Research Statement

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My research lies at the intersection of macroeconometrics, time-series analysis, and policy evaluation, with a focus on understanding the sources of economic fluctuations and long-run dynamics in multi-country settings. The driving motivation of my work is to uncover how macroeconomic and financial forces interact to shape business cycles, long-run growth, and policy effectiveness over time, and how these mechanisms differ across countries and sectors. I address these questions through the design and implementation of large-dimensional econometric models that exploit rich and diverse data sources to extract the key structural and cyclical forces driving the economy. In my current work, I focus extensively on the Euro Area, which provides an ideal environment for studying cross-country heterogeneity within an integrated economic system.

While large, standardized datasets are well established for the United States, comparable resources for the Euro Area (EA)–and even more so for its member countries–remain limited. This is a missed opportunity, as country-level data in the Euro Area offer enormous potential for understanding structural differences and common dynamics across countries. If the objective is to foster a stronger cohesion within the Euro Area, understanding how national economies diverge from the aggregate and along which dimensions remains a crucial question for policymakers. Prompted by the need to systematize data collection and ensure the traceability of data revisions, I built and now maintain EA-MD-QD, one of the first large-scale macroeconomic and financial datasets for the Euro Area and its largest member countries. The database comprises over 1,000 monthly and quarterly series and is regularly updated on a monthly basis, therefore including real-time vintages. It is accompanied by open-source routines for data processing and transformation. By providing a transparent and reproducible infrastructure, this work substantially reduces the cost of data collection, updating, and preprocessing, fostering future empirical and policy analysis on the EA and its member states.

Leveraging this large dataset, my job-market paper, *Measuring the Euro Area Output Gap*, develops a large-dimensional non-stationary dynamic factor model to estimate potential output and the output gap in the Euro Area. We find that potential output growth decelerated after the 2008 financial crisis, suggesting that the EA faces a structural rather than cyclical challenge. In *Common Trends and Cycles in the Euro Area*, we extend this framework by combining the flexibility of large data with model-based theoretical restrictions, providing a unified approach to jointly estimate the key "macroeconomic stars" of the Euro Area. *Large Datasets for the Euro Area and Its Member Countries and the Dynamic Effects of the Common Monetary Policy* presents EA-MD-QD in detail and employs it to study cross-country heterogeneity in monetary-policy transmission, which proves to be moderate but non-negligible across several indicators. Yet, monetary transmission is only one dimension along which member states differ: heterogeneity is pervasive and can emerge across the entire distribution of country-level indicators, shaping both the central tendency and the tails of economic outcomes. In *Heterogeneous Economic Growth Vulnerability Across Euro Area Countries Under Stressed Scenarios*, we examine downside risks to economic growth in Germany, France, Italy, and Spain, uncovering meaningful asymmetries at the tails and highlighting the amplifying role of financial variables during adverse conditions.

Although traditional data sources remain the cornerstone of macroeconomic research, the emergence of Large Language Models (LLMs) and other AI tools has significantly expanded the information set available for modeling and forecasting. This underscores the importance of incorporating novel, text-based indicators into both traditional and new econometric frameworks. Moreover, the COVID-19 pandemic and the recent inflation surge have highlighted the need to account for potential nonlinearities in standard estimation approaches. Along these lines, in *Forecasting the Euro Area Job Vacancy Rate Using Earnings Calls Data*, we leverage firm-level text information from earnings calls to enhance nowcast and forecast models for the EA job vacancy rate. In *When Did the Phillips Curve Become Flat? A Time-Varying Estimate of Structural Parameters*, we propose a fully nonlinear framework to estimate the Phillips Curve in the US and the EA, uncovering dynamic relationships that would be missed by standard linear models.

My research is closely connected to policy, providing data-driven insights and concrete implications for the conduct of monetary, fiscal, and macroprudential policy. During my PhD, I had the opportunity to further develop this line of research within several Eurosystem institutions, which strengthened its policy orientation and opened new research directions.

Measuring the Euro Area Output Gap (*job market paper*), with Matteo Barigozzi and Matteo Luciani.

We develop a large-dimensional non-stationary dynamic factor model combined with an unobserved components trend–cycle decomposition to deliver data-driven estimates of potential output and the output gap. Decomposing these two quantities is essential for policymakers to assess both the pace of the economy's long-run capacity and its cyclical position. These measures are central to the conduct of monetary policy–by gauging potential inflationary pressures–and to fiscal policy–by assessing countries' fiscal space within the Euro Area (EA) surveillance framework.

Model. Our model is both large-dimensional and non-stationary. The large cross-section allows us to capture the well-established comovements across macroeconomic variables, ensuring the *recoverability* of potential output and the output gap (Buncic et al., 2023), while accounting for abrupt, large-scale comovements driven by Covid-related outliers (Stock and Watson, 2025). Allowing for non-stationarity, in turn, preserves the low-frequency dynamics that are crucial for identifying common and idiosyncratic trends and for capturing meaningful, theory-consistent relationships among variables over the business cycle (Bianchi et al., 2023).

Results. Four main results emerge from our analysis. First, our estimates indicate that potential output growth decelerated after the 2008 Global Financial Crisis (GFC) and has not yet returned to its pre-crisis pace. This finding contrasts with institutional estimates, suggesting that the EA economy in the post-GFC was tighter than estimated by the European Commission or the IMF. Our results suggest that the EA has a potential output issue, rather than a business cycle problem. Second, we provide evidence on the historical linkages among real activity, unemployment, and inflation over the business cycle. Though not imposed, the model naturally embeds Okun's law and Phillips Curve relationships, highlighting the model's ability to recover empirically relevant and theory-consistent macroeconomic regularities. Third, we shed light on the "missing-inflation puzzle" in the post-GFC period. Our results point to a persistent decline in trend inflation–rather than economic slack–as the main factor holding down core inflation. Conversely, focusing on the post-Covid inflation surge, we find that at least 30% of the increase in core inflation can be attributed to economic slack, reinforcing the role of demand forces during this high-inflation period. Lastly, we find that growth heavily financed through households debt is not sustainable in the long-run, with short-lived booms followed by large and prolonged busts. This underscores how financial and real factors jointly shape the cyclical and structural stance of the economy over time, and highlights the importance of using large, information-rich datasets to accurately identify these latent "macroeconomic stars".

Policy relevance. Our model provides timely estimates of the EA output gap and potential output which are economically meaningful and reliable in real time. In light of our findings, if the policy target is to achieve better economic conditions in the EA, European countries should both: (i) implement structural reforms, by promoting productivity-enhancing investments and (ii) support aggregate demand more forcefully during downturns, to mitigate output losses. In contrast, policies aiming at boosting debt-financed households consumption or residential investment will only yield short-term gains.

Large Datasets for the Euro Area and Its Member Countries and the Dynamic Effects of the Common Monetary Policy, with Matteo Barigozzi and Lorenzo Tonni.

We present EA-MD-QD, and provide evidence on one of the many applications for which can be exploited for research. Specifically, we employ EA-MD-QD to study cross-country heterogeneity in the transmission of common monetary policy shocks. Accounting for such heterogeneity is crucial, as it may affect the effectiveness of monetary policy transmission across countries.

Model. Using the recently developed Common Component Vector Autoregression (CC-VAR) framework (Forni et al., 2025), we isolate the common components of the data–i.e., the variation jointly explained by comovements across variables and countries–thereby purging idiosyncratic dynamics and focusing on how monetary policy shocks propagate across member states and along multiple dimensions of the economy. We quantify heterogeneity by comparing, for each variable of interest, the national impulse response functions (IRFs) with the corresponding EA-level responses. The magnitude and statistical significance of these differences provide a measure of asymmetry in monetary transmission, while correlations with structural indicators–such as labor market features, household balance sheets, and saving behavior–shed light on its underlying drivers.

Results. Our results reveal moderate but non-negligible heterogeneity in monetary transmission across countries. The clearest patterns emerge for Germany and Greece: Germany's responses closely track the EA aggregate, whereas Greece displays more pronounced deviations. Transmission is further shaped by structural

factors, with homeownership rates and saving dynamics amplifying or dampening the effects of monetary policy.

Policy relevance. While these asymmetries do not threaten the implementation of a common policy, they underscore the need to monitor within-country dynamics to ensure smooth transmission and mitigate adverse effects on domestic production, labor-market conditions, and financing costs–particularly in the context of the post-Covid surge in public spending.

Heterogeneous Economic Growth Vulnerability Across Euro Area Countries Under Stressed Scenarios, with Esther Ruiz.

We study cross-country differences in downside risks to economic growth for the four largest EA economies–Germany, France, Italy, and Spain. Understanding the risk of severe economic downturns has become a central concern for policymakers, as sudden and large contractions in economic activity pose significant challenges to macro-financial stability. Given the high degree of interconnectedness among EA economies, combined with diverse structural characteristics across member states, it is crucial to design models that capture both EA-wide and country-specific sources of vulnerability.

Model. Building on the EA-MD-QD dataset, we employ a multi-level dynamic factor model to extract EA-wide and country-specific macro-financial conditions, which are then used to estimate the conditional distribution of GDP growth for each country through a factor-augmented quantile regression framework (Adrian et al., 2019). We subsequently perform a series of stress-test simulations for the underlying macro-financial conditions at the EA, sectoral, and country level to evaluate how systemic, sector-specific, and idiosyncratic shocks shape downside growth risks.

Results. Our findings reveal significant heterogeneity across countries. Economies that are highly exposed to EA-wide conditions–such as Germany–and those dominated by strong domestic dynamics–such as Spain–display higher levels of growth vulnerability. Importantly, vulnerability is systematically underestimated when financial conditions are ignored, underscoring the key amplifying role of financial stress in driving adverse economic outcomes. Moreover, accounting for both cross-country and cross-sectoral dynamics proves essential: even severe country- or sector-specific shocks fail to generate the level of vulnerability observed under milder systemic stress. This highlights that growth vulnerability across EA countries primarily stems from the interaction between EA-wide and domestic macro-financial forces.

Policy relevance. These results underline the systemic nature of growth risks and the pivotal role played by the interplay between macroeconomic and financial conditions in shaping vulnerabilities across countries. They provide valuable insights for policymakers, pointing to the need for coordinated macro-prudential policies–complementing monetary and fiscal instruments–to address both common and country-specific vulnerabilities. Such coordination is essential to mitigate growth risks effectively and to strengthen economic resilience within the Euro Area.

Common Trends and Cycles in the Euro Area, with Guido Ascari, Matteo Luciani, and Sebastian Rast.

This paper a work in progress started during my PhD internship at De Nederlandsche Bank. In this project, we extend the framework employed in my job market paper to combine the advantages of large data with model-based theoretical restrictions, providing a unified approach to jointly estimate the key "macroeconomic stars" of the Euro Area and decompose them into permanent and cyclical components, leveraging theory-based restrictions to identify trends and cycles.

Setup. A distinctive feature of our model is the coexistence of idiosyncratic trends, specific to individual or small groups of variables, and a common trend, pervasive across the cross-section. While idiosyncratic trends are linked by underlying theoretical provisions (as in, e.g., Laubach and Williams (2003)), the common trend only leverages information from the data. Preliminary evidence suggests that, alongside employment, financial variables–particularly those related to household debt–play a central role in driving the common trend in the Euro Area. On the cyclical side, the factor structure in the data points toward the presence of multiple structural cycles underlying aggregate fluctuations. We identify a standard business cycle, explaining most of the variation in real indicators and a significant portion of inflation dynamics, and a nominal cycle, closely linked to inflation expectations but with negligible effects on real activity. Importantly, we also uncover additional, economically meaningful cycles that account for a sizable share of the variation in energy inflation and interest rates, thereby challenging the traditional dichotomy of a real and nominal cycles.

When Did the Phillips Curve Become Flat? A Time-Varying Estimate of Structural Parameters, with Antonio Marsi and Edoardo Zanelli.

The coexistence of different nominal cycles is one possible reason for the weakened relationship between inflation and real activity over the business cycle. Another explanation is more structural and concerns the slope of the Phillips Curve (PC). In this paper, we study this question for both the United States and the Euro Area within a fully time-varying framework.

Setup. We estimate a non-parametric time-varying VAR and recover the deep parameters of a standard New Keynesian PC by regressing the impulse response functions to a well-identified demand shock (Lewis and Mertens, 2022). This approach allows us to trace the evolution of the PC coefficient over time under minimal assumptions on its dynamics. Our estimates suggest that the flattening of the PC in the US began already in the late 1980s, with the coefficient approaching zero in the following decades. This pattern appears to reverse during the recent inflation surge, pointing to a temporary steepening of the PC that has yet to stabilize. Similar results hold for the Euro Area, reinforcing the evidence for inflation dynamics presented in my job-market paper. We reconcile these findings within a standard three-equation New Keynesian model allowing for time variation in the key structural parameters, providing evidence that accounting for potential nonlinearities and time variation is crucial for understanding the evolving link between inflation and real activity.

Forecasting the Euro Area job vacancy rate using earnings calls data, with Claudia Foroni and Christofer Schroeder.

During my current stay at the European Central Bank, I am exploring whether text-based indicators of labor market slack can provide timely signals of labor market conditions. In this paper, we employ a high-frequency text-based indicator of job vacancies derived from firm-level earnings calls to nowcast and forecast the Euro Area job-vacancy rate.

Setup. Earnings calls offer a forward-looking perspective on firms' labor market expectations and, importantly, are not subject to data revisions. Preliminary results suggest that these indicators significantly improve short-term forecasts–particularly when combined with survey-based measures of labor market conditions. Building on these findings, we aim to develop a unified empirical framework and a reliable policy tool for forecasting the Euro Area job-vacancy rate, thereby integrating text-based and traditional macroeconomic data in real-time policy analysis.

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