

# BOOK OF ABSTRACTS

DEPARTMENT OF ECONOMICS - UNIVERSITY OF CRETE

**30th**

## International Conference on Macroeconomic Analysis and International Finance

**27 – 30 May, 2026**

Keynote Speakers:

**Steven J. Davis**

(Hoover Institution at Stanford University)

**Stavros Panageas**

(UCLA)

**Mark Spiegel**

(Federal Reserve Bank of San Francisco)

**Timothy Taylor**

(Journal of Economic Perspectives)

*Journal of International Money and Finance*

*Journal of Financial Stability*

*Oxford Economic Papers*

*Journal of Forecasting*

University Campus, Rethymno, Greece

<https://icmaif.soc.uoc.gr>



**BANK OF GREECE**  
EUROSYSTEM



CRETAN RHIZOTOMISTS

## Contents

Parallel Session 1A: Macroeconomic Theory and Policy I.....	4
Parallel Session 1B: Banking and Finance I .....	8
Parallel Session 1C: Inflation I.....	12
Parallel Session 1D: Labor Market, Gender and Inequality I .....	16
Parallel Session 1E: European Economics I .....	20
Parallel Session 2A: Monetary Theory and Policy I .....	24
Parallel Session 2B: FinTech and Digital Currency .....	28
Parallel Session 2C: Fiscal Policy I.....	32
Parallel Session 2D: Climate Risk.....	36
Parallel Session 2E: Financial Economics I .....	40
Parallel Session 3A: Inflation II .....	44
Parallel Session 3B: Fiscal Policy II .....	48
Parallel Session 3C: Machine Learning & Forecasting .....	52
Parallel Session 3D: Financial Stress and Stability .....	56
Parallel Session 3E: International Finance I .....	60
Parallel Session 4A: Exchange Rate Economics I.....	64
Parallel Session 4B: Financial Markets I.....	68
Parallel Session 4C: Investment, Productivity and Growth.....	72
Parallel Session 4D: Financial Econometrics I .....	76
Parallel Session 4E: Monetary Theory and Policy II .....	80
Parallel Session 5A: Macroprudential Policy I.....	84
Parallel Session 5B: Currency Markets .....	88
Parallel Session 5C: Banking and Finance II .....	92
Parallel Session 5D: Labor Market, Gender and Inequality II .....	96
Parallel Session 5E: Central Banking I.....	100
Parallel Session 6A: Banking and Financial Stress I .....	104
Parallel Session 6B: Macroeconomic Forecasting I .....	108
Parallel Session 6C: Financial Markets II.....	112
Parallel Session 6D: Environmental, Social and Governance .....	116
Parallel Session 6E: Crisis and Uncertainty.....	120
Parallel Session 7A: Monetary Theory and Policy III .....	124
Parallel Session 7B: Banking and Financial Stress II .....	128
Parallel Session 7C: International Finance II .....	132
Parallel Session 7D: Macroeconomic Forecasting II .....	136
Parallel Session 7E: Currency Risk and Credit Volatility.....	140

Parallel Session 8A: Exchange Rate Economics II.....	143
Parallel Session 8B: Macroeconomic Theory and Policy II.....	147
Parallel Session 8C: Macroprudential Policy II .....	151
Parallel Session 8D: Fiscal Policy II.....	155
Parallel Session 8E: European Economics II .....	159
Parallel Session 9A: Macroprudential Policy III.....	163
Parallel Session 9B: Financial Economics II .....	167
Parallel Session 9C: Inflation III .....	171
Parallel Session 9D: Exchange Rate Economics III .....	175
Parallel Session 9E: Central Banking II.....	179
Parallel Session 10A: Monetary Theory and Policy IV .....	183
Parallel Session 10B: Banking and Finance III .....	187
Parallel Session 10C: Financial Econometrics II.....	191
Parallel Session 10D: Green Economy.....	195

# Parallel Session 1A: Macroeconomic Theory and Policy I

## **Distributional Dynamics**

Luis Calderon (University of Bonn), Christian Bayer (University of Bonn), Moritz Kuhn (University of Mannheim)

We develop a new method for deriving high-frequency synthetic distributions of consumption, income, and wealth that can incorporate different microdata sources, regardless of their frequency and variable coverage. The core of the method is to treat the distributional data as a time series of functions whose underlying factor structure follows a state-space model which we estimate using Bayesian techniques. Using a wide range of U.S. micro data, we show that the novel method provides high-quality, high-frequency distributional data on consumption, income, and wealth that are of interest to modern theories of macroeconomic dynamics.

# **Real-Time Assessment of Regional Economic Activity in Russia Using a Dynamic Factor Model**

Ilya Gulenkov (HSE University)

This paper develops monthly coincident indicators of regional economic activity for 79 Russian regions using a Bayesian dynamic factor model. Gross regional product (GRP) is published only annually with an 18-month lag, severely constraining policy analysis and empirical research on regional heterogeneity. The methodology combines annual GRP with monthly and quarterly indicators across production, income, and expenditure sides of the economy, and handles mixed-frequency data within a state-space representation. Estimated via Gibbs sampler, the proxy-GRP successfully identifies major economic episodes including the 2014-2016 commodity recession, COVID-19 pandemic, and post-2022 developments. Its correlation with a nation-wide counterpart exceeds 0.9 in the latter part of the sample. The estimates reveal synchronized business cycles with heterogeneous amplitudes across regions, providing a valuable tool for analyzing policy transmission mechanisms at business-cycle frequencies.

## **The fiscal sources of euro area inflation through the lens of the Bernanke-Blanchard model**

Dennis Bonam (De Nederlandsche Bank), Mariana Montserrat Cerra Pacheco (European Central Bank), Cristina Westphal (European Central Bank)

We estimate the contribution of discretionary fiscal policy measures to euro area inflation in the post-pandemic era using an extension of Bernanke and Blanchard (2024b)'s semi-structural model. Since the pandemic, aggregate discretionary fiscal measures had a modest yet progressively increasing positive contribution to inflation that partly worked through an indirect effect on wage growth and inflation expectations. However, net indirect taxes helped to contain inflationary pressures, both during the pandemic and energy crises. Fiscal policy, therefore, can be a powerful tool to smooth the inflationary effects of adverse supply shocks, yet may also increase inflation persistence if fiscal stimulus is not timely withdrawn.

## **Population aging through the lens of DSGE-OLG-NK model: Implications for unemployment and monetary policy in the Euro area**

Sylwia Radomska (Polish Academy of Sciences and GRAPE), Joanna Tyrowicz (GRAPE), Krzysztof Makarski (University of Regensburg and GRAPE)

We study how the evolving age structure of the working population affects unemployment and monetary policy. Using a large-scale New Keynesian overlapping generations (OLG) model calibrated to the Euro area, we show that demographic change has reduced the unemployment rate by about two percentage points. Beyond this long-run effect, we also examine how aging shapes broader macroeconomic dynamics and the conduct of monetary policy. We also find that an aging workforce leads to greater macroeconomic stability. In parallel, the monetary policy sacrifice ratio - the amount of real volatility required to reduce inflation volatility - declines in an aging society. This result is driven by a feedback loop between compositional and behavioral effects: older workers respond less to monetary policy shocks, stabilizing labor demand and allowing policy to focus more on inflation control. Our findings suggest that continued population aging in Europe may keep unemployment low and support a more hawkish monetary policy stance

## Parallel Session 1B: Banking and Finance I

### **Do Bank Stress Tests Constrain Growth? Evidence from Quasi-Random Exposure to Capital Regulation**

Sam Deegan (University College Dublin)

Bank stress tests are intended to strengthen financial stability, yet critics argue they restrict credit and constrain real economic activity. This paper quantifies the effects of the U.S. Comprehensive Capital Analysis and Review (CCAR) stress tests on county-level personal income growth by transforming institutionally endogenous regulatory treatment into plausibly exogenous, geographically varying exposure. I link stress-tested bank holding companies to U.S. counties through subsidiary bank and branch networks, constructing a novel, time-varying index of local exposure. Using a local projections framework, I find that a one-percentage-point increase in CCAR exposure raises personal income growth by about 0.02–0.03 percentage points in the short run—around 0.2–0.3 percentage points for the average county, which is exposed to roughly 10 per cent of deposits in stress-tested institutions—before reversing, implying banks deleverage or reallocate assets away from lending.

## **Why do SMEs not apply for Loans? Bank Loan Application Behavior and Access to Finance in the Eurozone**

Florian Horky (Slovak National Bank; Zeppelin University), Jan Klacso (Slovak National Bank), Reiner Martin (Slovak National Bank), Jarko Fidrmuc (Zeppelin University)

Non-application behavior for bank loans among European SMEs is economically more prevalent than loan application rejections by banks. Therefore, it should not be treated as a residual state but disentangled by its different reasons. Using microdata from the Survey on the Access to Finance of Enterprises (2014–2025), we document how firms choose and switch between loan application, discouragement, reliance on internal funds, and other non-application reasons. We combine an expected-utility framework with empirical estimations through multinomial and standard logit models. The main novelty is our ability to simultaneously investigate different types of non-application for bank loans, which are driven by differing forces. Discouragement manifests as a belief-driven channel of non-application, loan costs and the supply side drive another, cost-driven channel of non-application. By disentangling driving forces of non-application for bank loans as core element of the analysis, our study provides new evidence on why SMEs choose not to apply for bank loans. We highlight that these decisions can reflect diverse and contradictory underlying conditions. Our results are important for understanding and addressing these differing driving forces of SMEs bank loan application behavior.

## **Bridging the Gap: How Banks' Maturity Mismatch Shapes Monetary Policy Transmission**

Serkan Kocabas (Universidad Carlos III de Madrid), Lorenzo Ferrante (European Central Bank; University of Zurich)

This study examines how maturity mismatches in banks' balance sheets shape the transmission of monetary policy to credit supply. Linking supervisory data on approximately 1,800 euro area banks to loan-level credit records, we show that the role of maturity mismatches is highly 'shock-specific', settling a long-standing debate in the literature. Mismatches amplify the effects of unconventional but not conventional monetary policies. Banks with larger maturity gaps reduce lending more sharply following monetary policy surprises regarding quantitative tightening (QT) because valuation losses on long-term assets negatively affect their net worth, causing tighter leverage constraints. A New Keynesian DSGE model with endogenous maturity choices explains this asymmetry: banks with high maturity mismatches are more exposed to long-duration losses that compress net worth and amplify real effects. In contrast, standard policy rate shocks, which mainly affect short-term rates, generate little heterogeneity in lending responses.

## **The Economic Effects of Shocks to Bank Capital Regulation: Evidence from the United Kingdom**

Federico D'Amario (Bank of England), Sebastian de-Ramon (Bank of England), William B. Francis (Bank of England)

We analyse the effects of prudential capital shocks on lending behaviour, macroeconomic outcomes, and banking competition using UK data within a structural VAR framework with sign and narrative restrictions. Narrative constraints draw on the UK regulator's 2014–2015 stress tests and the 2016 annual cyclical scenario. Impulse responses indicate that banks primarily adjust by reducing risk-weighted assets rather than raising new equity. Higher capital requirements entail negligible long-run costs, with modest short-run macroeconomic effects: corporate lending contracts by about 0.25%, household lending by 0.05%, and lending spreads rise across sectors. A 100-basis-point increase in the Tier 1 ratio is associated with a GDP decline of roughly 0.2%. These estimates are broadly in line with those reported in other VAR studies on bank capital. Historical decomposition shows the 2015 Concurrent Stress Test had the largest impact, raising Tier 1 capital by up to 0.8% and reducing risk-weighted assets by 1.39%. State-dependent analysis reveals asymmetries: recessions amplify short-run contractions but accelerate recovery, while expansions exhibit smaller yet more persistent effects. Indicators of market power (Boone, HHI, Lerner) suggest that tighter capital requirements temporarily reduce banking competition.

## Parallel Session 1C: Inflation I

### **A Chicken-and-Egg Problem: Profits and Inflation after COVID-19**

Angela Torres Noblejas (University of Alicante)

In 2022, unit profits contributed two-thirds to domestic price pressures in the Euro area, while the historical average was one third. Particularly significant was the increase in upstream sectors, where mining and utilities, which historically contributed marginally to the GDP deflator, accounted for one fifth of its increase. Although profits have gained increasing attention amongst economists as an inflationary source, existing studies just offer a partial analysis, studying their effect in isolation from other price pressures. In this paper, I propose a unified framework to disentangle how profits have affected inflation in the Euro area focusing on the period after the pandemic. The model I employ is a Bayesian VAR with 19 variables and 9 shocks. Besides the typical drivers of supply and demand, global and domestic, I include additional supply drivers that are not so common in the literature, such as global supply chain pressures and gas shocks to better capture the inflationary dynamics of the period. The results show that although the initial increase in inflation in the post-COVID period was primarily driven by a boost in demand and skyrocketing energy prices, profits in upstream companies further reinforced the surge in prices.

## **The Great Inflation and the neo-Fisher effect - a revisit of Uribe (2022)**

Helmut Herwartz (University of Göttingen), Lasse Trienens (University  
of Göttingen)

Interpreting changes in the common permanent component of yields and inflation (henceforth, the CPC) as permanent monetary shocks, Uribe (2022) showed that these shocks have been a major driver of US inflation from 1954 to 2018 and generated short run positive inflation responses (the neo-Fisher effect). Revisiting this analysis, we find that CPC changes are governed by multiple factors: monetary, fiscal, supply, and demand shocks. Questioning the existence of the neo-Fisher effect in the US, however, temporary monetary shocks and CPC changes are negatively related. These findings underscore the empirical relevance of new-Keynesian theory with price rigidities and fiscal backing.

## **Shaping Inflation Attention through Inequality**

Francesco Ferlaino (University of Salerno), Carolina Serpieri (Sapienza - University of Rome), Giovanni Di Bartolomeo (Sapienza - University of Rome)

This paper investigates how consumption inequality shapes inflation inattention. We develop a Two-Agent New Keynesian (TANK) model with noisy information, where Ricardian households endogenously adjust their attention to inflation based on observable consumption disparities with HtM households. Empirical evidence from a Structural VAR for the U.S. supports this mechanism as rising inequality is associated with a significant decline in inflation estimation errors. Theoretically, incorporating this behavioral feedback improves the responsiveness and stability of inflation expectations, particularly under monetary and cost-push shocks. Moreover, this behavioral mechanism shapes the impact of optimal monetary policy, enhancing the central bank's ability to stabilize inflation, albeit at the expense of a more pronounced decline in economic activity

## **Inflation, profit shares and market power: sectoral evidence from Greece**

Dimitris Sideris (Panteion University; Bank of Greece), Georgia Pavlou (Bank of Greece)

The rise in unit profits has been a major contributor to price inflation across the euro area in the post-pandemic period. A widely cited explanation in the literature attributes this trend to post-pandemic supply bottlenecks, which temporarily allowed firms in key sectors to exercise market power, thereby increasing profit margins. An additional argument posits that the degree of competition in these sectors plays a more structural role in shaping and driving unit profit growth. The present study empirically tests that hypothesis, using Greece as a case study—an economy within the euro area that saw particularly sharp increases in prices and unit profits during the post-pandemic years. To this end, annual panel data from Greece's main economic sectors covering the period 2011–2022 are used. The econometric analysis confirms this hypothesis, indicating that the market structure — measured by sectoral concentration rates — has been a significant determinant of profit and inflation dynamics in the period under consideration.

## Parallel Session 1D: Labor Market, Gender and Inequality I

### **Monetary Policy and Labour Income Inequality: A Regional Approach**

Barbara Livorova (Charles University and Czech National Bank), Adam Gersl (Charles University)

This paper contributes to studying the impacts of monetary policy on labour income inequality in the euro area using subnational regional data on compensation per employee. The dataset covers 932 NUTS3 regions from 16 countries over the period 2000 – 2022 at a yearly frequency. Using sub-sample analysis combined with local projections, the results show that monetary policy rate changes have heterogeneous effects on the growth of real compensation per employee (deflated by the GDP deflator) at both the bottom and upper ends of the regional distribution within individual countries. From the whole euro area perspective, monetary policy tightening has a heterogeneous effect on labour incomes between regions - in times of monetary policy easing, shortening the gap between average low- and high-income regions.

## **Inequality falls, discrimination persists? Monetary policy and the gender pay gap**

Daniel Stempel (Heinrich Heine University Dusseldorf)

A large body of literature analyzes distributional effects of monetary policy. This paper shows that monetary policy affects the gender pay gap. I first estimate a time series of the unadjusted and the adjusted gender pay gap in the US for the past 40 years. Using local projections, I then show that an expansionary monetary policy shock decreases the unadjusted and the adjusted gender pay gap. However, the difference between the adjusted and the unadjusted gap increases significantly. These empirical findings can be rationalized by a HANK model that includes a constant, persistent level of gender discrimination. The model further shows that the transmission of monetary policy on consumption, output, and inflation is weaker in a discriminatory economy.

## **Ideas, Competition, and Inequality**

Andrea Colciago (University of Milano–Bicocca and De Nederlandsche Bank), Timo Haber (De Nederlandsche Bank), Rajssa Mechelli (University of Oxford)

Over the last few decades, the US economy has experienced a marked increase in income inequality. At the same time, several indicators suggest a decline in competition. Since the 1980s, estimated price markups and the profit share of income have trended upward, while the labor share and the firm entry rate have declined. We develop a general equilibrium model with household heterogeneity, incomplete markets, and endogenous markups that is consistent with these trends. We argue that the shift in the distribution of resources from the less concentrated labor income to the more concentrated profit income contributed substantially to the rise in income inequality since the late 1980s. We find that only a minority of households benefit from these developments.

## **Aging and the Wealth of Labor**

Mirko Abbritti (University of Navarra), Jacopo Cimadomo (European Central Bank), Agostino Consolo (European Central Bank)

This paper analyzes the role of labor supply factors in affecting GDP growth per working-age population. We propose a growth accounting decomposition for some advanced economies and a neoclassical growth model which extends Fernandez Villaverde et al. (2025). Our analysis suggests that labor supply factors - such as increased participation of women and the elderly in the workforce, e.g., through pension reforms that extend working life - have fostered convergence in growth rates of GDP per working-age population, thus moderating the negative effects of aging. A comparison with available population projections from the E.U.'s Ageing Working Group shows that the gains from higher labor market participation in the largest euro area countries are expected to be quantitatively sizable

## Parallel Session 1E: European Economics I

### **Looser, Tighter, Clearer: A new Financial Conditions Index for the Euro Area**

Tilman Bletzinger (European Central Bank), Giulia Martorana (European Central Bank and Università Cattolica del Sacro Cuore), Jakub Mistak (European Central Bank)

Financial Conditions Indices (FCIs) are a convenient tool to assess the broader monetary policy stance beyond the central bank's full control. The presented Macro-Finance FCI is based on a novel estimation approach of a vector autoregressive (VAR) model. The VAR coefficients and the weights of financial variables entering the FCI are estimated jointly in one step, thereby overcoming the lack of a model-consistent two-way feedback between macroeconomic and financial variables in other FCIs. The baseline estimation for the euro area features nine asset prices (from risk-free rates, sovereign spreads, risk assets and the euro), overall giving a dominant role to nominal interest rates, and performs better than other FCIs in out-of-sample forecasts of inflation and output. The design and VAR dynamics make the resulting Macro-Finance FCI interpretable as a broader stance measure or, during the lower bound episode, as a shadow policy rate. A structural identification of supply, demand and financial shocks reveals that financial conditions require up to one year to transmit to the real economy and almost up to two years to inflation.

## **Implementing borrower-based measures in the EU: the role of institutional frameworks**

Elena Durante (European Central Bank), Giovanna Milone (Center for Monetary and Financial Studies), Mara Pirovano (European Central Bank), Radu Popa (European Central Bank)

This study examines how institutional frameworks influence the likelihood of introducing borrower-based measures (BBMs), utilizing a panel dataset of 27 EU countries spanning 2014 to 2024. The analysis controls for residential real estate (RRE) risks and key macro-financial indicators. The results indicate that in jurisdictions where central banks hold primary responsibility for BBMs, these institutions employ a broader range of BBMs and are significantly more likely to adopt income-based measures compared to countries with other institutional arrangements. While the likelihood of introducing loan-to-value (LTV) limits is similar across different frameworks, central banks tend to enforce stricter LTV limits, with tighter calibrations compared to other arrangements. Additionally, the findings show that when central banks also act as the national macroprudential authority, with both risk identification and policy implementation responsibilities, the likelihood of implementing BBMs increases significantly relative to cases where central banks do not serve as the NMA. The study also underscores the importance of access to granular loan-level data through credit registries, which facilitates the effective and timely implementation of BBMs. Finally, the analysis highlights the critical role of cyclical indicators of residential real estate risks in driving the adoption of BBMs.

# **Financial Stress Dynamics in European Economies: A Wavelet Coherence Analysis**

Andreas Tsopanakis (Cardiff Business School), Alexandros Tsioutsios  
(National and Kapodistrian University of Athens)

This paper examines the time–frequency transmission of financial stress across eleven Eurozone countries over 2001–2013 using wavelet coherence. Treating Germany as a benchmark economy, the paper document heterogeneous co-movements that intensify during the Global Financial Crisis and the European Sovereign Debt Crisis. Coherence is generally strongest and most persistent in money-market stress, while banking and bond stress linkages are more localized and crisis-specific, with weaker synchronization for some peripheral economies. Robustness checks using local Gaussian correlations support nonlinear and asymmetric dependence, reinforcing the value of a time–frequency approach for systemic risk monitoring and policy coordination. Overall, the study contributes a segment-level, time–frequency mapping of Eurozone stress spillovers that goes beyond static connectedness measures and can inform real-time systemic risk monitoring and coordinated macro-financial policy.

## **GDP per capita convergence in the euro area and the EU: A national and regional perspective**

Mirko Licchetta (DG ECFIN), Mattozzi Giovanni (DG ECFIN), Pasquale D'Apice (DG REGIO)

This paper investigates determinants of convergence in GDP per capita in the euro area and the EU between 1995 and 2023. It examines the impact of the pandemic and energy crisis on real GDP convergence at both the national and regional level. Assessing both short-term and long-term implications of these shocks, we find that the euro area and the EU proved significantly resilient following initial substantial income losses during the pandemic, attributing recovery to effective fiscal policies and EU instruments such as Next Generation EU and SURE. Through regional data, we identify varying convergence responses across distinct EU macro-regions: notably, southern and eastern countries demonstrate accelerated convergence post-crisis, contrasting with previous prolonged adjustments observed during the global financial crisis. Regression results at both national and regional level provide further evidence of convergence in the euro area and the EU over the period 1995-2023. Regression analysis at the regional level confirms the slowdown in convergence since the global financial crisis, which can be mostly attributed both to a contraction in investment rates in converging countries and to the limited catch-up in total factor productivity growth, especially in euro area countries. These findings underscore the importance of timely, cohesive policy interventions that leverage both structural and cyclical elements to foster sustainable and inclusive growth within the EU amidst evolving economic conditions. The paper contributes to the broader discourse on European economic convergence by providing insights into the spatial dynamics of investment and productivity, particularly around significant economic shocks.

## Parallel Session 2A: Monetary Theory and Policy I

### **Unconventional Monetary Policy and Bank-Type Resilience in Germany in a Regime-Switching Model**

Moritz Pfeifer (University of Leipzig), Karl-Friedrich Israel (Université Catholique de l'Ouest), Tim Sepp (Kampmann Management), Benjamin Treitz (BNP Paribas)

We study how monetary policy shapes bank resilience in Germany across regimes and bank types. A regime-switching model uses k-means on macro covariates and the shadow rate to separate conventional and unconventional periods of monetary policy. We extend the analysis to assess the multidimensionality of monetary policy. Local projections trace impulse responses of bank-group Z-scores to tightening shocks. Overall, the results show strong state dependence and bank-type heterogeneity in the transmission of tightening to bank stability, with implications for the joint use of monetary and macroprudential tools.

# **Fed Forward Guidance and Inflation Uncertainty: The Role of Asymmetric Tail Risk**

Ameerah Alsumluq (Innsbruck University)

This paper investigates the impact of Fed forward guidance shocks on inflation uncertainty dynamics. Alongside this, it examines how asymmetry in the distribution of interest rate expectations can alter the response of inflation uncertainty to forward guidance shocks. Using the state-dependence local projection method, the findings suggest that the effect of forward guidance on inflation uncertainty is heterogeneous and varies based on the nature of the implemented strategy. While the Odyssean shock causes a decrease in inflation uncertainty, the Delphic produces a muted response. The paper also shows that the propagation of forward guidance shocks on inflation uncertainty is asymmetric and depends on the direction of skewness in monetary policy expectations.

# **Monetary Regime Asymmetries and the QE Transmission Mechanism in the EU: Capital Outflows and Asset-Price Dynamics**

Stefan Stojkov (University of Novi Sad), Emilija Beker Pucar (University of Novi Sad), Aleksandar Sekulić (University of Novi Sad)

This paper investigates how quantitative easing (QE) reshapes cross-border capital allocation and asset-price dynamics within heterogeneous EU monetary regimes (EZ members vs monetary autonomous EU countries). Applying a heterogeneous non-stationary dynamic macro panel ARDL (PMG) framework on 11 EU economies during 2014Q1-2023Q1, the analysis confirms QE transmission on two dimensions of financial stability: regime-dependent and state-dependent. The results imply that large-scale asset purchases systemically increase portfolio outflows through the portfolio-rebalancing channel. However, the magnitude and persistence diverge across monetary regimes. EZ members exhibit a strong error-correction mechanism (ECT), indicating a robust institutional framework and capital market integration. This enables domestic equity markets to function as a shock (capital) absorber, mitigating capital outflows toward foreign assets. In contrast, monetary autonomous economies lack such an adjustment mechanism, generating stronger and persistent outflows. A state-dependent specification further illustrates QE effectiveness on equity markets: during turbulent market episodes, QE temporarily amplifies equity market sensitivity, yet after a period of risk premia adjustment, long-run stabilization dominates. These findings highlight structural asymmetries and capital-market vulnerabilities within the EU, underscoring the need for further institutional convergence and macro-financial policy coordination.

## **Mapping the Evolution of Unconventional Monetary Policy: A Bibliometric and Network Analysis**

Athanasios Kazanas (Aristotle University of Thessaloniki), Stephanos Papadamou (Aristotle University of Thessaloniki), Kaimakamis, Ioannis-Christos (University of Thessaly)

This research presents a comprehensive bibliometric and network analysis of unconventional monetary policy (UMP) literature, covering a period of almost 25 years. Utilizing a sample of 1,004 high-quality articles from ABS 3+ journals, the study employs quantitative tools like VOS viewer and qualitative methods such as Latent Dirichlet Allocation (LDA) to map the field's evolution. The analysis identifies the United States as the most dominant contributor, followed by the UK and Germany, while the Journal of International Money and Finance, Journal of Monetary Economics, and Journal of Money, Credit and Banking emerge as the most influential publication venues. The research categorizes the literature into four distinct thematic streams: Banking and Monetary Policy Dynamics, Financial Markets and Risk Analysis, Unconventional Monetary Policy and Credit, and Empirical Macro and Policy Impact Studies. Key findings reveal a significant surge in scholarly interest following the 2008 global financial crisis, with a transition from conventional tools to more complex, non-standard interventions. Network analysis further highlights central concepts such as forward guidance, the zero lower bound, and various transmission channels like bank lending and portfolio balance channel. By systematizing influential authors, journals, and trending topics, this study provides a foundational framework for understanding the intellectual structure of UMP, identifying established research traditions and emerging areas for future exploration.

## Parallel Session 2B: FinTech and Digital Currency

### **Market Performance and the Hidden Mechanics of the Crypto Token Industry**

Zsofia Kraussl (Bayes Business School, City St. Georges University of London), Hsin-Cheng Yeh (Bayes Business School, City St. Georges University of London)

This paper investigates the performance implications of blockchain-enabled tokens' mechanical infrastructure. Using a panel dataset between January 2018 and March 2026 from on-chain data sources, supplemented by 200,000 signals of stablecoin chain-supply data from DefiLlama, we document the following observations. First, Ethereum-dependent tokens exhibit progressively integrating risk-return structures with traditional equity markets. Second, infrastructural diversification supports functional segmentation among different tokens and plays a measurable role for their reward structure. As a consequence, the medium-of-exchange and store-of-value monetary functions have specialised across different blockchains over time, as payment tokens prominently demonstrate that.

## **Network Structure and Regulatory Enforcement in Cryptocurrency Markets**

Charis Eleftheriou (Cyprus University of Technology), Campbell R. Harvey (Duke University), Demetris Koursaros (Cyprus University of Technology), Christodoulos Louca (Cyprus University of Technology), Roni Michaely (University of Hong Kong)

Exploiting network interactions and communication patterns, we develop a novel user-level measure of enforcement exposure in cryptocurrency markets based on users' structural proximity to enforcement risk. The measure identifies at-risk users well in advance of enforcement action and strongly predicts future SEC enforcement. Consistent with attention-based trading, coins receiving disproportionate exposure from high-risk users experience elevated trading volume, temporary price increases, and greater short-term volatility. These findings suggest that enforcement risk propagates through social communication networks and is incorporated into asset prices prior to formal enforcement actions.

## **Designing for Trust: Institutional, Political and Financial Drivers of Digital Euro Adoption**

Pavel Gertler (National Bank of Slovakia), Andrej Cupak (National Bank of Slovakia), Jan Klacso (National Bank of Slovakia), Stefan Rychtarik (National Bank of Slovakia), Daniel Hajdiak (National Bank of Slovakia)

Our results from a face-to-face survey show that political preferences strongly shape both awareness of and willingness to use the digital euro, influencing not only the likelihood of adoption but also the envisaged intensity of use. Standard factors such as trust in the central bank, ownership of financial assets, and cash affinity also play important roles, with right-leaning and EU-skeptical respondents displaying systematically different propensities. Diverging evidence from cash affine and financially savvy respondents further indicates that the digital euro would substitute more for deposits rather than cash. Privacy and transaction security also emerge as central concerns for potential users. Taken together, these findings highlight the need to anticipate how different groups perceive the digital euro and to design communication strategies that adapt as attitudes and information evolve prior to its launch.

## **Cryptocurrencies, Stablecoins, and the Role of Global Currencies**

Maria-Eleni K. Agoraki (University of the Peloponnese), Nektarios Aslanidis (Universitat Rovira i Virgili), Aurelio F. Bariviera (Universitat Rovira i Virgili), Georgios P. Kouretas (Athens University of Economics and Business)

This paper investigates the implications of the rapid expansion of crypto assets and stablecoins for the international monetary system and the global roles of major currencies. Specifically, it examines how regulatory and policy regimes governing crypto assets and stablecoins shape the international position of the U.S. dollar relative to competing currencies. From a methodological perspective, the paper applies a range of econometric techniques to analyze both short-run dynamics and long-run relationships between stablecoins and exchange rates vis-à-vis the U.S. dollar. Cross-market connectedness is quantified using the Diebold–Yilmaz vector autoregression (VAR)–based framework and its frequency-domain extension proposed by Baruník and Křehlík, which enables a decomposition of common shocks into transitory and persistent components. Finally, the paper develops early-warning indicators to detect structural changes in the interactions between digital asset markets and foreign exchange markets.

## Parallel Session 2C: Fiscal Policy I

### **Fiscal Policy and Sectoral Spillovers in Open Economy HANK**

Charles de Beaufort (National Bank of Belgium), Ansgar Rannenberg  
(European Central Bank)

Government spending is concentrated in services. We show empirically that a spending shock stimulates private consumption with sizable spillovers to the goods sector and that these spillovers are associated with a relative decline in the price of tradable goods. We develop an open-economy Heterogeneous-Agent New Keynesian (HANK) model to rationalize these findings. Uninsurable idiosyncratic income risk and precautionary savings lead to a persistent income-driven expansion in private consumption following the fiscal shock. In the tradable sector, the pass-through of higher wages to final prices is limited by the import share of consumption and the imperfect labor reallocation across sectors, matching the empirically observed price co-movements. The resulting expenditure switching produces a positive response of tradable output, despite a deterioration in net exports. Our results highlight the role of household heterogeneity and trade openness in shaping sectoral fiscal multipliers.

## **Fiscal Policy and Financial Markets: Do Revenue and Spending Shocks Matter Differently?**

Alessandra Centinaio (LIUC Università Cattaneo), Fausto Pacicco (LIUC Università Cattaneo), Andrea Venegoni (LIUC Università Cattaneo),  
Massimiliano Serati (LIUC Università Cattaneo)

We investigate whether financial market responses to fiscal policy differ across instruments and expenditure composition. Using a Bayesian Mixed Frequency Time-Varying Parameter Factor-Augmented VAR model for eleven Euro Area countries over 2001-2024, we analyse the effects of expansionary shocks to taxation and ten COFOG public expenditure categories on stock prices and sovereign bond yields. Our results show strong heterogeneity across fiscal instruments, spending functions, and macroeconomic regimes. Financial markets respond more favourably to growth-oriented expenditure, while redistributive spending and tax cuts often raise sovereign risk, especially under fiscal stress.

## **Insurance, Targeting, and Public Finance in HANK–SAM**

Stefano Grancini (Nova School of Business and Economics), Marcos Poplawski-Ribeiro (International Monetary Fund), Danila Smirnov (International Monetary Fund)

Providing operational guidance on policies to stabilize household welfare in recessions requires a framework that captures heterogeneity, unemployment risk, and general-equilibrium labor dynamics. We study a contractionary demand shock in a Heterogeneous-Agent New-Keynesian model with search-and-matching friction on the labor market (HANK–SAM) and compare effectiveness of several policies. Starting from a common fiscal envelope that equalizes peak debt, we horse-race transitory boosts to unemployment insurance, targeted transfers to hand-to-mouth households, and universal transfers. The criterion used is the aggregate consumers' welfare, measured along the transition and expressed in consumption-equivalent variation units. For an economy calibrated on US data, boost to unemployment insurance delivers the largest welfare gain per unit of fiscal space, targeted transfers are second best, and universal transfers are least effective. The effectiveness of unemployment insurance combines cash-flow and insurance channels—supporting very high-MPC unemployed households and lowering precautionary saving among the employed—while targeted transfers concentrate cash handouts but their effectiveness fades faster, finally effectiveness of universal transfers is diluted by large share of payments going to low-MPC savers.

## **Forward guidance and fiscal rules in HANK**

Ansgar Rannenberg (European Central Bank)

I show that, compared to a representative agent model, the effects of a nominal interest-rate peg on output and inflation are dramatically reduced in a HANK model if the fiscal rule is characterized by an empirically plausible small response of taxes to government debt and strong automatic stabilizers. The reason is that the decline in government debt, and thus household liquid assets in response to the peg implied by this fiscal rule incentivizes precautionary saving. This attenuation is robust across several HANK frameworks. By contrast, a balanced-budget fiscal rule strongly amplifies the effects of the peg.

## Parallel Session 2D: Climate Risk

### **The Dynamic Effect of Climate News on Financial Markets: Evidence from France**

Hamza Bennani (Nantes Université), Samuel Ligonnière (University of Evry Paris-Saclay)

We investigate the dynamic response of stock market returns of 137 French companies to climate risks in France, proxied by media coverage, using local projections. First, we move beyond the conventional two-group approach by classifying firms into three categories—green, middle-brown, and super-brown—capturing heterogeneity in carbon emissions. Second, we distinguish between transitory and persistent climate-risk news shocks and trace their effect over a 24-month horizon. We find that climate-risk news shocks depress stock returns persistently, but this long-lasting effect is concentrated among middle-brown firms. Both the quantitative intensity and the qualitative tone of climate news matter. These results suggest that investors incorporate climate-related information only gradually, especially when firms' environmental positioning is not clear.

## **Misfortunes Never Come Singly: Managing the Risk of Chain Disasters**

Aleksey Minabutdinov (ETH Zurich), Alexandra Brausmann (University of Vienna), Lucas Bretschger (ETH Zurich)

Large economic, ecological, natural and health-related disasters have the potential to set off a sequence of secondary calamities, initiating cascading effects that impose substantial additional economic costs. This paper examines the repercussions of contagion effects for optimal public policy. We compare the optimality of precautionary measures taken ahead of time with a "reactive" approach to disaster management, i.e. disaster-mitigation efforts adopted after the gravity of the first shock has been established. We develop a novel dynamic stochastic framework, where disaster arrivals are modeled via the Hawkes process which possesses a self-excitation mechanism. We derive analytical solutions and show that the optimal policy consists of devoting a stochastic fraction of output to disaster-mitigation. The mitigation propensity is an increasing function of the Hawkes intensity and essentially tracks disaster arrivals. The latter implies that the policy is indeed reactive. This result is in contrast with the existing literature, which does not take into account the possibility of contagion and therefore finds a constant mitigation propensity to be optimal.

## **Climate-Related Communication of Central Banks and Bank Risk**

Marius Alin Andries (Alexandru Ioan Cuza University of Iași and Institute for Economic Forecasting, Romanian Academy), Nicu Sprincean (Alexandru Ioan Cuza University of Iași and National Institute for Economic Research, Romanian Academy)

Our study examines the influence of green rhetoric from central banks on banking institutions. Using a sample of 437 publicly listed banks from 43 countries between 2000 and 2019, we find a positive correlation between an increased proportion of climate-related discourse in central bank speeches and a reduction in both systematic and systemic risk for banks. This may be attributed to improved transparent communication by central banks, which reduces individual and systemic risk for banks. This, in turn, supports the accountability and independence of central banks, which are negatively correlated with bank risk-taking behavior. In a similar vein, central banks that are most vocal about climate issues are also leading the way in adopting climate-related policies that facilitate the transition to net zero, which are positively associated with financial stability. The findings of this study have significant policy implications in the context of central banks' growing involvement in climate-related issues and their consequent shaping of market participants' perceptions.

## **Flood risk and credit market conditions for Italian SMEs**

Andrea Cipollini (University of Palermo; ReCent; Cefin), Fabio Parla  
(University of Palermo)

We study the impact of flood risk on credit supply to Italian small and medium-sized enterprises (SMEs) over the period 2008-2019, with the aim of detecting which geographical areas should be targeted (through local government interventions, such as loan guarantees) to smooth its negative impact on credit market conditions. We contribute to the existing literature in two ways. First, using sign restrictions, we construct a province-level (NUTS-3) indicator of credit rationing for Italian SMEs. Second, our empirical approach, based on rolling-window estimation, allows us to assess the time-varying effect of higher exposure to flood risk on credit rationing across Italian provinces. The empirical findings reveal a pronounced North-South divide in credit rationing, with southern provinces exhibiting tighter credit market conditions. Moreover, while, on average, flood risk does not play a statistically significant role in shaping provincial credit rationing over the full sample period, we find a positive and statistically significant effect of higher flood-risk exposure starting from 2016, corresponding to a period characterized by greater climate change concern.

## Parallel Session 2E: Financial Economics I

### **How Effective is the Ban on Naked CDS?**

Xinxuan Liu (University of Surrey), Mario Pascoa (University of Surrey)

Do restrictions on derivatives stabilize or destabilize bond markets? This paper studies how credit default swap (CDS) covering requirements affect equilibrium bond prices. We address this through the lens of a general equilibrium model where CDS, security and repo markets coexist. If CDS purchases are required to be covered by exposures in the underlying, the impact on bond prices will depend on how repo rates and CDS premia will adjust. The outcome will depend on how the performance of the bond is correlated with the economy performance that affects agents' resources. A positive correlation helps agents intending to short the bond, directly or synthetically. But a negative correlation may imply that solvency constraints are binding for these agents, in states of nature where the bond performs. In the absence of binding solvency constraints, pessimistic agents can be fully levered, some of them as CDS buyers and others as short sellers, depending on their degree of pessimism. Imposing coverage of CDS purchases triggers a substitution between these two shorting avenues: collateral demanded by short sellers will rise, repo rates and CDS premia tend to fall, contributing to higher bond prices. When solvency constraints bind, pessimists stay solvent by combining CDS purchases and short sales. Now, CDS covering requirements create an income effect on the composition of that combined portfolio: short sales decrease and CDS purchases actually increase. This pushes the CDS premium upward, creating an incentive for optimists to be long synthetically rather than directly on the bond, which brings down the bond price. As a result, these findings imply that the CDS covering regulation increases prices of bonds that are positively correlated with economic performance, while it decreases the safe-haven bond prices during stress.

## **The Term Structure of Commodity Futures Prices as a Predictor of Economic Activity**

Aikaterini Karadimitropoulou (University of Piraeus), Marcos Poplawski-Ribeiro (International Monetary Fund), Athanasios Triantafyllou (Audencia Business School)

In this paper, we examine the predictive information content of comovement in the slope of commodity futures curves for real output and global trade growth. We show that a synchronous downward shift in the slopes of major agricultural, metals and energy futures curves—empirically identified as a market-based signal for increased global demand for industrial commodities—predicts a persistent increase in economic growth and export activity across both advanced and emerging economies. We further demonstrate that comovement shocks to the energy futures slope generate the strongest expansionary effects on the global economy, boosting growth and exports in both oil-importing and oil-exporting countries. In contrast, shocks originating from comovement in the slopes of precious metals futures markets have contractionary effects, underscoring the role of precious metals as safe-haven assets.

## **The Crash–Payout Policy Nexus**

Dimitris Anastasiou (Athens University of Economics and Business),  
Athanasios Michairinas (Athens University of Economics and Business),  
Athanasios Sakkas (Athens University of Economics and Business)

We study how firm-specific stock price crash risk shapes payout policy using a global panel of G7-listed firms from 2000 to 2023. We show that higher crash risk leads firms to increase both dividends and share repurchases, consistent with managers using payouts to reassure investors and stabilize prices. These findings hold across alternative measures and identification strategies. We also document real effects: when crash risk is low, payouts and investment move together, but when crash risk is high, additional payouts are increasingly funded by cuts to CAPEX and R&D, particularly among smaller firms. Finally, we show that this crash-dividend nexus operates through an agency-free cash flow channel. Our results highlight payout policy as a key stabilizing tool through which firms manage crash risk, with potential costs, however, for long-term investment.

## **Pyrrhic Diversification: Foreign Institutional Ownership and Stock Return Sensitivity to the Global Financial Cycle**

Gene Ambrocio (Bank of Finland), Dien Giau Bui (Yuan Ze University),  
Iftekhar Hasan (Fordham University), Chih-Yung Lin (National Yang  
Ming Chiao Tung University)

We demonstrate that foreign institutional ownership (FIO) is associated with stronger stock return sensitivity to the Global Financial Cycle (GFC), indicating greater global co-movement among stocks selected by FIOs compared to those not selected. We conjecture that this may be because (i) FIOs tend to pick ex-ante very similar firms when investing abroad, or (ii) FIO investments itself makes firms ex-post more similar and more sensitive to the GFC. We find evidence in support of both hypotheses: that the increased co-movement may be due to FIO's selecting more homogeneous firms and that the sensitivity to the GFC increases after FIO investment. However, we find no significant difference between firms that have longer exposure to FIO investors and those that have only recently obtained FIO investment. Our results indicate that diversification gains are left on the table when FIOs select firms to invest in.

## Parallel Session 3A: Inflation II

### **Subsistence Consumption and Inflation Heterogeneity: Implications for Monetary Policy Transmission in a HANK Model**

Ulrike Neyer (Heinrich-Heine University Düsseldorf), Daniel Stempel (Heinrich-Heine University Düsseldorf), Alexandra Stevens (Heinrich-Heine University Düsseldorf)

Households differ in their consumption baskets and inflation rates along the wealth and income distribution. We use German data to show that subsistence consumption is a main driver of these differences. Using local projections, we show that the price index associated with subsistence consumption reacts significantly more strongly to monetary policy shocks than other price indices. We then set up a HANK model that incorporates these facts. We find that heterogeneous consumption baskets across households weaken monetary policy transmission. We identify a novel indirect transmission channel of monetary policy operating through the real value of subsistence consumption.

## **Inflation Persistence Before and After the 2021-2023 Surge**

Emanuele Franceschi (European Central Bank)

We study how U.S. inflation persistence has evolved from the postwar period through the 2021–2023 reflation, using five quarterly inflation measures (headline and core CPI, headline and core PCE, and the GDP deflator) through 2024Q2. We estimate persistence in a sequence of increasingly flexible reduced-form models: rolling-window autoregressions with data-driven lag selection, a Bayesian time-varying-parameter state-space model, and recurrent neural networks (LSTM) used to extend the data with model-consistent forecasts and to capture nonlinear dynamics. Across measures and methods, we document a pronounced decline in persistence beginning in the mid-1990s, with inflation behaving close to white noise for much of the 2000–2020 period. The 2021–2023 episode marks a sharp reversal, with persistence returning toward levels seen in the early 2000s. The timing of the earlier decline, preceding major increases in global value-chain integration and the rise in commodities-price volatility, suggests that these forces alone cannot account for the persistence pattern. Higher current persistence implies slower transmission from monetary policy to realized inflation and, consequently, a need for more sustained policy actions to restore price stability.

## **Macro-financial Effects of Monetary Policy Surprises: Does Inflation Composition Matter?**

Maria-Anna Tzanaki (University of Crete), Nikolaos Giannellis  
(University of Crete)

This paper studies how the effectiveness of U.S. monetary policy depends on the composition of inflation, specifically on whether inflationary pressures originate from demand or from supply. Using monthly U.S. data from 1989 to 2023, the paper employs smooth local projections with continuous state dependence to trace the dynamic effects of exogenous monetary policy shocks on financial stress, industrial production, inflation, and unemployment across different inflation regimes. The results show that monetary policy transmission is highly state contingent. The response of macro-financial variables to monetary policy surprises is stronger when inflation is driven primarily by supply-side factors than when inflationary pressures originate on the demand side. Specifically, following a tightening shock, financial stress rises more quickly and to a greater extent, while recession (lower output and higher unemployment) is similarly more intense under a supply-driven inflation regime. By contrast, disinflationary policy is shown to be more effective when inflationary pressures are demand-driven. These asymmetries extend to easing episodes and are robust to alternative inference procedures, horizons, and lag structures. Overall, the findings demonstrate that not all inflation is equally responsive to monetary policy and highlight the importance of inflation composition for assessing policy effectiveness and trade-offs.

# **The Inflation Consequences of Political Intervention in Monetary Policy**

William Witheridge (University of Maryland)

I study the impact of political intervention in monetary policy on inflation. I examine episodes of political pressure on central banks in emerging markets and find that market inflation expectations increase following political pressure events. I model the game between a government and a central bank in a New Keynesian economy where the government can intervene and take control of monetary policy. I show the central bank may set inflation above its target to prevent government intervention. The quantitative model finds the threat of government intervention in monetary policy can explain half of the observed increase in inflation above the central bank's target.

## Parallel Session 3B: Fiscal Policy II

### **Redistributing through Seigniorage: The Case of South Africa**

Yoseph Getachew (University of Pretoria), Nyemwererai Matshaka (University of Pretoria), Nicola Viegi (University of Pretoria)

This study investigates how inequality affects the efficacy of monetary policy and its redistributive effects through inflation and money growth. Motivated by persistent disparities in income and wealth, we explore the bidirectional relationships between inequality, monetary policy, and macroeconomic outcomes, using an overlapping generations framework with a cash-in-advance constraint and heterogeneous agents subject to idiosyncratic ability shocks. We calibrate the model to the South African economy, contrasting scenarios between productivity disparities and those without. Our findings reveal that in an unequal economy, increases in money growth reduce capital, output, and old-age consumption, while young-age consumption slightly rises. Inequality decreases temporarily due to seigniorage, which also enhances welfare in the short term. In a more equal economy, macroeconomic aggregates show heightened sensitivity to policy changes, indicating a trade-off between stability and welfare. These results offer valuable insights for policymakers balancing growth, inequality, and stability.

## **Fiscal Reaction Functions and Debt Sustainability in the Euro Area: A Panel Data Analysis**

Barbier-Gauchard Amélie (University of Strasbourg), Thanassis Kazanas (Aristotle University of Thessaloniki), Moise Sidiropoulos (Aristotle University of Thessaloniki)

This paper investigates the heterogeneous fiscal behaviors of 19 euro-area countries and the sustainability of their public debt over the period 2001q1–2022q4. The central objective is to determine whether fiscal fatigue—a diminishing fiscal response as debt levels rise—is a robust characteristic of these economies or an artifact of unmodeled slope heterogeneity. We test if the debt-to-GDP ratio remains a significant determinant of the primary balance once country-specific reactions are accounted for. Our findings indicate a significant heterogeneous reaction of the primary balance to lagged debt, suggesting that fiscal fatigue is not a general characteristic shared by all countries in the panel. Furthermore, results confirm that fiscal balances tend to deteriorate during economic contractions without a corresponding improvement during expansions. Long-run estimations via Fully Modified OLS (FMOLS) reveal that while debt sustainability is generally maintained, particularly when debt exceeds a 90% threshold, national fiscal policies are heavily influenced by the Fiscal Rule Index (FRI), election cycles, and the broader macroeconomic environment.

## **Fiscal risks and consolidations**

Francesco Frangiamore (University of Palermo), Davide Furceri (International Monetary Fund; University of Palermo; CEPR; RCEA), Domenico Giannone (Johns Hopkins University; CEPR), Faizaan Khatib (International Monetary Fund), Pietro Pizzuto (University of Palermo)

Fiscal consolidations substantially reduce debt-at-risk—the probability of very high future public debt outcomes—by simultaneously lowering both expected debt and the uncertainty surrounding it. We document this fact using annual data for 192 countries from 1991 to 2021. These effects are persistent and particularly strong in countries with high initial debt and credible fiscal rules.

## **Taxing Capital, Rewarding Labor? The International and Generational Dimensions**

Matthias Schön (Deutsche Bundesbank), Nikolai Stähler (Deutsche Bundesbank)

This paper studies whether capital income taxation can finance social insurance more efficiently and equitably than labor taxation, and which instrument minimizes distortions. We build a two-region overlapping-generations model with life-cycle saving, labor-market frictions, and open capital markets, calibrated to Germany and the rest of the EU. The benchmark reform permanently cuts the labor income tax and raises the savings-income tax to balance the budget. Employment rises by about 2.5 percentage points and output increases temporarily by roughly 2.4 percent. Over time, the higher savings tax lowers aggregate saving (about 1.5 percent in the long run), worsens the net foreign asset position (around 10 percentage points of GDP), and raises the world real interest rate by about 20 basis points. We then compare two revenue-neutral alternatives: taxing capital used in production and taxing accidental bequests. A production-capital tax sharply reduces capital intensity and lowers long-run output by about 3 percent. A bequest tax avoids distorting firms' investment decisions and yields stronger activity in the short run, but produces pronounced intergenerational redistribution. Welfare gains accrue mainly to post-reform cohorts under savings-tax financing, while bequest taxation creates cohort-specific losses around the reform date and in the far future.

## Parallel Session 3C: Machine Learning & Forecasting

### **Machine Learning Meets Budget: Forecasting German Government Expenditure Components**

Clara Augustin (Deutsche Bundesbank, and Goethe University Frankfurt), Natascha Hinterlang (Deutsche Bundesbank), Jan Kuckuck (Deutsche Bundesbank)

This paper evaluates the forecasting performance for German government expenditure components across 15 prediction models, using annual data from 1994 to 2023. We compare traditional linear models, advanced Machine Learning techniques, and forecast combination methods to expert forecasts produced by the Deutsche Bundesbank, focusing on eleven expenditure components for five levels of government. Our results show that expert forecasts are highly accurate, particularly for short-term (one-step ahead) predictions. Machine Learning models, like (Macro-) Random Forests or KNN are strong complements. They outperform linear alternatives and experts, especially at longer horizons and in the 2020-2023 time period. Using the GDP growth rate as prediction for expenditure growth serves as a powerful benchmark. We also find substantial heterogeneity in model performance across expenditure components, government levels, and forecast horizons.

## **Forecasting household consumption in Russia: Machine learning and time-series approaches**

Maria Alekseeva (Bank of Russia, HSE)

This paper evaluates a comprehensive forecasting toolkit for household consumption forecasting, designed to capture time-varying trends and volatility, mitigate the influence of outliers and account for potential nonlinearities and complex dynamics. We propose a monthly household consumption indicator and produce forecasts for both aggregate household consumption and its key components: retail trade turnover, paid services revenue and catering turnover. We compare nine time-series and machine learning models, including TVP-ARX, UCSV, RLS, Elastic Net, FAVAR, random forest and gradient boosting as well as their combinations against AR(1) using out-of-sample forecasts in a pseudo real-time sample on one to six months horizon. Among individual models, those with time-varying parameters perform well across all variables, while paid services and catering turnover forecasts also benefit from models that incorporate stochastic volatility. Gradient boosting and random forest show good forecasting quality, but only at short-term horizons. These findings underscore the value of adaptive univariate approaches and dynamic ensemble methods for forecasting consumption in evolving economic environments. Our results show that performance-based model averaging consistently delivers accurate forecasts across all variables and horizons. Overall, we get a statistically significant improvement of up to 21-38% for the consumption index when forecasting up to six months ahead.

# **Forecasts and Forecast Errors of German GDP: Can Machine Learning and Regression Approaches Improve Forecast Accuracy?**

Dominik Maltritz (University of Erfurt), Vincent Roschy (University of Erfurt)

We examine forecasts of German economic growth rates produced by major German research institutes and international organizations for the period from 2001 to 2024 and show that forecast errors can be explained significantly by a range of observable variables. In particular, survey-based sentiment indicators as well as market-based indicators derived from stock prices, exchange rates, and oil prices exert a significant influence on forecast errors. Building on these findings, we construct our own forecasts based on, on the one hand, AI-based machine learning approaches and, on the other hand, regression estimates. We show that, in most applications, these approaches exhibit either substantially higher efficiency or at least a considerably lower bias than the forecasts produced by the institutes and organizations.

## **Forecasting wages with machine learning**

Michele Lenza (European Central Bank and CEPR), Claudia Marchini  
(European Central Bank)

This study explores the application of Local Linear Forests (LLFs) for wage forecasting in France, Germany, and Italy. Comparing LLFs against benchmarks such as Random Walk (RW) and Random Forest (RF), we find LLFs to be effective in capturing local linear dynamics and improving forecasting accuracy. Our results suggest that domestic information suffices for robust wage predictions, while sophisticated hyperparameter tuning offers limited benefits.

## Parallel Session 3D: Financial Stress and Stability

### **Examining the Impact of Climate Change on Financial Stability: Evidence from Panel LPs**

George Apostolakis (University of Crete), Nikolaos Giannellis  
(University of Crete)

This paper examines the nexus between climate change and financial stress on a panel data sample of 23 economies ranging from 2005 to 2023. For the purpose of this paper, we built a climate risk index and a financial stress index for the 23 economies. We examine the nonlinear relationship between climate change and financial stress, employing the panel local projection approach of Jordà (2005), allowing for changes in the level of financial stress conditions and the monetary policy stance. Our results from the impulse response analysis provide evidence that climate change affects financial stress conditional on financial stress status and the monetary policy stance. The impact of climate change has long-term effects, with transition impacts stemming from transitions from climate risk to physical climate risk. Global climate shocks have a greater impact on financial stress than do domestic shocks. This outcome reveals the importance of global climate shocks to financial stress, as global warming and climate change are global phenomena that affect regions and continents and are not restricted to local areas.

## **AI and Financial Stability**

Francisco Nadal De Simone (UBI Business School)

Artificial-intelligence (AI) tool-kits drive credit scoring engines, shape real-time market-making algorithms and populate regulator dashboards. Because these models co-evolve with the financial system they steer, the old “exogenous-shock” lens used to analyze and discuss financial stability is no longer sufficient. Moreover, the centrality of time-varying non-linearities and feedback effects for measuring systemic risk cannot be ignored, as has often been the case in the post-global financial crisis’ empirical literature. This paper makes two assumptions: first, that the objective of financial stability is to minimize systemic risk, which is viewed as endogenous to the macrofinancial system. Second, systemic risk can take three forms, as a global shock to the financial system, as contagion among financial institutions and as slow buildup of vulnerabilities, all of which end up eventually negatively affecting the real economy (ECB, 2009). The paper explores how and through which channels AI may reshape systemic risk, and tests whether the extensive application of AI in the EU banking industry in the last decade has had any significant effect on systemic risk as predicted in the literature.

## **Cross-Country Transmission of Financial Stress: Evidence from a Global Panel**

Luca Bettarelli (University of Palermo), Davide Furceri (International Monetary Fund), Francesco Scianna (University of Palermo)

This paper examines how external financial stress originating in partner countries affects domestic output, using a large sample of advanced and developing economies from 1967–2023 and a newly constructed measure of bilateral financial linkages. Results show that external financial stress spillovers significantly and persistently reduce real GDP. The effects are stronger in economies with greater financial and trade openness, and more financially liberalized. In addition, the effect is reduced in policy frameworks characterized by stronger monetary autonomy, well-capitalized banks, higher central bank reserves, lower public debt, stronger fiscal rules and more counter-cyclical fiscal policy. Results are robust to several sensitivity checks, including an instrumental variable strategy that accounts for the potential correlation between source-country shocks and bilateral financial ties. We also show that external financial stress simultaneously affects both the conditional mean and the conditional variance of GDP growth, widening the distribution and raising macroeconomic uncertainty.

## **Natural Disasters and Discouraged SMEs**

Maria-Eleni Agoraki (University of the Peloponnese), Dimitris Anastasiou (Athens University of Economics and Business), Antonis Ballis (Aston University), Christos Chrysanthakopoulos (University of Patras), Christos Kallandranis (University of West Attica)

We examine the impact of extreme natural disasters on a specific credit market outcome, discouraged bank borrowers in the Eurozone, using a unique anonymized (confidential) dataset from the European Central Bank (ECB). Drawing on a large sample of small and medium-sized enterprises (SMEs) across all Eurozone countries over the period from 2009 to 2022, probit models' estimation shows that extreme natural disasters in a country increase the probability of an SME being more discouraged (self-credit rationed). The results hold across a variety of robustness checks. Our findings indicate that when faced with severe natural catastrophes, SMEs tend to be more self-constrained in their intent to access finance. The study enhances our understanding of how natural disasters affect credit-related choices, calling for proactive actions to incorporate natural catastrophe evaluations into lending procedures.

## Parallel Session 3E: International Finance I

### **International Spillovers from Euro Area Monetary Policy to Advanced Small Open Economies: Investment Behavior of Czech Firms**

Volha Audzei (Czech National Bank), Michal Franta (Czech National Bank)

The paper examines international spillovers of Euro Area (EA) monetary policy into the real economy of an advanced small open economy with high degree of credit euroization and tight trade links with the EA. We focus on Czechia as it shares similar degree of trade and financial integration with EA as the rest of the non-EA countries in the region. Based on firm-level data and high-frequency identified monetary policy shocks, we assess the channels of EA monetary policy spillovers. More precisely, we estimate the responses of Czech firms' investment to EA monetary policy shocks using panel local projections and compare the responses for various groups of firms. Results suggest the presence of trade channel of spillovers transmission. Some evidence is found for the balance sheet channel. The foreign currency borrowing cost channel is detected after 2014 suggesting that the large credit euroization in Czechia has altered the transmission of spillovers of EA monetary policy. Importantly, the overall spillovers from the EA have significantly weakened since 2014. Our results suggest that the weakening is consistent with weakening of EA monetary policy transmission to the real economy in EA and loose financial conditions observed during the period of unconventional monetary policies.

## **Tilting the Balance Towards Equity: Capital Controls and the Structure of External Liabilities**

Tobias Krahnke (International Monetary Fund), Wenjie Li (International Monetary Fund)

Capital flow restrictions have long been debated as a tool to manage external financial vulnerabilities, as volatile international capital flows and high external debt can contribute to financial crises. However, empirical evidence on whether capital flow management measures (CFMs) can shift the composition of countries' external liabilities toward more stable types of funding is limited. Using a novel dataset of granular capital account openness indicators measuring policy intensity, we show that an asymmetric liberalization favoring equity over debt can tilt external capital structures toward equity. This effect is stronger in countries with higher institutional quality, underscoring the role of governance in attracting stable foreign investment.

## **Global Financial Cycles, Portfolio Frictions, and Bank Profitability: Evidence from Small Open Economies**

Petr Jakubík (Charles University), Saida Teleu (Charles University),  
Matěj Kořínek (Charles University)

This paper examines how global financial conditions shape bank profitability in small, open, and externally dependent economies. Using bank-level data for Caribbean and Central American countries and System GMM estimation, we assess the impact of U.S. long-term interest rates on two profitability measures: return on equity (ROE) and return on assets (ROA). We find that U.S. Treasury yields have a strong positive effect on ROE, while the response of ROA is considerably weaker. This asymmetric transmission reflects portfolio and balance-sheet frictions that limit asset expansion, restrict portfolio reallocation, and generate slow and uneven adjustment of loan and deposit rates. As a result, profit shocks accrue disproportionately to equity rather than being distributed across the full asset base. We show that this divergence is a systematic feature of constrained intermediation rather than a mechanical leverage effect. The findings indicate that equity-based profitability measures are more informative indicators of external financial transmission, with implications for international financial analysis and financial stability monitoring in small open economies.

## **From Brussels to Bangkok: How Investment Funds Transmit Financial Spillovers**

Pablo Anaya Longaric (European Central Bank), Katharina Cera (European Central Bank), Georgios Georgiadis (European Central Bank), Christoph Kaufmann (European Central Bank)

We explore whether investment funds transmit spillovers from local shocks to financial markets in other economies. As a laboratory we consider shocks to financial-market beliefs about the probability of a rare, euro-related disaster and their spillovers to Asian sovereign debt markets. Given their geographic distance from and relatively limited macroeconomic exposure to the euro area, these markets are an ideal testing ground a priori stacking the deck against finding evidence for investment funds transmitting spillovers from euro disaster risk shocks. Analyzing proprietary security level holdings data over the period from 2014 to 2023, we find that investment funds strongly shed Asian sovereign debt in response to euro disaster risk shocks. Markets with greater investment-fund presence exhibit considerably larger price spillovers. The main driver of this sell-off is the need to generate liquidity to meet investor redemption demands rather than portfolio rebalancing. Especially market liquidity determines which sovereign debt investment funds shed. Taken together, our findings suggest that due to a flighty investor base investment funds are powerful transmitters of spillovers from local shocks across global financial markets.

## Parallel Session 4A: Exchange Rate Economics I

### **Global Exchange Rate Uncertainty**

Joscha Beckmann (Fernuniversität Hagen), Robert Czudaj (University of Freiberg)

This paper provides a new perspective on global exchange rate uncertainty. We adopt survey data to assess uncertainty based on forecast errors and disagreement. Our results show that there is not an "one size fits all" approach for exchange rate uncertainty. Common exchange rate uncertainty tends to increase over time for Emerging Economies, while there is no such trend for Advanced Economies. We also identify significant effects on risk premia and global economic activity which tend to be stronger for forecast error uncertainty. We also find that disagreement acts as propagation mechanism for financial market risk and illustrate that media coverage response to exchange rate uncertainty.

## **Learning Across Countries: Real Exchange Rates**

John Devereux (Queens College, City University of New York), Gerald P. Dwyer (Clemson University), James R. Lothian (Fordham University)

Evidence from classical statistical tests using long-term historical data is quite consistent with Purchasing Power Parity (PPP). Evidence from shorter but still rather lengthy data sets, in contrast, is mixed. In such data sets, it often is impossible to reject the hypothesis that PPP does not hold. Most of this evidence, however, comes from tests that are now well known to have low power in anything other than long spans of data. In this paper, we re-examine this issue using data for OECD countries over the post-WW II period. We run Augmented Dickey-Fuller tests, which produce the typical mixed results. We then conduct a Bayesian analysis of these data which is more consistent with convergence to a mean real exchange rate. We extend the Bayesian analysis to include learning across datasets and countries. Data from other individual countries provides information to learn about the parameters characterizing the distributions for each country. We expect this to make a very big difference in the analysis.

## **Oil Price Uncertainty and Exchange Rates**

Dimitrios Bakas (Nottingham Trent University; Rimini Centre for Economic Analysis), Aikaterini Karadimitropoulou (University of Piraeus), Marcos Poplawski-Ribeiro (International Monetary Fund), Athanasios Triantafyllou (Audencia Business School)

In this work, we measure oil price uncertainty as the volatility of the unforecastable component of oil price changes and show that uncertainty shocks at different forecasting horizons lead to a significant and persistent appreciation of the U.S. real effective exchange rate over the period from January 1997 to April 2022. Beyond the strengthening of the trade balance, we identify an additional transmission channel operating through an increase in U.S. net foreign assets, consistent with a flight-to-safety toward dollar-denominated assets and with previous findings of heightened investment in commodity-exporting economies following oil price uncertainty shocks. Oil price uncertainty generates larger and more persistent effects on the U.S. dollar than those associated with the VIX. In contrast, the euro exchange rate responds much more weakly to oil price uncertainty shocks, reflecting the Euro area's status as a net oil importer.

## **On the Dynamics of Purchasing Power Parity**

Stephen G. Hall (Leicester University; Bank of Greece; University of Pretoria), George S. Tavlas (Bank of Greece; Hoover Institution, Stanford University)

Purchasing power parity (PPP) is one of the most widely examined propositions in international economics, with long-run studies generally concluding that PPP holds despite substantial short-run deviations. However, these studies typically span more than a century and therefore combine periods with fundamentally different exchange rate regimes. Because PPP operates through different adjustment mechanisms under floating and fixed regimes—exchange rates adjust in the former, domestic prices in the latter—standard empirical approaches may mask important regime-specific dynamics.

This paper addresses this issue by explicitly modelling how PPP behaves across exchange rate regimes. Using the Jorda-Schularick-Taylor macrohistory database, which provides annual data for 15 countries from 1870 to 2020 along with detailed regime classifications, we revisit long-run PPP in a framework that allows for structural shifts. Building on Ong (2024), who applied reduced-rank vector error correction models (VECMs) but did not estimate the PPP cointegrating vector or test the unit-coefficient restriction, we generalize the VECM to incorporate regime-dependent parameters.

This approach enables us to assess whether domestic price adjustment intensifies during fixed-rate periods and whether exchange rate responses differ under floating regimes. Our findings show that accounting for regime shifts is essential for understanding how PPP is maintained and for interpreting long-run international price convergence.

## Parallel Session 4B: Financial Markets I

### **Disentangling Supply-Side and Demand-Side Effects of Uncertainty Shocks on U.S. Financial Markets: Identification using Prices of Gold and Oil**

Timo Bettendorf (Deutsche Bundesbank)

This paper investigates the effects of uncertainty shocks on selected U.S. financial asset prices by decomposing a traditional uncertainty shock into its supply-side and demand-side components. Following the approach by Piffer and Podstawski (2018), we identify uncertainty shocks using the price of gold and enhance this strategy by introducing the price of oil as a second variable. By examining daily price changes during significant events that trigger uncertainty, we provide evidence suggesting that despite an increase in gold prices, supply-side uncertainty shocks (e.g. armed conflicts or natural disasters) tend to result in higher oil prices, while demand-side uncertainty shocks (e.g. political and economic events) lead to declining oil prices. By exploiting this information with help of sign restrictions, we create two proxy variables and estimate Bayesian Vector Autoregression (BVAR) models to identify supply-side and demand-side uncertainty shocks. Our findings indicate that while gold prices alone can identify uncertainty shocks for most variables, the inclusion of oil prices reveals an additional dimension. The effects of these shocks differ in their impact on inflation expectations and may thus be a potential source of price puzzles if only the price of gold is considered.

# **Revisiting Fundamentals of the European Gas Market: The Role of Supply Substitution**

Jorge Arenas (University of Alicante)

The 2022 European energy crisis exposed the central role of supply substitution in natural gas markets, as disruptions to Russian pipeline flows were accompanied by a sharp surge in liquefied natural gas (LNG) imports. This paper revisits the fundamentals of the European natural gas market by explicitly distinguishing between pipeline gas and LNG supplies. Using a Bayesian Structural Vector Autoregression (SVAR) identified through sign and elasticity restrictions, the analysis jointly identifies the contemporaneous elasticities of natural gas prices, supply by source, inventories, and euro area industrial production. The results reveal pronounced heterogeneity across supply channels: pipeline gas is highly price inelastic, whereas LNG serves as the primary adjustment channel on the supply side. Although both supply shocks affect prices, pipeline disruptions generate sharp but short-lived inflationary effects, while LNG supply shocks exert more persistent influences on price dynamics. More broadly, the dynamics of gas prices exhibit a clear horizon-dependent structure, with short-run fluctuations driven by supply shocks and inventory behavior, and medium- to long-run movements increasingly shaped by aggregate demand forces. Counterfactual scenarios of the 2022 energy crisis quantify the stabilizing role of LNG availability and demand adjustment, highlighting how supply composition critically shapes energy price dynamics in Europe.

## **Financial Deregulation, Labor Allocation, and Economic Growth**

Andreas Hefti (Zurich ZHAW; Zurich UZH), Lilia Habibulina (Zurich UZH)

This paper revisits the finance-growth nexus and asks when financial deregulation fosters, and when it undermines, economic growth. We develop a stylized model in which financial intermediation improves the selection of productivity-enhancing innovations but expands by drawing labor away from the real economy. Because individual financial firms do not internalize the sector-wide erosion of the economy's innovation base created by their hiring, the model predicts a hump-shaped relationship between financial development and output, together with rising finance employment and relative wages. We test these predictions using U.S. state-level banking deregulation from the 1970s through the early 1990s as an instrument for relative finance-sector expansion. Deregulation disproportionately raises finance employment and wages, and its growth effect is non-monotone: positive early on, but negative in the long run in states where the financial sector expands more strongly.

## **Market-based finance is no island: Volatility spillovers across non-banks, markets and borders**

Eduardo Maqui (Bank of England)

This paper investigates volatility spillovers within the system of market-based finance (MBF) in the UK. Using a Generalised Vector Autoregressive (GVAR) framework and a novel decade-long dataset covering domestic and foreign-domiciled non-bank financial institutions (NBFIs, or non-banks), dealer banks, and core domestic markets, I estimate static and time-varying volatility spillover measures. Findings highlight a substantial role of non-banks as volatility transmitters and a material cross-border transmission channel, providing new insights beyond the prevailing focus on bank-driven and domestic contagion in the existing literature. Specifically, the non-bank segment associated with hedge fund-like activities consistently exhibits the largest volatility spillovers, while the inclusion of dealers - particularly foreign-owned subsidiaries - further amplifies transmission. Spillovers, however, vary markedly over time, peaking in the money market segment ahead of the liability-driven investment (LDI) crisis in the UK, offering novel evidence of shifts in transmission channels during market liquidity disruptions. Incorporating frequency-domain and tail-risk dynamics reveals that spillovers, while largely short-term, tend to persist under stress and display evolving distributional patterns over time. Results further show that cross-border linkages play a significant role in sovereign and corporate bond market volatility, advancing the literature by uncovering non-bank-to-core-market transmission channels within MBF.

## Parallel Session 4C: Investment, Productivity and Growth

### **Decoding Growth in Small Open Economies**

Petri Kuosmanen (University of Vaasa), Juuso Vataja (University of Vaasa)

The small open economy hypothesis posits that external economic conditions play a decisive role in shaping domestic economic activity. This study evaluates the predictive power of foreign economic activity and economic policy uncertainty relative to traditional financial indicators in forecasting GDP growth for seven European small open economies over 1987–2025. We employ the term spread and stock returns as established financial predictors and compare their forecasting performance with that of OECD aggregate GDP growth and the European Economic Policy Uncertainty Index, both proxies for external economic conditions. We also examine whether combining financial variables with foreign proxies improve forecast accuracy. The out-of-sample forecasting results indicate that foreign economic conditions carry substantial predictive power for many small open economies during tranquil periods. In contrast, the findings show that financial predictors assume a more prominent role in turbulent periods marked by multiple crises. Furthermore, the predictive usefulness of both financial variables and foreign indicators is inherently time-varying, with their relevance shifting across different economic environments.

# **Spillovers, Innovation Difficulty, and the Dynamics of Productivity**

Alice Albonico (University of Milano - Bicocca), Marco Guerzoni  
(University of Milano - Bicocca)

Despite rapid technological progress in recent decades, U.S. aggregate productivity growth has slowed, presenting a puzzle in macroeconomics. This paper investigates the sources of this divergence between innovation and productivity using a medium-scale DSGE model with endogenous technological change. The model distinguishes between frontier innovation and the probability of successful technology adoption and diffusion. We estimate the model using U.S. macroeconomic (including R&D) data over the period 1984–2019. Our results show that spillover shocks are the primary drivers of short- and medium-run total factor productivity (TFP) fluctuations, whereas shocks to innovation difficulty mainly affect productivity through adoption and diffusion, generating persistent dynamics. Incorporating patent-based measures of technological creativity dampens the estimated volatility of difficulty shocks and reveals their role as a slow-moving structural force shaping medium- and long-run productivity growth.

## **Human Capital Without Returns? Burnout as a Productivity Wedge in Income Generation**

Michael Chletsos (University of Piraeus), Eleftheria Stergiopoulou  
(University of Piraeus)

Standard endogenous growth models emphasize human capital accumulation and training as key drivers of productivity and income growth. Yet in advanced European economies, substantial investments in education and lifelong learning increasingly fail to generate commensurate income returns. This paper argues that occupational burnout constitutes a previously unmodeled productivity wedge that weakens the effective utilization of human capital without necessarily reducing human capital investment. Using harmonized microdata from multiple waves of the European Social Survey, we document a strong and robust negative association between occupational burnout and household income position across countries. While participation in training and skill formation is positively associated with income, its returns are significantly attenuated under high burnout conditions. In this context, income efficiency refers to the effectiveness with which human capital is translated into income, and we show that burnout introduces a productivity wedge that distorts the mapping from skills to earnings. By integrating psychosocial working conditions into the growth–income nexus, the paper highlights a macroeconomically relevant source of efficiency loss that contributes to lower effective labor productivity, slower income growth, and persistent inequality. Ignoring burnout risks overstating the growth payoffs of human capital policies.

## **Unlocking Growth? EU investment programmes and firm performance**

Alessandro De Sanctis (European Central Bank), Daniel Kapp (European Central Bank), Francesca Vinci (European Central Bank), Robert Wojciechowski (Universitat Pompeu Fabra; Barcelona School of Economics)

This study evaluates the effectiveness of EU Cohesion Policy as an investment programme, employing a novel dataset that links firm-level data from Orbis with project-level information from the Kohesio database. It focuses on two key questions: (1) Which firms receive EU funding? (2) How does receiving EU funding affect firm performance? By applying a logit model and a local projection difference-in-differences approach, we provide new insights into the allocation mechanisms of EU Cohesion Policy funds and their firm-level impact. Our findings show that funding tends to be allocated to firms that already perform relatively well, and that firms receiving EU funding experience a persistent productivity increase of approximately 3% after 4 years, with smaller and more financially constrained firms experiencing relatively greater improvements. Moreover, funding targeting “SME investment” tends to enhance firm performance disproportionately more than other categories, whereas projects directed the “green transition” appear comparatively less beneficial.

## Parallel Session 4D: Financial Econometrics I

### **Micro-based SVAR Identification**

Maximilian Schröder (European Central Bank), Annika Camehl (Erasmus University Rotterdam)

This paper develops a unified framework for integrating microeconomic evidence into the identification of structural shocks in vector autoregressive (SVAR) models. The approach allows information to flow between micro-level estimates and macroeconomic dynamics, bridging the gap between micro-based causal inference and aggregate time-series analysis. We introduce a total likelihood formulation that jointly estimates micro and macro models anchored by common structural parameters. The framework is flexible and modular, accommodating multiple micro studies or conventional identification schemes within a single coherent system. By linking micro evidence to macro impulse responses, it offers a transparent and data-driven strategy for improving the structural interpretation of aggregate shocks.

## **Forecasting risk and interdependencies for portfolio of assets using new robust multivariate range-based GARCH models**

Piotr Fiszeder (Nicolaus Copernicus University in Torun; Prague University of Economics and Business), Marta Małecka (University of Łódź; Prague University of Economics and Business), Radosław Pietrzyk (Wroclaw University of Economics and Business)

This paper introduces a new class of multivariate volatility models designed to analyze and forecast the dependence structure among assets originating from markets with markedly different risk characteristics. Modeling such relationships is empirically challenging, particularly when the portfolio includes assets exhibiting extreme volatility, such as cryptocurrencies, whose presence may substantially affect conditional variances, covariances, and correlations. To address these challenges, we propose a novel modeling framework that combines robust estimation techniques with range-based volatility measures within a multivariate setting. The key methodological contribution lies in embedding both features into a single dynamic correlation structure, allowing the model to remain stable in the presence of extreme observations while simultaneously exploiting the informational content of daily high, low, open, and close prices. Specifically, we develop two new specifications that extend the corrected dynamic conditional correlation (cDCC) model. The first specification incorporates a robust bounded innovation propagation mechanism into a range-based multivariate GARCH framework, while the second relies on a robust M-type variance estimator adapted to range-based inputs. The proposed models are evaluated against several benchmark multivariate GARCH specifications using covariance and risk forecast accuracy. The results demonstrate that the new robust range-based models deliver systematically improved performance, particularly in environments characterized by heightened volatility and abrupt shocks. These findings highlight the empirical relevance of the proposed framework for studying cross-market dependencies in heterogeneous portfolios, especially when at least one component represents a highly volatile asset class.

## **It Takes Two To Tango: Relative Valuation and Volatility Forecasting in Precious Metals Markets**

Lyócsa Štefan (Masaryk University; Slovak Academy of Sciences),  
Todorova Neda (Griffith University), Yingke Zhu (Masaryk University)

Market participants are valuing assets in terms of relative prices, like gold-to-silver ratio. We argue that rational and behavioral asset pricing models imply that such ratios should be informative about the value of underlying assets. In this study, we decompose the gold-to-silver ratio (GSR) into its predictable and unexpected component (shock) to model future volatility of futures of both gold and silver. Using high-frequency data from September 2009 to June 2025, we estimate impulse response functions within a local projection framework. Our results show that exogenous shocks to GSR and especially their volatility, have a persistent effect on future gold and silver volatility. An unexpected appreciation of gold relative to silver has a dampening effect on gold volatility, but amplifies the volatility of silver. The volatility of the shocks increases the volatility in both markets. The results hold after we control for gold-to-equity (GER) and silver-to-equity (SER) ratios, which are found to have even larger effects on the future levels of volatility of gold and silver. In an out-of-sample setting we provide further evidence that components of not only the GSR but also GER and SER ratios provide improvements in the accuracy of volatility forecasts for both gold and silver with the benefit of these components being stronger for the silver market. Our results suggest that the different impact of shocks on the volatility of the two precious metals might be related to the gold's role as a safe-haven asset and silver's greater sensitivity to industrial demand. Our findings also highlight that valuation ratios might serve as forward-looking indicators of risk.

## **Zero restrictions on linear combinations of impulse response functions or structural coefficients in SVARs – approach and applications**

Martin Mandler (Deutsche Bundesbank), Michael Scharnagl (Deutsche Bundesbank)

Sign and zero restrictions on impulse responses have become a widely used tool for the identification of structural economic shocks in structural vector autoregressions (SVARs). Arias, Rubio-Ramírez and Waggoner (2018) have presented a general algorithm for implementing this identification approach. We propose a simple extension that allows imposing zero restrictions on linear combinations of impulse responses or structural coefficients. We illustrate the approach by three applications combining identification by standard sign restrictions and zero restrictions on linear combinations of impulse responses or structural coefficients. The first uses the zero restrictions for imposing consistency of impact impulse responses of expectations with later dynamics of the actual variables, which can be interpreted as an approximation to rational expectations. The second imposes the expectations hypothesis of the term structure by zero restrictions on impulse responses of interest rates of different maturities. The third example imposes restrictions on the relative size of coefficients in the monetary policy reaction function

## Parallel Session 4E: Monetary Theory and Policy II

### **Monetary policy announcements and sacrifice ratios**

Gene Ambrocio (Bank of Finland), Markus Haavio (Bank of Finland),  
Nigel McClung (Bank of Finland)

Sacrifice ratios (the cumulative effect on output divided by the cumulative effect on inflation in response to monetary policy) are key summary statistics for central banks aiming to reduce inflation with minimal impact on the real economy. We show that sacrifice ratios associated with announcements of the most likely course of monetary policy are lower when the implementation date is further out into the future in a class of New Keynesian models. This is not due to forward guidance puzzle effects and holds even when agents' expectations feature cognitive discounting or when policy announcements are imperfectly credible, so that the forward guidance puzzle is resolved. We also show that the benefits are concentrated at short horizons: more than one third (half) of the maximum reduction in sacrifice ratios is achieved if policy is announced one (two) period(s) in advance. Finally, we provide some empirical evidence supporting the predictions of the theory.

## **Federal Reserve shocks: Which securities really flow?**

Silvestrini Maéva (Banque de France - Paris Dauphine University),  
Szczerbowicz Urszula (Skema Business School), Schmidt Julia (Banque  
de France)

This paper examines the impact of US monetary policy shocks on bilateral capital flows between US and foreign investors from March 1994 to June 2019. Contrary to the conventional view that capital inflows following unexpected US monetary tightening mainly reflect increased foreign demand for US safe assets, we find that a significant portion of these inflows is driven by US investors repatriating funds from foreign equity markets. This highlights important heterogeneity and market segmentation between domestic and foreign investors. Extending the analysis to Central Bank Information shocks—monetary surprises conveying additional economic information—we document a distinct global portfolio rebalancing characterized by risk-on behavior, with US investors increasing foreign equity holdings and foreign investors shifting into US equities.

## **Assessing the Effects of Monetary Shocks on Macroeconomic Stars: A SMUC-IV Framework**

Bowen Fu (Hunan University), Changhan Hou (Hunan University), Jan  
Prüser (TU Dortmund)

This paper proposes a structural multivariate unobserved components model with external instrument (SMUC-IV) to investigate the effects of monetary policy shocks on key U.S. macroeconomic "stars", namely, the potential GDP growth, trend inflation, and the neutral interest rate. A key feature of our approach is the use of an external instrument to identify monetary policy shocks within the multivariate unobserved components modelling framework. We develop an MCMC estimation method to facilitate posterior inference within our proposed SMUC-IV framework. In addition, we propose a marginal likelihood estimator to enable model comparison across alternative specifications. Our empirical analysis shows that contractionary monetary policy shocks have negative effects on the macroeconomic stars, highlighting the non-zero long-run effects of transitory monetary policy shocks.

## **The cost channel of monetary policy: evidence from euro area firm-level survey data**

Ugo Albertazzi (European Central Bank), Annalisa Ferrando (European Central Bank), Sofia Gori (European Central Bank), Judit Rariga (European Central Bank)

This paper explores empirically the cost channel of monetary policy transmission during the recent period of monetary policy tightening in the euro area. We combine unique data on firms' selling price expectation from the Survey on the access to finance of enterprises (SAFE), information on firms' borrowing from the euro area-wide credit register (AnaCredit) and ECB monetary policy surprises. Firms revise upwards their one-year-ahead selling price expectations following monetary announcements in a tightening cycle and this effect increases in firms' working capital exposure. The paper provides supportive evidence on the existence of a cost channel of monetary policy, adding to our understanding of monetary policy transmission to firms in the euro area.

## Parallel Session 5A: Macroprudential Policy I

### **The devil in the DeTail: Assessing state-contingent tail effects of a releasable macroprudential capital buffer using a parsimonious agent-based framework**

Enrico Minnella (Bank of England), Ana Pereira (Bank of England),  
Eugen Tereanu (Joint Vienna Institute; European Central Bank)

This paper develops an agent-based framework (DeTail) to assess the state-contingent tail effects of releasable macroprudential capital buffers. The model features heterogeneous firms, households, and banks, and a single central bank, all interacting in a fully integrated, stock-flow consistent framework which generates endogenous credit cycles. Using this approach, we evaluate how time-varying capital requirements affect the time-varying distributions of credit growth, firm and household default rates, and bank losses along the credit cycle. Policy experiments show that releasing capital buffers during economic downturns improves excessively risky (lower-tail) credit outcomes, reduces both households and firms defaults, and supports macro-financial resilience by limiting tail bank losses. At the same time, capital buffer accumulation during upturns imposes minimal costs and does not significantly constrain lending. These findings support the active use of releasable buffers to mitigate systemic risk and smooth credit cycles without weakening the banking system.

## **Networked UK Housing Markets: Implications for Systemic Risk and Macroprudential Design**

Ivan Paya (University of Alicante), Alberto Perez-Bernabeu (University of Alicante)

The paper studies the structure and evolution of regional housing market connectivity in the United Kingdom and its implications for systemic risk and financial stability. We develop a time-varying measure of housing-market connectedness based on Granger-causality networks, document a persistent upward tendency in interregional spillovers, and highlight pronounced asymmetries in the network roles of southern and northern regions. We further show that housing connectivity is counter-cyclical with the national house price cycle and largely unrelated to regional business-cycle synchronization, indicating that systemic housing risk can intensify during housing downturns even when real economic linkages remain comparatively stable. Finally, we provide evidence that the transmission of macroprudential policy is state-dependent in housing connectivity, with tighter networks associated with stronger policy effects on house prices, credit, and system-wide stress.

## **Bank Performance Under Biodiversity Risk**

Iiro Alikärri (University of Jyväskylä), Kari Heimonen (University of Jyväskylä)

This paper investigates the financial stability implications of biodiversity loss for European banks. We develop a structural credit-risk framework where environmental degradation drives default risk. Using a novel text-based biodiversity attention index, we empirically test these mechanisms across a panel of financial institutions data in European countries. We find evidence that biodiversity attention shocks significantly compress Net Interest Income, confirming an active "income channel." However, we find no significant impact on regulatory capital or systemic risk measures. Our results suggest that while nature loss currently erodes banking profitability, it has not yet crystallized into a solvency crisis.

## **Household Behavior under Macroprudential Borrower-Based Measures**

Jaunius Karmelavicius (International Monetary Fund), Julia Otten  
(International Monetary Fund)

This paper develops a life cycle model to study household choice under macroprudential borrower-based measures (BBMs). The model is extended to multiple heterogeneous households, allowing to assess both aggregate and distributional effects of BBMs on mortgage and housing demand. The framework is applied to Lithuanian and Slovak distributional data to quantify the impact of various BBM configurations. We find that the presence of binding BBMs can usefully dampen mortgage and house price growth. However, tight regulation may also redirect demand towards lower-valued housing, while pushing households into the rental market. In particular, loan-to-value (LTV) limits are most constraining for households with little or no initial wealth. This highlights the distributional consequences of BBMs and the importance of designing regulation to account for borrower characteristics.

## Parallel Session 5B: Currency Markets

### **The Determinants of International Currency Reserve Shares**

Ersi-Iliana Savvopoulou (National and Kapodistrian University of Athens)

This study probes into the determinants of international currency reserve shares. Using both a panel data and time series approach, for six countries or groups of countries (USA, UK, Japan, euro area, Canada and Switzerland) for quarterly data between 2000q1 and 2025q3, results show that different factors are at play for each currency. Principal Component Analysis is used to derive an estimate for institutional stability, to be subsequently used as a determinant of currency shares. Pooled Mean Group estimation results show that the real effective exchange rate is significant over the long run for the euro area. Cointegration analysis reveals a relationship between the US Dollar and institutional stability up to the end of 2013. Furthermore, for the US dollar, there exists an equilibrium relationship between reserve shares and Economic Policy Uncertainty. Threshold regression points to the variables that matter in low and high-uncertainty regimes, endogenously determining a critical level of uncertainty for each country, while simple regression confirms the significance of most of the traditional determinants of currency shares.

## **Uncertainty Spillovers and Trade Currencies: Export-Invoicing Evidence from a Global Panel**

Luca Bettarelli (University of Palermo), Davide Furceri (International Monetary Fund; University of Palermo; CEPR; RCEA), Pietro Pizzuto (University of Palermo), Khatereh Yarveisi (University of Palermo)

This paper investigates how uncertainty spillovers from Dominant-Currency Economies (DCEs)—the U.S., the euro area, and China—affect the currency composition of export invoicing across countries. Combining a recently released global invoicing database with the World Uncertainty Spillover Index, we assemble a three-dimensional panel covering 100 economies, three dominant invoicing currencies (U.S. dollars, euro, Chinese renminbi) over more three decades. Using a rich fixed-effects framework, we isolate the effects of foreign-origin uncertainty from domestic and global confounders. The results show that a one standard deviation increase in uncertainty spillovers reduces the use of dominant currencies in trade invoicing shares (-0.6 percentage point at peak), with the effects that are statistically significant, economically meaningful and persistent over time. We further document important nonlinearities: the impact of uncertainty spillovers is amplified under strong domestic economic conditions, less restrictions to capital and goods mobility, and higher bilateral exchange rate flexibility.

## **Central Bank Swap Networks and Currency Composition During Global Crises**

Zied Ftiti (EDC Paris Business School), Haithem Awijen (INSEEC BBA Business School), Wael Louhichi (Alfaical University), Hachmi Ben Ameer (INSEEC Grande Ecole)

Central bank swap lines have evolved from ad hoc crisis tools into a durable layer of international monetary infrastructure. This paper examines how access to the Federal Reserve and People's Bank of China (PBoC) swap networks shapes the currency composition of cross-border banking positions across major global crisis episodes. Using quarterly data on currency shares from the BIS Locational Banking Statistics for 224 countries (1995Q4-2025Q2), we estimate two-way fixed-effects difference-in-differences models that interact crisis-episode indicators - the Global Financial Crisis, the COVID-19 pandemic, and the post-2022 geopolitical fragmentation episode - with pre-crisis swap-network access. Across all three crises, countries connected to the Fed swap network exhibit larger declines in USD shares during crisis windows, consistent with swap-line access relaxing precautionary dollar funding constraints and enabling currency rebalancing. Effects are largest for countries connected to both networks, highlighting topology-driven amplification. In the post-2022 episode, these patterns are concentrated among countries with greater sanctions exposure, suggesting that geopolitical risk moderates the value of alternative liquidity infrastructure. Event-study estimates around each crisis onset confirm parallel pre-trends and show that compositional changes are concentrated in the post-crisis period. The findings imply that swap networks function as currency infrastructure capable of reshaping international portfolio allocation during periods of global financial stress.

## **The Global Dollar Cycle and the Gravity of Finance and Trade**

Harald Sander (TH Köln & Maastricht University), Stefanie Kleimeier (Maastricht University & University of Stellenbosch Business School)

Cross-border finance matters for cross-border trade but is underexplored in the empirical trade literature. In particular, a global financial cycle, importantly driven by the U.S. dollar's nominal effective exchange rate is a key driver of trade. By developing a finance-augmented trade gravity model we explore the relevance of cross-border loans for bilateral trade and detail how a global dollar cycle affects exports both directly and indirectly via a finance-trade channel, differentiated by country-level development. We also shed new light on the workings of classical gravity variables, such as physical distance and common borders. In particular, we reveal that the trade effect of currency unions is strongly enabled by boosting cross-border lending.

## Parallel Session 5C: Banking and Finance II

### **Do capital requirements and their international differences affect banks' profitability?**

Manuel Buchholz (Deutsche Bundesbank), Axel Loeffler (Deutsche Bundesbank), Patrick Sigel (Deutsche Bundesbank)

A key element of the Basel III reforms are stricter capital requirements, which have been implemented with varying degrees of stringency across jurisdictions. We examine the impact of these requirements on bank profitability in the US and Europe between 2019 and 2024. We find no evidence that higher capital ratios or requirements negatively affect profitability. However, our results indicate that international differences in capital requirements can influence the profitability of banks that operate globally: Since capital requirements in a jurisdiction apply only to domestic banks and foreign subsidiaries, foreign banks operating through cross-border or branch-based activities may gain a competitive advantage. Nevertheless, the effect appears to be limited to the subsample of German significant institutions (SIs). Moreover, our analysis of policy scenarios based on the estimated spillover effects suggests that lowering capital requirements is not an effective strategy for improving bank profitability and could even be detrimental if reciprocated by foreign jurisdictions.

## **Beyond financing: Effects of changes in bank relationships on client-firms**

Steven Poelhekke (Vrije Universiteit Amsterdam and CEPR, Tinbergen Institute), Razvan Vlahu (Dutch Central Bank), Vadym Volosovych (Erasmus University Rotterdam, Tinbergen Institute)

Using a large dataset of firm-bank and ownership information for 23 European countries from 2008 to 2015, we explore how firm and bank heterogeneity shape the effects of bank switching on firm performance. We show that adding banks who are knowledgeable about economy increases firm investment and trade credit, while leaving loan volumes unchanged and raising interest expenses. Adding banks specialized in the firm's industry leads to higher output growth and productivity. These effects are economically meaningful and persist among financially constrained firms. Overall, our findings highlight the role of banks as providers of information and complementary services, operating through channels beyond traditional investment and financing effects.

## **A Comparative Review of Worldwide On-site Banking Supervision Trends Through the Lens of International Monetary Fund/World Bank FSAP**

Alessandro Santoni (European Central Bank), Valentina Rapalino (European Central Bank), Roberta Nesti (European Central Bank)

The IMF working paper, “Good Supervision: lessons from the field,” examines the effectiveness of On-site Inspections (OSIs) as a supervisory tool in advanced economies (AEs), drawing insights from 60 Basel Core Principles (BCPs) assessments conducted between 2012 and June 2023. Despite their critical role in ensuring financial stability, OSIs are identified as the second-largest weakness among supervisory techniques in AEs. The study highlights challenges such as limited supervisory resources, infrequent inspections of smaller banks, and an overreliance on off-site monitoring, which cannot fully substitute the insights gained from in-person supervision. Key deficiencies include gaps in OSI scope, frequency, staffing, and enforcement mechanisms, as well as communication and structural issues. The paper underscores the need for supervisory authorities to balance onsite and off-site methods, enhance staffing and inspection practices, and strengthen enforcement capabilities. These improvements are deemed essential to align supervisory practices with BCP standards and foster a more resilient financial system.

## **Artificial Intelligence and Bank Profitability: Opportunities and Risks**

Małgorzata Pawłowska (SGH Warsaw School of Economics), Piotr Mazur (SGH Warsaw School of Economics), George Kouretas (Athens University of Economics and Business)

This paper examines the impact of FinTech and Artificial Intelligence (AI) on the profitability of banks in the European Union (EU). Recent developments in the European financial system, driven by digitalization, AI, and FinTech companies, have reshaped traditional banking models and introduced new risks. In addition to technological progress, financial risk associated with digitalization and climate change has become increasingly relevant. To assess these dynamics, we conduct a critical review of the latest literature and reports from financial institutions. Furthermore, using a sample of EU banks over the period 2014–2024 and applying two econometric models, our findings indicate a positive short-term impact of AI and FinTech on bank profitability. However, we also identify risks related to AI adoption in the financial sector. The paper concludes by presenting both the positive and negative implications of FinTech and AI for traditional banking performance.

## Parallel Session 5D: Labor Market, Gender and Inequality II

### **Do Pay Transparency Laws Reduce the Gender Wage Gap? Insights from a Meta-Analysis**

Klára Kantová (Institute of Economic Studies, Charles University),  
Michaela Hasíková (Institute of Economic Studies, Charles University)

Pay transparency laws are a key policy response to persistent gender wage disparities, yet evidence on their effectiveness is mixed. This meta-analysis synthesizes 268 estimates from 12 studies. Across a broad suite of publication bias diagnostics, we find at most weak evidence of selective reporting, while most approaches indicate a small but significant positive effect beyond bias. The pooled mean effect is 0.012 log points, corresponding to an average 1.2% increase in women's wages relative to men, consistent with a modest narrowing of the gap. Heterogeneity analysis using Bayesian and frequentist model averaging shows that policy design is pivotal. Public disclosure regimes produce larger reductions than internal access or job-ad disclosure, while evidence for pay-secrecy bans is imprecise. Specification choices also matter, with regional and employee controls attenuating effects and sector controls amplifying them. Overall, effective transparency depends on both robust policy design and careful empirical specification.

## **Public Attention to Gender Equality and Stock Market Returns**

Imane El Ouadghiri (De Vinci Higher Education, De Vinci Research Center), Jonathan Peillex (ICD Business School)

We examine the potential relationship between public attention to gender equality and returns on two U.S. pro-gender diversity stock indices (the MSCI USA Women's Leadership and the Morningstar Women's Empowerment index) in comparison to their traditional counterparts (the MSCI USA and the Morningstar USA index) over the 2017-2022 period. We consider several measures of public attention to gender equality: (1) the U.S. daily Google Search Volume Index for different keywords related to gender equality, (2) the number of daily visits to specific Wikipedia pages devoted to gender equality, and (3) the daily number of news stories related to this phenomenon. We find a positive association between public attention to gender equality and returns on U.S. pro-gender diversity stock indices. We attribute this result to an increasing investor's preferences for owning stocks of companies that promote gender diversity in the workplace during periods of high public attention to gender equality. This finding which is robust to a battery of alternative estimation methods and proxies offers important managerial and public policy implications.

## **Amenities and Wages over the Business Cycle: Dynamics and Gender Implications**

Benjamin Lochner (Institute for Employment Research, Friedrich-Alexander-Universität), Christian Merkl (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Every job can be described as the bundle of a wage and a non-wage amenities (e.g., certain employer-side demands). The business cycle behavior of the latter is largely unknown. Our paper provides novel evidence on the dynamics of amenity provision over time for Germany. Based on the IAB Job Vacancy Survey, we show that firms are less demanding in terms of employer-side flexibility requirements during booms than during recessions. Furthermore, we document that the probability that an interview turns into a job increases during booms. We propose a search and matching model with endogenous amenity provision that can replicate these facts. We show in a counterfactual exercise that amenity provision is an important labor market amplifier. In addition, in a model version with two types of agents (more and less flexible), the less flexible agents' job-acceptance probability reacts more during booms than during recessions, as firms reduce the flexibility demands. This aligns with empirical evidence from the PASS survey showing that women's job acceptance probability is more cyclical than men's. Finally, we show in the model that there is an important interaction between wage cyclicalities and amenity provision. More procyclical wages lead to less countercyclical amenity provision.

## **Beyond Gender Quotas: Determinants of Women's Participation in European Corporate Boards**

Martin Černek (European Research University), Michal Fridrich (European Research University), Svatopluk Kapounek (Mendel University in Brno)

This study examines the impact of gender role models in political and economic leadership on women's representation on corporate boards across the EU. Using panel data from 28 countries (2012–2022), we find that women's representation in central banks and the adoption of national gender equality directives significantly enhance board diversity. The effect of female political leadership is strongest during economic growth. We also confirm the effect of the glass ceiling. These findings highlight the importance of credible role models, institutional support, and favorable macroeconomic conditions in advancing gender inclusive corporate governance.

## Parallel Session 5E: Central Banking I

### **Central bank reserves and banks' portfolio rebalancing in the euro area**

Athanasios Lampousis (Bank of Greece), Petros Migiakis (Bank of Greece)

This article studies the role of central bank reserves in the balance sheets of euro area banks. It documents a positive interaction between banks' reserve balances after the launch of the expanded asset purchase programme by the European Central Bank in 2015 and bank lending in line with portfolio rebalancing effects of quantitative easing. The results are more pronounced to lending with longer maturities and are robust to using an instrument for reserve creation and an explicit balance sheet measure of portfolio adjustments. Extending the analysis to the post-QE period, bank reserves were likely to buffer loan growth declines amid tighter liquidity conditions, consistent with a precautionary motive. Overall, our results suggest that a reserve-induced portfolio rebalancing channel in asset purchases may increase bank dependency on central bank liquidity in the post-QE world.

## **Political Pressure on The Fed – Is This Time Different?**

Sören Karau (Deutsche Bundesbank), Ivan Frankovic (Deutsche Bundesbank)

We examine how financial markets respond to political pressure on the Federal Reserve by US President Trump in his second term, in which his public calls for lower interest rates coincided with unprecedented efforts to reshape the Fed Board. Using a dataset of dozens of political pressure events in 2025, we use high-frequency asset price responses as multi-dimensional external instruments in a proxy VAR, identifying a shock to political pressure on the Fed. We find that, unlike during Trump's first term, Fed pressure does not materialize as a de facto monetary easing: although interest rates decline, equity prices tend to fall and measures of uncertainty rise, consistent with a deterioration in market confidence. The identified shock can account for much of the response by financial markets to the "Liberation Day" tariff announcements in early April 2025, and continues to weigh on the USD's exchange rate, indicating a sustained loss of confidence in the dollar.

## **Complexity in Monetary Policy Communications**

Frederico Mira Godinho (Bank of Portugal)

How does the complexity of policy statements affect economic outcomes? When looking at monetary policy announcements, I show that complex language reduces the effects of monetary policy shocks on asset prices. I then look at how the general public, a non-specialized audience, reacts to distinct policy statements that only differ in the complexity of the words used, by making use of data from a new Randomized Control Trial experiment. For this audience, a simpler message is more effective in shaping households' expectations and enhancing understanding, but it reduces the credibility of the Federal Reserve relative to more complex, and less easily understood, communication.

## **The Dynamics of Central Banks' Reserves under High Uncertainty**

Deborah Defang (Leicester University), Stephen G. Hall (Leicester University; Bank of Greece; University of Pretoria), George S. Tavlas (Bank of Greece; Hoover Institution, Stanford University)

We study the determinants of changes in the composition of central bank reserve holdings using constrained regressions that impose the accounting identity that increases in one currency's share are offset by declines in others. We document the effects of a wide range of economic and political variables, with particular emphasis on tariffs, sanctions, and measures of global economic uncertainty. Our approach provides a unified framework for analysing how macroeconomic and geopolitical factors shape the allocation of sovereign reserve portfolios.

## Parallel Session 6A: Banking and Financial Stress I

### **Policy Uncertainty and Banks' Lending Behavior**

Sheida Teimouri (University of Wisconsin–La Crosse), Amir Tayebi  
(University of Wisconsin–La Crosse)

We examine how banks adjust their lending growth in response to policy uncertainty arising from gubernatorial elections in their headquarters states. Using a bank–county–year panel from 1994–2016 that integrates mortgage data from the Home Mortgage Disclosure Act (HMDA), small business lending data from the Community Reinvestment Act (CRA), and bank financial reports from Call Reports, we analyze how different types of elections and institutional characteristics shape credit allocation. We distinguish between incumbent re-election bids, which generate moderate uncertainty, and term-limited contests, which create high uncertainty due to guaranteed leadership turnover. Our results indicate that banks respond to policy uncertainty through active portfolio reallocation rather than uniform contraction. During incumbent elections, lending growth shifts from mortgages to small business credit, driven primarily by small banks, particularly small national banks, that expand small business lending. During term-limited elections, the pattern reverses: lending growth shifts from small business to mortgage credit, led by large national banks reallocating toward safer, more liquid assets. Large state-chartered banks, however, counter this pattern by expanding small business lending growth, partially offsetting national banks' retrenchment. Across both election types, headquarters counties remain largely insulated, indicating that portfolio adjustments occur primarily in non-headquarters markets. Overall, smaller and state-chartered institutions play a stabilizing role during episodes of policy uncertainty by sustaining small business lending growth when large national banks reallocate toward mortgages. These stabilizing effects highlight the importance of institutional diversity in buffering local credit markets against uncertainty. Close elections, however, tend to temper or fully halt portfolio reallocation, as banks adopt a "wait-and-see" stance amid heightened ambiguity and delay adjustments until policy outcomes become clearer.

## **Supply Chain Risk and Firm Financial Stability**

Konstantina K. Agoraki (University of Piraeus), Maria-Eleni K. Agoraki (University of the Peloponnese), Maria Giaka (The American College of Greece), Dimitrios Konstantios (Alba Graduate Business School at the American Graduate Business School)

This paper investigates whether and how supply chain risk shapes firm financial stability. Using firm level financial statements from Compustat, equity market data from CRSP, and supply chain relationship information from FactSet Revere via WRDS, we construct several measures of supply chain risk, including supplier and customer concentration and, where feasible, network exposure metrics. We assess financial stability with both accounting based and market-based outcomes, including distress scores and liquidity or coverage measures, market implied distance to default, and idiosyncratic residual return volatility computed from factor model residuals. To strengthen causal interpretation, we estimate panel regressions with firm and time fixed effects and explore shock-based designs that leverage plausibly exogenous disruptions affecting upstream partners. We then apply survival methods, including Cox proportional hazards and discrete time hazard models, to quantify how supply chain risk relates to the hazard of delisting and bankruptcy. Overall, the analysis clarifies whether supply chain fragility translates into greater distress and exit risk and identifies potential transmission channels such as cash flow volatility, financing constraints, and operating disruptions.

## **Mortgage loan rates and the defaults of variable rate mortgages**

Barbara Jarmulska (European Central Bank), Emil Bandoni (Central Bank of Ireland and University College Dublin), Friederike Fourné (ifo Institute Munich)

Using a granular database of variable rate euro area loans and analysing their defaults between 2014 and 2019, we show that the effect of interest rate changes on mortgage defaults is highly non-linear. First, we find that the risk associated with higher contemporaneous interest rates is concentrated among borrowers who got the loan at ultra-low interest rates, their default probability being 2.6 times higher than our sample average. Second, we show that the effect of interest rate changes on the default probability is asymmetric: interest rate cuts have rather small effects, whereas increases significantly raise default probabilities. Finally, we show that the magnitude of the effect of an interest rate increase depends on the history of net interest rate changes, with a consecutive interest rate increase having a 3 times stronger impact on the default probability than an increase following an interest rate decrease.

## **Lending Activity Patterns among Central and Eastern European Banks**

Evzen Kocenda (Charles University; Mendel University), Svatopluk Kapounek (Mendel University), Peter Albrecht (Mendel University), Daniel Pastorek (Mendel University), Martin Stachon (Mendel University)

Using a panel dataset of over 450 banks across fifteen CEE countries from 1994 to 2022, we identify systematic differences in lending activities between foreign- and domestically owned banks. Our results indicate that foreign ownership is associated with a modest but statistically significant increase in lending, which is supported by higher net interest margins. Foreign banks in CEE, while benefiting from access to cheaper liquidity through their parent institutions in Western Europe, exhibit lending behavior that is more vulnerable to operational inefficiencies and external shocks. In contrast, domestic banks are more constrained by liquidity and capitalization, with higher equity and liquid asset ratios significantly reducing their lending capacity. Our findings underscore the significance of foreign ownership in influencing the transmission of financial characteristics into lending behavior, and emphasize the need to consider this factor when evaluating financial system stability. A direct message applies to the specific institutional features of central banks due to the structural trade-offs between cross-border integration and domestic autonomy within post-transition banking systems.

## Parallel Session 6B: Macroeconomic Forecasting I

### **A Novel Global Learning Framework for Forecasting Economic Growth in the Eurozone**

Alexandros Tsioutsios (National and Kapodistrian University of Athens),  
Georgios Angelopoulos (University of West Attica & Bank of Greece),  
Zacharias Bragoudakis (Bank of Greece), Dimitrios Dimitriou  
(University of West Attica)

This paper evaluates the forecasting performance of the Global Unrefined (GlobalUN) model for real GDP growth in the euro area. Using a global pooled neural-network framework, we employ a quarterly panel for 20 euro-area countries plus the EA-20 aggregate over 2001Q1–2025Q3, with predictors that capture real activity, expectations, external conditions, and financing costs (industrial production, sentiment, confidence, capacity utilization, external demand, openness, unemployment, and the 10-year yield). Forecasts are generated under a rolling-origin design at 1-, 2-, and 4-quarter horizons and compared with ARIMA, a naïve benchmark, XGBoost, and a simple NN baseline. Our results are clear: GlobalUN delivers the most accurate and stable forecasts overall, dominating at short and medium horizons across most countries and remaining best on average at four quarters, even though ARIMA is competitive in a subset of cases. These findings are relevant for policy institutions and practitioners who require reliable quarterly growth projections across the euro area.

# **Inflation Forecasting with Large Language Models: A Real-Time Evaluation Against Central Bank Projections**

Krystian Jaworski (SGH Warsaw School of Economics), Adam Wałach  
(SGH Warsaw School of Economics)

This paper evaluates the inflation forecasting capabilities of reasoning-capable Large Language Models (LLMs), specifically GPT-5, by benchmarking them against published central bank projections across six advanced economies: the Euro area, United Kingdom, Switzerland, Norway, New Zealand, and Czechia. Addressing methodological concerns regarding look-ahead bias and memorization in AI forecasting, we employ a rigorous design that strictly differentiates between pseudo out-of-sample diagnostics and genuine post-cutoff evaluation relative to the model's September 2024 knowledge cutoff. The methodology utilizes a safeguarded conditional prompting framework, supplying the model with historical numerical data and redacted central bank narratives to faithfully simulate real-time information constraints. Our results yield three primary insights. First, GPT-5 demonstrates strong genuine out-of-sample performance, consistently outperforming naïve benchmarks and frequently exceeding central bank accuracy at medium horizons, though it trails institutions at the nowcast horizon due to data latency. Second, forecasting success is critically dependent on reasoning capability and model scale; reasoning-oriented models (such as GPT-5 and o3) significantly outperform non-reasoning predecessors and smaller-capacity variants, helping to reconcile mixed evidence found in prior literature. Third, while prompt-based safeguards mitigate leakage, we argue that only post-cutoff evaluation provides definitive evidence of predictive skill. These findings suggest that reasoning-capable LLMs can serve as credible, effective complements to traditional institutional forecasting frameworks.

## **Density nowcasts for U.S. GDP by probabilistic neural networks**

Kristóf Németh (Budapest University of Technology and Economics),  
Dániel Hadházi (Budapest University of Technology and Economics)

Recent results in the literature indicate that artificial neural networks (ANNs) can outperform the dynamic factor model (DFM) in terms of the accuracy of GDP nowcasts. Compared to the DFM, the performance advantage of these highly flexible, nonlinear estimators is particularly evident in periods of recessions and structural breaks. From the perspective of policy-makers, however, nowcasts are the most useful when they are conveyed with a measure of uncertainty attached to them. While the DFM and other classical time series approaches analytically derive the predictive (conditional) distribution for GDP growth, ANNs can only produce point nowcasts based on their default training procedure (backpropagation). To fill this gap, first in the literature, we adopt two different deep learning approaches that enable ANNs to generate density nowcasts for U.S. GDP growth: Bayes by Backprop and Monte Carlo dropout. We evaluate the accuracy of the implied point nowcasts, defined as the mean of the empirical predictive distribution relative to a naive constant growth model and a benchmark DFM specification. Using a one-dimensional convolutional neural network, both methods outperform the benchmarks during the evaluation period (2012:Q1-2022:Q4). Furthermore, both algorithms are able to dynamically adjust the location (mean), scale (variance), and shape (skew) of the empirical predictive distribution. The results indicate that both Bayes by Backprop and Monte Carlo dropout can effectively augment the scope and functionality of ANNs, rendering them a fully compatible and competitive alternative for classical time series approaches.

## **Does Money Help Forecast Nominal GDP in Deep Learning Models?**

John V. Duca (Oberlin College and Federal Reserve Bank of Dallas),  
Kenean Yamane Kejela (Google)

This study analyzes whether adding one of three broad Divisia money measures (Divisia M3, M4, or M4-) constructed by the Center for Financial Stability (CFS) and a determinant of their long-run demand—stock mutual fund loads—improves deep learning model forecasts of nominal GDP. We train a long short-term memory (LSTM) neural network on data from 1985q1 to 2013q4, using 8 datasets: a baseline pair of 1,500 FRED variables and a version adding three COVID-19 variables, and three other pairs that add stock mutual fund loads plus one of the three broad Divisia money measures. Adding any one of the Divisia variables plus stock mutual fund loads significantly improved one-quarter- and four-quarter-ahead forecasts of nominal GDP, particularly in capturing long-run trends. Findings imply that broad Divisia money should be among variables used to monitor and forecast nominal GDP, with results slightly favoring adding the broadest measure, Divisia M4, for forecasting nominal GDP four quarters ahead.

## Parallel Session 6C: Financial Markets II

### **Stock Market Dynamics in the RBC Framework**

Arthur Galichère (University of Warwick)

This paper proposes a simple extension of the real business cycle model to study stock market dynamics within a dynamic stochastic general equilibrium framework. The model introduces stochastic firm exit and new equity issuance. Firms may exit the economy stochastically, and exiting firms are replaced by new entrants that issue equity to finance investment. This mechanism generates firm turnover and creates endogenous fluctuations in aggregate dividends and equity valuations. Productivity, exit, and sentiment shocks jointly drive movements in output, capital, dividends, and stock prices. The model remains transparent and tractable, yet delivers richer asset price dynamics than the standard RBC benchmark. It offers a clean framework to study the interaction between firm turnover, equity markets, and macroeconomic fluctuations, and provides a natural starting point for future extensions and policy analysis.

## **Stock Price Crash Risk and the Managerial Rhetoric Mechanism: Evidence from R&D Narrative Disclosure in 10-K filings**

Panayiotis C. Andreou (Cyprus University of Technology), Neophytos Lambertides (Cyprus University of Technology), Marina Magidou (Open University of Cyprus)

We operationalize managerial rhetoric by utilizing narrative disclosure of forward-looking R&D activities in the MD&A section of 10-K filings. Using ChatGPT, we demonstrate that this managerial rhetoric is contextually relevant and aligns with cues indicative of investor optimism. The empirical tests show that managerial rhetoric is positively associated with future idiosyncratic stock price crashes. This association is pronounced in firms facing high competition, lower entrenchment, and covered by analysts. Intriguingly, stronger internal corporate governance does not mitigate the managerial rhetoric-crash relation. This study identifies cheap talk by linking positive changes in R&D narrative disclosures to stock price crash risk, revealing that such rhetoric, when unsubstantiated, is negatively associated with future patent outputs. Our findings underscore the existence of a mechanism that managers exploit to hype investors' expectations and inflate stock prices.

## **Stock Market Accounting**

Ioannis Koutsonikolis (University of Minnesota)

Why have stock market valuations risen so dramatically since 1955? I build a model of the U.S. macroeconomy featuring pure rents, intangible capital, variation in discount rates, and a rich system of distortionary taxes. I use the model to decompose the origins of the approximately two-fold increase in the observed market capitalization to GDP (MCAP/GDP) and price dividend (PD) ratios, that occurred for the U.S. corporate sector between 1955 and 2022. I find that changes in tax policy alone account for approximately half of the increase in these valuation ratios. Increases in corporate sector markups, generating rent-based cash flows, generate, approximately, the remaining half of the increase in MCAP/GDP. Changes in productivity and discounting play minimal roles in the evolution of MCAP/GDP, but produce some relevant variation in the price-dividend ratio.

## **Political Business Cycles and Equity Markets: Evidence from EU Member States**

Kari Heimonen (University of Jyväskylä), Jussi Leskinen (University of Jyväskylä)

This paper examines whether political business cycles (PBCs) and government ideology affect equity market performance in the European Union. Using data from 27 member states, we construct a novel continuous measure of government ideology that combines parliamentary election outcomes with voter survey data, capturing the left–right spectrum within each country’s political context. Panel estimations reveal no robust evidence that government ideology significantly influences equity returns or volatility. While some country-specific effects and weak indications of market reactions to government changes appear, these results are not consistent across specifications. Our findings suggest that ideology-related risk is minimal and that EU-level institutional constraints likely mitigate national policy impacts on domestic markets. We also find no evidence that small-cap indices are more sensitive to partisan cycles, challenging prior claims that multinational firms are insulated from domestic politics. These results contribute to the literature by introducing a unique political risk metric and reinforcing the view that PBCs exert only limited economic effects. Future research should explore institutional factors, such as electoral systems, to better understand the interaction between politics and financial markets.

## Parallel Session 6D: Environmental, Social and Governance

### **Sources of Oil Price Fluctuations and Dynamic Elasticities in a General Equilibrium Model**

Romain Houssa (UNamur), Jolan Mohimont (National Bank of Belgium)

This paper develops a Real Business Cycle model to characterize how dynamic price elasticities of oil supply and demand shape the transmission and persistence of structural shocks to global crude oil prices. These elasticities capture the gradual adjustment of oil producers and consumers over time. The model derives closed-form solutions for the contemporaneous and dynamic elasticities. Using Bayesian methods, we estimate the model with monthly data on industrial production and oil market indicators (production, inventories, and prices). Diffuse priors yield constant elasticities over time, contrary to empirical evidence. In contrast, informative priors—or enlarging the information set with drilling activity data—produce dynamic elasticities that increase with the horizons and raise the share of oil price variance attributed to supply shocks.

## **Is There a Resource Curse in the US and Canada: Evidence from the Shale Revolution**

Steven Yamarik (California State University Long Beach), Florian Horky (National Bank of Slovakia), Jarko Fidrmuc (Zeppelin University Friedrichshafen)

We test whether the shale revolution generated has led to the resource curse in North America. Using newly published basin-level estimates of unproved technically recoverable unconventional resources as an exogenous source of variation, we identified the long-run effects of resource abundance on regional economic growth across U.S. states and Canadian provinces. Applying two-stage least squares estimation as well as DiD analysis, we present that resource dependence - proxied by mining production and employment - negatively affects regional growth. These results hold across multiple specifications, alternative GDP measures, and instrument sets, underscoring the robustness of our findings. Moreover, the estimated effects are economically important. For North America as a whole, a one percentage point increase in mining production is associated with a reduction in annual per capita GDP growth of approximately 0.13 percentage points, while a similar increase in mining employment reduces growth by about 0.16 percentage points. Thus, the shale revolution appears to have induced structural adjustments similarly to those observed in classical resource booms. Our analysis of transmission mechanisms suggests that the education channel plays a central role in this recent episode. Resource abundance is associated with a decline in the share of college-educated workers, reduced non-resource tax revenues, and lower trade openness, while showing no significant effect on investment. These patterns indicate that resource-driven labor market shifts toward high-paying blue-collar jobs may have discouraged skill formation and long-term diversification. The evidence for Dutch disease effects, reflected in relative price changes, further reinforces the interpretation that resource booms can crowd out tradable sectors even in advanced economies.

# **Do Credit Rating Agencies Interpret ESG Disclosures Differently? Evidence from Moody's and Fitch Downgrade Action**

Sylwia Frydrych (Warsaw School of Economics), Paweł Kliber (Poznan University of Economics and Business)

**Research Background:** ESG information is increasingly incorporated into European credit risk assessment, but prior research often treats credit ratings as homogeneous outputs and assumes similar ESG interpretation across agencies. This study questions that assumption by focusing on Moody's and Fitch downgrade actions.

**Purpose of the Article:** The article examines whether Moody's and Fitch differ in how they incorporate ESG-related information into corporate credit rating downgrades. It distinguishes between persistent ESG performance, captured by lagged ESG scores, and salient negative ESG events, captured by ESG controversies.

**Methods:** Using a rating-action-level dataset of European corporate issuers jointly covered by Moody's and Fitch from 2015 to mid-2025, we estimate binary response models for downgrade actions. Two-year lagged Refinitiv ESG scores proxy long-term ESG-related signals, while contemporaneous ESG controversies capture immediate negative shocks. The analysis combines agency-specific estimations with pooled models including agency interaction terms.

**Findings & Value Added:** The results reveal clear cross-agency heterogeneity. Fitch systematically associates stronger two-year lagged ESG scores with a lower downgrade probability, suggesting that long-term ESG performance acts as a risk-mitigating signal. No comparable association is found for Moody's. By contrast, both agencies react similarly to ESG controversies, associated with higher downgrade probability. These findings show that ESG integration in credit ratings is institutionally mediated and depends on the timing and nature of ESG information. The study cautions investors and regulators against assuming uniform ESG-informed credit risk assessments across rating agencies.

# **ESG Scores as a Buffer Against Credit Rating Downgrades: Evidence from European Corporate Issuers**

Pawel Kliber (Poznan University of Economics and Business), Sylwia Frydrych (Warsaw School of Economics)

**Research Background:** Credit rating downgrades are critical events for corporate issuers, particularly in European capital markets where ratings affect financing conditions and investment constraints. Existing evidence documents a weak contemporaneous relationship between ESG scores and credit ratings, raising questions about whether ESG-related information is ignored or incorporated into rating transitions.

**Purpose of the Article:** This paper examines whether ESG score levels act as a buffer against credit rating downgrades for European corporate issuers. It contrasts the lagged integration of ESG scores with the contemporaneous impact of ESG controversies on downgrade probability.

**Methods:** The analysis is based on European non-financial corporate issuers observed between 2015 and mid-2025. The empirical framework operates at the rating-action level. ESG-related signals are captured using Refinitiv aggregate ESG scores and pillar-level indicators. ESG scores are included with one- and two-year lags, while ESG controversies enter contemporaneously. Binary response models are estimated with financial controls and sector indicators.

**Findings & Value Added:** Lagged ESG scores, particularly at the two-year horizon, are significantly associated with lower downgrade probability, indicating a rating cushion linked to sustained ESG-related signals. In contrast, contemporaneous ESG scores are not significantly associated with downgrade risk. ESG controversies are associated with immediate increases in downgrade probability, confirming the asymmetric treatment of positive and negative ESG information. Pillar-level results show that Environmental and Social dimensions are the primary contributors to long-term downgrade resilience, with Governance providing incremental protection when sustained. Overall, ESG-related signals influence downgrade risk dynamically and asymmetrically.

## Parallel Session 6E: Crisis and Uncertainty

### **Northern insights: Geopolitical risk from Finnish news media**

Joni Heikkinen (Bank of Finland), Gene Ambrocio (Bank of Finland),  
Zuzana Fungacova (Bank of Finland), Eeva Kerola (Bank of Finland),  
Iikka Korhonen (Bank of Finland), Anni Norring (Bank of Finland)

We construct a geopolitical risk indicator for Finland using local, Finnish language news media - FinnGPR. We compare FinnGPR to global and country-specific measures of geopolitical risk derived from Anglo-Saxon media. We show that in the case of Finland, local geopolitical risk perceptions based on local news media differ from global attention on geopolitical risk in Finland as reflected in the global media. We study the effects of FinnGPR on the Finnish economy and find that the Finnish economy tends to be resilient to geopolitical risk shocks. Nevertheless, we find that geopolitical risks can represent a threat to Finnish financial market stability.

## **Measuring Geoeconomic Tension: A Large-Language-Model Approach for the Euro Area**

Demosthenes Ioannou (European Central Bank), Raffaele Prioriello (European Central Bank), Agha Durrani (European Central Bank)

We construct an index of geopolitical and geoeconomic tension for the euro area using Large-Language Models (LLMs) that prompt a large dataset of European newspaper articles. The resulting LLM Geoeconomic and Geopolitical Tension (LGPT) index and its subindices seek to provide an accurate narrative of tensions and their sources over the last quarter century. The LLM approach allows for a separation between geopolitical and geoeconomic tensions and for granularity in the identification of the source of such tensions including trade, energy and finance. This lends itself to more accurate economic analysis on the impact of geopolitics on the euro area economy. The LLM approach is capable among other things of extracting trends regarding the international institutional actors involved in developments. We illustrate one potential use of the index by estimating the impact of geoeconomic tensions on output and inflation in the euro area in a Bayesian structural VAR framework.

# **Political Authority and Presidential Communications: Evidence from Social Media and Economic Policy Uncertainty**

Nikolaos Antonakakis (University of Nicosia)

While a growing literature documents that presidential social media communications affect financial markets, existing studies treat political authority as static. This paper introduces political authority as a dynamic, time-varying determinant of communication effects by exploiting Donald Trump's unique four-phase political trajectory: candidate (2015-2017), first-term president (2017-2021), ex-president (2022-2025), and second-term president (2025-present). Using 65,605 social media posts from Twitter and Truth Social merged with daily EPU indices over 2,398 trading days, I test how the market impact of policy communications varies with institutional position.

## **Channels of risk sharing in times of crisis: Evidence from European Households**

Nicola Di Rienzo (European Central Bank, and Roma Tre University),  
Eleonora Pierucc (Roma Tre University), Paolo D'Imperio (Sapienza  
University of Rome)

This study presents the first cross-country analysis of risk sharing mechanisms at micro level within the euro area, focusing on how households coped with idiosyncratic income shocks during the COVID-19 crisis. Using microdata from the Household Finance and Consumption Survey (HFCS), the analysis concentrates on the three largest euro area economies (France, Germany, Italy) and compares two distinct periods: the economic expansion from 2014 to 2017 and the pandemic-induced downturn from 2017 to 2020. Despite the severity of the crisis, the overall level of risk sharing remained broadly in line with the previous period, suggesting that existing channels were effective in preserving consumption streams. Our results show that, for households affected by employment disruptions due to the pandemic, government transfers emerged as the primary tool for mitigating income shocks. Among these transfers, social assistance programs played a particularly prominent role, exceeding the relative contribution of unemployment benefits. At the same time, reliance on personal savings as a financial buffer declined significantly, reflecting a shift toward greater dependence on public safety nets during a period of widespread economic uncertainty. These results underscore the crucial role of public interventions in stabilizing household consumption during crises. In particular, the evidence highlights the importance of broad-based, flexible social programs and responsive fiscal frameworks in strengthening household resilience in the face of systemic disruptions.

## Parallel Session 7A: Monetary Theory and Policy III

### **Estimation of the monetary policy transmission of the Bank of Russia by the Local Projections method**

Vadim Grishchenko (Bank of Russia), Tatiana Shelovanova (Bank of Russia; Higher School of Economics)

This paper investigates the transmission mechanism of the Bank of Russia's monetary policy to inflation, focusing on the simultaneous decomposition of its effects through multiple economic channels. Building on the Local Projections framework (Jordà, 2005) and recent IMF methodologies (Eklou, 2023), we isolate exogenous monetary policy shocks from the systematic policy rule. To rigorously identify the causal contribution of each transmission pathway, we employ Causal Mediation Analysis (CMA), which allows us to decompose the total policy effect into direct impacts and indirect effects operating through specific mediators. The study simultaneously evaluates three key channels prevalent in emerging markets: the exchange rate channel, the asset price channel, and the bank lending channel.

Our findings confirm that monetary policy tightening exerts a significant disinflationary effect, with the exchange rate channel serving as the primary transmission mechanism. The bank lending and asset price channels also contribute meaningfully to the overall policy impact, albeit to a lesser extent. Furthermore, we document a delayed transmission to real economic activity and uncover pronounced non-linearities in both the central bank's reaction function and the strength of policy transmission, which vary considerably with macroeconomic conditions and over time. By integrating CMA into a dynamic macroeconomic framework, this research provides a robust, causally identified decomposition of monetary policy transmission. The results offer valuable insights for policymakers in calibrating intervention strategies and for market participants in anticipating the heterogeneous effects of interest rate decisions in the Russian economy.

## **High-frequency identification of multidimensional monetary policy surprises for Russia**

Kalimzhan Beiseuov (Bank of Russia), Konstantin Buryak (Bank of Russia), Vadim Grishchenko (Bank of Russia)

This paper is focused on high-frequency identification of monetary policy surprises with regard to the Russian specifics. We use two methods: a SVAR with external instrumental variables (proxy SVAR) to obtain a univariate monetary policy shock, and a SVAR with sign restrictions as in Jarocinski and Karadi (2020) to get two orthogonal shocks related to current and future monetary policy decisions. To get high-frequency data, we compute bond yields using Nelson-Siegel procedure. Monetary policy surprises reach their peaks during crisis episodes, when uncertainty is higher and the volatility of macroeconomic indicators increases. To ensure robustness, we also use local projection estimates of the coefficients of monetary policy transmission mechanism.

## **Do Lending Standards Matter for Non-Financial Corporate Credit? Evidence from Albania**

Meri Papavangjeli (Charles University & Joint Vienna Institute), Lorena Skufi (Bank of Albania), Adam Gersl (Charles University)

This study investigates the relationship between lending standards and credit dynamics in Albania. Using a unique bank-level dataset from the Bank Lending Standards Survey, we differentiate between newly issued domestic-currency and foreign-currency loans to non-financial corporations. We construct a quantitative index of lending standards using detailed bank-level and macro-financial data. The analysis reveals that tightening internal credit criteria, driven by macroeconomic uncertainty, regulatory constraints, or risk aversion, significantly reduces new business lending, weakening bank–firm relationships. In addition, we assess the role of monetary and macroprudential policies, finding that policy changes affect domestic-currency and foreign-currency credit differently, amplifying the impact of supply-side tightening. Firms face limited ability to offset these constraints through alternative lenders, reflecting low substitutability in the Albanian credit market. The effects of tightening are persistent and intensify during economic stress, yielding important implications for monetary transmission, macroprudential policy effectiveness, financial stability, and crisis resilience in small, bank-based economies.

## **The channels of monetary policy transmission via bank security portfolios**

Oana Peia (University College Dublin), Sorcha Foster (Central Bank of Ireland)

We study the effect of large declines in banks' security portfolios on lending to the real economy. We exploit the sharp increase in key policy rates during 2022-2023, together with granular data at the security and loan level of Euro area banks. Our results show that banks' exposure to interest rate risk impacted their lending to non-financial firms. Specifically, banks experiencing larger price declines in their securities portfolios contracted credit supply to a greater extent, regardless of whether the losses in securities portfolios were realised or unrealised. We explore three different mechanisms for this effect and find that it primarily occurs through a collateral channel and a liquidity stock channel.

## Parallel Session 7B: Banking and Financial Stress II

### **Risk Propagation in the European Banking System: Amplification Effects from NBFIs and Market Risks**

Laura Valderrama (International Monetary Fund), Richard Varghese  
(International Monetary Fund)

This paper applies network analysis to examine the impact of non-bank financial institutions (NBFIs) and financial market stress on contagion risk within the interbank network. Using network-based simulations on euro area banks' supervisory data, we find that banks' strong capital and liquidity buffers significantly reduce contagion through interbank exposures: baseline scenarios show only modest capital losses and no cascading defaults. In contrast, stress originating from NBFIs under heightened market volatility markedly amplifies systemic risk. These findings highlight NBFIs and market volatility as key amplifiers of financial stress in the euro area. Our findings call for integrating contagion models into system-wide stress testing and designing macroprudential policies that encompass the entire financial ecosystem. Such policies should account for amplification risks from banks' NBFI exposures when calibrating buffers and identifying systemic institutions.

## **Contagion of Affinity: Predicting CDS Spikes in Global Systemically Important Banks**

Gisela Reichmuth (ZHAW Zurich University of Applied Sciences)

This paper examines the predictive power of credit default swap (CDS) spread correlations in the context of the 2023 Credit Suisse failure. By splitting the data into a 50-week pre-crisis observation period and a final two-week "jump" window, we analyse the transmission of systemic distress across the Global Systemically Important Bank (G-SIB) landscape. Our findings indicate that the magnitude of the CDS spread jump during the crisis was significantly correlated with the historical co-movement of those spreads in the preceding year. Specifically, we identify a striking regional divergence: European G-SIBs exhibited a near-perfect linear relationship ( $r=0.97$ ) between pre-crisis correlation and crisis-period volatility, while non-European institutions showed significantly higher idiosyncratic variance ( $r=0.59$ ). We argue that these pre-existing correlations acted as a "market-implied map" of systemic vulnerability, where banks perceived as sharing similar risk topographies to Credit Suisse were immediately penalized by investors during the liquidity run. The study concludes that monitoring long-term CDS correlation regimes provides an efficient early-warning mechanism for identifying the "next-in-line" during a localized banking failure, offering vital implications for macroprudential oversight and systemic risk management.

## **Heterogeneous Bank Failures and Type-Specific Early-Warning Rules: Evidence from 1863-2024**

Haithem Awijen (INSEEC Grande Ecole Paris), Maria-Eleni K. Agoraki (University of the Peloponnese)

Bank failures arise from heterogeneous vulnerabilities, yet empirical early-warning systems often treat distress as a homogeneous event. Using annual U.S. Call Report balance-sheet data spanning 1863–2024, complemented with supervisory cause-of-failure classifications in the interwar period and modern failure records, we develop a transparent solvency–funding taxonomy based on within-year percentiles of a solvency ratio and a non-core funding share. Each bank-year is classified into one of four states: Type A (low solvency and high non-core funding), Type B (low solvency only), Type C (high non-core funding only), and Type D (benchmark). The taxonomy receives partial external validation in the interwar period and reveals pronounced shifts in the composition of failed banks across historical and modern regulatory regimes. In panel regressions with state and year fixed effects, the type indicators predict one-year-ahead failures, with joint solvency–funding weakness associated with the highest subsequent risk. Framing early warning as screening under a fixed examination budget, era-specific thresholds outperform pooled cutoffs in detection rates and, where loss data are available, in loss-weighted recall. At the state-year level, higher lagged Type-A concentration is associated with higher subsequent failure intensity, consistent with geographically clustered fragility. Overall, the framework links balance-sheet vulnerability, supervisory monitoring, and systemic risk over long horizons.

## **Financial Contagion in China, Real Estate Markets, and Regulatory Intervention**

Shiyun Cao (Institute for Economic and Social Research, Jinan University), Jennifer T. Lai (Guangdong University of Foreign Studies), Paul D. McNelis (Boston College)

We examine sectoral risk transmission in China from 2011 to 2023, with a focus on the “Three Red Lines” policy that imposed leverage constraints on property developers. Our results show that banks consistently emerge as net receivers of systemic risk, while also functioning as key intermediaries in the transmission of shocks originating from the real estate sector. Although the policy aimed to curb systemic risk, real estate shocks continued to propagate through the banking sector, leading to a persistent increase in bank-level risk. These findings highlight the central role of banks in amplifying sectoral spillovers and underscore the importance of containing bank-mediated risk transmission to safeguard financial stability.

## Parallel Session 7C: International Finance II

### **Tariffs across the supply chain**

Nicolò Gnocato (European Central Bank), Carlos Montes-Galdon (European Central Bank), Giovanni Stamato (Central Bank of Malta)

What are the macroeconomic impacts of tariffs on final goods versus intermediate inputs? We set up a two-region, multi-sector model with global production networks, sticky prices and wages, and trade in consumption, investment, and intermediate goods. We show, analytically and quantitatively, that import tariffs on final goods have a smaller negative impact on GDP compared to tariffs on intermediate inputs, as final goods can be more readily substituted domestically. In contrast, tariffs on intermediate inputs lead to larger GDP losses, given the limited substitutability of foreign inputs. Moreover, inflation persistence is lower under tariffs on final goods, whereas tariffs on intermediate goods give rise to persistent cost pressures through production linkages. The results imply that revenue-equivalent import tariffs targeting only final goods can cushion the adverse effects of trade fragmentation.

## **Trade Restrictions, Trade Policy Uncertainty and FDI Flows**

Francesco Scianna (University of Palermo), Davide Furceri (International Monetary Fund; University of Palermo; CEPR; RCEA), Jonathan D. Ostry (University of Toronto; Bruegel; CEPR), Hites Ahir (International Monetary Fund), Luca Bettarelli (University of Palermo), Francesco Frangiamore (University of Palermo)

Using a panel of 38 host and 243 source countries over the period 1985–2023, and employing dynamic gravity-based local projections, we show that both trade restrictions and trade policy uncertainty lead to an economically significant and persistent decline in bilateral FDI flows. Cross-country differences reveal that host countries with stronger counter-cyclical fiscal policies experience smaller effects; over time, the effects are more pronounced during periods of weak growth and heightened financial stress. Moreover, trade and global value chain (GVC) linkages further amplify these adverse effects. Finally, we demonstrate that trade restrictions and, especially, trade policy uncertainty have a dual impact on FDI flows: they not only reduce the mean but also increase FDI's volatility, amplifying downside risks. Our results are robust to various specifications, including instrumental variable (IV) and difference-in-differences approaches.

## **The determinants of the BRICS countries' exports to the BRICS+ group**

Oliver Hülsewig (Munich University of Applied Sciences), Ronald Wittenzellner (Munich University of Applied Sciences)

For each BRICS country, we estimate gravity models of bilateral exports to analyze the country-specific determinants of trade within the BRICS+ group using the Poisson Pseudo-Maximum Likelihood estimator. We employ panel data covering the period from 2000 to 2024. Our empirical results suggest that most BRICS countries' exports are positively affected by rising income per capita in the BRICS+ group and negatively affected by an appreciation of the real exchange rate, which deteriorates international price competitiveness. Moreover, we find that bilateral exports from BRICS countries to the BRICS+ group are asymmetrically affected by bilateral investment treaties. China benefits from these treaties within the BRICS+ group, while in India they have a negative impact on exports.

## **America First? The Macroeconomic Implications of Punitive Tariffs in a Production Network Model**

Anne Ernst (Deutsche Bundesbank), Natascha Hinterlang (Deutsche Bundesbank), Marius Jäger (Deutsche Bundesbank; Albert-Ludwigs-Universität Freiburg), Nikolai Stähler (Deutsche Bundesbank)

Since 2018, tariffs have re-emerged as a tool for protecting domestic economies, particularly in the US. This paper examines the macroeconomic and welfare effects of various import tariff scenarios using a four-region dynamic general equilibrium model with a multi-sectoral production network. The scenarios include unilateral US tariffs, coordinated US-EU tariffs, Chinese retaliation, Europe's non-participation, and sector-specific versus broad tariffs. Our results show that tariffs initially boost domestic value-added output by making local goods relatively cheaper. While consumption can increase permanently, the output benefits are short-lived. Increased production costs and reduced global income largely offset the output gains over time. Tariff-targeted countries have an incentive to retaliate, and when they do, these output/consumption gains do not materialize. As a result, welfare effects are negative. Regardless of direct involvement in tariff conflicts, the rest of the world suffers from reduced aggregate income. The effects of tariffs and strategic interactions depend on which sectors are subject to tariffs. Overall, tariffs appear to be an inefficient tool for economic protection due to the high probability of retaliation.

## Parallel Session 7D: Macroeconomic Forecasting II

### **Forecasting the Business Cycle using a Granular Firm Level Stress Indicator in South Africa: A Reverse Unrestricted MIDAS Approach**

Michael John Meyer (University of Pretoria, and Stellenbosch University), Nicola Viegi (University of Pretoria)

The study investigates how idiosyncratic firm-level shocks contribute to aggregate economic fluctuations in South Africa through the granular hypothesis lens. While conventional macroeconomic theory suggests that firm-specific shocks diversify away in the aggregate, this assumption falters when the firm size distribution is fat-tailed, as is empirically observed in the South African economy. The paper tests the granular hypothesis of Gabaix (2011) for South Africa, using a novel panel dataset constructed from Statistics South Africa's Annual Financial Surveys covering 2007-2020, examining whether idiosyncratic shocks to large firms have aggregate macroeconomic implications. We construct a firm-level stress indicator from idiosyncratic productivity shocks to the top 100 firms and employ a Bayesian RU-MIDAS framework to assess its ability to explain quarterly aggregate GDP fluctuations. Through systematic testing of six alternative value-added measurement methods, we demonstrate that turnover-based measures achieve a granular contribution of 30.40%. This result strongly validates the granular hypothesis in an emerging market context, showing that idiosyncratic shocks to large firms do not fully diversify away in aggregate due to high concentration. We implement the RU-MIDAS framework to forecast quarterly GDP growth using the annual firm stress indicator, finding that the stress indicator exhibits clear co-movement with the business cycle and tracks major economic events. Our methodological contribution demonstrates that turnover is superior to traditional accounting-based measures for granular analysis in emerging markets. The RU-MIDAS approach allows us to effectively utilize low-frequency firm-level stress indicators to forecast high-frequency macroeconomic outcomes, demonstrating significant improvements in both point and density forecasts compared to benchmark models. The findings have important implications for macroprudential policy and the monitoring of systemically large firm behavior in South Africa.

## **Real-Time Macroeconomic Forecasting with Time Series Foundation Models**

Tim Dass (Columbia University), Simon Racheter (University of Bern), Rolf Scheufele (Swiss National Bank), Yannic Stucki (Swiss National Bank), Christoph Winter (Swiss National Bank), Alessandra Vollmer (Swiss National Bank)

This paper evaluates the forecasting performance of Time Series Foundation Models (TSFMs) and compares them with traditional time series models such as ARIMA, BVAR and random walk. A key challenge is that standard pseudo-out-of-sample exercises are often infeasible for TSFMs, since full re-estimation at each iteration is not possible due to lack of control of training data or prohibitively high computational costs. We address this challenge by conducting a real-time forecast evaluation using daily data from June 2025, covering exchange rates, interest rates, and equity prices. Our findings show that TSFMs outperform traditional models only in specific settings. Only TimeGPT consistently delivers forecast performance nearly on par with our benchmarks across all variables and forecast horizons considered. Bolt demonstrates superior performance when forecasting equity indices over longer horizons. However, besides these models, the TSFMs generally underperform, with some failing badly.

## **Diagnosing Structural Forecast Errors: A Neural Network Framework for DSGE Models**

Marco Guerzoni (DEMS University of Milan Bicocca), Alice Albonico (DEMS University of Milan Bicocca), Andrei Florin Rusu (European Central Bank)

This paper proposes a novel methodological framework that uses neural networks as diagnostic tools to identify structural misspecifications in DSGE models. Rather than treating hybrid DSGE-neural network models merely as forecasting devices, we demonstrate that the pattern of forecast improvements reveals where and why theory-driven models fall short. By augmenting a canonical New-Keynesian DSGE model with a Temporal Difference Variational Autoencoder (TD-VAE) and analyzing the resulting neural residual, we can pinpoint the origin of forecasting errors and which shock processes require richer dynamics. Applied to Euro Area data(1980Q1–2019Q4), our diagnostic framework reveals that the linearized Phillips curves constitute an ideal candidate to explain of DSGE forecast failure, with cost-push shock dynamics being particularly poorly captured. This methodological contribution shifts the focus from “can neural networks beat DSGE models?” to “what can neural networks teach us about DSGE models?” We deliberately employ a simple, canonical DSGE specification as a proof-of-concept; future work will extend this diagnostic framework to richer structural models and additional economies.

## **Forecasting economic activity with central bank narrative**

Sercan Eraslan (Deutsche Bundesbank), Eniko Gabor-Toth (Bank for International Settlements Innovation Hub)

We analyse the Deutsche Bundesbank's narrative of the German economy. Using natural language processing methods, we construct sentiment indicators and embedding factors for various topics on economic activity covered by the monthly reports of the Bundesbank. We use these indices to examine the predictive power of the Bundesbank's qualitative assessment of the German economic outlook in forecasting key short-term macroeconomic indicators. Our paper contributes to various strands of the related literature. First, the literature on central bank communication focuses mainly on the central bank speeches analysing their impact on monetary policy, inflation and asset prices. We contribute to the growing part of the literature investigating the narrative on economic activity. Second, studies using textual analysis for economic forecasting mostly extract sentiment indicators from newspaper articles. Instead we use central bank publications consisting of regular commentaries on current macroeconomic developments. In addition to sentiment indicators, we also make use of document embeddings to exploit a wide range of unobserved features of the narrative. Against this backdrop we complement the related literature by (i) introducing a novel textual dataset to analyse (non-) monetary policy related central bank communication; (ii) building central bank narrative indexes related to the economic activity; and (iii) investigating the predictive power of such indexes in forecasting key short-term macroeconomic indicators. Our findings reveal important insights into the Bundesbank's narrative of the current macroeconomic developments. First, the comovement between central bank narrative indexes and their underlying macroeconomic indicators seems to exhibit various lag/lead patterns. Finally, in a real-time recursive forecasting exercise we show that Bundesbank's narrative of the economic outlook is able to improve the forecast accuracy of several business cycle indicators, especially in economically turbulent times in Germany.

## Parallel Session 7E: Currency Risk and Credit Volatility

### **Breaking the Link: Risk, Carry, and Commodity Currencies**

Robert Lindahl (Linköping University), David Stenvall (Linköping University)

This paper investigates the stability of the relationship between commodity prices and exchange rates using a novel dataset of daily, country-specific commodity export price indices for ten major commodity-exporting economies. We first show that the relationship between exchange rates and our commodity price indices varies substantially over time, at times even breaking down entirely. We then examine the state-dependent nature of the commodity-currency relationship using threshold local projections. Our results reveal heterogeneity depending on the source of global risk. Geopolitical risk constitutes a structural break that weakens the commodity–currency link in favor of safe-haven flows into the US dollar, while periods of systemic financial stress amplify the transmission of commodity price shocks. We further show that the use of these currencies as investment vehicles can create speculative crowding. In high-carry regimes, positive commodity shocks trigger profit-taking reversals rather than sustained appreciations. Overall, our findings suggest that the commodity–currency relationship is not as permanent and stable feature as suggested in the existing literature, but is instead affected by the prevailing global financial and geopolitical environment.

## **Currency Risk, Supply Chain, and Green Energy ETFs: Evidence of Post-Paris Agreement Structural Shift**

Amin Sadeghi (University of Jyväskylä), Heikki Lehkonen (University of Jyväskylä), Kari Heimonen (University of Jyväskylä)

Concerns about global warming have significantly altered the predictability of green energy-related assets. Our in-sample analysis shows that there is a regime shift following the Paris Agreement, and exchange rate fluctuations and industrial metal returns significantly predict green energy ETF returns when interacted with oil volatility (OVX) and climate policy uncertainty indices. Out-of-sample forecasts demonstrate that exchange rate and industrial metal-based predictors generate statistically and economically significant returns for the group of green energy ETFs, with predictability increasing at longer forecast horizons. These findings suggest that currency risk and supply chain exposures are underappreciated determinants of green energy asset prices, with implications for portfolio allocation and risk management in the energy transition.

## **Protectionist U.S. Trade Policies and the Cross-Section of Emerging Market Currency Returns**

Jantke de Boer (Ruhr University Bochum), Stefan Eichler (TU Dresden)

This paper analyzes the impact of expected US protectionist trade policies on the cross-section of emerging market exchange rates, using intraday data from US presidential TV debates in the period 1996 to 2016 as exogenous shocks. Currencies depreciate when the protectionist candidate wins the debate, with stronger effects for countries with more exports to the US. Higher FX reserves, capital controls, higher net foreign assets, and political stability mitigate currency depreciation. Latin American currencies experience significant larger depreciation after protectionist shocks, while Asia-Pacific currencies experience less depreciation.

## Parallel Session 8A: Exchange Rate Economics II

### **Global and Regional Currency Factors: A Case of Central European Exchange Rates**

Sona Benecka (Czech National Bank)

We analyze currency co-movement in a hierarchical international monetary system, focusing on the Czech koruna (CZK), Polish zloty (PLN), and Hungarian forint (HUF). While the U.S. dollar is the dominant global currency, CEE exchange rates are also influenced by euro-area conditions and region-specific shocks, implying that their responses to global dollar pressure are shaped by the euro leg and regional dynamics. We propose a unified framework that decomposes exchange rate movements into a global USD factor, a European/euro-area factor, and a CEE regional factor. We estimate these components using complementary factor methods (PCA, a Gaussian dynamic factor model, a canonical-correlation approach, and a hierarchical dynamic factor model) and examine time-varying factor exposures and drivers using dynamic model averaging. The results document robust hierarchical co-movement: the USD and EUR global factors differ, a euro-centered second-level factor emerges in USD panels, and the CEE factor is strongly local in EUR-denominated rates.

# **The Central Bank of Russia's Strategic FX Policy Response to the 2022 Financial Sanctions**

Juha-Matti Tauriainen (University of Jyväskylä), Juha Junntila (Oulu Business School)

This paper investigates the Central Bank of Russia's (CBR) foreign exchange (FX) policy response to the 2022 Western financial sanctions imposed following the invasion of Ukraine. Using a non-Gaussian Bayesian Structural Vector Autoregression model, we identify the roles of geopolitical risk, commodity terms of trade, FX reserves, interest rate differentials and the ruble spot FX rate in shaping the CBR's strategic behavior. A key contribution is the incorporation of short-term commodity trade finance as a transmission channel, captured through persistent deviations from the covered interest parity under capital controls. In this channel, arbitrage opportunities incentivize foreign intermediaries to maintain trade and financing relations with Russia. These insights contribute to emerging literature on geoeconomics, analyzing linkages between geopolitics and international finance.

## **The Two Fixings for the Chinese Yuan: Central Bank vs. Market**

Qisi Zhang (Ghent University), Michael Frömmel (Ghent University)

This paper examines the relationship between two significant Renminbi (RMB) benchmark rates: the onshore domestic fixing (CNYFIX), set by the central bank, and the offshore international fixing (CNHFIX), derived from market transactions. Utilizing a Markov Switching Error Correction Model (MSECM), the study investigates their alignment and deviations. The findings reveal that the onshore market demonstrates a consistent mean-reverting behavior, reflecting the central bank's stabilization-oriented exchange rate policy stance. In contrast, the offshore market is influenced by the interest rate differential (IRD), which leads to regime shifts. The model captures non-linearity by adjusting transition probabilities based on deviations in fixings and the IRD. A higher IRD weakens the persistence of the mean-reverting regime, thereby diminishing the convergence between onshore and offshore rates. These results highlight the crucial role of the IRD in shaping the interaction between policy-driven and market-driven RMB exchange rates.

## **Communication Confounds: The Case of Brexit**

Hareem Fatima (Universidad Pontificia Comillas), Peter Claeys  
(Universidad Pontificia Comillas)

This paper investigates how actor-specific communication from political, technocratic, and journalistic sources influenced volatility in the EUR/GBP exchange rate during the Brexit referendum period (2015–2017). Utilizing GARCH and eGARCH models, the study finds that not all Brexit-related news influenced markets; instead, volatility was driven by the tone, timing, and credibility of the message. Central banks and journalists had a stronger effect than politicians, whose repeated “hard Brexit” messaging often fell into the realm of “cheap talk.” The study contributes to behavioral finance and macroprudential literature by integrating sentiment analysis and credibility theory into exchange rate models. It concludes that communication is both a systemic risk amplifier and a stabilizer—and must be wielded strategically during periods of geopolitical uncertainty.

## Parallel Session 8B: Macroeconomic Theory and Policy II

### **House of Cards or Rock Solid? Shadow Economy Empirical Identification with D(S)GE**

Andrzej Torój (SGH Warsaw School of Economics and Fiscal Council in Poland)

This paper aims to shed new light on existing dynamic (stochastic) general equilibrium models, and their applications, related to shadow economy (SE) measurement. Since the measurement alone usually constitutes only part of such applications, in which relatively more attention is devoted to fiscal policy analysis and simulations, little room is left for sensitivity checks. I expand on this by investigating 3 models representative of this literature strand: that of Elgin and Oztunali (2012) (highly related to Ihrig and Moe, 2004) as Model 1, Marshall et al. (2023) (highly related to Solis-Garcia and Xie, 2018) as Model 2, and Orsi et al. (2014) (highly related to Herranz and Turino, 2023) as Model 3. I verify the sensitivity of the SE estimates with respect to the: (i) identification scheme (i.e. set of equations and observables selected to derive the shadow output formula), (ii) parameter values, (iii) further assumptions on proxy data or external SE level for some base period. The key finding is a high level dependence of Model 1 and Model 2 on the base period SE share, sourced from previous studies based on MIMIC approach where level identification is also missing. In the identification scheme applied with Model 2, the scaling of the TFP index appears – deeming as a minor technicality – appears to be critical for the result. Model 3 takes full advantage of the DGE approach with the self-contained identification of the SE level through the computation of the steady state. This comes at a cost of assuming a deterministic, common labour productivity trend for both shadow and formal sector. Future research should prioritize richer model structures (probably in exchange for less transparency) that create room for using more observable variables that are more closely linked to the shadow sector, and estimated models with a thorough parameter identification analysis.

## **Short-Run and Long-Run News: Evidence from Giant Commodity Discoveries**

Kirill Shakhnov (University of Surrey), Jean-Paul L'Huillier (Brandeis University), Laure Simon (Bank of Canada)

The bulk of the news shocks literature focuses on shocks materializing after 4 or 5 quarters, with limited evidence on news about longer-run events. We build a new dataset of discovery and production start dates for a wide range of giant commodity discoveries worldwide from 1960 to 2012. Standard open economy models match the empirical responses of short-run news, but fail in the case of long-run news. Incorporating financial frictions in the form of collateral constraints is crucial for capturing the dynamics implied by long-run news. We also provide direct evidence on the role of these frictions.

## **Uncertainty and the Demand for Cash: Robust Inference with Missing High-Frequency GDP Data**

Jan Acedański (University of Economics in Katowice), Jacek Pietrucha (University of Economics in Katowice)

Empirical work at high frequency is often constrained by the absence of high-frequency measures of economic activity, most notably GDP. We study the role of economic uncertainty and other determinants of cash demand using a novel robust inference framework for regression with a missing high-frequency variable. Instead of relying on a single disaggregated GDP series, we combine sensitivity analysis for omitted variable bias with methods of temporal disaggregation. We evaluate inference robustness across the entire set of feasible high-frequency GDP paths consistent with observed quarterly data and mild additional restrictions, allowing valid statistical conclusions without committing to a specific disaggregation procedure. The empirical analysis uses monthly data for a sample of advanced and emerging market economies over the period 2001–2021, with country-specific cash demand equations. The results indicate that the effect of economic uncertainty on cash demand is heterogeneous across countries. For all advanced economies, uncertainty has statistically insignificant impact, while a positive response to rising uncertainty is found in a subset of emerging market economies. When attention is restricted to extraordinary increases in uncertainty during crisis periods, a statistically significant effect emerges exclusively for Poland. Interest rates exert a negative and economically meaningful effect on cash demand across most countries, consistent with standard money demand theory. The proposed inference framework shows that these findings are quite stable despite missing monthly GDP data. Low decision-change probabilities indicate that standard short-run cash demand regressions can deliver reliable inference even when high-frequency output measures are unavailable.

## **Uncertainty Shocks and Economic Activity: A Meta-Analysis**

Dimitrios Bakas (Nottingham Trent University), Krzysztof Beck (Lazarski University), Karen Jackson (University of Westminster), Georgios Magkonis (University of Portsmouth), Valeryia Yersh (Lazarski University)

Following the Global Financial Crisis, a substantial body of academic literature has examined the impact of uncertainty shocks on economic activity, yet findings remain mixed, particularly regarding their magnitude and persistence. To understand these discrepancies, this study conducts the first meta-analysis of the empirical VAR-based literature, drawing on more than 2,000 reported impulse responses across different time horizons from 73 studies. Our results provide evidence of publication bias, with researchers more likely to report short-run negative effects. Nonetheless, we find a genuine negative effect of uncertainty on economic activity beyond any publication bias. Moreover, the choice of uncertainty measure and the methodological framework are two key factors that significantly influence the estimated responses. These findings underscore the importance of methodological rigour in empirical research on uncertainty and its macroeconomic implications.

## Parallel Session 8C: Macroprudential Policy II

### **Developing a Financial Stability Network Model: The Macroprudential Two-Mode Network (M2MN) toolbox**

Martin Saldias (Banco de Portugal), Daniel Maas (Oesterreichische Nationalbank), Roberto Panzica (Banco de Portugal)

This paper introduces the Macroprudential Two-Mode Network Analysis Toolbox (M2MN), a modular framework designed to assess credit risk shocks and contagion through overlapping exposures in banking systems. The M2MN toolbox uses a weighted two-mode network structure linking banks to grouped credit exposures, capturing indirect interconnectedness and systemic vulnerabilities arising from portfolio overlaps. The framework comprises three integrated modules: (i) a network diagnostics module that computes exposure-based metrics and community structures; (ii) a first-round sensitivity analysis simulating credit losses and capital impacts under CRR2 regulatory thresholds; and (iii) a second-round effects module. The toolbox is applied to supervisory data for 31 Portuguese banks, with calibrated scenarios targeting key exposures. Results show that most losses are absorbed by voluntary capital buffers, with limited contagion under conservative stress assumptions, reflecting the strong capitalization of the system. The M2MN toolbox provides a flexible and empirically grounded platform for systemic risk monitoring, buffer calibration, and supervisory scenario design, contributing to the refinement of macroprudential tools within the regulatory framework.

## **Macroprudential Policy, Bank Regulation, and Income Inequality: Cross-Country Evidence**

Adam Gersl (Charles University), Zuzana Metelakova (Charles University)

This paper examines how microprudential policy (bank regulation) affects income inequality, and whether and how the effect of macroprudential policy on income inequality depends on the stance of microprudential policy. Applying the system GMM method on a dataset covering 70 countries over a period of almost two decades, the analysis provides evidence that tighter microprudential policy leads to a reduction in income inequality as measured by the Gini coefficient. Nonetheless, the effect of an overall tightening of microprudential policy disappears in countries with low levels of economic development. Among the inspected individual microprudential policies, the power and independence of supervisory authorities have the greatest effect on income inequality. In addition, the results suggest that macroprudential policy tightening is effective in reducing income inequality under a strong microprudential policy framework, while the effect is reversed under a weak microprudential policy regime. This paper contributes to the growing literature on the spillover effects of banking regulation and supervision and on the relationship between financial sector policies and income inequality.

## **Macroprudential Policy and Firm Leverage: Theory and Evidence from China**

Athanasios Andrikopoulos (University of Sussex), Zhongfei Chen (Jinan University), Kexin Li (Peking University)

This study investigates whether and how macroprudential policy tightening can mitigate systemic risks arising from excessive corporate leverage. We develop a theoretical framework that motivates the construction of a composite macroprudential policy index and derive testable predictions concerning its asymmetric effects on corporate debt maturity structures. Using a comprehensive dataset of 2,442 listed nonfinancial firms in China from 2002 to 2020, we find that tighter macroprudential policies significantly reduce firm leverage—measured both in ratio and logarithmic form. The effects, however, are heterogeneous: policy tightening constrains short-term leverage more strongly than long-term leverage, and the impact varies with the intensity and direction of policy changes as well as with firm characteristics such as ownership type, size, and listing board. However, we find no evidence that firms substitute into bond debt or trade credit in response to tighter macroprudential measures. Our results emphasize the effectiveness of macroprudential tools in containing corporate leverage and highlight important asymmetries that policymakers should consider in the design and use of such instruments.

## **Are Sector-Specific Bank Capital Requirements Still Useful? Evidence from a DSGE Model**

Jolan Mohimont (National Bank of Belgium), Thomas Lejeune (National Bank of Belgium)

We examine the impact of sector-specific bank capital requirements using a New Keynesian dynamic stochastic general equilibrium (NK-DSGE) model. In the model, banks issue long-term residential mortgage and corporate loans, face credit default risks, and must comply with risk-weighted capital requirements. We show that sector-specific instruments crowd out credit supply in other untreated sectors and these crowding out effects depend on the banks business model, loan maturities, and initial risk weights. In addition, adding multi-period fixed-rate loans amplifies the propagation of default risks and strengthens the effectiveness of macroprudential policy. This amplification operates through a bank capital channel and a market timing effect that delays borrowing and investment when rates are expected to fall. The bank capital channel also propagates shocks across sectors via universal banks granting both corporate and mortgage loans.

## Parallel Session 8D: Fiscal Policy II

### **Fiscal policy shocks and financial stability**

Nikolay Hristov (Deutsche Bundesbank and CESifo), Oliver Huelsewig (Munich University of Applied Sciences and CESifo), Benedikt Kolb (Deutsche Bundesbank)

Fiscal policy shocks have a significant impact on financial stability. In a sample of 19 advanced economies, we document that contractionary fiscal innovations -- irrespective of whether they occur on the spending or the tax revenue side - while leading to short-lived increase in financial stress indicators, are associated with a significant reduction in a broad range of the most common medium-term oriented indicators of systemic financial risks. Likewise, expansionary fiscal shocks induce a short-run reduction of financial stress but a significant increase in systemic risk in the medium term. These findings are robust to using different measures for tax surprises or government spending shocks. Moreover, we find no evidence for asymmetries between fiscal contractions and expansions. In a DSGE model with endogenous bank runs, we show that financial sector leverage is a key driver of the increase in financial risk after expansionary fiscal shocks.

## **Spending on the frontline: The macroeconomic implications of rising defence expenditure**

Daragh Clancy (Central Bank of Ireland), Matija Lozej (Central Bank of Ireland)

European countries plan to boost their defence capabilities to deter external security threats. This implies a substantial change in the volume and composition of fiscal expenditure, as well as the structure of the industrial base. We analyse the macroeconomic implications of alternative policy choices to boost national security. We augment a global dynamic general equilibrium model to include a public good role for defence capabilities, a defence industry with R&D externalities, trade in military equipment, and public investment in dual-use goods. We show that rising security concerns can reduce all forms of economic activity. Enhancing defence capabilities mitigates this effect and boosts aggregate output (GDP) through increased defence industry production and government value added. However, this reorientation leads to a permanent crowding out of private consumption and a minimal effect of CPI inflation, unless the shock is temporary.

## **Monetary–Fiscal Interactions and the Liquidity Channel of Debt Sustainability**

Cristiano Cantore (Sapienza University of Rome), Matteo Gatto (Sapienza University of Rome), Francesco Saverio Gaudio (Sapienza University of Rome), Pascal Meichtry (Banque de France)

This paper examines how the steady-state debt-to-GDP ratio shapes the transmission of fiscal and monetary policy shocks in a tractable heterogeneous-agent New Keynesian model. When households value government debt for its liquidity services for self-insurance, higher debt levels amplify the adverse fiscal consequences of expansionary government spending shocks. With debt already high, fiscal expansions require the central bank to maintain higher real interest rates for longer to sustain liquid-asset demand and clear bond markets, raising debt servicing costs and reducing fiscal space. By contrast, the transmission of monetary expansions is largely insensitive to steady-state debt levels. The results highlight the crucial role of the liquidity premium and self-insurance motive in shaping the interaction between initial public indebtedness and debt sustainability.

## **Domestic and Spillover Effects of EU Defense Spending**

Davide Furceri (International Monetary Fund; University of Palermo; CEPR; RCEA), Pedro Juarros (International Monetary Fund), Saurabh Mishra (Taiyo), Anh D.M. Nguyen (International Monetary Fund), Ana Sofia Pessoa (International Monetary Fund), and Alexandre Sollaci (International Monetary Fund)

Europe's defense spending is undergoing a historic shift. With NATO members expected to reach 2% of GDP and discussions underway to increase targets to 5% by 2035, this paper examines the macroeconomic consequences of such rearmament. Using an annual panel dataset covering 27 EU countries over the period 1989–2023, we show that defense spending has a positive effect in stimulating economic activity, especially in the short term, and sizable cross-border spillovers. Importantly, we find that spending multipliers vary considerably across countries and over time: they tend to be larger when import intensity is low, fiscal space (captured by sovereign yields spread) is ample, and public investment efficiency is high. These findings underscore the importance of country-specific structural and fiscal conditions in shaping the macroeconomic impact of Europe's ongoing defense buildup.

## Parallel Session 8E: European Economics II

### **Monetary Policy Effectiveness in the Euro Area: A Cross-Country Analysis with Vector Autoregressions**

Erneszt Kazmin (Corvinus University of Budapest), Miklós Váry  
(Corvinus University of Budapest & ELTE Centre for Economic and  
Regional Studies)

This paper revisits the question of how heterogeneously the European Central Bank's (ECB's) monetary policy shocks transmit to individual Euro Area (EA) member states. Compared to earlier studies, it makes use of a longer sample that includes the time period between the Global Financial Crisis and the COVID-19 pandemic, thereby, a larger number of EA member states and a period with a binding zero lower bound on the policy rate. The series of common monetary policy shocks is identified using a sign-restricted structural vector autoregressive (VAR) model. Then, it is added to country-specific VARs as an exogenous variable, allowing to estimate each member state's output and price level responses to the same shocks. In line with the existing literature, the ECB's monetary policy is found to be typically more effective in more developed core countries than in less developed peripheral ones. Compared to previous studies, this paper makes use of a larger set of country-specific structural characteristics to explain the estimated cross-country differences. In general, financial variables turn out to have larger explanatory power than real economic variables emphasized by the earlier literature. The results imply that the costs of having sacrificed independent monetary policy may be larger for peripheral EA member states with less developed financial markets, hence, they have to rely more on their national policies to stabilize their business cycles. The ECB also has to consider cross-country heterogeneity in the responses to its monetary policy interventions, while designing them.

## **Is monetary policy transmission heterogeneous across euro area countries and time? A reassessment**

Agnès Bénassy-Quéré (Banque de France), Matthieu Bussière (Banque de France), Thaïs Massei (Banque de France), Arthur Saint-Guilhem (Banque de France; European Central Bank)

This paper assesses the degree of heterogeneity in monetary policy transmission across euro area countries for the period 2000–2025. Using monthly local projections, we estimate the effects of monetary policy on a broad set of transmission variables at both the euro area and national levels. We find that the responses of mortgage and labor market variables display significant asymmetries. In contrast, the responses of output and inflation remain notably homogeneous. Second, our results suggest that key structural differences, including household indebtedness, debt maturity, interest rate rigidity and sectoral composition, shape the national responses to a common monetary policy shock. However, taken altogether, these differences tend to offset one another, resulting in a broadly uniform transmission of monetary policy across euro area countries. Third, based on a rolling-window estimated FAVAR, we document that time-varying heterogeneity in monetary policy transmission features temporary and crisis-driven divergences linked to strong policy interventions, followed every time by a reversion to a low baseline level.

## **Monetary Integration and Structural Change in a Small Open Economy: Evidence from Slovakia**

André Casalis (National Bank of Slovakia), Gregor von Schweinitz (Corvinus University)

This paper studies how Slovakia's adoption of the euro in 2009 affected the structural macroeconomic relationships governing inflation, output, and monetary policy. We estimate a two-country structural VAR for Slovakia and the rest of the euro area, allowing for regime-specific contemporaneous interactions while keeping lag dynamics comparable across regimes. We find that euro adoption led to a pronounced flattening of the Slovak Phillips curve and a decline in the inflation sensitivity of aggregate demand, substantially reducing the inflation-output trade-off. Post-euro, Slovak supply and demand relationships become quantitatively similar to those of the euro area. These results suggest that monetary integration can induce genuine structural convergence in small open economies, reflecting changes in nominal anchoring and real economic integration beyond the mechanical loss of an independent monetary policy.

## **Online Social Interaction and the European Macroeconomy**

Luca Onorante (Joint Research Centre - European Commission), Luigi Longo (Joint Research Centre - European Commission), Konstantin Boss (Joint Research Centre - European Commission)

We show how discussions among social media users can be used to improve our understanding of inflation and unemployment dynamics in Europe. We extract forward-looking and context-sensitive sentiment from millions of Reddit posts and, crucially, from their associated comments threads and user feedback. Our empirical results show that taking discussions into account delivers consistent gains in out-of-sample accuracy relative to indicators built without consideration for social interaction, as well as relative to daily newspaper sentiment and financial variables. Moreover, we find that Reddit-based signals which incorporate comments significantly enhance explanatory power for business and consumer expectations. Our results suggest that the interaction among social media users can describe general expectations and sentiment better than indicators without social interaction. Overall, our paper highlights the role of online social discussion in selecting appropriate economic information.

## Parallel Session 9A: Macroprudential Policy III

### **Macroprudential Policy Spillovers and Banks Profitability**

Ernest Owusu Boakye (University of Jyväskylä), Kari Heimonen  
(University of Jyväskylä)

This study investigates the spillover effects of macroprudential policy stances on bank profitability in the European Union (EU) and United States (U.S.) using a dynamic connectedness framework. The results reveal strong asymmetry in policy transmission. EU macroprudential policies: aggregate stance and GDP-weighted intensity are dominant systemic transmitters, explaining up to 43% of incoming shocks for major EU banks and 29–34% for leading U.S. banks. In contrast, U.S. macroprudential stances exhibit limited influence; the aggregate stance acts as a net receiver with negligible spillovers, while the GDP-weighted stance shows moderate effects, contributing less than 20% even for the most exposed banks. These findings underscore the global reach of EU policies and the inward orientation of U.S. measures, highlighting the need for cross-border coordination and integration of foreign shocks into stress-testing frameworks.

## **How banks' sustainability activities shape borrowers' ESG performance: Evidence of peer effects through lending networks**

Geyao Zhang (University of Leeds)

As corporate Environmental, Social, and Governance (ESG) strategy has received relatively high attention, financial institutions are playing an increasingly critical role in shaping corporate sustainable behavior. Although existing research has mainly focused on the internal factors that can influence firm's ESG decision, the role of banks as external organisations who exert ESG influence through credit relationships has not been fully revealed. In this article, we explore how banks' sustainable strategy affect the ESG performance of their borrowers. Based on a global panel dataset of 2,038 leveraged loan facilities over the period 2002 to 2023, we find that banks' ESG strategy will significantly promote the improvement of their borrowers' ESG performance, while designation as green bank is likewise positively related to borrowers' ESG outcomes. The analysis addresses common endogeneity issues and includes firm and year-fixed effects. Further analysis shows that stable lending relationship between banks and borrowers can significantly enhances the ESG transmission effect, while sustainable regulation at the national level can strengthen banks' ESG influence. Finally, we found significant ESG peer effects at the industry and regional levels, indicating that the ESG impact transmitted by banks can further spread to non direct borrowing firms. This study expands the literature on sustainable finance, revealing the communication pathways of ESG policies in credit markets.

## **Resilience and Distributional Effects of Borrower-Based Macroprudential Policies: Evidence from a Cross-Country Micro-Macro Simulation**

Stelios Giannoulakis (Athens University of Economics and Business),  
Marco Forletta (European Central Bank), Marco Gross (International  
Monetary Fund), Eugen Tereanu (Joint Vienna Institute)

We develop and apply a multi-country micro-macro simulation model to assess the resilience and distributional effects of borrower-based macroprudential policies (BBMs) in the European Union. The model integrates household-level balance sheet dynamics, labor market risks, macroeconomic scenarios, and banking system exposures to quantify the impact of loan-to-value (LTV), debt-to-income (DTI), and debt service-to-income (DSTI) limits. Using data from 19 EU countries, we find that BBMs significantly reduce household default risks and bank capital vulnerability, with the joint implementation of limits yielding stronger effects than individual measures. The policy-induced contraction of mortgage credit partly offsets – but not overturn – the risk reductions. The resilience gains are more pronounced for households with below-median income and wealth, underscoring the policies' stabilizing effects across the distribution. These findings highlight the value of targeted BBMs in strengthening financial stability.

## **When Monetary and Macroprudential Policies Tighten Together: Evidence from the Czech Mortgage Market**

Martin Hodula (Czech National Bank), Simona Malovaná (Czech National Bank), Lukáš Pfeifer (Czech National Bank)

This paper examines how mortgage lending adjusts when higher interest rates coincide with tighter borrower-based regulatory constraints. Using loan-level data from the Czech Republic for 2020–2023, we exploit a unique policy sequence that combines rapid monetary tightening with the subsequent re-tightening of LTV, DTI, and DSTI limits in order to trace changes in borrower and loan characteristics among new originations. During the initial phase of tightening, higher interest rates curtailed mortgage lending, yet some adjustment was still possible: new loans started to feature higher downpayments and longer maturities, which partly absorbed the rise in financing costs. As tightening persisted and borrower-based limits were reinstated, these adjustment margins narrowed. Liquidity buffers were depleted, and new lending increasingly reflected financially stronger borrowers with lower leverage and lower default risk. The evidence further shows that while monetary policy primarily reduced lending volumes, it was the re-application of borrower-based limits that improved the risk composition of new loans.

## Parallel Session 9B: Financial Economics II

### **The Interaction of Capital Constraints and Financial Volatility**

Giacomo Cattelan (University of St Andrews)

This paper presents new evidence on how the countercyclicality of excess returns is driven by the interaction between the financial sector's balance sheet conditions and uncertainty shocks. Using a nonlinear specification of the local projection method to estimate impulse response functions, I find that the effects of shocks to various volatility indices—both on excess returns and real economic variables—are amplified when the financial sector was under-capitalized prior to the shock. These empirical findings are replicated by a macro-finance general equilibrium model that incorporates an occasionally constrained financial sector as in Gertler and Karadi (2011). The model introduces a novel source of uncertainty, modeled as a stochastic component affecting the total external funding available to financial intermediaries. When this “financial uncertainty” increases, it raises the likelihood that intermediaries' financial constraints will bind, triggering precautionary deleveraging. This, in turn, leads to a surge in excess returns and a decline in economic activity, effects that grow in magnitude as intermediaries' capitalization weakens.

## **The time-varying impact of risky bond supply on zero-coupon yields**

Harri Turunen (Banque de France)

We investigate how the impact of changes in government debt supply on bond yields interacts with the level of risk in a group of advanced economies: Canada, Germany, the United Kingdom and the United States. We find that the simple debt-to-GDP ratio performs well in predicting zero-coupon yields only in Canada, whereas in the United States the estimated impact of increases in debt supply is negative. We construct a novel measure of bond risk based on a TVP-VAR for the excess returns of 10-year zero-coupon bonds. By weighting the debt supply with this measure of time-varying risk, we obtain estimates for Canada and Germany that indicate that yields increase as debt and risk increase. For the United States the relationship is weaker, and for the United Kingdom we find no apparent link between yields and risk.

## **European insolvency law and firm leverage**

Beau Soederhuizen (CPB Netherlands; Nyenrode Business University),  
Fien van Solinge (Ministry of Finance Netherlands)

In this paper we examine how changes in insolvency law affect firm leverage in European countries. Recent debates have centered around removing barriers for financing firms in the step towards higher competitiveness. An important element in it is the convergence of insolvency laws. Using a comprehensive dataset covering balance sheet information for nearly 2 million European firms, we find robust evidence that improving national insolvency law is associated with higher long-term leverage ratios. This effect is most pronounced for older firms, those that are larger, and with more tangible assets. In addition, we find that total leverage is unaffected by changes in insolvency law. Instead, firms appear to substitute short term for long-term funding. Furthermore, we find supportive evidence that strengthening the judicial position of debtors is responsible for the increase in long-term leverage of firms. This is associated with a stronger demand for credit when debtors are more protected against a potential insolvency. Lastly, we find that not only the law on the books matters. Even with strong insolvency law on the book, we observe that the increase of long term leverage ratios is less pronounced in countries that suffer from long insolvency procedures.

## **Equity Duration and Monetary Policy**

Eric Offner (Frankfurt School of Finance and Management)

Equity duration plays a central role in the transmission of monetary policy to equity markets. Using dividend futures and empirical estimates of aggregate equity duration, I show that stock market reactions to monetary policy are stronger when equity duration is high. In the cross-section, variation in equity duration explains the heterogeneous sensitivity of U.S. stock returns to monetary policy across a broad set of firm characteristics, including dividend yield, market-to-book ratio, cash flow-to-price ratio, profitability, investment growth, and payout ratio. In contrast, differences in betas, size, or financial constraints do not account for this heterogeneity. An asset-pricing model in which heterogeneity stems solely from differences in cash flow maturity can reproduce these new empirical findings and clarifies the underlying duration channel.

## Parallel Session 9C: Inflation III

### **Short-term Inflation Projections: The new BoG'STIP model**

Zacharias Bragoudakis (Bank of Greece), Alexandros Karakitsios (Bank of Greece), Evangelia Kasimati (Bank of Greece)

This paper outlines the operational framework of the new Short-Term Inflation Projections model for the Greek economy - BoG'STIP model (hereafter) currently employed by the Bank of Greece within the context of the Eurosystem's inflation projection exercises. The new BoG'STIP model is designed to produce monthly projections for the Greek inflation over a 36-month horizon, providing a critical input for monetary policy decisions. It consists of a set of short-term dynamic equations for the Harmonised Index of Consumer Prices (HICP) and its main components, estimated with emphasis on both the statistical fit and the economic plausibility of the estimated coefficients. Using a pseudo real-time forecasting setup, the model is estimated over the period 1995–2021 and generates projections for 2022–2024. The findings indicate that BoG'STIP model outperforms benchmark models such as AR and ARIMA across most HICP components, except for energy, confirming its robustness and practical value despite certain limitations. The model also exhibits strong forecasting performance for headline inflation, particularly at the 12-month horizon, and effectively captures broader inflationary trends even over longer horizons (up to 36 months). The paper contributes both operationally, by documenting a projection framework compatible with the Broadly Eurosystem Macroeconomics Projections Exercise ((B)MPE) and the Eurosystem Narrow Inflation Projections Exercise (NIPE) and empirically, by providing a transparent and policy-ready inflation forecasting tool tailored to the Greek economy.

## **Business Cycle Fluctuations during the German Hyperinflation**

Mathias Cammerlander (Leopold-Franzens-Universität Innsbruck)

We employ the structural vector autoregressive (SVAR) framework with narrative sign re-strictions to analyze the transmission of aggregate demand (AD), supply (AS), uncertainty (UNC), and monetized government expenditure (MGE) shocks on unemployment and inflation data during the German hyperinflation of 1923. Time-varying impulse responses suggest that the economy was most sensitive to AS and AD shocks, while historical decompositions suggest that UNC and MGE shocks explain most of the macroeconomic instability. The hyperinflationary period ended with decisive contributions of UNC and MGE shocks to the economy. The results support the necessity of believable statutory fiscal constraints and Reichsbank balance sheet reshuffling. These uncertainty-calming reforms dampened financial market fluctuations and halted the speculative frenzy driving foreign exchange rate volatility. Restored policy credibility allowed the monetary authority to re-anchor expectations, transitioning the economy from explosive instability to equilibrium. We further highlight sluggish and problematic expectation formation and the absence of a Taylor rule as sources of instability using counterfactual analysis.

## **Can LLMs Mimic Household Surveys?: From Representative Agents to Population Distributions**

Ami Dalloul (University Duisburg-Essen), Moritz Pfeifer (University of Leipzig)

This paper studies whether large language models can simulate household surveys for measuring inflation expectations. Real-world surveys show wide disagreement across individuals, which is central for understanding how beliefs form and respond to monetary policy. Simulating surveys with large language models reveal that they accurately match average expectations but that responses collapse into a narrow range, behaving like a single representative agent. This limits their value for research that relies on variation across households. We link this failure to memorized training data and test unlearning methods that remove such information. These methods widen the spread of responses and improve replication of experimental results. The appeal of synthetic surveys lies in tools that reproduce both averages and dispersion.

## **Implied inflation expectations**

Julia Krotova (Bank of Russia), Henry Penikas (Bank of Russia)

Implied inflation expectations are expectation values calculated from responses to questions about the prices of individual goods or a basket of goods. We use internal and external surveys to compare implied estimates with direct (traditional) ones, where one of several percentage intervals is selected. After testing the collected data for consistency with stylized facts about inflation expectations, we compare all variations of the questions on expectations. We find that the implied estimates of actual inflation and inflation expectations are higher than the direct estimates. Estimates from more complex questions, where the calculation of expectations is delegated to the interviewer, are generally lower than those from simpler ones. Implied estimates of expectations from questions about the cost of a basket of weekly household expenditures may be more attractive to some respondents, although they yield higher values and may capture the income effect (the increase/decrease in the cost of the basket with a corresponding change in household income without a change in the prices of the goods themselves). Therefore, we formulate recommendations to ask the question about the basket in an open-ended form (without reference to a round expenditure amount), and to consider as a general estimate of inflation expectations only the responses of those who have not experienced and do not anticipate changes in their level of well-being. Our principal claim is that people overreact in consumer spending because they are thinking in terms of implied inflation expectations, and neither in terms of direct or diagnostic IE as suggested by Coibion and Gorodnichenko (2015); L’Huillier et al. (2024).

## Parallel Session 9D: Exchange Rate Economics III

### **FX Debt and Optimal Exchange Rate Hedging**

Laura Alfaro (Inter-American Development Bank), Julian Caballero (Bank for International Settlements), Bryan Hardy (Bank for International Settlements)

This paper examines optimal foreign currency (FX) hedging by non-financial corporations globally. Using a cross-country, firm-level dataset, we first document key patterns of FX borrowing across advanced (AEs) and emerging market economies (EMEs). We find that while FX debt is prevalent in both groups, its intensity varies considerably. We assess the optimality of firms' exchange rate exposures using a risk-management framework where hedging serves to minimize the impact of cash flow volatility on firm value. Our results indicate that most firms hedge optimally, as exposures from FX debt are largely offset by other exposures, like foreign revenues and assets. While the distribution of exchange rate risk is broadly similar between AE and EME firms, the EME distribution has thicker tails, revealing a larger concentration of firms with significant, unhedged depreciation risk.

## **How U.S. Price Conflict Shapes Global Exchange Rates?**

Yassine Bakkar (Queen's Belfast University), Sami Ben Jabeur (Lyon Catholic University, ESDES), Leila Hedhili Zaier (University of Tunis),  
Maria-Eleni K. Agoraki (University of the Peloponnese)

This paper examines how U.S. price conflict shocks, measured by the Price Conflict Index (PCI), influence the real exchange rates (REER) of the United States, China, and the Euro Area. Building on the methodology of Saadaoui et al. (2025), we employ a structural VAR approach to identify orthogonal PCI shocks and combine it with time-varying local projections (TVP-LP) to estimate the dynamic and state-dependent responses of exchange rates. The empirical framework incorporates a comprehensive set of uncertainty controls, including economic policy uncertainty (EPU), geopolitical risk (GPR), macroeconomic uncertainty, financial uncertainty, and real economic uncertainty. The findings reveal that U.S. conflict shocks trigger heterogeneous and regime dependent exchange rate dynamics across economies. While the euro appreciates in the short run as a safe haven, it later depreciates as uncertainty spills over to the real economy. China's REER shows only weak and transitory responses, reflecting its managed exchange rate regime and capital controls. For the U.S. itself, the dollar exhibits time-varying and state dependent movements, alternating between vulnerability driven depreciation and safe haven appreciation. Crucially, the TVP-LP framework uncovers substantial nonlinearity and time variation in all responses, which constant parameter models systematically mask. Our results highlight the importance of accounting for uncertainty regimes and time-varying spillover channels when assessing how geopolitical conflicts propagate across global currency markets.

## **Distributional Effects of Exchange Rate Depreciations**

Boris Fissera (Slovak Academy of Sciences), Jarko Fidrmuc (Zeppelin University)

While it is often argued that exchange rate depreciation has a beggar-thy-neighbour effect, in this paper, we investigate whether exchange rate depreciation has a beggar-thyself effect. Specifically, we explore the distributional consequences of exchange rate movements in a panel of 72 advanced and emerging economies. Using a heterogeneous panel cointegration approach, we find that, on average, small depreciations of the domestic currency decrease income inequality over the long term. However, large depreciations increase income inequality over the long term. Large appreciations of the domestic currency also increase income inequality. Next, we identify 119 episodes of managed depreciations to improve the identification of the distributional consequences of exchange rate depreciation. Managed depreciations are instances in which the central bank intervenes to depreciate its domestic currency. Using the local projections (LP) approach, we find that managed depreciation shocks decrease income inequality. Our evidence suggests that depreciations reduce inequality primarily by improving economic performance. To conclude, we find no evidence supporting the idea that a small or moderate exchange rate depreciation has a beggar-thyself effect with respect to income inequality, as it does not seem to increase inequality.

## **Do geopolitical risks raise or lower exchange rates? Asymmetries under crises periods**

Theodoros Bratis (Athens University of Economics and Business),  
Georgios Kouretas (Athens University of Economics and Business)

In this paper we discuss the volatility interconnectedness and co-movements of USD exchange rates to BRICS+ under geopolitical uncertainty. We expand the short and long run dynamic linkages and focus on the differences between pre-conflict crisis and post-conflict crisis periods. Specifically, we address the crisis and non-crisis regimes between exchange rates and GPR and detect possible bubbles due to conflicts. We compare the effects of exogenous shock events on the dynamics among cryptos and financial markets per period. Moreover, we the probability of currency appreciation/devaluation

## Parallel Session 9E: Central Banking II

### **Dynamic Interactions Between the Federal Reserve and European Central Banks**

Nikiforos T. Laopodis (The American College of Greece), Rupayan Gupta (Roger Williams University), Eleftheria Kostika (The Bank of International Settlements & The Bank of Greece)

We investigate the nature and extent of cooperation and/or policy correlation between the Federal Reserve's and the European Central Bank's main policy tools (effective fed funds rate and main refinancing operations, respectively) for the 2000-25 period. Our results generally suggest the following. First, we found that the ECB's policy tool was reacting much stronger to the Fed's policy tool and often with a lag. Hence, we may conclude a leader-follower relationship with the Fed being the leader central bank. Second, evidence of occasional policy divergencies highlights the effect of decoupling between the two rates, which implies that there was no systematic coordination of monetary policies. Third, although we observed some kind of effective synchronization of policies and co-operation between the two central banks, occasionally, in other years we saw divergences (as in 2006, 2008, 2020-2022, for example). Finally, our results do not suggest evidence of consistent similarities (correlations) in policy rate changes throughout the sample period. This was observed during the 2007/8 Global Financial Crisis period but not during the 2020-22 Global Health Pandemic period. Again, although there was some degree of correlation in the direction of monetary policy between the Fed and ECB, the timing and mechanisms differed.

## **What's the story? The media channel of monetary policy transmission to the public**

Laura Pagenhardt (DIW Berlin)

The media play a crucial intermediary role in transmitting central bank messages. This paper investigates how media coverage of European Central Bank (ECB) communication influences consumer inflation expectations, with a particular focus on what monetary policy related topics matter most to consumers. I identify seven key topics: interest rates, inflation, economic growth, purchase programme, uncertainty, fiscal policy, and financial markets. I use Latent Semantic Indexing with factor rotation to measure focus on those topics in media coverage of the ECB in leading daily economic outlets in the euro area. Employing an event-study approach, I isolate shifts in media topic focus and assess their impact on expectations through local projections. The findings reveal that media coverage significantly affects consumer inflation expectations, with discussions on inflation and economic growth raising expectations, while coverage on financial markets dampens them. Responses to the interest rate and purchase programme topics are in line with the central bank information effect. Rather than the central bank's own messaging, I find that the responses are mainly driven by the media's framing of ECB communication. Although media generally reinforce ECB messaging, the exception is the fiscal (policy) topic, where consumer expectations move in opposing directions depending on the source. These findings offer a new perspective on the role of media in the transmission of central bank communication on public expectations.

# **Monetary Policy Implementation in Times of High Excess Liquidity - Commercial Banks' Profits and Central Banks' Losses**

Ulrike Neyer (Heinrich Heine University Düsseldorf), Daniel Stempel  
(Heinrich Heine University Düsseldorf)

The Eurosystem's large-scale asset purchases (quantitative easing, QE) have resulted in huge excess liquidity holdings within the euro area banking sector. Until 2015, the banking sector faced a structural liquidity deficit that could only be covered by borrowing from the Eurosystem. Since 2015, however, the banking sector has experienced a structural liquidity surplus due to the Eurosystem's massive asset purchases. With the start of the interest rate hikes in 2022, the Eurosystem recorded significant losses, while commercial banks benefitted from high interest earnings, as the central bank has had to pay substantial interest on the commercial banks' liquidity holdings. Against this background, the aim of this paper is twofold. First, using a simple theoretical model of a banking sector, it examines how different monetary policy instruments affect commercial banks' credit supply in an environment of structural liquidity surplus. Second, it analyzes whether (a) increasing reserve requirements or (b) introducing a two-tier remuneration system for excess liquidity are effective measures to mitigate central bank losses. We conduct this analysis for a homogeneous banking sector and for a heterogeneous one, where excess liquidity is unevenly distributed across banks. We find that the interest rate applied to required reserves is crucial for the impact of different monetary policy instruments on bank loan supply, and that instruments may have a different impact than in times when banks face a structural deficit, and that banks are affected differently. Furthermore, our findings suggest that particularly a two-tier remuneration system can be an appropriate tool for reducing central bank losses.

## **The Effects of Central Bank Communication through published Forecasts on Financial Market Analysts Forecasts**

Pontsho Mathebula (University of Pretoria), Nicola Viegi (University of Pretoria)

Central banks in many advanced countries have placed increasing emphasis on improving communication of their macroeconomic forecasts to the public, especially to financial institutions and market analysts, in order to influence market expectations. The South African Reserve Bank (SARB) similarly implemented such an initiative in 2015 by releasing their monetary policy projections and this research will analyse if this communication strategy by the SARB had any effect on the private sector's projections. Specifically, the research focuses on whether private sector forecasts for inflation rate, interest rate, and GDP are correlated to the released SARB projections after their Monetary Policy Meeting (MPC). For the analysis, we construct a data set of historical forecasts published by the MPC and corresponding private sector forecasts from Reuters' market consensus survey for the period 2001 to 2021. The results indicate that the SARB's increased transparency has a positive and significant effect or that the private sector forecasts more closely align to the SARB projections after the MPC meetings.

## Parallel Session 10A: Monetary Theory and Policy IV

### **The Transmission of Monetary Policy Shocks in the Government Bond Secondary Market**

Valentina Catapano (University of Padova), Luciano Greco (University of Padova), Eleonora Turato (University of Padova)

Market liquidity constitutes a pivotal element for financial stability, ensuring that large volumes of bonds can be traded at low transaction costs. This paper aims to investigate the role of monetary policy in shaping the liquidity conditions of the Italian sovereign bond market. In particular, drawing inspiration from the works of Altavilla et al. (2019) and Jarocinski and Karadi (2020), the study examines how the distinction between information shocks and pure monetary policy shocks affects market liquidity within a structural vector autoregression (SVAR) framework. The empirical analysis is underpinned by an enriched dataset of high-frequency monetary policy surprises, complemented by granular liquidity measures derived from a rich dataset obtained from MTS Italy – the regulated wholesale secondary market for Italian government bonds – which is the first electronic market in Europe. This paper sheds light on the complex interactions between central bank actions, investor expectations, and sovereign debt markets in the euro area. The findings aim to contribute to the design of effective monetary policy frameworks and to enhance the resilience of government bond market in times of heightened uncertainty.

## **Durable Goods Demand and Monetary Policy Transmission in a Monetary Union**

Marie-Hélène Gagnon (Université Laval), Céline Gimet (Sciences Po Aix-en-Provence and Aix-Marseille School of Economics), Uroš Herman (Aix-Marseille School of Economics)

This paper examines the transmission of European monetary policy through the joint roles of durables, labour market risk, and household heterogeneity, thereby contributing to a new generation of OCA analyses. A two-country HANK model is used, in which durables are traded on a secondary market, provide direct utility services, and can be pledged as collateral under an LTV constraint that shapes their liquidity. Combining the model with a panel B-SVAR estimated on post-GFC euro area data, the analysis shows that differences in durable-asset holdings, collateral capacity, and labour market risk generate heterogeneous responses to common monetary policy shocks. The findings suggest that the distribution of durables plays a key role in shaping monetary transmission and represents an important, yet often overlooked, source of asymmetry within a monetary union.

## **Conventional monetary policy across the wealth distribution: the Maltese case**

Valentina Antonaroli (Central Bank of Malta), Germano Ruisi (Central Bank of Malta)

This paper studies how conventional monetary policy affects household wealth in Malta across the wealth distribution. We combine euro-area macroeconomic responses to a monetary policy shock with household-level microdata on assets, liabilities, income, and consumption from the 2023 Maltese Household Finance and Consumption Survey to quantify distributional wealth effects. The impact of the shock depends both on the size of households' asset and liability holdings and on the composition of their portfolios across wealth deciles. Housing and the underlying mortgage debt play a major role for the transmission of a contractionary policy. Households at the bottom of the wealth distribution appear to be the least affected, whilst middle deciles are hit the hardest. Finally, wealthiest households experience more moderate losses. Additional results on income sources and consumption-bundle prices also reveal heterogeneous effects. The former are characterised by their reliance on self-employment and entrepreneurial activities, while the latter depend on the consumption allocation for each decile. These findings underscore the importance of assessing the distributional consequences of monetary policy by exploiting the richness offered by the microeconomic data.

## **The effects of monetary policy on banks and non-banks in times of stress**

Anisa Tiza Mimun (European Central Bank), Matthias Sydow (European Central Bank), Gabor Fukker (European Central Bank)

This paper investigates the effects of monetary policy on banks and non-bank financial institutions (NBFI), with particular attention to the role of financial stress. We use high-frequency identified monetary policy shocks and state-dependent local projections to capture non-linear responses across financial sectors. Drawing on aggregated balance sheet data, including total assets, debt securities, and total loans, we find that monetary tightening leads to broad-based contractions in total assets and debt securities, with particularly pronounced effects for banks and investment funds. Loan responses are more heterogeneous, but money market funds and pension funds exhibit notable declines in loan exposures, especially under high stress conditions. Importantly, we find that financial stress significantly amplifies the contractionary effects of monetary policy across all sectors and asset classes. Our results highlight the differentiated roles and vulnerabilities of financial intermediaries in the transmission of monetary policy and underline the importance of financial conditions in determining its overall effectiveness.

## Parallel Session 10B: Banking and Finance III

### **The Role of Loan Supply and Demand Dynamics in Housing Loan Expansion and Housing Price Cycles**

Elias Oikarinen (University of Oulu), Vance Martin (University of Melbourne)

This study provides the first investigation of the joint contributions of loan supply and demand shocks, together with housing market shocks, on housing loan expansion and housing prices. A 6-variate structural vector-error correction model is specified with identification of the shocks achieved by a combination of short- and long-run restrictions, and restrictions arising from the presence of cointegration. An important feature of the model is the identification of a full set of shocks across loan, housing, goods and money markets, including the identification of supply and demand shocks in the loan market. Using quarterly Finnish data from 1985 to 2024, the empirical results show that both loan supply and demand shocks can affect financial stability by significantly influencing housing loan expansion and housing prices over the short and mid term. The findings further indicate that housing price movements are more likely to respond to loan market shocks rather than to cause loan expansion. Implications for Europe through the lens of the Finnish market of the Russian war of aggression in Ukraine are also investigated.

## **Are SWF official mandate informative ? Evidence from behavioural clustering across economic regimes**

Louise Schraeverus (CeReFiM - NaXys), Jean-Yves Gnabo (CeReFiM)

We study the extent to which Sovereign Wealth Funds (SWFs) behave in accordance with their legally stated mandates and how this alignment varies across macroeconomic regimes. We assemble a novel multi-source dataset that matches monthly portfolio equity for 36SWFs over 2000–2023 with a new text-based classification of de jure mandates. Using laws, charters, reports and websites, we construct a dictionary-driven algorithm that assigns each fund to savings, stabilisation, development, hybrid categories. This data architecture allows the first large-scale comparison between legal mandates and observed investment behaviour. Applying unsupervised clustering to portfolio and activity indicators, focusing on the post-2008 period following the Santiago Principles, we identify stable behavioural groups without imposing prior labels. We document substantial and systematic misalignment between legal mandates and actual behaviour. Misalignment intensifies during economic downturns, consistent with SWFs being repurposed as contingent fiscal or macro-stabilisation instruments when pressures arise. Robustness checks confirm the stability of the behavioural taxonomy. Overall, SWFs appear to operate less as rule-based long-term investors and more as adaptive state instruments, raising new questions about mandate credibility, accountability, and the governance of public financial institutions.

## **Rapid Monetary Transmission: High-Frequency Evidence from the UK**

Lennart Brandt (Bank of England), Johannes Fischer (Deutsche Bundesbank), Carl-Wolfram Horn (Frankfurt School of Finance and Management), Silvia Miranda-Agrippino (Oxford and CEPR), Filippo Pallotti (University College London and Lombard Odier)

We study the speed of transmission of monetary policy to economic activity in the United Kingdom, exploiting a novel dataset of daily private consumption spending, online prices, and posted vacancies. We find that high-frequency identified monetary policy shocks have significant short-run effects on household spending and posted vacancies, with both variables responding within days. The quick consumption response can be explained by heightened consumer attention to economic conditions and increased concerns about adverse labour market outcomes following contractionary monetary policy. Prices, on the other hand, react more sluggishly, with a significant response emerging only after approximately 100 days. These results provide new evidence on the speed of monetary policy transmission that went undetected in previous studies due to their reliance on lower-frequency data.

## **Asset prices, collateral and bank lending - The case of Covid-19 and real estate**

Aoife Horan (European Central Bank), Barbara Jarmulska (European Central Bank), Ellen Ryan (European Central Bank)

We study how bank behaviour may shape the financial accelerator mechanism by examining euro area banks' treatment of commercial real estate collateral during the Covid-19 crisis. Using granular credit registry data, we first show that firms relying on real estate collateral received almost a third less credit than their peers following the outbreak of the pandemic, even when endogeneity is strictly controlled for. We then study banks' revaluation of almost 5 million pieces of commercial real estate collateral over the course of the pandemic. Despite sharply cutting lending against it, banks did not engage in widespread downward revaluation of this collateral. Banks' slowness to revalue collateral appears to have amplified their lending response by increasing uncertainty regarding collateral values.

## Parallel Session 10C: Financial Econometrics II

### **Modeling Financial Contagion as a Self-Exciting Point Process**

Luca Persia (Università della Svizzera Italiana)

Financial crises rarely manifest as isolated shocks; rather, they cluster over time. Building on this idea, in this paper we propose an event-based approach to systemic risk that models the timing of extreme market movements as a point process. We construct daily stress events from left-tail return exceedances and study whether their arrival mechanism is compatible with conditionally independent shocks (Poisson benchmarks) or exhibits endogenous amplification and contagion. We estimate univariate and marked multivariate Hawkes processes, where past events increase near-term event risk and severe shocks generate stronger excitation. In a case study on the Global Financial Crisis using the S&P 500 (SPX) and the U.S. financial sector (XLF), Poisson models are rejected, while Hawkes specifications provide a substantially better fit to crisis clustering. Overall, the results support a macro-financial interpretation of crises as self-exciting processes and illustrate how Hawkes models can provide operational monitoring tools for financial stability, including measures of endogeneity, contagion, and counterfactual scenario analysis.

# **Transversality Condition Matters: Ensuring Uniqueness of Deep Learning Solutions in Continuous-Time Economics and Finance**

Aleksey Minabutdinov (ETH Zurich)

Transversality conditions are essential for uniquely identifying solutions of infinite-horizon economic and financial models. Without them, the Hamilton–Jacobi–Bellman (HJB) equation admits a continuum of solutions, and numerical methods risk converging arbitrarily to economically meaningless ones. In practice, deep learning-based solvers such as Deep Galerkin and Physics-Informed Neural Networks often ignore transversality, relying on “implicit regularization” to avoid explosive solutions. We show analytically and numerically that this mechanism can fail in endogenous growth models. We propose a functional transformation approach that maps the unbounded state space into a bounded domain and embeds the transversality condition as an amenable boundary condition. The transformed HJB equation can still be solved by standard Deep Galerkin or PINNs methods, and an explicit inverse transform recovers the initial HJB solution uniquely in one step. We derive conditions under which small residuals in the transformed problem imply small errors in the original HJB equation, and we further illustrate the approach by solving nonlinear deterministic and stochastic endogenous growth models. The results show that the approach restores uniqueness and yields accurate value and policy functions in settings where current methods might fail.

## **From Financial Stability to Real Investment: The Confidence Channel of Macprudential Policy**

Dimitris Anastasiou (Athens University of Economics and Business),  
Theodoros Bratis (Athens University of Economics and Business), Stelios  
Giannoulakis (Athens University of Economics and Business)

This paper investigates how macroprudential policy (MaP) actions shape firm investment behavior in the euro area. Leveraging firm-level data from the ECB's Survey on the Access to Finance of Enterprises (SAFE) and policy information from the IMF's iMaPP database, we examine the likelihood that firms reduce investment despite reporting a need to invest. Our results show that macroprudential tightening, on average, lowers the probability of de-investment, indicating a stabilizing effect on corporate behavior. This supports the view that regulatory actions aimed at safeguarding financial stability can bolster firm confidence and reduce precautionary investment cutbacks. However, the impact varies across policy types. Credit-based and liquidity-based measures are particularly effective in mitigating de-investment risk, while tightening housing credit policies is associated with an increased probability of de-investment - likely due to heightened collateral constraints. These findings point to a behavioral "confidence channel" through which macroprudential tools affect real firm outcomes and underscore the importance of policy design and calibration in avoiding unintended effects on investment.

## **Risk-Adjusting Forecasts for Increased Portfolio Performance**

Sebastian Stöckl (University of Liechtenstein), Lukas Salcher (University of Liechtenstein), Michael Hanke (University of Liechtenstein)

We develop and validate an easy-to-implement modification to forecasts that are used as inputs to portfolio strategies. The approach is based on a decomposition of the Sharpe-ratio gap for the tangency portfolio into its components. It purposefully combines Stein-type shrinkage of expected returns with spectral cleaning of the covariance matrix to minimize the upper bound on the Sharpe-ratio gap. Monte-Carlo simulations illustrate economic performance gains under idealized assumptions, and an application to 60 years of Fama-French data validates the approach empirically.

## Parallel Session 10D: Green Economy

### **The Macro-Regional Effects of Green Public Funds**

Carolin Nerlich (European Central Bank), Damiano di Francesco  
(Sant'Anna School of Advanced Studies)

In the paper we explore the macroeconomic effects of green public funds at EU level. We construct a novel EU-wide panel on green public funds at regional level, based on project-level information within the context of the European Structural and Investment Funds. We exploit cross-regional variation using a panel local-projection instrumental variable method. Our results confirm that green public funds contribute to raising regional GDP and crowding in private investment, while fostering green patents.

## **Firm-Level Determinants of Green Bond Issuance in a Global, Institutionally Heterogeneous Setting**

Syrine Ayachi (University of Namur; CeReFiM), Jean-Yves Gnabo (University of Namur; CeReFiM), Oscar Bernal (University of Namur; CeReFiM)

This paper examines why firms choose green bonds over conventional bonds using a global panel of corporate issuances from 2013 to 2024 that combines bond-level characteristics with firm-level financial, governance, and ESG data, as well as macro-institutional and climate-related indicators. We model bond issuance as a two-step process: first, whether a company chooses to issue in the bond market, and second, conditional on issuing the bond, whether to issue a green bond. Three key findings emerge. First, access to bond markets is driven by traditional corporate finance factors. Firm size, profitability and leverage positively influence a firm's likelihood of issuing any type of bond, while stronger legal institutions help access the market. Second, conditional on issuance, the adoption of green bonds is contingent primarily on bond design and sustainability-related factors, as opposed to financial strength alone. Larger issue sizes increase the probability of issuing green bonds, whereas longer maturities reduce it, suggesting that green bonds are typically used for sizeable but shorter-horizon financing. Governance capacity and ESG performance also increase the likelihood of green bond issuance, although their effects vary across regions. Third, institutional and environmental contexts play a critical role in determining the volumes of green bonds issued globally. Compared to other regions, Asian companies have a higher likelihood of issuing green bonds. In addition, countries with greater levels of climate vulnerability benefit most from regulations that support the development of green financial products. The findings suggest that corporate growth in green debt is driven by a combination of firm-level sustainability capacity, bond characteristics, and institutional environments aligned with climate risks.

## **Green investment, inequality and misallocation**

Louis-Marie Harpedanne de Belleville (Banque de France; Paris School of Economics)

The poor have higher present biases and face higher interest rates, but in a simple model of lumpy investment, only the latter matter when deciding whether to invest in a green durable. Non-discriminating subsidies favor the rich to the extent that they are more likely to choose the green durables, but have a stronger incentive on the poor. Only full subsidies (i.e., subsidies that fully compensate for the price difference between green and brown durables) can ensure full allocative efficiency and fairness. Such full subsidies induce the systematic choice of the green durable and are therefore not compatible with a positive private, social or environmental discount rate. The latter is defined as a social discount rate consistent with the net-zero target: it is lower than usual social discount rate, but is still positive in the presence of carbon capture technologies. Credit policies may ensure allocative efficiency and fairness over a wider range of situations.

**THE CONFERENCE IS SPONSORED BY**



**BANK OF GREECE**  
EUROSYSTEM



CRETAN RHIZOTOMISTS

**ORGANIZING COMMITTEE**

**CHAIRMAN: Nikolaos Giannellis**

University of Crete

**MEMBERS**

**Maria-Eleni K. Agoraki, University of the Peloponnese**

**George Apostolakis, University of Crete**

**Minoas Koukouritakis, University of Crete**

**George Kouretas, Athens University of Economics and Business**

**Athanasios Papadopoulos, University of Crete**

**Dimitris Sakellaridis, System Administrator, University of Crete**

**Panagiota Vlachaki, Secretariat**



**UNIVERSITY OF CRETE**  
**DEPARTMENT OF ECONOMICS**