

The 8th annual conference of the SCOR-PSE Macroeconomic Risk Chair took place at the Paris School of Economics on September, 26th 2025. The event brought together leading researchers in macroeconomics to present their most recent work on a wide range of topics related to macroeconomic risk.

This newsletter features **four presentations from the conference**, covering financial frictions and firm heterogeneity, bilateral sovereign debt dynamics, industry life cycles and innovation policy, and convenience yield spillovers in the euro area. It also includes **the annual lecture by Mirko Wiederholt** (LMU Munich) on the effects of monetary policy with measured expectations, accompanied by **an interview**. [+](#)

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Macroeconomic Risk

# Scalable versus Productive Technologies

Mons Chan (Queen's University), Guangbin Hong (University of Chicago), Joachim Hubmer (University of Pennsylvania), Serdar Ozkan (Federal Reserve Bank of St. Louis), and Sergio Salgado (University of Pennsylvania) (presented by Serdar Ozkan)

[Scalable versus Productive Technologies](#), Working Paper, 2025. [+](#)

Why do financial frictions harm some economies far more than others — and why might standard estimates of that harm be too small? The answer may lie in a distinction that economists have long overlooked: the difference between firms that are more productive and firms that are more **scalable versus productive**. Chan, Hong, Hubmer, Ozkan, and Salgado argue that conflating these two sources of firm size has led the misallocation literature to systematically understate the costs of financing constraints.

The central insight begins with a deceptively simple question: why are large firms large? The conventional answer is that they have higher total factor productivity (TFP) — they squeeze more output from a given set of inputs. The authors challenge this view. Using the nonparametric GNR method to estimate production functions on 4.3 million Canadian firm-year observations, they find that firm size is better explained by how easily a firm can expand than by how efficiently it operates at any given scale. Larger firms tend to have higher returns to scale (how much output increases when all inputs are scaled up proportionally), driven by larger elasticities of intermediate inputs. Strikingly, **TFP peaks around the 90th percentile and declines among the largest firms** — the top 10%. These findings hold when cross-validated on U.S. manufacturing census data and on Orbis data covering eleven European countries.

This distinction has direct implications for how financial frictions distort the economy. When a firm faces a binding financing constraint — a limit on input expenditures relative to its wealth — it is forced to operate below its efficient scale. The severity of that distortion depends on the shape of its technology. A highly scalable firm, whose marginal products decline slowly as it expands, responds to a tightening constraint by cutting inputs sharply, because the cost of remaining

undersized is large. A firm with high TFP but standard returns to scale faces a steeper decline in marginal products and adjusts less. Misallocation costs are therefore larger when the firms most affected by financing frictions are those with high scalability rather than high TFP.

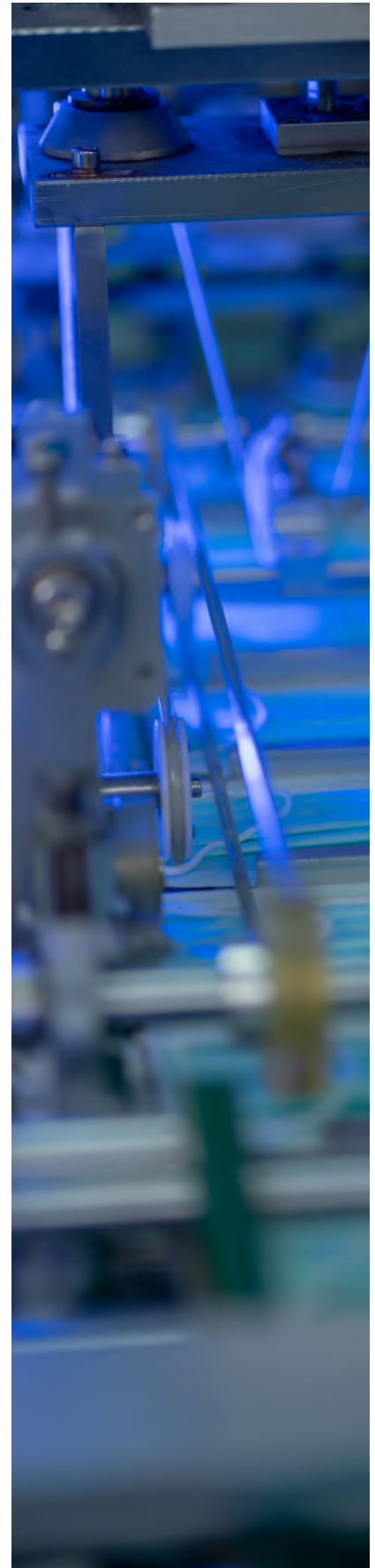
The authors formalize this logic in a quantitative model of entrepreneurship in the tradition of Cagetti-De Nardi and Quadri, extended to allow each entrepreneur to draw both a TFP parameter and an idiosyncratic returns-to-scale parameter from a joint distribution with a negative correlation — reflecting the empirical pattern that highly scalable firms tend to have lower TFP. At a standard constraint tightness, **the model generates an output loss of 18.3 log points — compared to just 7.4 log points**

**TFP peaks around the 90th percentile and declines among the largest firms.**

**when all technological differences are restricted to TFP — an amplification of 147%.** The static component of misallocation roughly doubles on its own. Under alternative calibrations, the amplification reaches as high as 398%.

A further mechanism reinforces these results. Entrepreneurs with highly scalable technologies but modest initial wealth face a compounding disadvantage: they are less profitable at small scale and therefore struggle to accumulate the assets that would let them outgrow the constraint, remaining financially constrained for longer than high-TFP entrepreneurs.

These findings carry a clear message for how researchers and policymakers should think about the costs of imperfect capital markets. Any policy aimed at relaxing financing constraints — whether through credit guarantees or financial development — is likely to generate larger gains than previously calculated, particularly when it reaches scalable entrepreneurs who are currently wealth-constrained.



# The Perils of Bilateral Sovereign Debt

Francisco Roldan (International Monetary Fund) and César Sosa-Padilla (University of Notre Dame and NBER) (presented by Francisco Roldan)

[The Perils of Bilateral Sovereign Debt](#), Working Paper, 2025. [+](#)

When a cash-strapped government borrows from a single powerful lender willing to offer loans outside the scrutiny of international bond markets, does that access provide a useful lifeline, or does it quietly undermine the borrower's fiscal position? Francisco Roldan and César Sosa-Padilla arrive at a striking answer: even a small stock of bilateral lending – loans from a single creditor that cannot be defaulted on – can destabilize a much larger stock of conventional market debt and leave the borrowing government materially worse off.

The paper is motivated by the rise of lending by large creditor countries – China being the most prominent example – to emerging-market sovereigns. These loans carry preferential terms, are negotiated rather than auctioned, and are effectively senior to other debt. Roldan and Sosa-Padilla ask whether this structural seniority, combined with a lender that adjusts its terms in response to the borrower's condition, generates dynamics that harm the very government being lent to. To answer this, the authors build a quantitative model of sovereign borrowing and default calibrated to Argentina before its 2001 crisis. A small economy faces uncertain income and can borrow from competitive bond markets, where

default is possible, and from a bilateral monopolist whose short-term loans must always be repaid. The bilateral interest rate is determined through bargaining each period.

The central mechanism the authors uncover is what they call **relational overborrowing**. Because bilateral financing is most valuable when the government is distressed – when bond spreads are high and market access is costly – the lender's bargaining position is strongest at those moments. Anticipating this, the lender subsidizes loans early on, encouraging the government to accumulate market debt. Once debt is

large and spreads are wide, the lender extracts profits through elevated bilateral rates. The net effect is that bilateral terms become cheaper as market indebtedness grows, directly counteracting the disciplinary signal that rising spreads are supposed to

send. Governments borrow more than they otherwise would, default more frequently, and end up worse off.

The quantitative results make the mechanism vivid. A sovereign borrowing only from bond markets runs an average spread of 804 basis points and defaults at an annualized rate of 6.53%. Introducing a

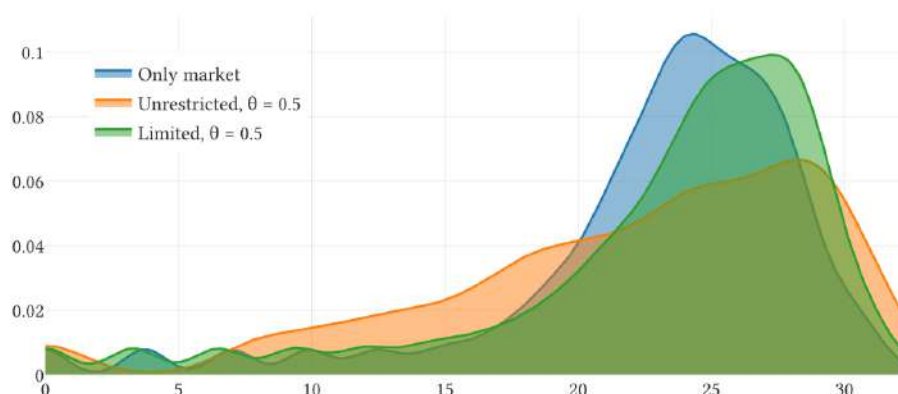
**bilateral creditor averaging just 3.3% of annual income more than doubles the default frequency to 14.7% and drives average spreads to 2,396 basis points – a rise of roughly 1,600 basis points.** The associated welfare loss amounts to 0.41% of lifetime consumption. A variant restricting bilateral lending during default episodes reduces but does not eliminate the harm: the default frequency falls to 9.34% and the welfare loss narrows but remains significant. The overborrowing channel operates through normal borrowing decisions in good times, not through what happens at the moment of default.

The most informative counterfactual concerns the terms of bilateral lending. When the authors replace the negotiated rate with a fixed rule that does not respond to market spreads, the default frequency falls to 5.13% and welfare improves by 0.61% relative to having no bilateral lender at all. **The source of the distortion is not bilateral lending per se, but the responsiveness of its terms to the borrower's market conditions.**

Roldan and Sosa-Padilla demonstrate that the structure of a government's creditor base – not just its total debt – shapes whether market prices signal fiscal discipline or obscure it. For policymakers, the paper delivers a precise diagnostic: if bilateral loan rates fall when a sovereign's market spreads rise, the bilateral creditor is likely making matters worse, not better.

The central mechanism the authors uncover is what they call relational overborrowing.

Distribution of debt levels



# Industry Life Cycles in General Equilibrium

Laurent Cavenaile (University of Toronto), Ruben Gaetani (University of Toronto), Pau Roldan-Blanco (Banco de España and CEMFI), and Tom Schmitz (Queen Mary University of London) (presented by Pau Roldan-Blanco)

[Industry Life Cycles in General Equilibrium](#), Working Paper, 2024. [+](#)

When a major new technology arrives — electrification, digital computing — industries do not grow steadily in its wake. They first explode with new entrants competing to bring novel products to market, then quietly consolidate into a smaller group of dominant survivors. Why does this pattern recur so reliably, and what does it imply for governments that want to support innovation? Cavenaile, Gaetani, Roldan-Blanco, and Schmitz construct a unified theoretical framework and test it empirically, showing that the industry life cycle is the predictable output of **product innovation and process innovation pulling in opposite directions**.

Product innovation — the introduction of new or improved varieties — drives the early expansion phase. New entrants have a natural advantage: unlike incumbents, they are not weighed down by organizational capital optimized for the old technology. When a breakthrough opens the frontier, entrants flood in, expanding firm count and pushing the industry toward greater variety. Process innovation, by contrast, makes production more efficient — reducing costs, climbing the productivity ladder. This type favors incumbents who have survived initial competition and can exploit their market position to invest in internal improvements. As leading firms pull ahead, they squeeze smaller rivals out of profitability, triggering exits. The shakeout emerges not from policy failure but from the normal competitive dynamics of productivity leadership.

To test these ideas, the authors turn to US patent records from 1976 to 2019, covering 167 non-ICT industries at the six-digit NAICS level. The identification strategy exploits the ICT Revolution of the late 1980s as a quasi-natural experiment: industries more exposed to information

and communication technologies before the revolution — measured by their ICT patent share in 1985–89 — were hit harder by the general-purpose technology shock. Using local projections, the paper tracks how these differentially exposed industries evolved over three decades.

The empirical results match the theory closely. **A one-standard-deviation increase in pre-existing ICT exposure raised net firm entry by 3.0 percentage points at the peak of the surge (1995–99), followed by a reversal of -2.1 percentage points by 2010–14** — a clean inverted-U in firm demographics. At the same time, more-exposed industries

shifted measurably toward process-oriented patenting: by 2010–14, their process patent share was 2.4 percentage points higher per standard deviation of exposure. The data confirm both the demographic and innovative dimensions of the cycle.

The theoretical model — a continuous-time general equilibrium framework with oligopolistic competition and finite quality and productivity ladders — is then used to assess R&D policy. The results carry an important warning. Both product and process innovation subsidies raise welfare up to a point, but beyond it the fiscal cost of sustaining additional research outweighs the output gains. The two subsidies also diverge structurally: product subsidies expand the number of active firms, while process subsidies contract it, because more productive incumbents deter entry. Yet despite opposite effects on concentration, **both types of subsidy compress markups** — a reminder that market structure and competitive intensity do not always move together.

These findings counsel caution about

blanket R&D support. A sector that looks diversified today may simply be in the early, entry-heavy phase of a life cycle that will end in consolidation — and generous subsidies may accelerate that transition rather than prevent it.

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The industry life cycle is the predictable output of product innovation and process innovation pulling in opposite directions



# Dangerous Liaisons? Debt Supply and Convenience Yield Spillovers in the Euro Area

Cristian Arcidiacono (University of Bern), Matthieu Bellon (International Monetary Fund), and Matthias Gnewuch (European Stability Mechanism) (presented by Matthias Gnewuch)

[Dangerous Liaisons? Debt Supply and Convenience Yield Spillovers in the Euro Area](#), Working Paper, 2025. [+](#)

When Germany decides to issue more government bonds, does this make it harder or easier for France to borrow? The answer touches on one of the most consequential features of European fiscal architecture: whether the safe-asset market in the euro area functions as a commons, where each country's issuance decisions impose costs on its neighbors. In their paper, Arcidiacono, Bellon, and Gnewuch investigate precisely this question, providing the first identification of debt supply shocks using issuance plan announcements for euro area countries and tracing how those shocks spill over into the borrowing conditions of peers.

The analysis centers on the convenience yield — the discount on interest rates that investors accept in exchange for holding bonds that are safe, liquid, and useful as collateral. A government bond with a high convenience yield is more than a claim on future revenues: it is an insurance instrument that can be sold quickly at favorable prices even during recessions. The higher this insurance value, the lower the interest rate the government needs to offer.

The central mechanism is one of substitutability. Safe sovereign bonds across the euro area — German, French, Dutch, Finnish — offer essentially the same insurance service. When Germany expands its supply, the aggregate stock of this insurance grows, reducing its marginal value. Since French or Dutch bonds provide the same hedging service, their convenience yields decline almost automatically. By contrast, Italian or Spanish bonds carry meaningful default risk, eroding their value as a hedge, so German supply shocks pass through to them much less.

To identify these spillovers, Arcidiacono, Bellon, and Gnewuch exploit a natural feature of German fiscal policy: the German debt management office publishes its annual debt issuance plan in December and provides quarterly updates. The authors measure the 30-minute change in yields around each announcement as a

clean debt supply shock, uncontaminated by simultaneous news about growth or inflation. The empirical work draws on daily and intraday data for nine euro area sovereign yields, credit default swap rates, and overnight interest swap rates from 2009 to 2023. A stylized theoretical model with idiosyncratic income risk and sovereign default risk provides the conceptual backbone.

The quantitative findings are striking. **A German debt supply shock that raises Germany's own convenience yield by one basis point raises France's by 0.92 basis points and the Netherlands' by 0.97 — both statistically indistinguishable from one.** Finland

comes in at 1.19 basis points, Austria at 0.67. The spillover to Italy, Spain, and Portugal is smaller on average and statistically insignificant, but when those countries' credit default swap spreads are low, the spillover coefficient rises substantially, approaching the level seen for the safe-country group. EU supranational bonds and investment-grade corporate bonds

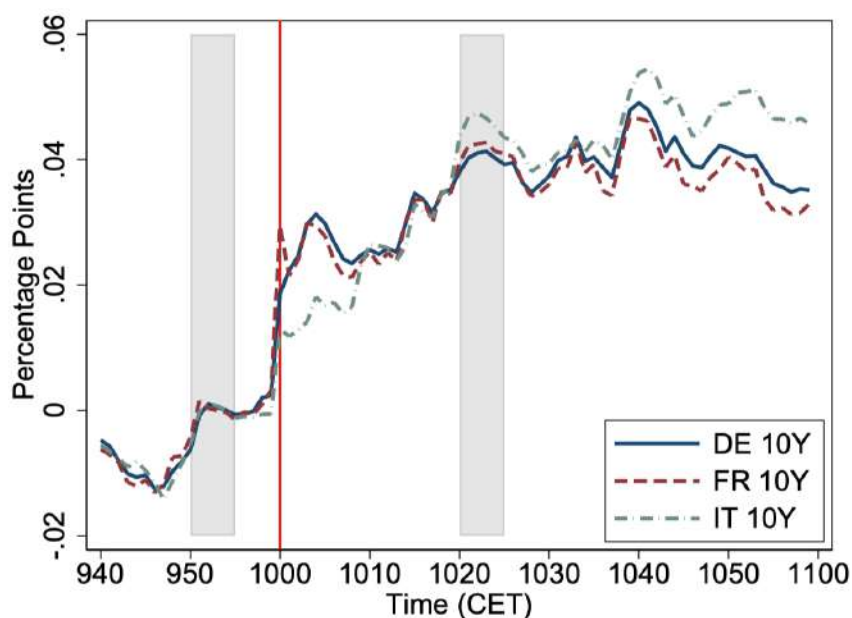
display similar sensitivity, with coefficients between 0.80 and 1.11. Spillovers to US Treasuries and Japanese government bonds are indistinguishable from zero, but the paper finds significant pass-through to the UK, Denmark, Sweden, and Norway — evidence that **geographic proximity matters, not just common currency membership.**

Arcidiacono, Bellon, and Gnewuch document **a fiscal externality that has been largely invisible in policy debates**

about European fiscal coordination: when any major euro area sovereign expands its debt supply, it implicitly reduces the borrowing advantage of every other issuer offering similar insurance services. This effect operates in calm times, requires no

deterioration in fundamentals, and is quantitatively material. The implication is that the case for coordinated European fiscal rules rests not only on concerns about default risk, but on how shared safe-asset markets distribute the costs of public borrowing across borders.

**Geographic proximity matters, not just common currency membership.**



# The Effects of Monetary Policy: Theory with Measured Expectations

Mirko Wiederholt (LMU Munich), Christopher Roth (University of Cologne), and Johannes Wohlfart (University of Copenhagen) (presented by Mirko Wiederholt)

[The Effects of Monetary Policy: Theory with Measured Expectations](#), Working Paper, July 2023. [+](#)

How does a change in interest rates affect household spending — and does the answer depend on the economic environment at the time? These questions sit at the heart of monetary policy, yet economists have long disagreed about the mechanism because the answer turns on how households form expectations about their future income and the cost of borrowing. Different assumptions can reverse both the sign and magnitude of estimated policy effects. In their paper, Wiederholt, Roth, and Wohlfart propose an approach that sidesteps this controversy: rather than assuming how households form expectations, they measure those expectations directly.

The key insight is that, in a standard heterogeneous-agent macroeconomic model, an unconstrained household's consumption depends on its expectations about future real income, future real interest rates, and current wealth. When comparing consumption under two alternative policies, all level terms cancel and what remains is the difference in expectations across scenarios. These expectation differences are sufficient statistics for the consumption response of non-hand-to-mouth households, and they can be measured via surveys without any assumption about underlying belief formation. Hand-to-mouth households, by contrast, simply consume their current income, so the identification strategy fundamentally depends on distinguishing between the two groups.

To implement this, the authors conducted two surveys. In March 2021, more than

2,000 respondents reported their income and inflation expectations under two versions of Federal Reserve forward guidance — one holding the projected end-2023 rate near zero, one raising it to 0.5%. In March 2022, a second survey of around 700 respondents compared keeping the current rate near zero with raising it immediately to 0.5%. Each respondent answered under both scenarios, so the expectation differences are within-person comparisons.

The results reveal striking state dependence. In March 2021, a projected rate increase led households to lower their inflation expectations — consistent with the standard view that tighter policy suppresses prices. In March 2022, the same rate increase led households to raise their inflation expectations, interpreting the hike as a signal of inflationary pressures the Fed had already detected. **No single fixed model of expectation formation can produce both responses.** This matters for transmission: in 2022, higher inflation expectations eroded expected real income, so the income channel and the intertemporal substitution channel reinforced each other rather than partly offsetting.

On aggregate, the forward guidance scenario would have reduced consumption by 0.14% on impact, while the conventional rate increase would have reduced it by 0.30%. The modest forward guidance effect reflects the near-zero income expectation response, leaving intertemporal substitution as the primary channel, partly offset by a positive real income effect. **The conventional rate hike produced roughly twice the consumption effect of equivalent forward guidance**, a result that would be difficult to obtain from a model imposing symmetric expectation responses across policy types. A third survey, run in September 2022, validated the approach: the model's predictions matched the distribution of self-reported spending intentions, and model-based and self-reported responses were significantly correlated at the individual level.

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**The conventional rate hike produced roughly twice the consumption effect of equivalent forward guidance.**

Wiederholt, Roth, and Wohlfart demonstrate that quantitative monetary policy analysis does not require committing to a model of expectation formation — arguably the most contested input in modern macroeconomics. The broader lesson is that the effects of a given policy action depend on the macroeconomic context in which it is taken, and that measuring household beliefs directly may be the most reliable way to capture that dependence.



# Interview: Mirko Wiederholt

December 3rd, 2025

**Your research shows that household responses to policy announcements vary over time. In March 2021, a hypothetical rate increase lowered expected inflation; by September 2022, the same policy raised it. Could you elaborate on what explains this reversal? What does it reveal about how households interpret monetary policy?**

A likely explanation for this reversal is the discussion whether "inflation is here to stay" at the beginning of 2022. This may have led households to interpret rate increases in 2022 as signals that inflation is indeed here to stay.

**Standard models assume rational expectations. Your approach instead elicits expectations directly from households. Do you see this as a departure from or complement to rational expectations theory? Should policymakers rely more on measured beliefs when assessing policy transmission?**

Many households in our surveys report differences in expectations across policy scenarios that are difficult to reconcile with rational expectations. I think it's indeed a good idea to rely more on measured beliefs when assessing policy transmission.

**Your framework distinguishes hand-to-mouth from non-hand-to-mouth households, and attentive from inattentive ones. Do you think that central bank communication strategies should account for this heterogeneity? If so, how?**

We distinguish hand-to-mouth from non-hand-to-mouth households because they have different consumption functions. We also distinguish attentive from inattentive households, because we want to predict the effects of central bank announcements on consumption and attentive households are more likely to be reached by those announcements. There are additional reasons why central bank communication strategies should potentially account for this heterogeneity. For example, we also present evidence in the validation section of our paper

that choices of attentive households are more sensitive to beliefs than choices of inattentive households.

**In your vignettes, the Fed's long-run rate projection stays fixed while the immediate decision varies. How important is this forward guidance in anchoring expectations? Would results differ if the long-run projection also changed?**

Our goal was to imitate real-world central bank communication. We thought that some statement about the long run is typically part of the communication. Having said this, it would be no problem to include a vignette without a statement about the Fed's long-run rate projection. Comparing the results from such a vignette to the baseline results would make it possible to isolate the effects of communication about the long run.

**In September 2022, households expected lower income growth after a rate increase—a channel absent in earlier surveys. Does the income channel only become salient in certain conditions? How important is it relative to the direct interest rate effect?**

We find that own nominal income expectations typically do not vary across central bank announcements, but in September 2022, they do. This may be due to the fact that, at the Jackson Hole conference in August 2022, the Federal Reserve Chair Jerome H. Powell emphasized that higher interest rates will bring some pain to households and the news media widely reported this statement. We find that the real income expectations channel is always important, because not only households' lower own nominal income expectations but also households' higher inflation expectations reduce households' real income expectations. As a result, a real income expectations channel is always operating, but with varying strength.

**Your methodology predicts consumption responses before announcements occur. Could central banks adopt this as a regular tool, surveying households before each**

**meeting? What obstacles might prevent institutionalizing such surveys?**

I think they could adopt this as a regular tool. One concern I have heard is that by surveying households before meetings central banks would reveal which policy alternatives are on the table. This concern could be addressed by including more policy alternatives in the survey. One could, for example, have the simple rule that the survey includes all policy alternatives that the market is assigning positive probability to. This rule would ensure that fielding the survey does not reveal any information about the most likely policy actions by the central bank.

**Your September 2025 survey finds that a 50-basis point cut would slightly raise inflation expectations but not affect income expectations. What does this suggest about how households perceive the Fed's current stance? Would a rate cut meaningfully affect consumption now?**

According to our latest wave, a current rate cut would have a very modest effect on consumption, because of the small effect on inflation expectations and the lack of an effect on own nominal income expectations.

**Having applied this methodology from the pre-inflation period through the post-pandemic surge to 2025, what is the most important lesson about how monetary policy works? What questions about policy transmission remain most pressing?**

We detect important differences in the effects of policy announcements over time: inflation expectations sometimes decrease and sometimes increase after rate hikes, and own nominal income expectations typically do not respond and occasionally respond to interest rate changes. Importantly, we identify the sign and size of expectation responses before the meetings, rather than becoming aware of them after the meetings. In the long run, one might also be able to identify systematic patterns about when expectations move in which direction.



# MACROECONOMIC RISK CHAIR

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**Publication:**

May 2026

**Layout:**

Caroline Galliano