Jae Sim</p> <p>Discussant: Christian Bayer (University of Bonn and CEPR)</p>
12:10-13:20	Lunch
13:20-14:10	<p>Keynote</p> <p>Beyond Certainty Equivalence: Higher-Order Solutions in the Sequence Space</p> <p>Adrien Auclert (Stanford University and CEPR)</p>
14:10-14:30	Break
14:30-15:20	<p>Battle of the Ages: Distributional and Aggregate Effects of Monetary Policy in a Model with Age Demographics</p> <p>Wouter Den Haan (London School of Economics and CEPR), with Alessandro Ferrari, Falk Mazelis and Annukka Ristiniemi</p> <p>Discussant: Jeanne Commault (Sciences Po)</p>
15:20-15:40	Break

15:40-16:30	Poster session
	<p>The aggregate and distributional implications of credit shocks on housing and rental markets Juan Castellanos (Bank of England), with Andrew Hannon and Gonzalo Paz-Pardo</p>
	<p>International risk-sharing and inequality transmission: an application to the Euro area Naomi Cohen (Sciences Po)</p>
	<p>Energy Price Shocks, Unemployment, and Monetary Policy Nicolò Gnocato (European Central Bank)</p>
	<p>Quantifying the Fiscal Channel of Monetary Policy Frederik Kurcz (DIW Berlin, Berlin School of Economics)</p>
	<p>Sticky Information, Heterogeneity, and Aggregate Demand Pascal Meichtry (Banque de France)</p>
	<p>Strike while the Iron is Hot – Optimal Monetary Policy under State-Dependent Pricing Anton Nakov (European Central Bank and CEPR), with Peter Karadi, Galo Nuno, Ernesto Pasten and Dominik Thaler</p>
	<p>Debt Contracts, Investment, and Monetary Policy Ozgen Ozturk (University of Oxford)</p>
	<p>Forward guidance and fiscal rules in HANK Ansgar Rannenberg (National Bank of Belgium)</p>
	<p>Inflation, Inequality, and the Business Cycle Sofia Semik (Goethe University Frankfurt), with Clara Lindemann and Mathias Trabandt</p>
	<p>Monetary policy along the yield curve: Why can central banks affect long-term real rates? Tim Willems (Bank of England), with Paul Beaudry and Paolo Cavallino</p>

16:30-17:20	Non-Essential Business Cycles Natalie Rickard (Bank of England), with Michele Andreolli and Paolo Surico Discussant: Rustam Jamilov (University of Oxford)
17:20-17:40	Break
17:40-18:30	Ramsey Optimal Inflation with Heterogeneous Firms Anton Nakov (European Central Bank and CEPR), with Henning Weber Discussant: Callum Jones (Federal Reserve Board)