

**Research Statement**  
**Adrien Auclert, Stanford University, September 2023**

I am a macroeconomist working on monetary economics and the aggregate implications of heterogeneity. My research shows that heterogeneity between households is a crucial determinant of “aggregate demand”: it can help us understand how monetary policy and fiscal policy work, why exchange rate depreciations or increases in energy prices can cause recessions, why consumer bankruptcy policy has aggregate effects, or how phenomena such as rising income inequality or population aging are affecting the macroeconomy. This perspective substantially broadens the standard macro view on these questions, which is based on models with a representative agent.

General equilibrium models with heterogeneous agents are challenging to solve and understand. My papers develop a sufficient statistic approach that is useful to solve these models, shed light on their core mechanisms, and determine the best way to take them to the micro data. This approach relies on a novel “sequence-space” representation of models that has the potential to transform the field of quantitative macroeconomics. So far, I have used it to advance the development of the Heterogeneous-Agent New Keynesian (“HANK”) literature, as well as the literature on price-setting with heterogeneous firms. Together with my coauthors, I have also developed a computational toolkit and online course material that are turning these methods into a leading paradigm for solving these types of models.

**High and heterogeneous MPCs: implications for modeling and policy.** A key empirical moment that rejects the representative-agent model is the Marginal Propensity to Consume (MPC)—it is high and heterogeneous in the micro data, versus low and uniform in the representative agent model. An important part of my work has been to flesh out the macroeconomic implications of the level and heterogeneity in MPCs that we observe empirically.

*Monetary policy.* In “Monetary Policy and the Redistribution Channel” [2], I establish the importance of MPCs for the transmission mechanism of monetary policy. I show that standard representative-agent models miss three key channels of monetary policy transmission: an earnings heterogeneity channel from unequal income gains, a Fisher channel from unexpected inflation, and an interest rate exposure channel from real interest rate changes. I develop a sufficient statistic approach to evaluating the magnitudes of these three new channels, and show that all three are likely to contribute to the transmission of monetary policy. Hence, redistribution isn’t only a side effect of monetary policy: it shapes aggregate economic activity, making interest rate cuts more stimulative than one would infer from the elasticity of intertemporal substitution alone. My framework clarifies who gains and who loses when monetary policy changes—a point that policy discussions often get wrong—and provides a measurement device to inform the redistributive consequences of changes in interest rates by central banks.

The findings in [2] helped spur the development of the Heterogeneous-Agent New Keynesian literature. Models in this literature have the benefit of being consistent with “micro moments”—such as MPCs and the distributions of income and wealth we observe in the data—but have so far been inconsistent with the “macro moments” that the earlier monetary policy literature focused on, such as the empirical impulse response to monetary policy shocks studied by Christiano, Eichenbaum, Evans and others. In [10], Matt Rognlie, Ludwig Straub and I show that it is possible to reconcile these two approaches by introducing sluggishness in the adjustment of households’ expectations of aggregate variables. Our estimated model—the first such model that is at once consistent with micro and macro moments—implies a large role for investment in the transmission mechanism of monetary policy. The reason is that, in our model, monetary policy stimulates investment, which raises incomes and—because MPCs are high—feeds into consumption. An implication of our paper is that factors affecting investment are much more important for monetary policy than previously thought. Our

model also generates a natural comovement between consumption and investment over the business cycle, resolving a challenge for New-Keynesian models.

*Fiscal policy.* MPCs feature prominently in the traditional textbook analysis of fiscal policy, which is based on the IS-LM framework. In “The Intertemporal Keynesian Cross” [8] (with Rognlie and Straub), we show that a modern version of the Keynesian cross is also present in heterogeneous-agent models with nominal rigidities. But, to really understand the aggregate effects of government spending and transfer policy, one must go beyond MPCs, and instead consider a new set of moments we call iMPCs, for “intertemporal Marginal Propensities to Consume”—the impulse response of consumption to transitory income changes at different dates. We show that these are a sufficient statistic for household heterogeneity, and thus a powerful model discrimination device. The empirical estimates of iMPCs we provide show that, when households receive a transfer, they spend at an elevated rate not only in the period of the transfer, but in subsequent periods as well. This fact favors certain types of heterogeneous-agent models over the other classes of models used to study fiscal policy to date: representative-agent models, saver-spender models, or simple heterogeneous-agent models with a single liquid asset in large supply. Matching iMPCs implies that the financing of fiscal policy really matters: deficit-financing is much more powerful at stimulating economic activity than tax-financing. Our paper is the first to flesh out this implication of models that match iMPCs. We extend our analysis to models with flexible labor supply in [4] (with Bence Bardóczy and Rognlie) and to the open economy in [5] (with Rishabh Aggarwal, Rognlie and Straub).

*Exchange rate depreciations and energy price shocks.* A standard perspective in international macroeconomics is that exchange rate depreciations help boost local economic activity by encouraging all agents to switch their expenditure towards domestically produced goods. Empirically, however, depreciations sometimes appear to cause declines in economic activity. In [11] (with Rognlie, Martin Souchier and Straub), we provide a simple explanation: depreciations make households poorer because they force them to pay more for imported goods, leading them to cut domestic spending. Then, if expenditure switching is muted or delayed, there can be a recession. Overall, our paper provides a guide as to when contractionary depreciations are more likely, depending on the state of household balance sheets, the degree of exchange rate pass-through, and the correlation between expenditure shares and MPCs. In [7] (with Hugo Monneray, Rognlie and Straub), we study a related phenomenon: for energy importers, rising energy prices cause a loss of real income and can lead to a recession. We argue that this mechanism is important to understand the aftermath of the 2021-2022 increase in energy prices in Europe.

**Macroeconomic implications of household default.** A standard narrative of the recent Great Recession is that impaired household balance sheets prevented a fast recovery by dragging down consumer spending. An implication of this view is that debt forgiveness could have helped the economy bounce back faster. In [9] (with Will Dobbie and Paul Goldsmith-Pinkham), we test this hypothesis by exploiting the heterogeneous amount of debt relief that took place during the recession, driven by plausibly exogenous variation in the leniency of state bankruptcy laws. We show that more lenient states had better employment performance. We then develop a heterogeneous-agent model in which borrowers have higher MPCs than savers, and use the model to recover the aggregate effect of debt forgiveness during the Great Recession, which we find to have been large. Our paper introduces a general framework to connect well-identified regional regressions to aggregate economic counterfactuals, showing what general equilibrium effects are differenced out by empirical strategies such as ours, and uses the model to quantify these general equilibrium spillovers. While our model assumes away potential adverse effects on credit supply from changes in consumer bankruptcy laws, in [14] (with Kurt Mitman) we analyze the extent to which bankruptcy policy acts as an automatic stabilizer when these credit supply effects are present, by adding nominal rigidities to the canonical Eaton-Gersovitz model that I analyzed with Matt Rognlie in [1].

**Demographic change, inequality, and interest rates.** Two major macroeconomic trends of the past decades have been the aging of the world population and the global rise of income inequality. In “Demographics, Wealth, and Global Imbalances in the 21st Century” [12] (with Hannes Malmberg, Frédéric Martenet, and Rognlie), we consider the aggregate implications of the first phenomenon. We show that, in many overlapping generations models, a simple statistic—which rolls the forecasted change in the age distribution of the population over fixed age profiles of assets and income—is useful to predict the effect of population aging on aggregate wealth accumulation, global imbalances, and equilibrium world interest rates. We collect and harmonize individual wealth and income data for 25 countries and show that, in a central scenario, world interest rates will fall by 125 basis points over the next 80 years—similar to the extent to which they have fallen over the past 70 years. Our results refute the “great demographic reversal” hypothesis, which argues that interest rates will rise as the aging process unfolds. In [13], Rognlie and I use a similar methodology to tackle the long-run effects of the rise of income inequality.

**Heterogeneity in prices and nominal rigidities.** Just as disaggregated data on households can tell us about aggregate consumption dynamics, disaggregated data on prices can tell us about aggregate inflation dynamics. In “New Pricing Models, Same Old Phillips Curves?” [6] (with Rodolfo Rigato, Rognlie and Straub), we study a class of price-setting models with idiosyncratic shocks to firms and menu costs, which are well-known to achieve a much better fit to the micro data on price changes relative to the canonical Calvo model. We work out the aggregate implications of these models and show that they are nearly the same as those of the Calvo model, provided that an appropriate adjustment for scale is performed to account for the so-called “selection effect”. Our results show how to use information from the micro data on price changes to form the entire dynamic Phillips curve. They also point to limitations of existing models, such as their limited ability to explain inflation inertia—a feature that is widely viewed as important in the macro data.

**Solution methods.** An impediment to research in the heterogeneous-agent literature has been the difficulty of solving models on the computer, owing to the very large state spaces that these models involve. In “Using the Sequence-Space Jacobian to Solve and Estimate Heterogeneous-Agent Models” [3] (with Bardóczy, Rognlie and Straub), we introduce a new solution method that linearizes with respect to aggregate variables, exploits certainty equivalence, and represents equilibrium as a linear system in the sequence space. Our method is both general and fast; we show how to apply it to compute impulse responses at hundreds of times the speed achieved by conventional methods. This methodological advance opens the door to likelihood-based model estimation, which had so far been out of reach for the literature. We maintain an online code repository, funded by an NSF grant, that contains a detailed guide to our methods, as well as many examples applying them.

**Teaching and advising.** I have taught four classes at Stanford: an undergraduate course in intermediate macro (Econ 52), a first-year graduate macro class on business cycles (Econ 211/212), a second-year graduate international finance class (Econ 269), and a second-year graduate macro class on monetary economics (Econ 234). I have also been involved in organizing the third-year seminar for graduate students (Econ 300) and the macro workshop, and I run a reading group jointly with Luigi Bocola.

In the past two years, Matt Rognlie, Ludwig Straub and I have also been running a workshop at the NBER, funded by my NSF CAREER grant, where we teach sequence-space methods to graduate students from all around the United States and Europe. This workshop has seen enormous demand and has received excellent reviews. I have been delighted to see students put what they learned to good use in their dissertations.

## Published and forthcoming papers

1. “Unique Equilibrium in the Eaton–Gersovitz Model of Sovereign Debt” (with Matthew Rognlie), *Journal of Monetary Economics*, December 2016, 84, 134–146.
2. “Monetary Policy and the Redistribution Channel,” *American Economic Review*, June 2019, 109 (6), 2333–2367.
3. “Using the Sequence-Space Jacobian to Solve and Estimate Heterogeneous-Agent Models” (with Bence Bardóczy, Matthew Rognlie and Ludwig Straub), *Econometrica*, September 2021, 89(5), 2375–2408.
4. “MPCs, MPEs and Multipliers: a Trilemma for New Keynesian Models” (with Bence Bardóczy and Matthew Rognlie), *The Review of Economics and Statistics*, May 2023, 105(3), 700-712.
5. “Excess Savings and Twin Deficits: The Transmission of Fiscal Stimulus in Open Economies” (with Rishabh Aggarwal, Matthew Rognlie and Ludwig Straub), *NBER Macroeconomics Annual 2022*, May 2023, vol. 37, 325-412.
6. “New Pricing Models, Same Old Phillips Curves?” (with Rodolfo Rigato, Matthew Rognlie and Ludwig Straub), *Quarterly Journal of Economics*, Forthcoming.
7. “Managing an Energy Shock: Fiscal and Monetary Policy” (with Hugo Monneray, Matthew Rognlie and Ludwig Straub), *Proceedings of the XXV Annual Conference of the Central Bank of Chile*, Forthcoming.

## Under revision

8. “The Intertemporal Keynesian Cross” (with Matthew Rognlie and Ludwig Straub), NBER Working Paper 25020, May 2023, Resubmitted to the *Journal of Political Economy*.
9. “Macroeconomic Effects of Debt Relief: Consumer Bankruptcy Protections in the Great Recession” (with Will Dobbie and Paul Goldsmith-Pinkham), NBER Working Paper 25685, March 2019, Revise and Resubmit at the *American Economic Review*.
10. “Micro Jumps, Macro Humps: Monetary Policy and Business Cycles in an Estimated HANK Model” (with Matthew Rognlie and Ludwig Straub), NBER Working Paper 26647, January 2020, Revise and Resubmit at the *American Economic Review*.
11. “Exchange Rates and Monetary Policy with Heterogeneous Agents: Sizing up the Real Income Channel” (with Matthew Rognlie, Martin Souchier and Ludwig Straub), NBER Working Paper 28872, May 2021, Revise and Resubmit at the *American Economic Review*.
12. “Demographics, Wealth, and Global Imbalances in the 21st Century” (with Hannes Malmberg, Frédéric Martenet and Matthew Rognlie), NBER Working Paper 29161, November 2021, Revise and Resubmit at the *Review of Economic Studies*.

## Working papers

13. “Inequality and Aggregate Demand” (with Matthew Rognlie), NBER Working Paper 24280, February 2018
14. “Consumer Bankruptcy as Aggregate Demand Management” (with Kurt Mitman), September 2023