

“Identifying Heterogeneous Bank Responses to US Monetary Policy Shocks”

(joint with Mauricio Salgado-Moreno (Bank of England))

We construct an informationally robust monetary policy instrument (MPI) and use bank-level data on excess reserves for US commercial banks to analyze whether the emergence of significant excess liquidity in the banking system influences the transmission of monetary policy. For our empirical analysis we employ panel local projections instrumental variables (LP-IV) methods, instrumenting the effective federal funds rate with our MPI to determine the causal effect of the unexpected component of monetary policy. We further refine our analysis through a state-dependency, categorizing banks in our sample into “cash liquid” and “cash illiquid” banks, using bank-specific excess reserves data. Our analysis focuses on banks’ loan supply and differentiates between unexpected monetary expansions and contractions. Our results confirm the theoretical bank-lending channel for the pre-Great Financial Crisis (GFC) sample period for both types of banks, but show a significant heterogeneity once we include the GFC and post-GFC period. Namely, “cash-liquid” banks now react with loan-supply expansions to both unexpected monetary expansions and contractions, while “cash-illiquid” banks still react in line with existing economic theory.

"System-Wide Stress Simulation: Sovereign Bond Market Fragmentation and Monetary Policy in the Euro Area"

(joint with Christoph Kaufmann (ECB) and Simon Kördel (ECB))

- We use a detailed agent-based model of the Euro area (EA) financial system to analyze the effects of a hypothetical fragmentation event in EA sovereign bond markets and a subsequent asset purchase programme (APP) intervention by the central bank. For this we build on the work of Aikman et al. (2019, BoE WP 809) and incorporate several changes: We (i) introduce a second endogenously priced sovereign bond and a new agent capturing EA-activities of non-EA investors, (ii) overhaul the behavior of the model’s commercial banking sector, turning it from a completely passive actor to a key market participant solving a complex constrained optimization problem, (iii) change the optimization problems of other model agents to be able to account for asset price changes “on-the-fly” during the model’s iterative equilibrium finding process. Using an automated EA-specific calibration, we test the model against the May 2018 Flash Event in the Italian sovereign bond markets. We show a close fit between model simulation results and the event data. Further, we show that monetary policy (in the form of asset purchases) replaces the commercial banking sector in buying the shocked sovereign bond and significantly reduces sovereign spreads, but has little impact on quantities traded (without supporting central bank communications). Finally, we show that both targeted TPI-style APPs and less targeted, PSPP-style purchases have beneficial effects – with the former one being more than twice as effective at stabilizing the shocked asset yield for the same envelope size.

Work in Progress

"An Early Warning System for Euro Area Investment Funds: A Machine Learning Approach"

- I combine a large number of granular data sets to develop an early warning system for European investment fund (EA IF) redemptions during stress episodes. A major contribution of this work is that I use a highly sophisticated scraping process for proprietary Refinitiv Eikon data to create a survivorship-bias free data set of EA IF portfolios the period January 2010 to December 2023. I use the ECB’s Lipper Global Data Feed (LGDF) to employ complex string matching methods and retrieve ISINs for securities missing unique identifiers. I also identify financial derivatives in the scraped data set so that I identify in total more than 96% of all securities held (by bond funds, equity funds and mixed funds). I further enrich the scraped and LGDF data with proprietary and ECB information at the security, security issuer, and fund level (Refinitiv Eikon, Lipper, ECB CSDB, SHSS). This information enables me to construct measures of portfolio overlaps, the footprints of individual funds in different securities, as well as general information on investment funds (including information on the holders of these funds). For the early warning

system, I employ a multilayer neural network using stochastic gradient descent incorporating a wide set of variables in line with existing literature. The holistic data approach and the flexibility of the neural network allow me to extract driving forces behind heterogenous investor redemptions during stress episodes while minimizing any omitted variables bias. Finally, combining the data set's information on funds' liquidation strategies, predicted investor redemptions, and information on total outstanding and average trade volumes, I can make additional financial stability statements about the market impacts of redemption runs on Euro area investment funds.

“Financial Contagion in a Network of Banks and Non-Bank Financial Intermediaries”

- I develop a theoretical network model in which banks receive short-term liquidity from open-ended money market mutual funds (MMFs). These MMFs are used as an investment tool for cash pools, called investors. Banks are similarly modelled to Montagna and Kok (2016, ECB WP 1944) and as such have to satisfy a liquidity and capital requirement and can further invest in risky, but illiquid, securities. They further hold interbank loans. Finally, banks hold deposits which are also subject to random withdrawals, justifying the need for a liquidity buffer. Funds only invest in short-term liabilities of banks and satisfy a self-imposed liquidity ratio to serve daily random investor redemptions. The system can be shocked in two ways: A default of one or more banks on all their liabilities, or a change in investors' beliefs regarding the quality of one or more MMF portfolios. The model dynamics then are: Funds must engage in fire sales to serve large investor redemptions. Due to a lack of deep secondary markets for their portfolios, they do so at endogenously determined price discounts. Banks whose liabilities were subject of these fire sales (simulating a lack of rolling over or renewal of short-term funding from MMFs), will struggle to satisfy their liquidity and capital requirements, and ultimately will default. These defaults will cause problems for further banks and funds, depending on their portfolio overlappings. Finally, the underlying network structure is modelled as follows: For funds I make use of Form N-MFP, providing linkages between funds and banks. Linkages within the banking sector are randomly generated, using a probability map (see e.g. Halaj and Kok (2013)), based on the EBA large exposures data.

“The Long-Term Implications of Rising Intangible Assets on Business Cycle Dynamics”

(joint with Roberto Pancrazi (Warwick) and Ivan Petrella (Warwick Business School))

- For the universe of Compustat firms, we construct firm-level intangible assets following the method of Peters and Taylor (2017) in order to answer the question of how the structural trend towards an intangible economy is affecting business cycle dynamics. In first tests, we confirm several empirical regularities along the intangibles dimension (such as low-intangible firms being larger, or high-intangible firms holding more cash). We further explore the puzzle of stagnating total factor productivity (TFP) measures. In our TFP construction we follow the methods of Olley & Pakes (1996) and show that for low-intangible firms labor and physical capital are the main equally-important inputs, whereas for high-intangible firms the role of physical capital is, effectively, dropping to zero and intangible capital makes up almost 40% of the TFP for these firms.

Conference Presentations

2023	Royal Economic Society & Scottish Economic Society (RES & SES) Annual Conference (Glasgow, UK)
2022	28 th International Conference on Computing in Economics and Finance (CEF, Dallas, USA), 16 th Dynare Conference (Lancaster, UK), European Economic Association & Econometric Society European Meeting (EEA-ESEM, Milan, Italy)
2021	11 th RCEA Money-Macro-Finance Conference (Online)

Scholarships

2021-present ESRC Midlands Graduate School DTP studentship, UKRI
2019-present University of Warwick Economics PhD Scholarship (on hold for ESRC scholarship)

Other Skills

Software: MATLAB, Python, SQL, Stata, LaTeX, Dynare, R, MS Office
Languages: German (native), English (fluent)

References/Supervisors

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