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CONSUMPTION AND SAVING IN THE EURO AREA AFTER COVID: A SCENARIO ANALYSIS

by Donato Ceci*, Claudia Pacella* and Fabrizio Venditti*

Abstract

This paper examines the unexpectedly weak consumption dynamics of euro-area households following the COVID-19 crisis. Despite a recovery in disposable income during the 2022 reopening and the government measures mitigating the energy shock after Russia's invasion of Ukraine, the saving rate rose and remained high through 2025. We show that tighter monetary policy dampened consumption via higher interest rates, while inflation eroded real financial wealth, limiting spending further. Persistently weak consumer confidence also weighed on expenditure. However, even after taking account of these factors, the increase in savings remains unusually large by historical standards. We discuss two possible explanations: heightened pessimism about future income due to the exceptional sequence of shocks, and the disproportionate contribution of wealthier households to aggregate savings, as suggested by micro-level evidence.

JEL Classification: C11, C32, C53, C54, E21, E31, E37, E52.

Keywords: consumption, savings, energy, monetary policy.

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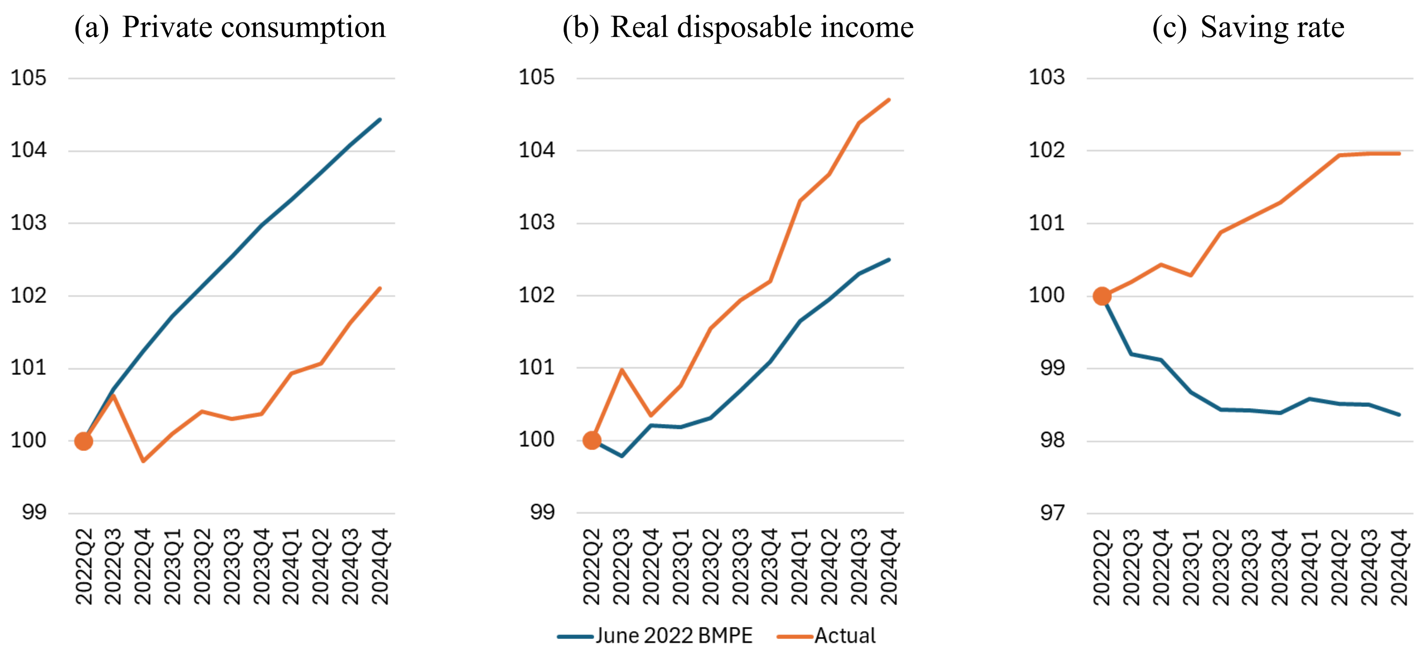
1. Introduction[1]

After the Covid-19 pandemic, the euro-area economy has been pulled by opposing forces. As mobility restrictions were lifted in 2022, activity rebounded rapidly. At the same time, the sharp rise in energy prices following Russia's invasion of Ukraine ignited inflation, also supported by pent-up demand and expansive fiscal policies. The ECB raised interest rates and tightened financial conditions. **The post-Covid recovery was**, however, **slower than projected by the Eurosystem staff, and significantly weaker than in the United States.**

Soft activity in the euro area reflected a sluggish recovery in consumption (Figure 1, panel a), **despite favorable labor-market conditions and higher-than-expected disposable income** (Figure 1, panel b). As a result, the saving rate increased and has remained high (Figure 1, panel c), more than 2 percentage points above its pre-pandemic average.

Figure 1: Deviations between projections and realizations

(2022Q2 = 100)



Note: the blue lines are June 2022 Eurosystem staff macroeconomic projections, orange lines actual data. All data scaled to 2022Q2=100.

[1] We wish to thank Valentina Aprigliano, Fabio Busetti, Michele Caivano, Davide Delle Monache and Giordano Zevi for helpful comments and suggestions. The views expressed in the article are those of the authors and do not involve the responsibility of the Bank of Italy. All remaining errors are ours.

Expectations of a consumption-led recovery in the euro area were repeatedly disappointed, leading the Eurosystem to revise down growth projections for the period 2022–2024.

This paper evaluates the role of six potential explanations for the underperformance of euro-area consumption and the concurrent rise in the saving rate.

- **Interest rates.** The monetary policy tightening that countered the inflation shock led to higher real interest rates. This partly boosted disposable income but also encouraged savings.
- **Consumer confidence.** The succession of crises – from the pandemic to the war in Ukraine – lowered households' confidence persistently and may have left lasting scars on households' spending behavior.
- **Energy inflation.** The inflation spike eroded households' purchasing power and restrained consumer spending, all else equal.
- **Uncertainty.** The same factors that depressed confidence may have raised households' uncertainty regarding the general economy as well as on their personal economic perspectives.
- **Non-labour income.** Growth in disposable income reflected, more than in the past, non-labour ('other') income, benefiting wealthier households with a higher propensity to save.
- **Financial wealth in real terms.** The desire to rebuild wealth buffers, eroded by inflation, may have driven the saving rate and compressed consumption.

We assess the relative importance of the six factors discussed above through scenario analyses. Consider, for example, interest rates. The projections produced in 2022 were conditioned on an interest-rate path reflecting the market developments prevailing in mid-May, which did not anticipate the magnitude of the subsequent ECB tightening. We then use an econometric model to forecast the behaviour of consumption and saving, conditioning on interest rates following their actual path rather than the one embedded in the original projections. The difference between these two conditional forecasts provides a measure of the contribution of interest rates developments to consumption, income and savings.

More generally, conditional forecasts are projections of variables of interest (such as GDP or consumer prices) based on assumed future paths for other variables treated as exogenous (e.g. commodity prices, interest rates, or exchange rates). By imposing alternative paths for selected variables, these projections can be used to construct counterfactual scenarios and assess their implications for the broader economy. A prominent example is provided by the Eurosystem staff macroeconomic projections, which are an important input into monetary policy decisions in the euro area.

Among the available empirical tools, vector autoregressive (VAR) models stand out for their simplicity and tractability. Their application to both conditional and unconditional forecasting dates back to Doan, Litterman and Sims (1986), with subsequent contributions extending the framework to more complex settings. In particular, Banbura, Giannone and Lenza (2015) build on the Kalman filter approach originally developed by Clarida and Coyle (1984) to accommodate large-scale VAR models. While much of the literature relies on reduced-form specifications, more recent work by Antolín-Díaz, Petrella and Rubio-Ramírez (2021) extends the framework to deliver a structural interpretation of the shocks underpinning the scenarios.

Following the approach by Crump et al. (2025), the analysis is based on a large-scale vector autoregression (VAR) model that has two important features. First, it captures the joint dynamics of the six aforementioned factors, the main outcome variables (consumption, income, and the saving rate), and several additional variables that represent key transmission channels of various shocks. Second, it can replicate the conditional nature of the projections. In particular, Eurosystem macroeconomic projections are constructed on the basis of assumed paths for a range of exogenous variables such as interest rates, exchange rates, foreign demand, and oil prices. Our model can also produce conditional forecasts and is therefore well suited for scenario analysis.

As a preliminary exercise, we validate our model by showing that its properties align along two dimensions with those of the models used in the Eurosystem macroeconomic projection exercises. First, **the forecasting performance of the model is comparable with that of the quarterly projections conducted by the Eurosystem staff**. Second, **the reactions of the main variables of interest to shocks to the price of oil are close to the average elasticities of the national macroeconomic models used** for projections and policy analysis **within the Eurosystem**.

The paper is organized as follows. Section 2 describes the data and the methods used to build scenarios. Section 3 describes the properties of the model in terms of elasticities and forecast accuracy. Section 4 presents the results on scenarios. Section 5 concludes.

2. Data and model

The dataset includes 25 euro-area variables at the quarterly frequency between 1996Q1 and 2025Q2. The choice of variables is inspired by Angelini et al. (2019) where the forecasting performance of a large VAR is compared with that of the Eurosystem staff macroeconomic projections.

The dataset includes real GDP and its main demand components, various measures of inflation, wages, employment and disposable income. We also add a set of variables that are considered as technical assumptions in forecasting exercises at the euro-area level: short and long-term interest rates, the US dollar/euro exchange rate, the oil price, and foreign demand.[2] Finally we add consumer

[2] Differently from Angelini et al. (2019), where data from the four largest euro-area countries (France, Germany, Italy and Spain) are grouped together, our analysis is based on euro-area aggregates.

confidence and a measure of economic uncertainty drawn from the European Commission surveys. The saving rate is not included but derived from disposable income and consumption. Variables and transformations are listed in Table A1 in the Appendix.

The model is a standard VAR with five lags. When the model is large, as in our case, the number of unrestricted parameters is high, resulting in overfitting. Estimation is then performed using Bayesian methods, see Appendix A1 for details.

3. Model validations: elasticities and forecast accuracy

We validate the model in two ways. First, we compare the forecasting performance of the model with that of the quarterly projections conducted by the Eurosystem staff.[3] We focus on three variables: consumption, disposable income and GDP. Table 1 reports the ratios between the Root Mean Square Forecast Errors (RMSFEs) obtained with our model and those implied by the Eurosystem projection errors. Values below 1 indicate that our model performs better than the official forecast. Our model performs well both in the years between 2015 and 2019 and in the post-Covid sample, as the ratios between RMSFEs are below 1. While a more rigorous horse race between our model and official forecasts is beyond the scope of this analysis, these results provide reassuring evidence on the time series properties of the model.

Table 1: Root Mean Square Forecast Error ratios

	2015-2019			2022-2025		
Horizon	4	8	12	4	8	12
Real disposable income	0.85	1.00	0.92	0.55	0.71	0.71
Consumption	0.84	0.96	0.83	0.36	0.49	0.49
GDP	0.88	0.98	0.84	0.63	0.92	0.71

Note: forecasts for the 2015–2019 out-of-sample period are generated using an expanding window approach, with forecast horizons ranging from one to twelve quarters ahead. Parameters estimated through 2019Q4 are then used to produce out-of-sample forecasts for the 2022–2025 period.

[3] The exercise is not meant as a precise horse race, as that would require reconstructing the exact information set at the time the projections are produced and a real-time database of the technical assumptions. Angelini et al. (2019) conduct such an accurate analysis and show that forecasts obtained with a model very similar to ours compare well with those of the Eurosystem. Our exercise is meant to show that an update of that model (i) on a longer sample and (ii) estimated on euro area aggregates, maintains these properties. A caveat concerns the fact that the information set underlying the unconditional BVAR forecasts differs from that used in Eurosystem exercises. First, it relies on final data rather than real-time vintages. Second, it assumes a more updated information set: for instance, in the spring exercise released in June, typically only the flash estimate of GDP for the first quarter is available, whereas the BVAR generates forecasts conditional on the final estimates of all variables.

Second, we analyze the response of GDP, consumption, income and the saving rate to an unexpected 10 percent increase in the price of oil. Results in terms of differences between elasticities of the model and those underlying Eurosystem model are shown in Table 2. Such shock lowers consumption, disposable income and GDP; the saving rate falls slightly, as the drop in income is stronger than that in consumption. Quantitatively, the effects are slightly higher, but very similar to those embedded in the Eurosystem models.

Table 2: Differences between elasticities of the model and those underlying Eurosystem models to an unexpected oil price increase

	t+1	t+2	t+3
Saving rate[(1)]	0.04	0.01	0.00
Real disposable income[(2)]	0.12	0.12	0.09
Consumption[(2)]	0.07	0.11	0.09
GDP	0.01	0.01	0.00

Note: (1) Difference between percentage points deviations from baseline. - (2) Difference percent deviations from baseline levels. Responses to an increase in oil prices by 10 percent over a three-year horizon.

4. Scenarios

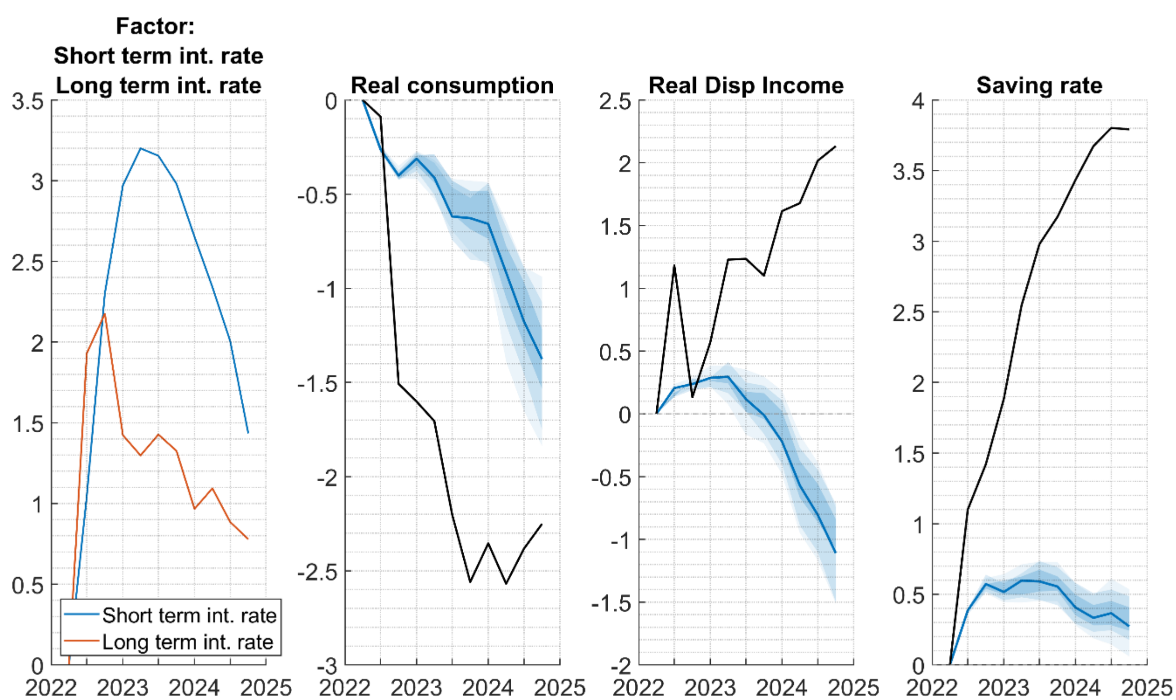
Having checked that the model performs reasonably well, we turn to scenario analyses. **Scenarios are constructed in two steps. First, the difference between a counterfactual path for the six factors of interest, one at a time, and a baseline path is computed.** In what follows we will refer to this difference as "a shock to the factor". It is important to clarify that these shocks do not have a structural interpretation but instead represent unexpected deviations from the baseline path. **In the second step the effects of these counterfactual paths on all the variables in the system are estimated using the model.** Technically, these are obtained by casting the model in state space and using the Kalman filter, as explained in the Appendix (section A2). To make this analysis operational we need to define a baseline and a counterfactual path.

Baseline and counterfactual paths.

The baseline path is derived from the June 2022 Eurosystem macroeconomic projections. This forecast is constructed conditionally on a given trajectory of selected exogenous indicators, most notably international energy prices, exchange rates, short- and long-term interest rates, and foreign demand. For interest rates, the technical assumptions underlying the Eurosystem staff projections directly provide the baseline path. The remaining five factors that we consider, however, lie outside the set of variables explicitly covered by the Eurosystem projections' framework. For these variables, we construct the baseline path using our model, generating conditional forecasts consistent with the exogenous assumptions underlying the Eurosystem exercise.

Interest rates. Figure 2 shows in four panels the deviation of actual short- and long-term interest rates between 2022Q2 and 2024Q4 (the last horizon of the considered Eurosystem projections) from their baseline, and the impact that this deviation had on consumption, income and the saving rate according to our model. In the panels for consumption, income and the saving rate, the black lines are the difference between the actual values and the June 2022 Eurosystem projections. Shaded areas are 50 percent confidence bands for the difference between the model forecasts obtained conditioning on actual interest rates and the baseline forecasts. Interest rates (in particular short-term ones) were markedly higher than assumed in the Eurosystem exercise, reflecting the ECB monetary policy tightening over that period. Their impact on consumption is negative and sizeable. Their effect on disposable income is initially positive, likely due to higher capital income, but eventually turns negative. Quantitatively, however, the impact is smaller than on consumption, resulting in almost a 1 percentage point rise in the saving rate. In short**, higher rates contribute, to some extent, to explaining weak consumption and higher savings, but they would have implied lower, rather than higher, disposable income.**

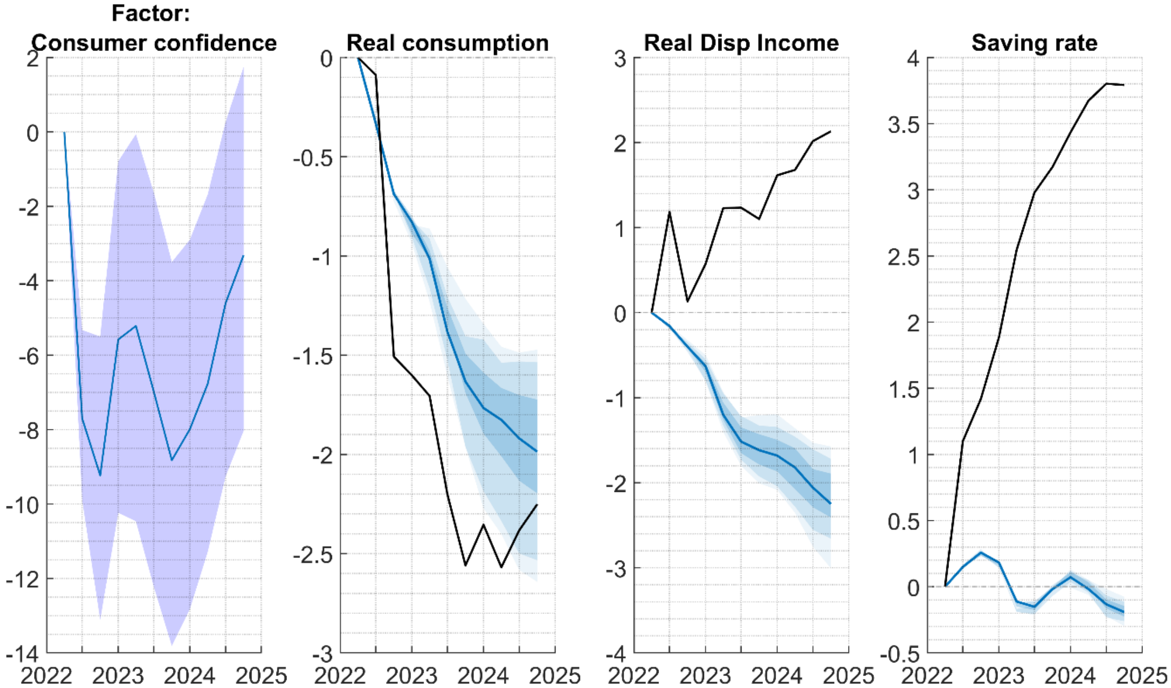
Figure 2: Impact of interest rates - Deviations from baseline



Note: interest rates are the difference between the realized values and the assumptions underlying the Eurosystem staff projections. For consumption, income and the saving rate the black lines are the difference between the actual values and the June 2022 Eurosystem projections. Percent deviations in the case of consumption and income; percentage points in the case of the saving rate. Shaded areas are 50 percent confidence bands for the difference between the model forecasts obtained conditioning on actual interest rates and the baseline forecasts.

Consumer confidence. Figure 3 shows the results obtained for consumer confidence. Confidence (left panel) was lower than expected between 2022 and 2024. Notice that consumer confidence is not part of the information set in the June 2022 Eurosystem projections, so the deviation shown in the left panel is obtained as the difference between the actual outcome and the conditional forecasts obtained with our model, given the assumptions underlying the Eurosystem staff projections. **Lower confidence contributes to explaining the negative surprise in consumption, but it has a similar effect on disposable income, resulting in a broadly flat profile for the saving rate.** As for interest rates, low confidence cannot explain the concurrent rise in income and savings.

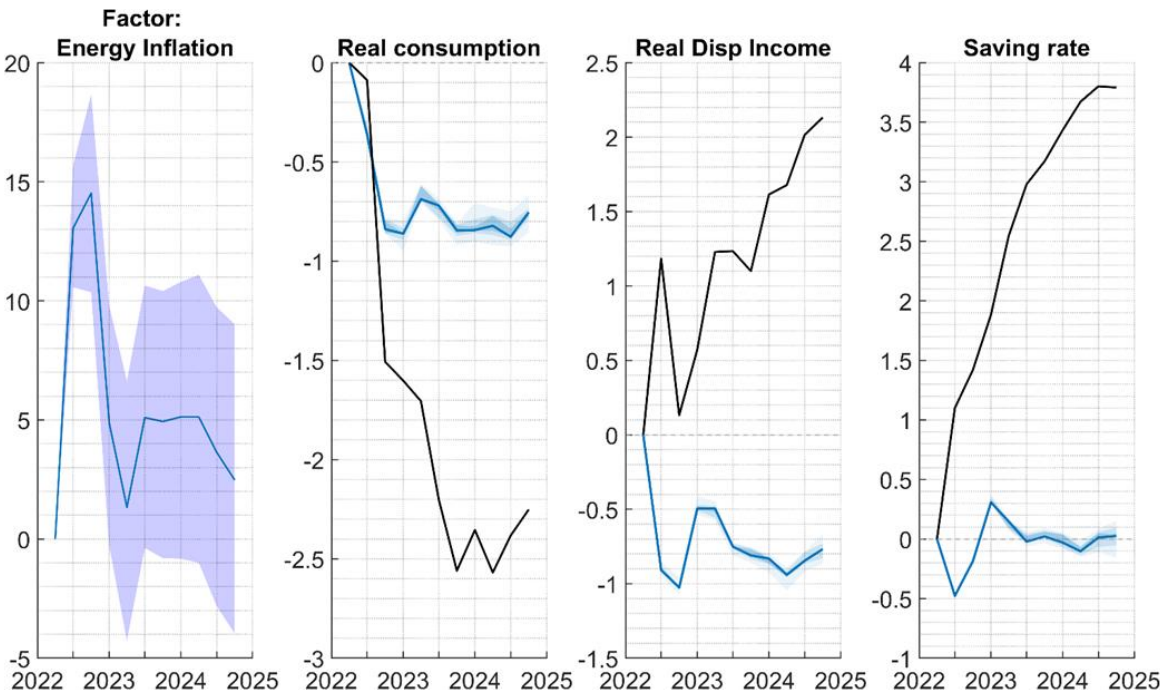
Figure 3: Impact of consumer confidence - Deviation from baseline



Note: the shaded area for consumer confidence is the difference between actual consumer confidence and the baseline forecasts. For consumption, income and the saving rate, the black lines are the difference between the actual values and the June 2022 Eurosystem projections. Percent deviations in the case of consumption and income; percentage points in the case of the saving rate. Shaded areas are 50 percent confidence bands for the difference between the model forecasts obtained conditioning on actual consumer confidence and the baseline forecasts.

Energy inflation. Following the bottlenecks in supply chains that emerged in the aftermath of the pandemic due to the faster-than-expected recovery of the aggregate demand and the invasion of Ukraine by Russia, energy inflation spiked and greatly surprised on the upside the forecasts produced with our model (Figure 4, left hand side panel). **The spike in energy prices reduced consumption growth and disposable income by a similar amount, with a negligible effect on the saving rate.**

Figure 4: Impact of energy inflation - Deviation from baseline

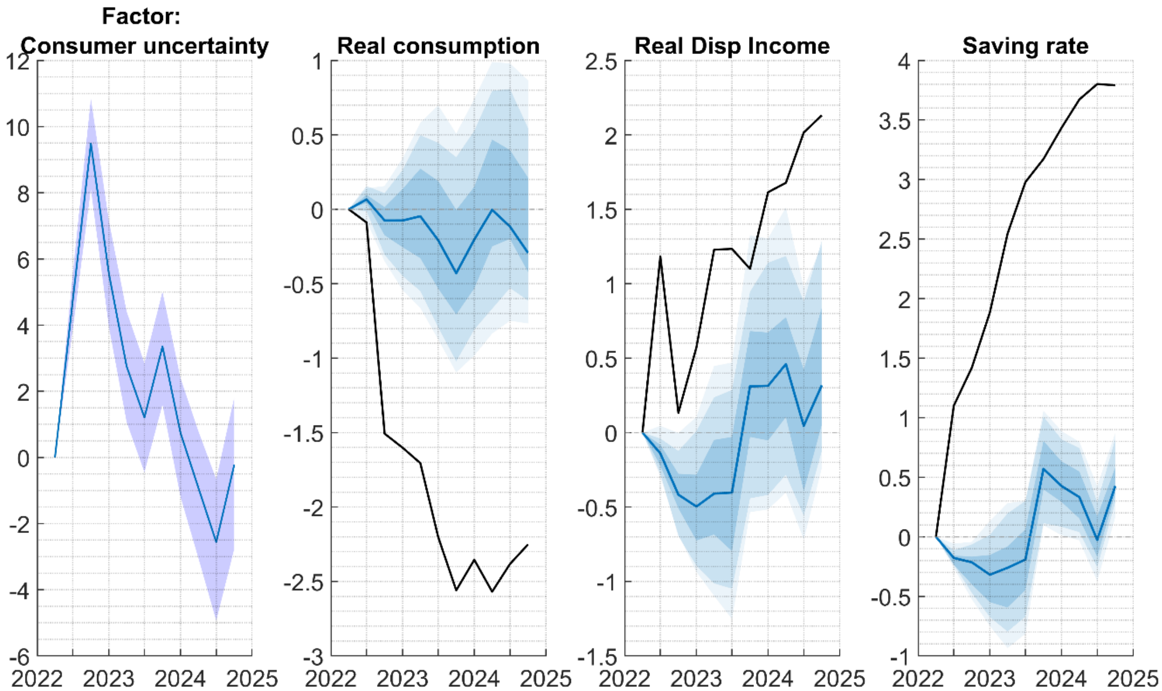


Note: the shaded area for energy inflation is the difference between actual energy inflation and the baseline forecasts. For consumption, income and the saving rate, the black lines are the difference between the actual values and the June 2022 Eurosystem projections. Percent deviations in the case of consumption and income; percentage points in the case of the saving rate. Shaded areas are 50 percent confidence bands for the difference between the model forecasts obtained conditioning on the shock to energy inflation and the baseline forecasts.

Uncertainty. While uncertainty strongly influences economic decisions, it cannot be directly measured and needs to be gauged on the basis surveys, asset prices or text-based indicators. While many measures of uncertainty peaked during the Russian invasion of Ukraine, they quickly receded from those peaks. Moreover, it is difficult to identify a measure of uncertainty that has a statistically significant impact over the 1996–2019 estimation sample. Figure 5 shows the results obtained with the measure of economic uncertainty obtained from the European Commission survey.[4] The spike in uncertainty is well visible over in the left panel. However, as shown in the remaining panels, when controlling for confidence and a broad set of economic indicators, **uncertainty did not have a significant impact on consumption and income in this sample**.[5]

[4] This measure of consumer uncertainty is relatively short and was backcast using a factor model.
[5] Results obtained with other uncertainty indicators are very similar.

Figure 5: Impact of consumer uncertainty - Deviation from baseline



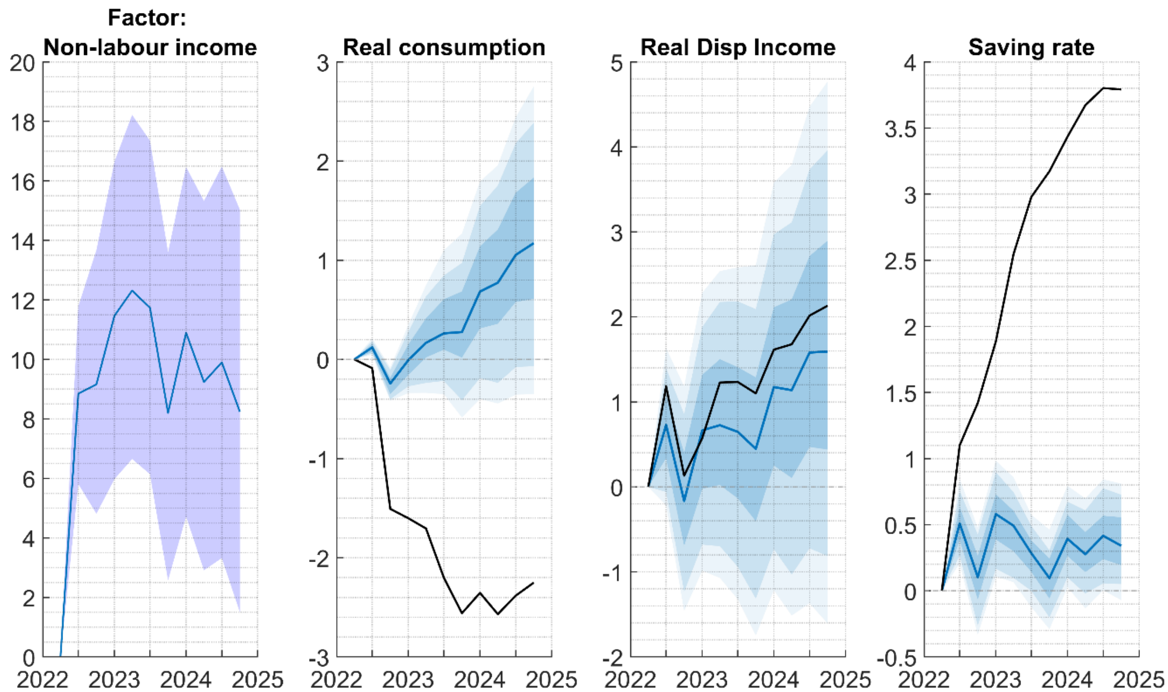
Note: consumer uncertainty is the difference between the realized values and the baseline forecasts. For consumption, income and the saving rate the black lines are the difference between the actual values and the June 2022 Eurosystem projections. Percent deviations in the case of consumption and income; percentage points in the case of the saving rate. Shaded areas are 50 percent confidence bands for the difference between the model forecasts obtained conditioning on actual consumer uncertainty and the baseline forecasts.

Non-labour income. One notable feature of the period analyzed is the upward surprise of disposable income (Figure 1, panel b). Disposable income is the sum of three components, labour income, property income and net transfers. Property income refers to the sum of the gross operating surplus (excluding mixed income), net interest income, and other net property income (adjusted for direct taxes), while transfers include social and other net benefits. Between 2021 and 2025 the composition of disposable income changed compared to the previous decade. In particular, the contribution of property income to annual total income growth— generally limited overall—was noticeably higher.[6] Transfers were also higher, although they were scaled back in 2023. Income composition matters for consumption and saving as property income typically accrues to relatively better off households who tend to save more. Figure 6 contrasts the behaviour of non-labour income (the sum of property and transfer income) with the model forecasts and shows the model-implied path of consumption, overall income and savings. **The upward surprise in non-labour income explains almost fully the behaviour of overall**

[6] See Ceci, D. and M. Flaccadoro (2025).

disposable income and about half percentage point of the increase in the saving rate compared to the forecast.

Figure 6: Impact of non-labour income - Deviation from baseline

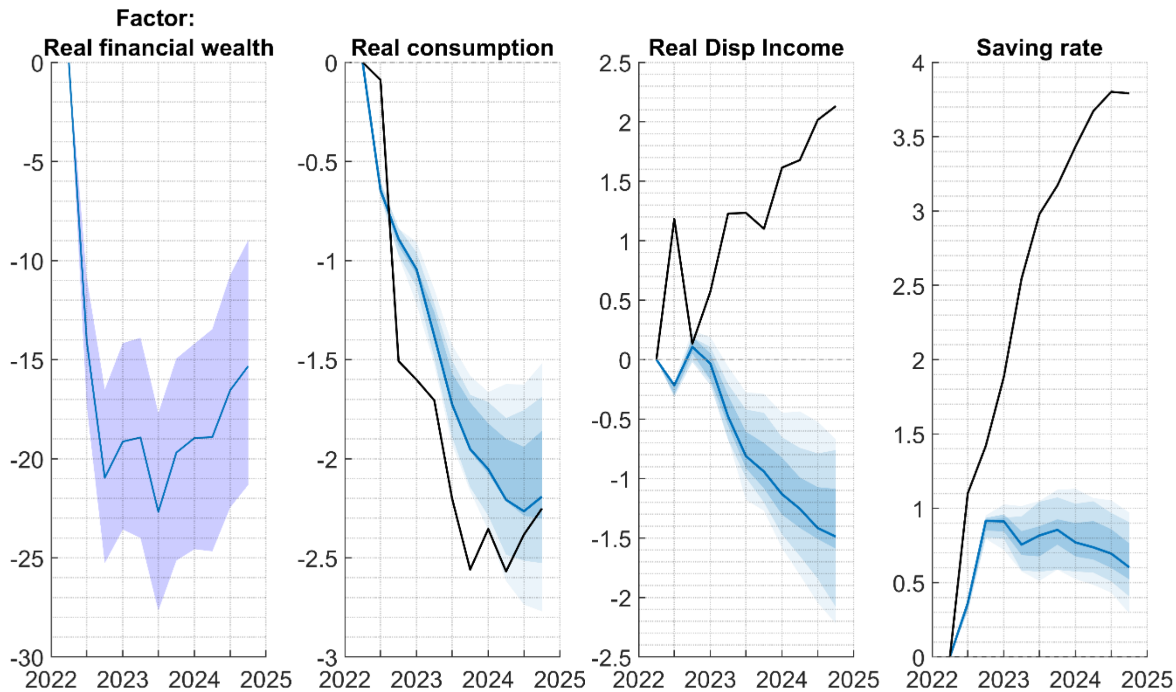


Note: non-labour income is the difference between the realized values and the baseline forecasts. For consumption, income and the saving rate the black lines are the difference between the actual values and the June 2022 Eurosystem projections. Percent deviations in the case of consumption and income; percentage points in the case of the saving rate. Shaded areas are 50 percent confidence bands for the difference between the model forecasts obtained conditioning on actual non-labour income and the baseline forecasts.

Financial wealth in real terms. High inflation eroded households' financial wealth, potentially depressing consumption and increasing households' incentive to save.[7] Our last scenario considers therefore what would have happened had the fall in financial wealth been predicted by the model. The role of the desire to re-build financial wealth in suppressing consumption and supporting savings is stressed, for instance, by Bobasu et al. (2025). The results, shown in Figure 7, indicate that in real terms financial wealth was significantly lower than forecast in 2022-2024. **The shock to financial wealth acted as a drag to consumption and, to a lesser extent, to disposable income, explaining almost a full percentage point of the increase in the saving rate over the period.**

[7] See Caivano M. (2026).

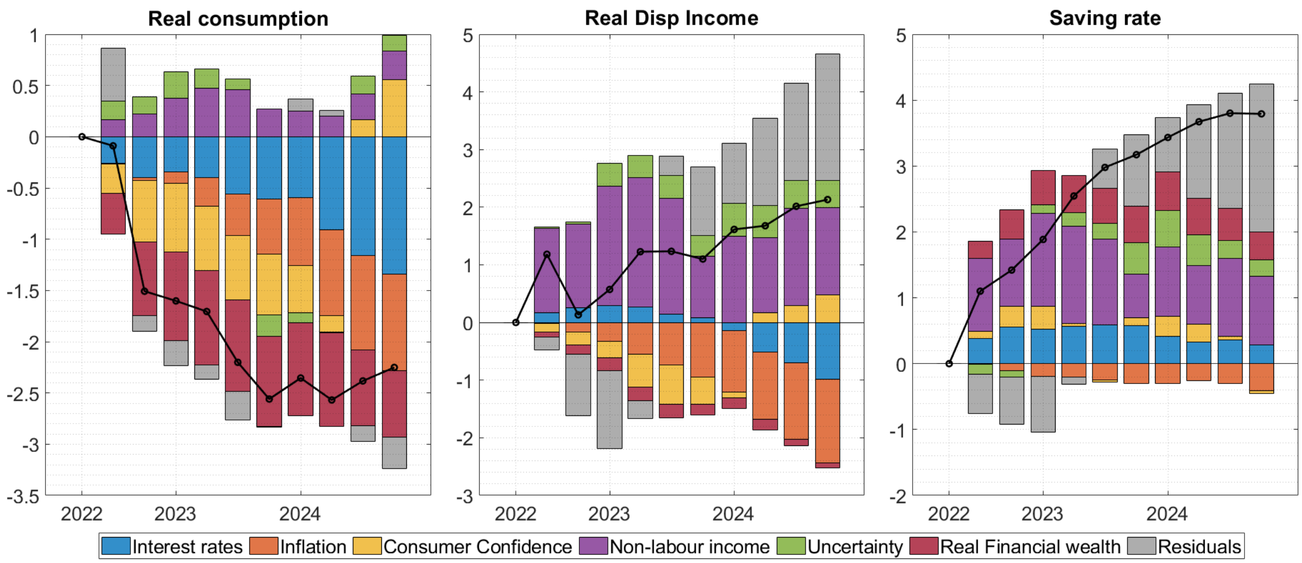
Figure 7: Impact of financial wealth - Deviation from baseline



Note: real financial wealth is the difference between the realized values and the baseline forecasts. For consumption, income and the saving rate the black lines are the difference between the actual values and the June 2022 Eurosystem projections. Percent deviations in the case of consumption and income; percentage points in the case of the saving rate. Shaded areas are 50 percent confidence bands for the difference between the model forecasts obtained conditioning on actual real financial wealth and the baseline forecasts.

Overall decomposition. An analysis of the individual factors is interesting but leaves some questions open. For instance, while some factors appear to explain the behavior of consumption reasonably well, their relative importance is not directly comparable. Moreover, the shocks to these factors are not orthogonal: for example, higher-than-expected interest rates may themselves reflect elevated inflation, so it is unclear how much of the sluggish growth in consumption can be attributed to monetary tightening rather than inflationary pressures. Figure 8 shows the results of an exercise designed to approximate a model-based decomposition of the three variables of interest under the scenarios discussed above. The decomposition is implemented through a backward induction procedure that approximates the marginal contribution of each factor. Starting from a forecast conditioned on all factors jointly, the conditioning variables are sequentially removed one at a time. The marginal effect of a given factor is then computed as the difference between two consecutive forecasts: the last forecast in which the factor is included and the first forecast in which it is excluded.

Figure 8: Model decomposition of consumption, income and savings - Deviations from projected path



Note: black lines represent the difference between observed values and those projected in the coordinated Eurosystem projection exercise published in June 2022. The decomposition of this deviation is presented as a sum of estimated marginal contributions of each factor: starting from a forecast conditioned on all factors jointly, the conditioning variables are sequentially removed one at a time. The marginal effect of a given factor is then computed as the difference between two consecutive forecasts: the last forecast in which the factor is included and the first forecast in which it is excluded. The category "Residuals" includes, in addition to the forecast error not explained by the BVAR, labour income, the unemployment rate, and other macroeconomic variables included in the BVAR.

The decomposition wraps up the main messages of our analysis. **The weakness of consumption growth in the years after Covid is mainly accounted for by higher-than-expected interest rates, the spike in inflation following the Ukraine invasion and the drop in financial wealth. Low consumer confidence also played a role, especially in the early part of the sample.** These factors, however, are overall recessionary and, indeed, depressed disposable income. **The upward surprise in disposable income comes in our model from the combined effect of rising property income** (due to the rise in interest rates and to the recovery of gross operating surplus of family firms after Covid) **and government support in the form of net transfers following the gas shock**.[8] These two forces resulted in a boost to other disposable income. Finally, our model accounts for between 2 and 3 percentage points (at the peak) of the increase in the saving rate, mostly on account of higher disposable

[8] See Checherita-Westphal and Dorrucci (2023).

income (between 1 and 1.5 percentage points), higher interest rates (half a percentage point) and a desire to re-build financial wealth (half a percentage point).

Part of the rise in the saving rate remains, however, unexplained, especially in 2024, when the macroeconomic factors that pushed consumption down in the previous years had largely abated. What kept savings so high in 2024 remains, to a certain extent, a puzzle. **Two competing explanations are plausible. The first is that the effect of some of the analyzed factors was stronger and more persistent than captured by historical regularities, in line with growing evidence in the literature that large shocks have non-linear effects** (Alvarez, Lippi and Passadore, 2017). For example, survey data from the ECB Consumer Expectations Survey (CES) indicate that households perceived the recovery in their disposable income to be slower than actual data would imply, a sign that the pandemic and inflation may have left a lasting scar on households' sentiment and spending behaviour.[9] **A second issue is the distribution of non-labour income, which might have accrued to better off households with a lower propensity to consume** (Carroll et al, 2017). Our aggregate analysis does not account for this cross-sectional aspect of income distribution and this could contribute to explaining why the model misses the persistence of the saving rate in the last part of the sample (Bulligan and Farroni, 2026).

5. Conclusions

Following the Covid crisis, euro-area households have displayed greater caution in their spending behaviour than anticipated. Despite the recovery in disposable income as the economy reopened in 2022—and notwithstanding government measures that cushioned the energy shock triggered by Russia's invasion of Ukraine—the saving rate increased and has remained elevated through 2025.

Our analysis helps explain these developments. Part of the shortfall in private consumption reflects the sharp rise in interest rates as the ECB tightened monetary policy to contain inflation. Inflation itself, by eroding households' real financial wealth, constituted an additional and largely unexpected headwind to consumption. Moreover, consumer confidence remained persistently weaker than anticipated and restrained spending.

Even after accounting for these factors, however, the increase in the saving rate remains unusually large by historical standards. One possible explanation is that households hold pessimistic perceptions about their income due to the exceptional nature of the Covid and inflation shocks. A second possibility is that aggregate savings reflect the behaviour of wealthier households, as suggested by analyses based on micro data.

[9] See Baumann et al (2025).

Appendix

A1. Model and inference

The model is a standard VAR of the type:

$$y_t = c + B_1 y_{t-1} + \ldots + B_p y_{t-p} + \varepsilon_t, \ \ \varepsilon_t \sim N(0, \Sigma),$$

where $B_1 \ldots B_p$ are matrices of VAR coefficients, y_t is an n-dimensional vector of variables, and ε_t is an n-dimensional vector of innovations. When the model is large, as in our case, the number of unrestricted parameters is high, resulting in overfitting. Estimation is then performed using prior shrinkage in a Bayesian framework. As discussed by Banbura, Giannone, and Reichlin (2010), informative priors make inference viable and reliable in high-dimensional macroeconomic systems that are characterized by substantial comovement.

Inference is conducted following Giannone, Lenza, and Primiceri (2015). The priors are normal-inverse-Wishart family. Define $\beta = vec([C, B_1, \ldots, B_p]^\wedge')$, the priors can be written as

$$\beta \backslash \Sigma \sim N\,(b, \Sigma \otimes \Omega),$$

$$\Sigma\ IW(\Psi;\ d),$$

where elements Ψ, d, b and Ω are functions of a lower-dimensional vector of hyperparameters γ. For a prior on the covariance matrix of innovations, Σ, the degrees of freedom are set to n + 2. The prior is a standard Minnesota prior, as in Litterman (1979), which is based on the assumptions that each variable follows an independent random walk process, possibly with drift, which is a parsimonious yet reasonable approximation of the behaviour of an economic variable. The prior first and second moments for the VAR coefficients are as follows:

$$E[\,(B_s)_{ij} \mid \Sigma\,] = \begin{cases} 1\ if\ \mathrm{i} = \mathrm{j}\ and\ \mathrm{s} = 1 \\ 0\ otherwise \end{cases}$$

$$cov(\,(B_s)_{ij}, (B_r)_{hm} \mid \Sigma\,) = \begin{cases} \lambda^2 \dfrac{1}{s^2} \dfrac{\Sigma_{ih}}{\psi_j/(d-n-1)} & if\ m = j\ and\ r = 2 \\ 0 & otherwise \end{cases}$$

The variance of this prior is lower for the coefficients associated with more distant lags, and the coefficients associated with the same variable and lag in different equations are allowed to be correlated. The key hyperparameter is $\lambda,$ which controls the scale of all the variances and covariances and effectively determines the overall tightness of this prior. The terms $\Sigma_{ih}/\Psi j$ account for the relative scale for the variables, while the prior for the intercept, C, is non-informative.

A.2 State space representation and scenario analysis

First, the model is cast in state space by defining the measurement equation as:

$$y_t = C_t S_t$$

and the transition equation as

$$S_{t+1} = G_t S_t + w_t, \qquad w_t \sim N(0, H_t),$$

where y_t is an n-dimensional vector of observables, S_t is an m-dimensional vector of latent states, w_t is a vector of iid errors. C_t is a selection matrix (i.e. a matrix of zero and ones) while G_t and H_t are a function of the model parameters $B_1 \ldots B_p$ and Σ_t. Once these are estimated, the Kalman smoother can be used to obtain an estimate of the latent states S_t. The involved matrices are described more in details below:

$$S_t = \left(y_t, y_{(t-1)}, \ldots, y_{(t-p+1)}, c\right)'$$

$$C_t = \left(I_n 0_{(n \times np)}\right)$$

$$G_t = \left(B_1 B_2 \ldots B_p 0_n; I_n 0_n \ldots 0_n 0_n; \ldots\right)$$

$$H_t = (\Sigma \ldots 0_n; \ldots \ddots \cdots; 0_n \ldots 0_n) \quad (8)$$

This set up is suitable for studying scenarios because state space models can handle missing observations.

Two implications follow. The first is that the model can be used to compute unconditional forecasts, by simply appending missing observations at the end of the sample. The second is that conditional forecasts are also easily computed by filling the conditioning variable (say y_j), with a desired path.

The Kalman smoother will then treat this as observed, while replacing the remaining missing observations with a linear forecast. These forecasts will be conditional on the imposed path for y_j. A scenario is then defined as the difference between the conditional and the unconditional forecast. Importantly for our purpose, the exercise can also be performed in-sample, allowing us to understand the behavior of consumption, income and saving rate under different conditional assumptions on uncertainty, confidence, inflation, interest rates and disposable income.

Table A1: data, data transformation and prior specifications

Variable	logarithm	Random walk
HICP Energy	1	1
HICP Total	1	1
HICP, ex food & energy	1	1
GDP, Real	1	1
Personal Consumer Expenditure, Real	1	1
Government Consumption, Real	1	1
Investment, Real	1	1
Housing Investment, Real	1	1
Exports of Goods and Services, Real	1	1
Imports of Goods and Services, Real	1	1
Whole Economy Employment (Hours)	1	1
Unemployment Rate	0	1
Labour income	1	1
Non-labour income	1	1
Households' real financial wealth	1	1
Debt-to-GDP ratio	0	1
Effective exchange rate	1	1
Euro/Dollar Exchange rate	0	0
Oil prices (brent)	1	1
Nominal short-term interest rate (Euribor 3-month)	0	1
Nominal long-term interest rate (Euro area 10-year gov. benchmark bond yield)	0	1
Foreign demand	1	1
EU Commission Consumer confidence	0	0
EU Commission Uncertainty	0	1

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