BANCA D'ITALIA
EUROSISTEMA

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ISSN 1972-6643 (online)

Designed by the Printing and Publishing Division of Banca d'Italia

MANY TOO MANY:
EXCESS SAVINGS AND THE TRANSMISSION OF MACROECONOMIC SHOCKS

by Andrea Foschi*, Stefano Pica* and Marianna Riggi*

Abstract

We show that the stock of excess savings alters the propagation of the business cycle. It markedly weakens the transmission of monetary policy shocks to real economic activity and inflation; in contrast, in the event of a cost-push disturbance, excess savings cushion the impact on output while amplifying and prolonging the pass-through to inflation. These findings underscore the importance of incorporating balance-sheet conditions into the assessment and calibration of monetary policy. They also offer additional insights into the 2022-23 cyclical episode in the euro area: in an environment characterized by historically elevated excess savings, the surge in energy prices and the unprecedented pace of policy rate hikes resulted in resilient growth and stubbornly persistent high inflation.

JEL Classification: E21, E31, E32, E52.

Keywords: excess savings, monetary policy, energy shocks, macroeconomic transmission.

DOI: 10.32057/0.QEF.2026.1031

* Banca d'Italia.

[. . .] much more of creative economic research is required
on the causes, consequences, and policy implications
of the pervasive private sector excess saving problem
Rachel and Summers, 2019

1 Introduction[1]

Excess savings have repeatedly featured in the macroeconomic discourse over the past two decades – from the notion of a global savings glut as a driver of the decline in estimated natural interest rates (Bernanke, 2005) to the secular stagnation literature, which links persistently weak growth to a structural imbalance between the supply of savings and the demand for investment at positive real interest rates (Summers, 2013, 2014; Eggertsson et al. 2019). More recently, the extraordinary buildup of household wealth in advanced economies during the pandemic – fueled by generous fiscal support, limited opportunities to spend during lockdowns, and precautionary saving motives amid extreme uncertainty – has brought the issue of savings exceeding normal levels back to the forefront of the business-cycle discussion.

Whether it is addressed from a structural, long-term perspective, as in the literature on secular stagnation, or examined within a business cycle framework, as in the debate following the pandemic, the issue of excess savings has always been intertwined with that of the effectiveness of monetary policy. In the long run, excess savings are thought to push the natural rate of interest into negative territory, thereby reducing the effectiveness of monetary policy when constrained by the zero lower bound (Eggertsson et al. 2019); in the short run, large liquidity buffers may dampen the pass-through of interest rates to consumption (Ferreira et al. 2025).

While the role of households' excess savings in the transmission of monetary policy has received some attention in the literature, how accumulated savings may alter the propagation of supply shocks remains an open question. This issue is of primary importance for at least two reasons. First, it bears directly on our understanding of the recent euro-area inflation surge of 2022-2023, marked by an exceptional sequence of energy price shocks against the backdrop of above-normal accumulated savings. Second, from a forward-looking perspective, it is becoming increasingly relevant as trade and geopolitical tensions heighten the likelihood

[1] We thank Valentina Aprigliano, Olivier Blanchard, Francesco Corsello, Stefano Neri, Tiziano Ropele, Fabrizio Venditti, Giordano Zevi and Roberta Zizza for useful comments and suggestions.

of larger and more frequent supply shocks.

This paper fills this gap by studying the role of households' excess savings in shaping the transmission of energy shocks in the euro area, while also corroborating the existing evidence on the transmission of monetary policy shocks. Our empirical strategy relies on local projections (Jordà 2005). Monetary policy shocks are identified following Jarociński and Karadi (2020), while oil supply shocks are identified as in Kanzig (2021).[2] Excess savings are measured as the cumulative sum of savings flows arising from deviations of the savings rate from its trend, in line with Ferreira et al. (2025).

Concerning the transmission of monetary policy shocks, we confirm that excess savings significantly dampen the transmission of the monetary impulse to both economic activity and core inflation. By contrast, we find that, when the economy is hit by a cost-push shock, the presence of excess savings mitigates the impact on economic activity but amplifies - and, above all, makes more persistent - the pass-through of the shock to core inflation.

These results provide a new perspective on the 2022–2023 cyclical phase, marked by a sharp surge in energy prices and by an unprecedented sequence of policy rate hikes, against the backdrop of historically elevated excess savings. Our findings suggest that while excess savings cushioned the impact of the energy shock on economic activity, they also amplified its pass-through to core inflation. At the same time, monetary policy proved less effective, as savings buffers dampened the transmission of policy tightening to both output and prices. The outcome was a cyclical phase characterized by a strong and persistent rise in core inflation alongside broadly resilient economic growth.

The paper is organized as follows. Section 2 provides a review of related literature. In Section 3 we provide some descriptive evidence motivating our analysis, we present empirical evidence based on local projections regressions and we provide some intuitions to explain our results. Section 4 offers concluding remarks.

2 Related literature

This work fits within several branches of literature. The most recent research on excess savings has focused on how they spill over into aggregate demand and to what extent they might translate into higher inflation following their drawdown. A key aspect in this line

[2]As shown in the Appendix, our results are robust when using a gas supply shock identified following Alessandri and Gazzani (2025), suggesting that they generalize to cost-push shocks.

of analysis is the distribution of excess savings across households. After the pandemic, the available evidence for Italy shows that in 2023 the majority of these assets (more than 60 per cent) were held by the highest-income quintile (Colabella et al 2019). Auclert et al. (2023) use an heterogenous new Keynesian model to map this distribution to the path of output, showing that the effect of excess savings on aggregate demand slowly dissipates as they "trickle up" the wealth distribution to agents with lower marginal propensities to consume (MPCs).

Several studies have sought to isolate the contribution of excess savings to post-pandemic inflation from other factors that – varying in intensity across geographical areas – jointly created the "perfect storm" behind the inflationary surge that began in 2022.[3] Along this line of research, Bardóczy et al (2025) develop a quantitative heterogenous new Keynesian model that attributes about one third of the COVID-19 pandemic trough-to-peak change in US inflation to demand fueled by excess savings.

Our work relates most directly to research on how the business cycle and the transmission of shocks are altered when savings are accumulated to high levels. Let us stress that excess savings and their implications for monetary policy effectiveness are not a concern that arose in the wake of the pandemic shock; rather, this issue has shaped the macroeconomic narrative of the previous two decades. In their seminal contribution, Rachel and Summers (2019) wrote of a "pervasive private-sector excess savings problem", identifying it as the essence of secular stagnation and the ultimate cause of the sharp decline in the advanced economies' neutral real rate:[4] the secular stagnation hypothesis posits a new normal in which real interest rates must be, on average, negative for the economy to attain full employment. This, given the zero lower bound on nominal rates, drastically reduces the effectiveness of expansionary monetary policy (Eggertson et al. 2019).

From a more cyclical standpoint, research on the interaction between accumulated savings

[3]These factors include monetary and fiscal shocks, pent-up demand following post-pandemic reopenings, supply bottlenecks, and the energy shock.

[4]According to this theory, over the past half century, several structural forces in advanced economies – such as the demographic transition, the decline in expected trend productivity growth, and the increase in income inequality — have profoundly altered the private sector's saving and investment propensities, resulting in a marked decline in the natural real rate. In macroeconomic data, secular stagnation would not manifest itself as an upward trend in the saving rate, but rather as the progressive reduction of the neutral real interest rate in the industrialized world, which has masked the underlying shifts in desired saving and investment propensities. Rachel and Summers (2019) calculate the counterfactual wedge between private sector saving and investment in the United States under an assumption of no decrease in the interest rate since the 1980s. They find that, absent the cushioning decline of the interest rate, in 2016 the excess saving gap would have been between 9 and 14 percentage points rather than 4.

and the transmission of monetary policy regained momentum after the pandemic, when limited opportunities to spend, together with a strong precautionary behavior driven by heightened income uncertainty, led to an exceptional buildup of savings in advanced economies. Using a panel of euro-area economies and high-frequency monetary policy shocks, Ferreira et al. (2025) find that monetary policy transmission to both inflation and economic activity is dampened in periods of high excess savings; they rationalize these findings using a New Keynesian model in which households face idiosyncratic unemployment and consumption risk against which they can only self-insure through savings. The notion that excess savings have dampened the transmission of the sharp post-pandemic interest rate hikes to aggregate demand is also supported by Elias et al. (2025): using Australian data, they show that adjustable-rate borrowers did not curtail their spending because they tapped into the sizable savings buffers accumulated during the pandemic. Consequently, the spending patterns of adjustable-rate mortgagors changed only marginally compared with those of fixed-rate mortgagors.

The literature on energy shocks is vast, encompassing analyses of how their effects have evolved over time (Blanchard and Gali 2007, Blanchard and Riggi 2013, Riggi and Venditti 2015), their redistributive effects (Corsello and Riggi forthcoming), the role played by different underlying sources of the disturbance (Kilian 2009, Lippi and Nobili 2012, Alessandri and Gazzani 2025) and the existence of state-dependent effects (Neri 2025) particularly in the aftermath of the large gas shock of 2022. However, to the best of our knowledge, no study has so far examined how the presence of excess savings may alter the transmission of energy shocks to macro variables. By filling this gap, our paper provides a comprehensive assessment of the interaction between excess savings and the business cycle, whether driven by demand or supply disturbances.

3 Empirical analysis

3.1 Measuring the excess of savings

Figure 1 panel A shows the evolution of the households' saving rate in the euro area. The exceptional increase in savings during the pandemic particularly stands out: this accumulation was clearly strongly connected to the inability to spend amid the extensive restrictions, as well as to the high uncertainty regarding the evolution of the broader macroeconomic outlook. By mid-2022, the euro-area saving rate had returned to levels in line with its pre-pandemic average, as the exceptional and largely involuntary dynamics observed during the pandemic years had fully unwound. From the summer of 2022 onward, however, the saving rate in the euro area began to increase again, stabilizing from mid-2024 at levels significantly above historical norms.[5]

Following Ferreira et al. (2025), we construct a measure of euro-area excess savings for the pre-pandemic sample by cumulating savings flows that are driven by deviations of the savings rate from its trend. More precisely, we extract a time-varying trend savings rate by using an Hodrick–Prescott filter over the pre-pandemic sample 1999-2019.[6] The Appendix shows that our results are robust to the use of an alternative filter. The resulting cyclical component extracted by the filter is multiplied by the corresponding disposable income for that quarter to obtain a measure of the flow of excess savings:

$$\text{Flow of excess savings}_t = (\text{Savings rate}_t - \text{Trend savings rate}_t) \times \text{Disposable income}_t \; . \quad (1)$$

We then cumulate these flows and divide them by nominal GDP to obtain the stock of excess savings, normalized by output:

$$\text{Stock of excess savings}_t = 100 \times \frac{\sum_{s=1999Q1}^{t} \text{Flow of excess savings}_s}{\text{Nominal GDP}_t} \; . \quad (2)$$

For the post-pandemic sample, we use an analogous procedure to construct a stock of excess accumulated savings, with the only difference that, in line with the most recent literature (e.g. de Soyres et al. 2023), we construct the trend savings rate used in (1) by extrapolating the corresponding pre-pandemic trend.[7] Based on these estimates, since the end of 2022 the saving rate has been significantly above the level consistent with the pre-COVID trend.

Figure 1 panel B illustrates our estimates for the accumulated stock of excess savings over our estimation sample, which ends at the end of 2019. It is noteworthy that the two recessionary episodes that occurred during this period were associated with markedly different levels of the saving rate. The 2008–09 recession (the Great Recession), triggered by the global financial crisis, was characterized by negative excess savings, i.e. accumulated savings falling below their long-run benchmark. By contrast, the 2011–13 double-dip recession associated with the sovereign debt crisis coincided with a period of excess savings.

[5] See Bobasu et al (2024) for an analysis of the factors underlying the rise in the euro-area saving rate between mid-2022 and mid-2024.

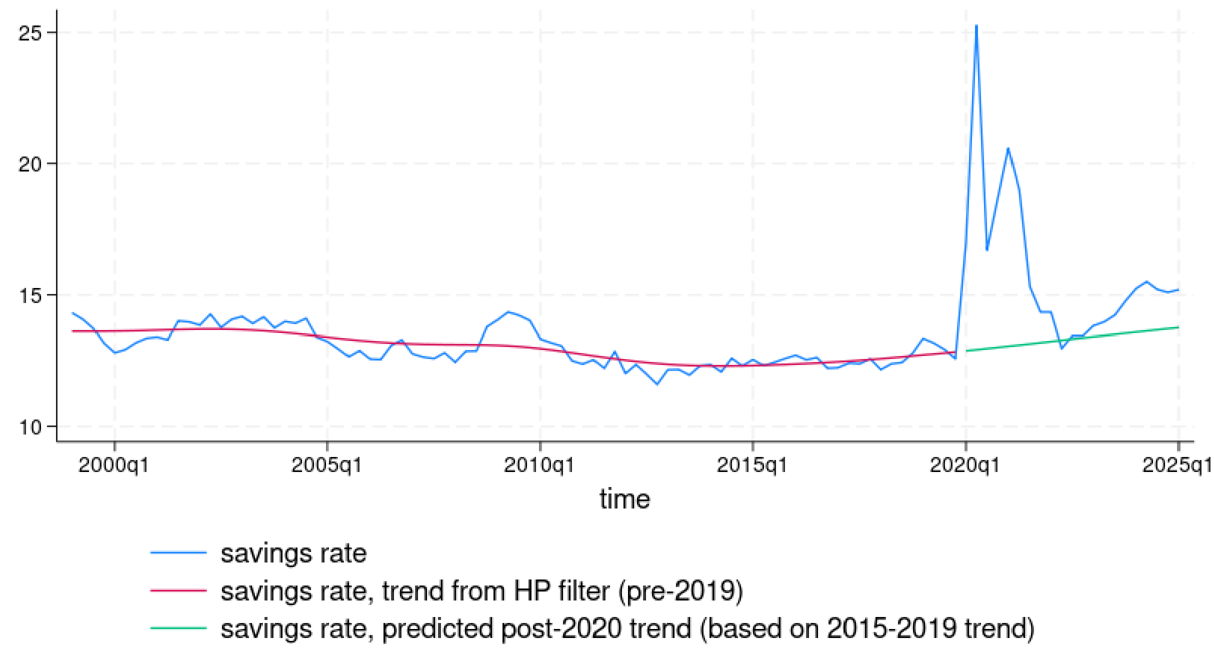
[6] Specifically, we use the standard two-sided Hodrick-Prescott filter with $\lambda = 1600$.

[7] The trend in the pandemic sample is obtained by estimating the regression Trend savings rate$_t = \alpha + \beta t + \gamma t^s + \delta t^3 + \varepsilon_t$ in the 2015Q1-2019Q4 sample and then predicting values in the pandemic sample.

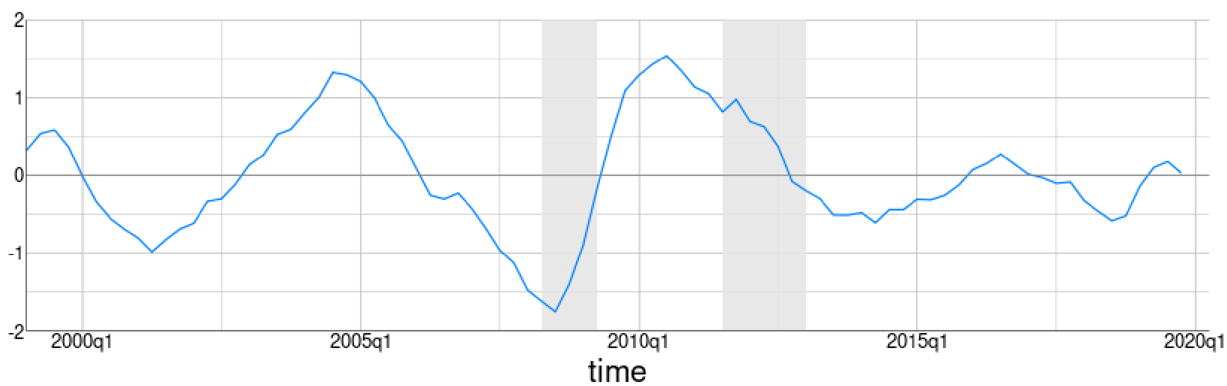
We now turn to analyzing how excess savings interact with the transmission of monetary policy and energy shocks.

Figure 1: Excess savings in the euro area

(a) Euro area savings rate



(b) Euro area stock of excess savings



Note: Panel A reports the actual euro area seasonally adjusted household saving rate (blue line), its HP trend computed on the 2015-2019 sample (red line), and its predicted values since 2020 using the HP trend. Panel B reports our measure of excess savings, computed as in equation 2. The shaded areas indicate recessionary phases according to the CEPR business cycle dating.
Source: Eurostat's quarterly sector accounts; authors' calculations.

3.2 Results

We estimate impulse response functions to monetary policy shocks and energy shocks through local projections (Jordà, 2005), using monthly data over the sample 2000m1 – 2019m12. Denoting with h the time horizon, the benchmark specification is as follows:

$$Y_{t+h} - Y_{t-1} = \alpha + \beta\varepsilon_t + \gamma D_{t-1} + \theta\varepsilon_t D_{t-1} + \Gamma X_t + u_t \ . \tag{3}$$

Here, Y_t is a monthly measure of economic activity (the unemployment rate or log industrial production) or prices (log core HICP); D_{t-1} is a binary dummy variable that takes the value of 0 if, in $t-1$, the stock of excess savings – measured as specified in Section 3.1 – is below a certain threshold (in the baseline, its median over the estimation sample), and is set to 1 otherwise.[8] The shocks in ε_t are either the euro-area monetary policy shocks by Jarociński and Karadi (2020) or the oil shocks by Kanzig (2021). The appendix shows that the results are also robust when using gas shocks instead of oil shocks. The controls in X_t include three lags of log industrial production, log headline HICP, log core HICP, the unemployment rate, the one-year Bund yield, the shock of interest, and the Goldman Sachs financial conditions index for the euro area; the oil regressions also additionally include three lags of the log of the real oil price. Standard errors are corrected with the Newey-West procedure controlling for $12 + h$ lags of autocorrelation.

The coefficient β captures the impact of the shocks when the stock of savings is below the threshold, i.e. when there are no excess savings. The coefficient θ captures the additional amplification effect (if it has the same sign as β) or attenuation effect (if it has the opposite sign) of excess savings.

Figure 2 shows the results for monetary policy shocks. As expected, in the absence of excess savings, a monetary tightening leads to a contraction in both economic activity and inflation. When excess savings are present, however, their dampening effect becomes substantial, significantly reducing – or even fully offsetting – the impact of the shock across all variables.

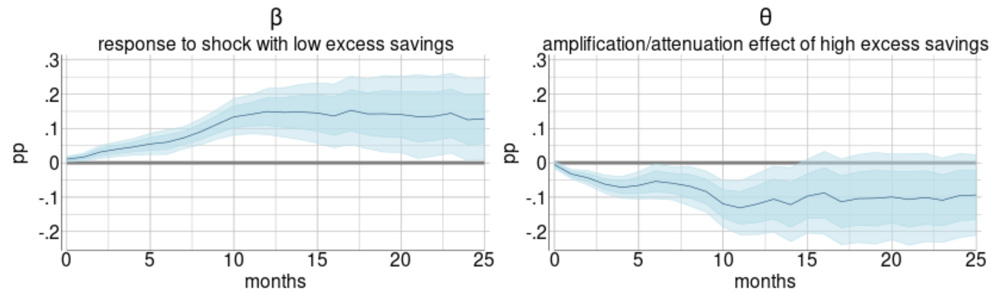
Figure 3 presents the results for oil shocks, which display a different pattern. In line with theoretical predictions, an oil price increase depresses economic activity while raising inflation when excess savings are absent. With excess savings, however, the dampening effect is observed only on economic activity – particularly on industrial production. For core inflation,

[8] Our baseline results are robust if we use as threshold the 75^{th} percentile of the distribution. We compute a monthly disaggregation of the quarterly excess savings variable by linear interpolation before defining the dummy.

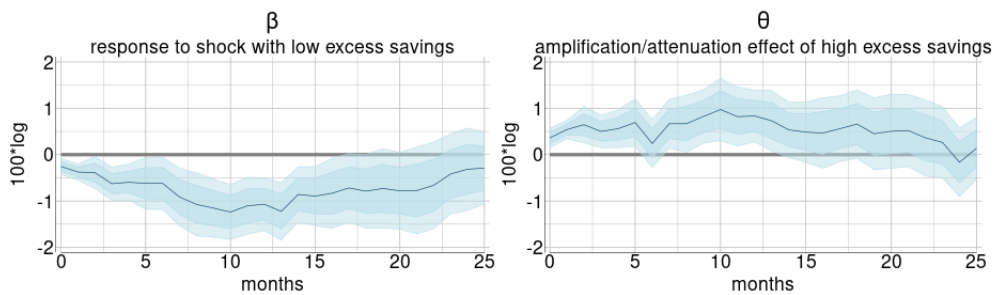
by contrast, excess savings generate an amplification effect, making the inflationary response of the shock considerably more persistent.

Figure 2: Effect of excess savings on the transmission of a monetary policy shock

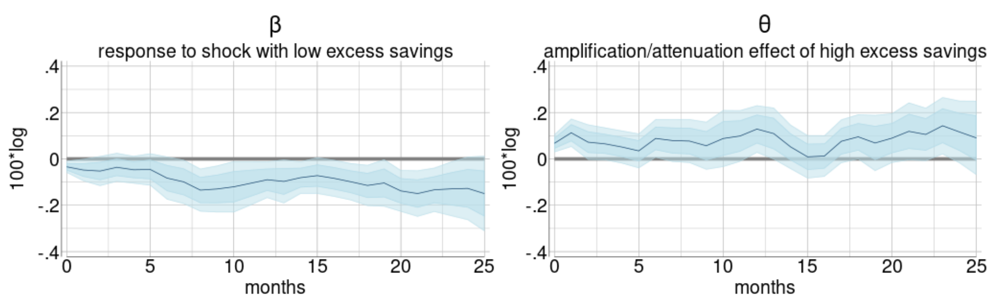
(a) Unemployment rate



(b) Industrial production



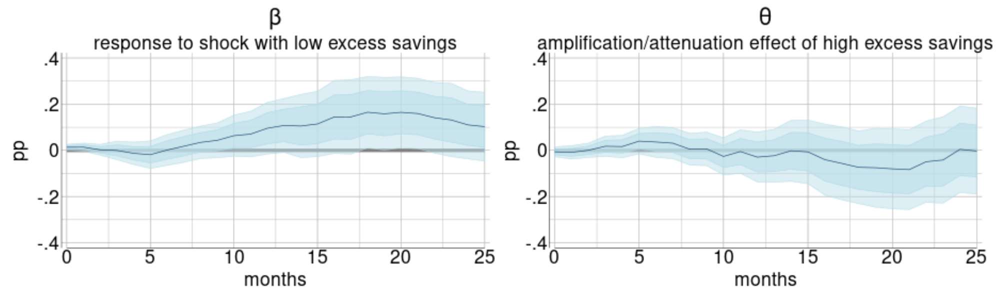
(c) Core HICP



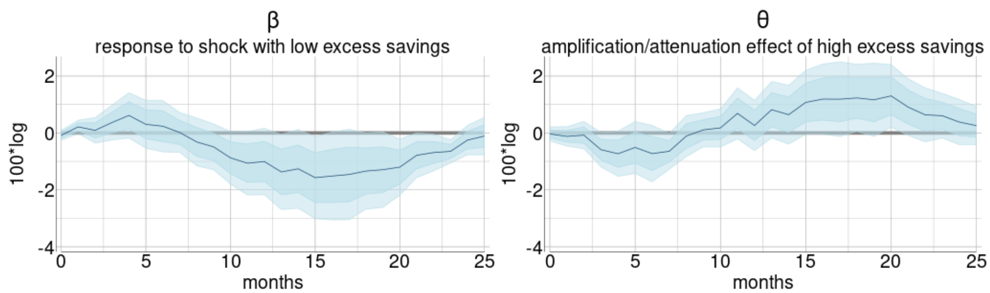
Note: The figure shows the responses of the unemployment rate (panel A), industrial production (panel B) and core HICP (panel C) to a monetary tightening of 5 basis points in the absence of excess savings (left plot of each panel, corresponding to the β in equation 3), along with the additional effect of excess savings (right plot of each panel, corresponding to the θ in equation 3). The shaded areas indicate 68% and 90% confidence intervals.
Source: authors' calculations.

Figure 3: Effect of excess savings on the transmission of an oil shock

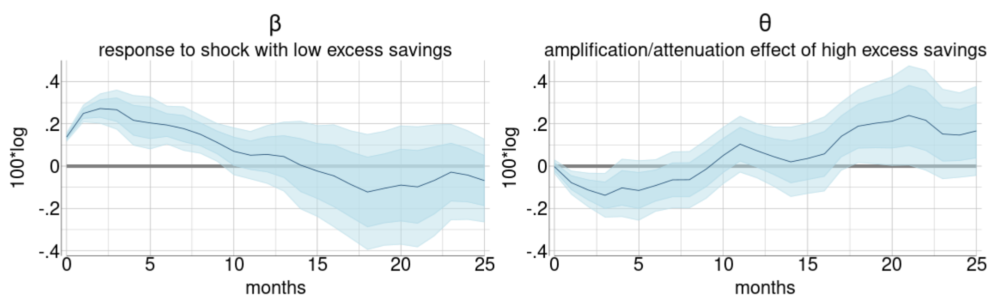
(a) Unemployment rate



(b) Industrial production



(c) Core HICP



Note: The figure shows the responses of the unemployment rate (panel A), industrial production (panel B) and core HICP (panel C) to an oil shock that increases the real price of oil by 10% on impact, in the absence of excess savings (left plot of each panel, corresponding to the β in equation 3), along with the additional effect of excess savings (right plot of each panel, corresponding to the θ in equation 3). The shaded areas indicate 68% and 90% confidence intervals.
Source: authors' calculations.

3.3 Interpreting the results

What macroeconomic narrative emerges from these results? The evidence is consistent with the view that a high stock of excess savings leads to a flatter Euler equation, that is, to a weaker sensitivity of current consumption to the real interest rate than what would prevail in an economy with zero or negative excess savings.

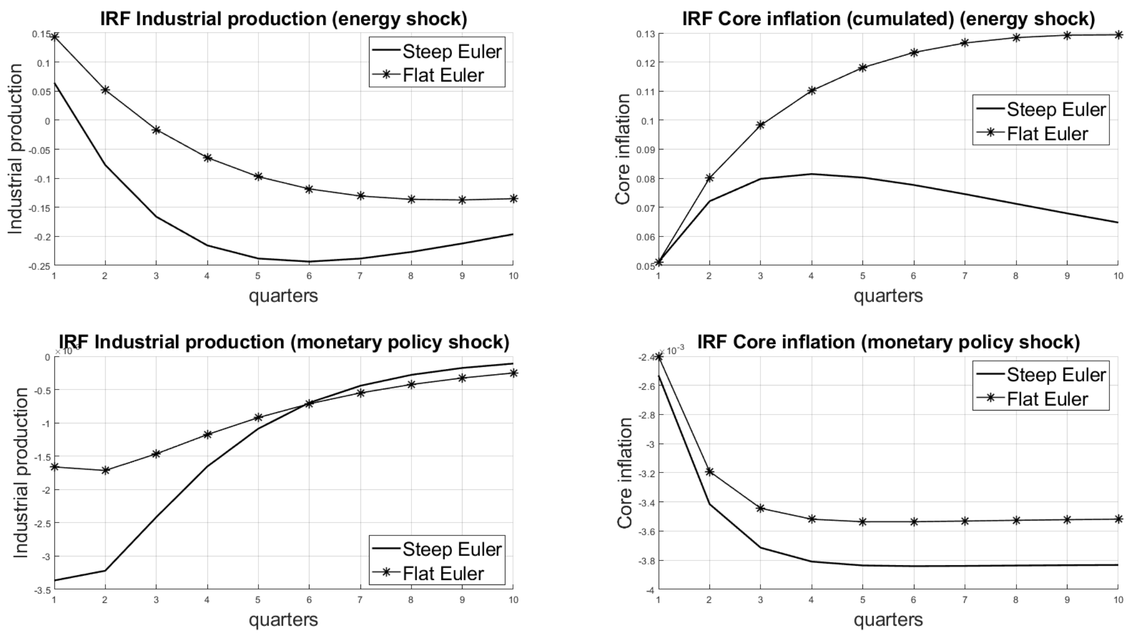
Consider first a monetary policy shock. Quite trivially, if consumption responds only weakly to changes in interest rates, the demand channel of monetary transmission is dampened. As a result, interest rate movements become less effective in influencing both real economic activity and inflation.

Now consider a cost-push shock, which raises inflation and triggers an endogenous monetary policy tightening. This policy response typically induces a contraction in consumption and economic activity, which in turn exerts downward pressure on inflation, gradually bringing it back toward equilibrium. However, in an environment characterized by a flatter Euler curve, the contraction in consumption and output is attenuated. Consequently, the decline in aggregate demand is weaker, and inflation increases more strongly and remains elevated for longer. In other words, cost-push shocks translate more strongly and persistently into core inflation because demand compresses less, limiting the offsetting disinflationary effect of a negative output gap.

To illustrate the strength of this mechanism, we report in Figure 4 the impulse responses to an energy shock and to a monetary policy shock obtained by simulating the representative-agent theoretical model developed in Blanchard and Riggi (2013), which captures macroeconomic dynamics for a country that imports energy at an exogenous nominal price within an otherwise standard New Keynesian framework. The figure shows the responses obtained using the parameters estimated by Blanchard and Riggi (2013) and those that would arise under the assumption of a flatter Euler curve, obtained by assuming a higher coefficient of risk aversion. As shown by this figure, from a macroeconomic perspective, our evidence is clearly consistent with the hypothesis that excess savings correspond to a flatter aggregate Euler curve.

To take the next step and explain why excess savings are associated with a flatter Euler curve, it is necessary to reason within a framework featuring heterogeneous agents. In the class of HANK models with incomplete markets, an episode of excess savings implies a reduction in the sensitivity of aggregate consumption to changes in interest rates relative to a scenario with zero or negative excess savings. The intuition stems from the heterogeneity of marginal propensities to consume (MPCs) along the wealth distribution. In these models, the response of aggregate demand to interest rates is governed by a sufficient statistic that combines individual MPCs with unhedged interest rate exposure (see Auclert 2019). When the wealth distribution shifts to the right, as during an episode of extraordinary liquidity accumulation, the share of households close to the liquidity constraint – typically characterized by high MPCs – declines, thereby reducing the importance of the redistributive channel of monetary policy. As a result, the weighted average of MPCs and interest rate exposures decreases, attenuating the response of aggregate consumption to changes in the real interest rate. In macroeconomic terms, this translates into a flatter Euler curve and a weaker short-run transmission of monetary policy compared with a situation in which a larger fraction of households is located near the liquidity constraint.

Figure 4: Theoretical impulse responses for different slopes of the Euler curve



Note: The figure reports the IRFs to an energy shock that raises the real price of energy by 10 per cent on impact and to a one-percent standard deviation monetary policy shock obtained using one of the calibration in Blanchard and Riggi (2013) ("Steep Euler") and under an alternative calibration ("Flat Euler") that differs only in the risk-aversion parameter, which governs the slope of the Euler equation.
Source: authors' calculations.

4 Conclusions

This paper has examined how the presence of excess savings shapes the transmission of demand shocks (monetary policy shocks) and supply shocks (energy shocks). Excess savings dampen the pass-through of monetary policy shocks to inflation, while amplifying and prolonging the inflationary effects of a cost-push shock. By contrast, the transmission to real activity is attenuated conditional on both types of economic disturbances.

From a policy perspective, the role of supply shocks is particularly relevant in the current context of increasing fragmentation and geopolitical tensions, which heightens the likelihood and frequency of energy and other cost-push disturbances. In such an environment, economies characterized by elevated excess savings may be more exposed to persistent inflationary episodes following adverse supply shocks. This, in turn, implies that monetary policy may face a more severe trade-off between stabilizing inflation and supporting real activity. The calibration of policy should therefore explicitly account for the stock of savings accumulated in the private sector, as it materially affects the strength and persistence of shock transmission. More broadly, excess savings should be considered a key macro-financial variable within the policy framework: integrating their dynamics into central bank analytical and forecasting models can enhance the assessment of inflationary risks, help explain heterogeneity in transmission across countries and periods, and provide an informative gauge of the underlying resilience of aggregate demand.

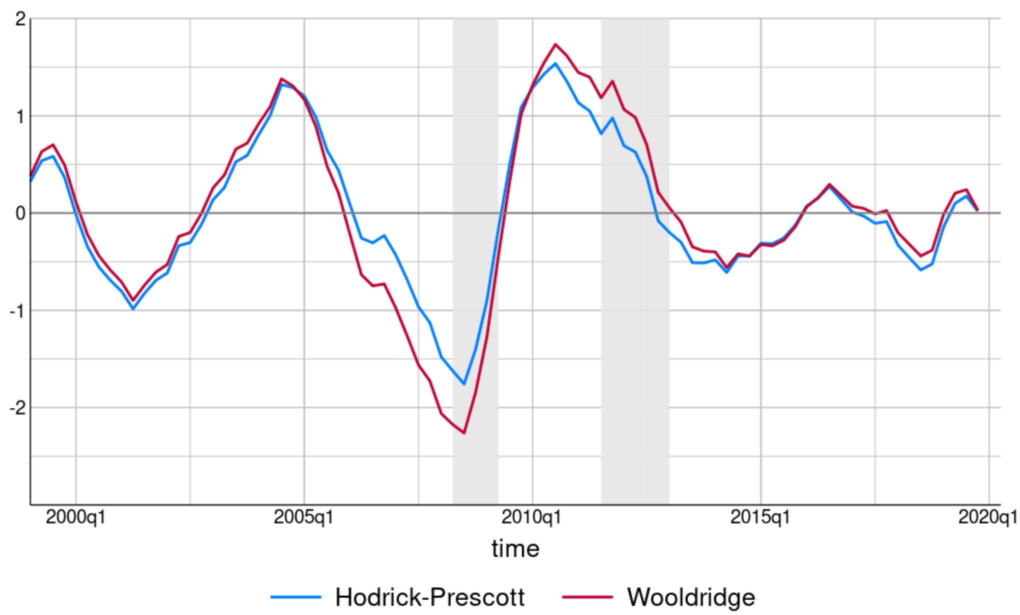
The paper sets out two avenues for future research. The first, from an empirical perspective, is to estimate the effects using a panel of euro area countries: expanding the dataset in this way would strengthen the empirical power of our results. The second, from a theoretical perspective, is to develop a micro founded model capable of rationalizing our findings and usable to explore the relationship between optimal monetary policy and the level of savings relative to trend.

Appendix

A Robustness to the filtering approach

As a robustness check, we detrend the saving rate using a cubic time trend following Wooldridge (2010). The results are almost unchanged. As shown in Figure A1, the measure of excess savings we obtain closely tracks that derived using the HP filter; the dummy is activated in almost exactly the same periods, and the impulse responses to the shocks – omitted for brevity – are very similar to those reported in the main text.

Figure A1: Excess savings in the euro area – Robustness to alternative filter



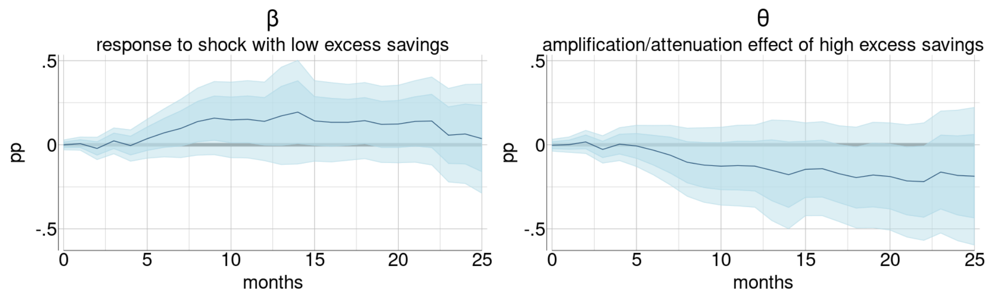
Note: The figure reports our measure of excess savings, computed as in equation 2 in the main text, using a cubic time trend following Wooldridge (2010) to detrend the seasonally adjusted euro area household saving rate, or the HP filter as in the main text. The shaded areas indicate recessionary phases according to the CEPR business cycle dating.
Source: Eurostat's quarterly sector accounts; authors' calculations.

B Robustness to gas shocks

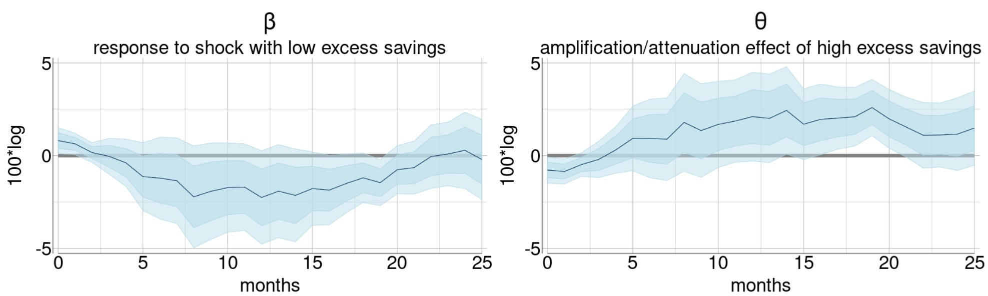
The transmission of a gas price shock may differ from that of an oil price shock (Alessandri and Gazzani, 2025). An important robustness check is therefore to verify whether our results continue to hold when the cost-push shock hitting the economy originates from movements in gas prices rather than disturbances in the oil market. To conduct this robustness exercise, we rely on gas shocks identified following Alessandri and Gazzani (2025). Results appear remarkably robust. A gas price shock generates stagflationary effects, in line with what we expect from a cost-push shock. However, in the presence of excess savings, the real effects are dampened while the inflationary effects are amplified.

Figure A2: Effect of excess savings on the transmission of a gas shock

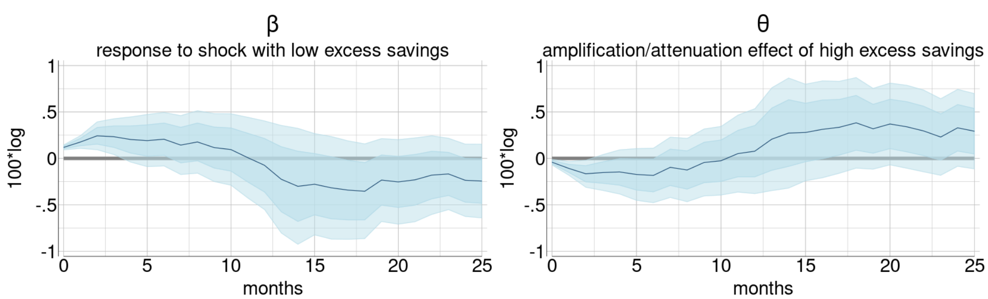
(a) Unemployment rate



(b) Industrial production



(c) Core HICP



Note: The figure shows the responses of the unemployment rate (panel A), industrial production (panel B) and core HICP (panel C) to a gas shock that increases the euro area HICP energy by 1% on impact, in the absence of excess savings (left plot of each panel, corresponding to the β in equation 3), along with the additional effect of excess savings (right plot of each panel, corresponding to the θ in equation 3). The shaded areas indicate 68% and 90% confidence intervals.
Source: authors' calculations.

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