

## Research Statement

I am a quantitative macroeconomist with a **primary agenda** in housing and macroeconomics using state of the art heterogeneous agent models. My recent research has explored this topic along three avenues: **1.)** Modeling the long-run implications of demographic change on house prices, I find that demographic change can help explain much of house price trends over recent decades with a large contribution coming through indirect general equilibrium effects from falling real rates. **2.)** In a project that formalizes the aggregate demand channel of a tightening loan-to-value collateral constraint, we find that this channel is sizable and study its distributional consequences and its interaction with monetary policy. **3.)** In a model with housing we study the distribution of marginal propensities to consume for households with heterogeneous tenure and portfolio positions.

My **secondary agenda** focuses on European integration and challenges of the Eurozone: **4.)** Modeling low and high debt regions in the currency union of the Eurozone, we find that an optimal central fiscal capacity that reallocates funds in response to asymmetric shocks is sizable and can be beneficial for both regions.

In **future work** I aim to **(A)** bridge the two agendas by investigating the role of mortgage heterogeneity in the Eurozone **(B)** expand on macroprudential and monetary policy interaction in the face of aggregate risk.

## 1 Housing and the Macroeconomy

The Great Financial Crisis, centered on the housing market, spurred renewed interest in housing's central role in macroeconomics. For many households, housing is their primary asset, serving as both a consumption good and an investment. At the same time, their distribution among households is highly relevant in assessing which households are effected by these shocks and policies. Its unique characteristics—discreteness, difficulty in diversification, and mortgage-debt financing—make it crucial for understanding how shocks and policies transmit through the portfolio of households. However, modeling these complexities presents technical challenges, such as discrete choices and non-linearities. My research aims to address these challenges and deepen our understanding of housing's influence on macroeconomic dynamics and its distributional consequence.

### 1.1 Demographic Change, House Prices, and the Real Rate

In recent decades, many advanced economies have experienced a significant rise in real house prices, raising concerns about affordability. At the same time, these economies have undergone a demographic transition toward aging societies.

My research, **Demographic Change, House Prices, and the Real Rate**, investigates the long-term impact of demographic change on house prices using a quantitative, overlapping-generations model with heterogeneous agents. My findings indicate that: (1) Demographic factors can account for a substantial portion of the long-term upward trend in house prices of which much can be attributed to the indirect general equilibrium effects of falling interest rates. (2) Looking ahead, the model suggests a decline in real house prices as populations continue to age in the latter part of the 21st century with muted contributions from a stabilizing interest rate. (3) As populations age, we observe a shift towards housing wealth which helps explain the stabilizing of interest rates despite a continued growth of wealth-to-GDP.

The results emphasize the importance in considering indirect general equilibrium in the determination of long-run house price trends while providing valuable insights into the role that housing wealth plays in the determination of real rates over the 21st century.

## 1.2 The Aggregate Demand Channel of Loan-to-Value Shocks

*(with C. Mendicino and P. Herrero)*

Following the housing market turmoil of the Great Financial Crisis, many European countries implemented stricter Loan-to-Value (LTV) limits as a macroprudential policy tool. Empirical studies have shown that these measures can have significant effects on output, inflation, and homeownership rates.

In the research project, **The Aggregate Demand Channel of Loan-to-Value Shocks**, we build a heterogeneous agent model with housing and nominal mortgage contracts to examine the aggregate and distributional consequences of LTV contractions. We find that a reduction in collateral constraints limits access to mortgage financing, leading to a decline in credit, housing demand, and house prices. However, our model highlights a second round demand channel: the resulting drop in consumption fuels an economic downturn, reducing income and further dampening consumption, housing demand, and mortgage demand.

On the distributional impacts, our analysis reveals renters are significantly impacted due to limited access to mortgages and lower income levels. However, homeowners with high LTV ratios face the most severe consequences, as they lose the ability to use their homes as precautionary savings and experience wealth effects from falling house prices.

We also emphasize the role of wage rigidities and monetary policy in mitigating the aggregate and distributional effects of LTV changes. Our research provides valuable insights for policymakers seeking to implement effective LTV restrictions and coordinate them with monetary policy.

## 1.3 MPC Heterogeneity and Monetary Policy Response of Mortgagors

*(with R. Cooper and C. Larkou)*

In the early stage project **MPC Heterogeneity and Monetary Policy Response of Mortgagors**, we explore the distribution of marginal propensity to consume (MPC) among homeowners in a life-cycle model with heterogeneous housing and tenure choices. Building on existing research suggesting that tenure status is linked to distinct consumption responses to monetary policy shocks, we aim to explain observed MPC heterogeneity within a structural framework.

Our research can shed light on how different population subgroups may be differentially affected by monetary policy while also examining how MPC heterogeneity influences the transmission of monetary policy to aggregate outcomes.

## 1.4 Marrying Fiscal Rules & Investment: a Central Fiscal Capacity for Europe

*(with F. Vinci)*

The European fiscal governance framework remains incomplete, hindering policy coordination during economic shocks and affecting the transmission of the single monetary policy. High public debt and low public investment worsen resilience across Member States. Many policymakers, institutions, and academics support establishing a central fiscal capacity (CFC) as a solution. Against this backdrop, in the project **Marrying Fiscal Rules & Investment: a Central Fiscal Capacity for Europe**, we propose a framework to assess a CFC in the euro area, aimed at stabilizing the business cycle, promoting sovereign debt sustainability, and reducing procyclicality in public

investment. The CFC enhances business cycle stabilization for both regions and significantly reduces the welfare cost of fluctuations. We also explore European bond issuance and a supranational investment strategy to address investment needs through European Public Goods.

## **2 Future Work**

### **2.1 Consequences of Heterogeneous Mortgage Structures for Monetary Policy**

The heterogeneity of income, wealth, and mortgage distributions across countries is striking. Particularly, the latter varies significantly across Europe, with different prevalence of fixed versus variable rate mortgage and maturities. Understanding how these distributional and mortgage characteristics influence monetary and macroprudential policy transmission across different countries remains understudied and is a crucial area for my future research. This is particularly relevant for currency unions like the Eurozone that is restricted to a single monetary policy to accommodate countries whose household portfolios vary considerably. Methodologically, macroeconomic frameworks that satisfactorily addresses variable and fixed rate mortgages remain scarce and I aim to contribute by providing a framework that can meaningfully speak to the relevance of their distribution for policy transmission.

### **2.2 Optimal Macroprudential Policy with Inefficient House Price Fluctuation**

Recent work argues that policy-makers should “lean against the wind” to dampen house price fluctuations through either monetary policy or mortgage regulations. However, several questions remain unanswered: Which tool is more effective at mitigating house price fluctuations? Which policy induces smaller costs? Do the distributional implications of these two policies differ and who wins and who loses? Answering these questions requires a heterogeneous agent model featuring housing, mortgage debt and inefficient house price fluctuations. In future work, we aim to extend our framework in “The Aggregate Demand Channel of Loan-to-Value shocks” by introducing inefficient house price fluctuations over the business cycle. Through the lens of this model, we plan to study the optimal degree and mix of macro-prudential and monetary policy.