Heterogeneity in the Euro Area and the Transmission of Monetary Policy

By Agnès Bénassy-Quéré[1]

Abstract

Despite marked differences in leverage, debt structure and wage setting systems, individual member states of the euro area seem to react in a broadly similar way to monetary-policy impulses. Heterogeneities along different lines may in fact partially cancel each other. Country-specific structures have an effect on the timing and amplitude of the transmission of monetary policy but without affecting the overall ability of monetary-policy transmission to be effective in each country individually.

1 Introduction

Between July 2022 and September 2023, the deposit facility rate of the ECB increased by 450 basis points (bp). It subsequently remained stable for nine months, and then was cut by 200 bp between June 2024 and June 2025. This 3-year interest-rate cycle that ended with a soft landing of the euro area economy offers a good occasion to re-assess the transmission of the single monetary policy to the different economies of the euro area.

This topic is not new. Angeloni and Ehrman (2003) surveyed papers published at the end of the 1990s and in the early 2000s on how the European Monetary Union (EMU) affected the transmission of monetary policy. They found that transmission through banks became more potent and homogeneous across countries after monetary unification. However, Corsetti *et al.* (2021) found still significant cross-country heterogeneities in monetary policy transmission to consumer prices over the 1999-2016 period, pointing mortgage markets as a significant source of heterogeneity. Based on BVAR estimations for four euro area countries over 1999Q1-2014Q3, Mandler *et al.* (2021) found a more forceful transmission of monetary policy to Germany for output, but to Spain for consumer price inflation.

Several dimensions of heterogeneity can affect transmission of monetary policy, potentially resulting in differences across countries. Slacalek *et al.* (2020) show that the reaction of household consumption to monetary policy shocks is mostly affected by the response of labor income and housing wealth effects. Financial frictions amplify GDP response to monetary policy actions during financial stress (Ciccarelli *et al.*, 2013; Altavilla *et al.*, 2020). The structure of corporate debt is also important, with

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a higher bond share, relative to bank debt, going along with a weaker transmission of short-term policy rate shocks to real activity (Holm-Hadulla and Thürwächter, 2021; Alder *et al.*, 2023).

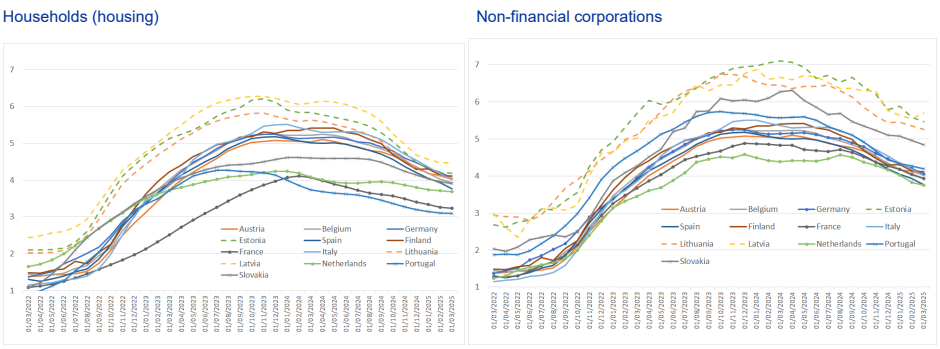
Here I limit myself to two potential sources of heterogeneity that seem to have mattered during the latest monetary-policy cycle: (i) the transmission of policy rates to lending rates and to interest payments of non-financial corporations; and (ii) wage-setting schemes across euro area countries. In doing so, I am discarding other channels of monetary policy transmission such as the balance-sheet channel, the asset-price channel, or the external channel.

2 Lending rates and interest payments

Chart 1 depicts the evolution of interest rates on new loans for several euro area countries during the 2022-25 interest-rate cycle. Although the level of interest rates varies across the member states (as inflation levels also differ), the overall profile has a similar hump-shape across countries. This is especially the case for loans to non-financial corporations (NFCs). For loans to households, a few countries display smoother rate variations,[2] but a majority follows similar pattern. This is remarkable since average rates on new loans naturally depend on the average maturity of the loans granted, whether they are at fixed or variables rates and how the whole yield curve moves in response to changes in the policy rate. Average rates move less in countries with long-term fixed rates loans if the rise in policy rates is associated with a flattening or an inversion of the yield curve, as happened in the euro area over this period. Overall, given the common profile on new rates, we expect the intertemporal substitution effect to be quite similar across the member states, except maybe through mortgage markets where some countries display idiosyncrasies.

Chart 1

Interest rates on new bank loans (in percent)



Sources: ECB Statistical Data Warehouse.
Notes: 3-month rolling average. First data point March 2022.

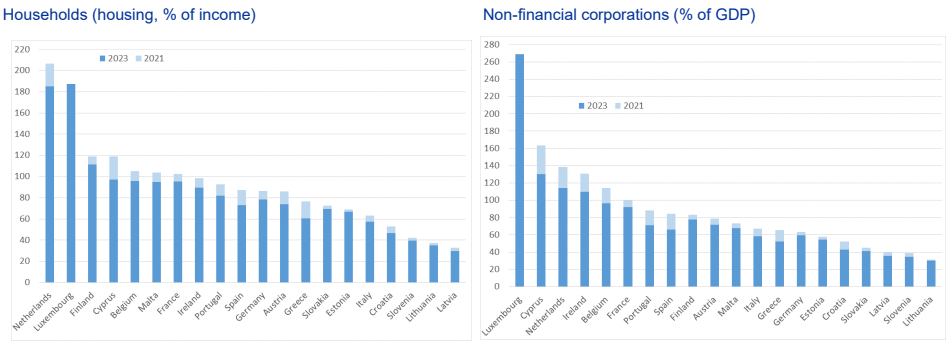
[2] In France, the slower increase in interest rates on housing credit in 2022 resulted from a regulation that caps interest rates on new loans based on a moving average, with quarterly revisions. From February to December 2023, the revision was made monthly to facilitate the transmission of policy rates.

In turn, the revenue channel depends on the outstanding amount of debt, combined with the structure of the debt in terms of maturity and fixed vs variable interest rate.

Chart 2 reports the gross debt ratios across euro area countries at the beginning of the monetary-tightening cycle (end-2021) and at the height of the cycle (end-2023). All countries did not enter the interest-rate cycle with similar leverage. For households, gross debt-to-income ratios range from 207% in the Netherlands to 33% in Latvia. There is even more heterogeneity across countries for NFCs, although some ratios are inflated by cross-border holdings and debts. Importantly, the same countries tend to have high leverage for both households and firms. We can expect the revenue channel of the interest rate to be more powerful in these countries.

Chart 2

Gross debt ratios at end-2021 and end-2023

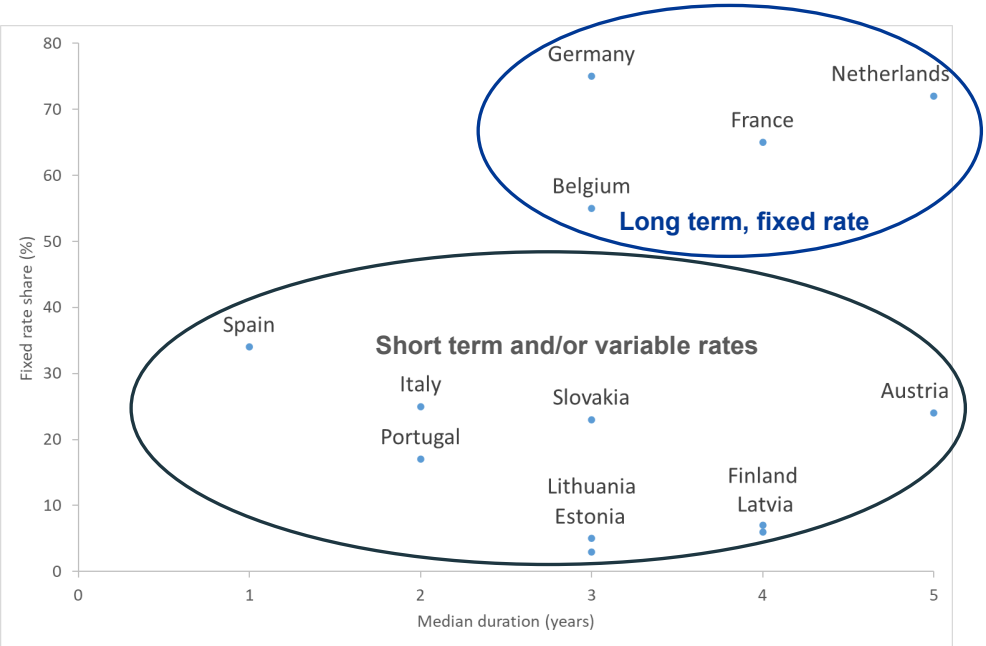


Sources: Eurostat.
Notes: NFC debt is consolidated at country level, but not consolidated for loans and debts of domestic NFCs vis-à-vis foreign NFCs (notably that of special purpose entities, especially present in CY, HU, IE, LU, MT and NL). Luxembourg is the only country where both household and NFC debt ratios increased between end-2021 and end-2023. For clarity, 2021 figures are not shown for this country.

However, the strength of the revenue channel also depends on how debt repayments adjust to changes in monetary policy. Debt characteristics matter, including debt maturity structure and the importance of fixed rate loans relative to adjustable-rate loans. Chart 3 shows that NFCs' loan characteristics differ widely across the euro area. Germany, France, Belgium and especially the Netherlands stand out as having both high median duration and high share of fixed rates. This smooths interest expenses over time and may mitigate to some extent the effect of leverage on the revenue channel in the short term. Conversely, Italy, Portugal and especially Spain display a combination of low median maturity and relatively low share of fixed rate. Although leverage is moderate in these countries, this magnifies the revenue channel of interest-rate variations in the short run.

Chart 3

NFCs' bank loan characteristics at end-2024



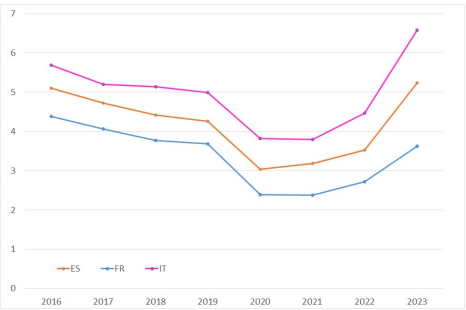
Sources: Anacredit, ECB.
Notes: median loans duration are relatively stable at the end of 2024 and similar to 2021-2023, except for Spain for which for instance the median duration at the end of 2022 was 2 years. Share of fixed rates are on total outstanding.

How do differences in debt structure ultimately affect the transmission of monetary policy to NFCs' funding costs? Chart 4 displays average and median funding costs for NFCs in France, Spain and Italy, from 2016 to 2023. In 2022 and especially 2023, as expected, effective costs increase more sharply in Italy and Spain, two countries characterized by both a high debt rollover and large share of adjustable-rate loans,. From 2022 to 2023, the average, effective cost of debt increased by about 250 bp in Italy, 150 bp in Spain and by less than 100 bp in France. The fact that the pattern is similar for median costs suggests that the result is not driven by a few large firms with high leverage.

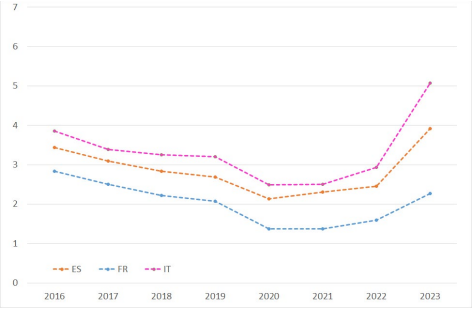
Chart 4

NFC funding costs, 2016-2023

Average effective cost of NFCs debt, 2016-2023



Median effective cost of NFCs debt, 2016-2023



Sources: Banque de France, IBACH.
Notes: Interest rates applicable on gross debt issued by non-financial firms.

Overall, it seems that, in the short-term, (i) the intertemporal channel is relatively similar across the member states, but (ii) the revenue channel may vary greatly across the member states, notably through NFC debt costs.[3] These differences recede in the medium term, since heterogeneity in maturity and share of fixed rates no longer affects agents funding costs once debt is rolled-over or repriced. As heterogeneity in the cost of debt after a monetary policy shock is smoothed over time, heterogeneity in the amount of debt becomes, on the contrary, more prevalent in the medium-term because debt itself displays inertia.

3 Wage setting

As discussed in the literature, there are many reasons why monetary policy transmission may differ across the member states, not just differences in leverage and in lending habits. Labour market heterogeneity might play a specific role since wages are key for the transmission of monetary policy. Wages are a major input cost for many firms, and wage developments will affect price decisions depending on demand pressure. Wages are also crucial for monetary policy because they are dependent on inflation expectations as well as past inflation.

Wage setting in the euro area depends strongly on various country-specific wage bargaining institutions. In the latest inflation cycle, these country differences played a significant role in shaping the response of wages to the inflationary shock. The ECB, in coordination with many national central banks, has developed new indicators tracking wage negotiations at national level in real time (see Bates et al. 2024).[4]

One key indicator in the assessment of wage growth is the annual growth rate of compensation per employee. It represents the overall labour costs payable by employers and includes base wages, bonuses but also all social contributions. It is usually expressed as an average per employee. Chart 5 shows the cumulated real wage growth over the inflation cycle in different member states and for the euro area. Following the inflation surge in 2021-2022, nominal wages growth increased in the euro area but much more gradually than inflation, which lead to a quick and substantial decrease in real wages in 2022. At the end of 2022, the cumulated real wage loss was of -3%. Then, after the peak of inflation, nominal wage growth exceeded inflation since wages were catching up with past inflation; the real losses gradually narrowed during the disinflation process. In 2025, real wages in the euro area as a whole have fully recovered.

In almost all euro area countries, we can observe a similar broad pattern in the cumulated real wage growth as the one found for the euro area. However, across countries, the initial drop in real wages, the speed of catching up or the long-term real wage losses/gains differ substantially (Chart 5). In Italy or Germany or the

[3] The transmission through household mortgages may also vary greatly across countries, as mentioned by the literature. However, consumption growth over the 2022-2024 monetary-policy cycle seems to be mostly related to the evolution of household purchasing power, which displays very large cross-country heterogeneities.

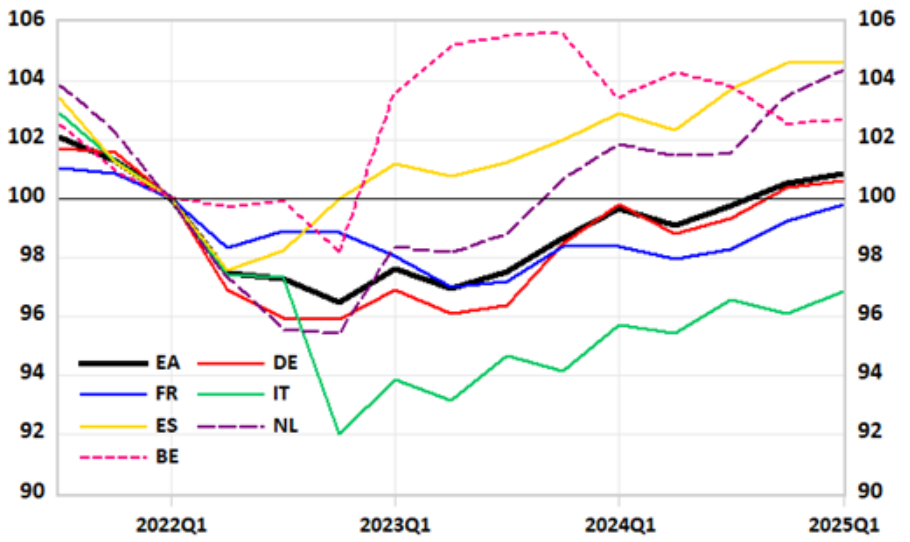
[4] The inflationary shock itself was heterogeneous across countries depending on the energy mix and on fiscal policies such as tax cuts or tariff shields.

Netherlands, the initial drop in real wage growth is much stronger than in Belgium or France whereas the persistence of these real wage losses is large in Italy but much more limited in the Netherlands. In 2025, at the end of the inflation cycle, the country dispersion in cumulated real wage losses is still substantial: real wage losses are the largest in Italy, more limited in Germany or France whereas in Spain or Belgium, real wages are above their levels of 2022.

Chart 5

Cumulated variation in real wages

(cumulated percent since 2022Q1)



Sources: Eurostat, Banque de France calculations.
Notes: Nominal compensation per employee deflated by total HICP. Compensation of employees consists of wages and salaries, and of employers' social contributions.

Country differences in wage bargaining features have played a fundamental role in accounting for the speed at which negotiated wages have responded to the inflation surge. There are many dimensions along which bargaining features can vary across countries: the level at which wages are negotiated, the duration of wage contracts, the degree of indexation, the existence of a national minimum wage (see Gornicka et al. 2023). Table 1 focuses on two dimensions that play a more fundamental role for the transmission of shocks: the frequency of revision of negotiated wages and the degree of wage indexation.

Table 1

Heterogeneity across the euro area: the role of wage setting institutions

Country	Level of negotiation	Typical duration of wage contracts (in years)	Indexation / explicit reference to inflation forecasts
Germany	Sector & sector x region	2	No
France	Sector & firms	1	Indexation only for national min. wage
Italy	Sector	3	Forecast – (3-year inflation excl. energy)
Spain	Sector x region	2-3	No
Netherlands	Sector & firms	1-2	No
Austria	Sector & sector x region	1	No
Belgium	Sector + national level for wage norm	2 (wage norm)	Indexation - automatic (inflation excl. petrol, tobacco and alcohol)

Sources: Gornicka et al. (2023) and Koester and Grapow (2021).

A first important indicator to account for the speed of reaction of wages to shocks is the frequency at which wages are revised by social partners. This frequency will depend on the frequency of wage negotiations but also on the duration of the wage agreement (both could be closely related). These two indicators can be both considered proxies for the degree of wage stickiness. For instance, in Germany, Italy or Spain, the duration of wage contracts is rather long, ranging between 2 and 3 years. In a high inflation environment, real wage losses can thus be substantial if the previous agreement was signed before the inflationary shock or did not account for the inflation surge (or for any unexpected price development). Such long wage contracts can also lead to large wage catch-up subsequently. In some countries like Italy, nominal wage stickiness is amplified by frequent delays in renegotiations.

By contrast, in France, by law, wages must be negotiated at least once a year in all sectors or large firms, and open-ended wage contracts can be revised whenever a new agreement is reached. During the inflation surge, some sectoral agreements were revised more than once a year to catch up with the national minimum wage increases (see below). Thus, French negotiated wages reacted very quickly to the inflation surge (Baudry et al., 2023).

Another important factor driving the response of wages to the inflationary shock is the degree of wage indexation. In most euro area countries, automatic wage indexation was abandoned in the 1970s-1980s as a way to prevent price-wage spirals and to anchor inflation expectations. One exception is Belgium where almost all wages are still automatically indexed (by law) to past inflation. Nominal wages are revised at different frequencies depending on each sectoral agreement, which implies that any real wage loss can only be transitory.

In some other countries, only the minimum wage is indexed formally to past inflation. In France, for instance, the national minimum wage (NMW) is indexed to past inflation (and to half the real wage gains). It is adjusted every January but also as soon as cumulated inflation since the last NMW adjustment has increased by more than 2%. This time- and state-dependent way of adjusting the NMW led to a several

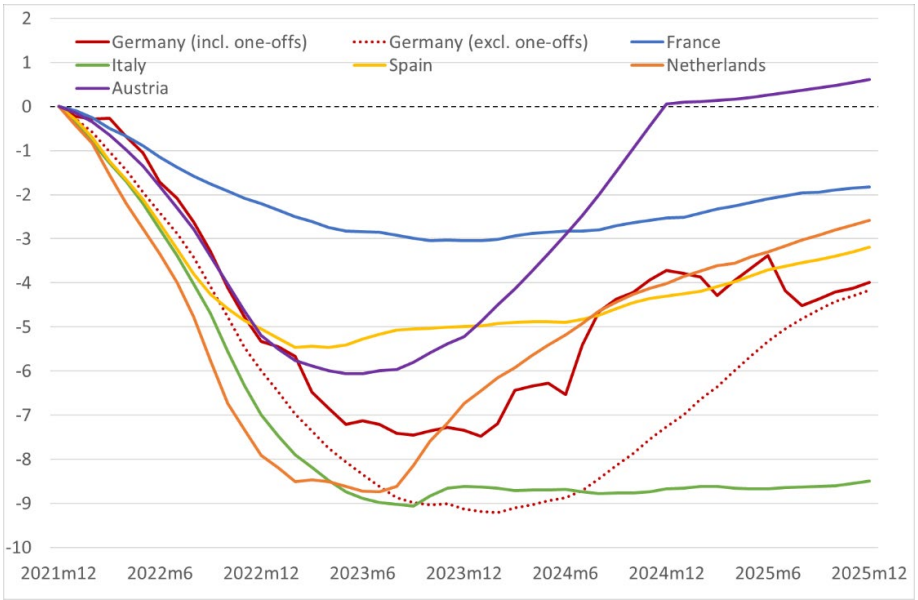
NMW adjustment over the high inflation period. Besides, since sectoral wage floors cannot be set below the NMW, the pass-through of NMW to sectoral agreements is strong and explains why even without an explicit indexation mechanism, negotiated wages in France reacted quickly to the inflation surge. In other countries, wage indexation mechanisms are not automatic, but wage agreements may contain some reference to past inflation or expected inflation as a benchmark for negotiations or as an explicit reference in clauses catching up for past real wage losses.

How can these country differences explain the heterogenous dynamics of real wages? Chart 6 shows the cumulated real *negotiated* wage growth from end-2021 on. The large initial drop in Italy, the Netherlands and Germany (excluding one-off payments), and more limited one in France are consistent with the above-mentioned differences in wage bargaining and minimum wage indexation. In 2025, cross country heterogeneity is still pervasive with persistent large real negotiated wage losses in Italy whereas in Germany, Spain or the Netherlands, the cumulated real wage losses are much smaller than in 2022 and in Austria, we even observe some real wage gains.

Chart 6

Cumulated variation in real negotiated wages

(%, cumulated real negotiated wage evolution – deflated by national HICP)



Sources: ECB (2025), calculations based on data on collective bargaining agreements signed up to mid-May 2025 provided by the Deutsche Bundesbank, the Banco de España, the Banque de France, the Banca d'Italia, the Oesterreichische Nationalbank, the Dutch employers' association AWVN and Eurostat. More on the ECB wage tracker

However, country differences in the total compensation response to inflation cannot be fully explained by differences in the response of negotiated wages. There are some other elements of wage compensation which might not be negotiated collectively such as individual bonuses, promotions, overtime but also social contributions. All these elements are defined as the wage drift. In the euro area, the

wage drift reacted quickly to the inflation surge and helped to reduce real wage losses due to delays in wage negotiations. In Spain, for instance, negotiated wages reacted quite sluggishly to the inflation surge (because of rather long contracts) but real growth in total compensation per employee recovered quickly. Tighter labour market conditions in Spain contributed substantially to the wage drift and to the overall wage growth in 2024 and to cumulated real wage gains in 2025.

Overall, wages reacted very differently from a country to another, mainly because wage setting institutions differ across euro area countries. These differences are relevant for monetary policy transmission since they might affect the persistence of the labour cost shocks hitting firm prices, and because they can also affect consumption if real wage losses have long-lasting effects on households' decisions. Importantly, country differences are much more pervasive for wage stickiness than for price stickiness (Gautier et al. 2025).

4 Macroeconomic impact of heterogeneity

We now explore whether the significant cross-country heterogeneities highlighted in the previous sections translate into heterogenous monetary-policy transmission to prices and GDP growth.

4.1 Inflation over the 2022-2025 cycle

All euro area countries experienced a sharp rise in headline and underlying inflation in 2021 and particularly 2022. Around, half of the inflation rise has been attributed to the supply (energy) shock.[5] However, this supply shock, particularly the energy price shock, was transmitted differently across the Euro area countries. The Baltic countries experienced an especially sharp increase in HICP price levels while other countries such as France and Spain experienced more moderate inflation rates thanks to greater energy autonomy and/or the implementation of a tariff shields (Chart 7).

After peaking in the summer of 2022, headline inflation declined rapidly across all euro area members, driven by falling energy and food prices. From the end of 2023, disinflation slowed, driven by the gradual dissipation of domestic and idiosyncratic factors and, increasingly, by the impact of monetary policy tightening. The decline in core inflation was faster in some countries, such as France and Italy, than in Germany, Spain, the Netherlands, or Belgium. Interestingly, these countries do not share similar wage setting patterns which normally would matter for services inflation. Over this period, the transmission of the energy price shock through supply chains, and government intervention through taxes and administered prices, may have mattered more than differences in wage stickiness.

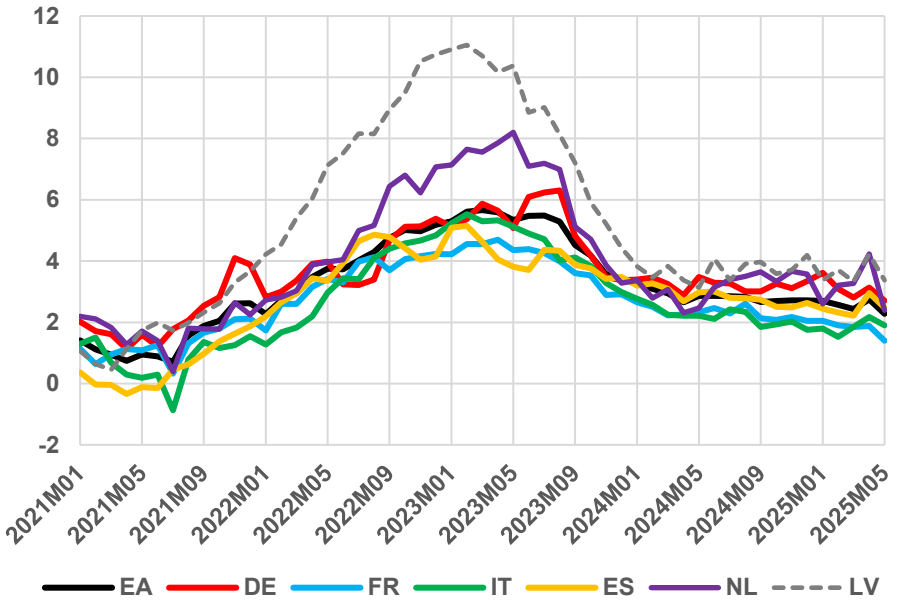
[5] see Banbura et al. (2024).

Overall, taking into account country specific factors, the speed of inflation and disinflation does not appear to be so different across countries, although the levels differ.

Chart 7

Underlying inflation in selected euro area countries

(year-on-year variations in %)



Sources: Eurostat, Banque de France calculations

4.2 Monetary policy transmission

De-zooming from the latest monetary-policy cycle, we now move to a more general assessment of cross-country heterogeneity in monetary-policy transmission, using monthly local projections *à la* Jorda (2005). We rely on monetary policy surprises extracted from high-frequency financial market data to identify exogenous changes in monetary policy rates. The series of shocks is built using minute-by-minute OIS data from January 2000 to December 2024, replicating and extending the Altavilla *et al.* (2019) Euro Area Monetary Policy Surprise Database (EAMPD). It focuses on high-frequency surprises in OIS rates (1M, 3M, 6M, and 1Y) in the windows covering the policy decision announcement and the press conference, on ECB Governing Council days.

Following Jarociński and Karadi (2020), the first principal component of these surprises is extracted, and then aggregated to a monthly frequency. The monetary policy surprises are purged from the central bank information effect through a sign restriction VAR approach. Therefore, the series of monetary policy shocks is fully comparable to the one commonly used in the empirical literature. Finally, the monetary policy shocks are rescaled to generate a predetermined change in the policy rate—specifically here, a 25 bp increase on impact in the one-year OIS rate.

This approach to scaling, which is frequently employed in the literature, produces larger effects than the alternative approach—also common—which consists in reporting the impact of a one standard deviation shock. As a matter of facts, the rescaled surprise shock should not be confused with a monetary policy decision to change the policy rate by 25 bp: in general, policy decisions are at least partially anticipated by the market, hence a large part of each decision stays outside our measure of policy surprises.

The panel local regressions are run on a balanced panel of the eleven countries that formed the euro area at its creation in 1999: France, Germany, Spain, Italy, Portugal, Luxembourg, Ireland, Austria, Netherlands, Belgium, and Finland. Country-level HICP, unemployment rate and real GDP are regressed on the monetary policy shocks.[6] The coefficients on the monetary policy shocks are common to all countries, with heterogeneity between countries only captured by country fixed effects:

$$y^{c}_{t+h} = \alpha^{h,c} + \beta^{h} * MPS_t + \sum_{k=1\ to\ p} \phi^{h}_{k} * {X^{c}}_{t-k} + {\epsilon^{c}}_{t+h} \quad (1)$$

Where *c* indexes the country, *t* indexes time (in months) and *h* denotes the number of months after the shocks. MPS_t represents the monetary policy shocks as described above, y^{c}_{t+h} are the dependent variables (GDP, HICP and unemployment rate), $\alpha^{h,c}$ are the country fixed effect, and ϵ^{c}_{t+h} is the error term.[7] Finally, ${X^{c}}_{t-k}$, represents the set of lagged controls and includes the lags of the dependent and other country-specific variables, the lags of the monetary policy shocks, the lags of euro area variables, as well as the euro-dollar exchange rate and the oil price.

For comparison purpose, a similar local projection is performed, but this time, using only euro area (EA) aggregate data:

$$y^{EA}_{t+h} = \alpha^{h,EA} + \beta^{h,EA} * MPS_t + \sum_{k=1\ to\ p} \phi^{h,EA}_{k} * {X^{EA}}_{t-k} + {\epsilon^{EA}}_{t+h} \quad (2)$$

The results of this comparison are presented in Chart 8. A monetary policy tightening has the expected effect of lowering aggregate demand and slowing down both GDP and inflation. Consumer price inflation responds with some delay relative to output. Both effects are statistically significant about one year after the monetary policy shock. For both activity and inflation, the impulse response function (IRF) obtained using panel data is very close to the IRF obtained using only the time series at the level of the euro area. The confidence band is narrower, suggesting that the approximation of similar transmission across the eleven countries is sensible.[8]

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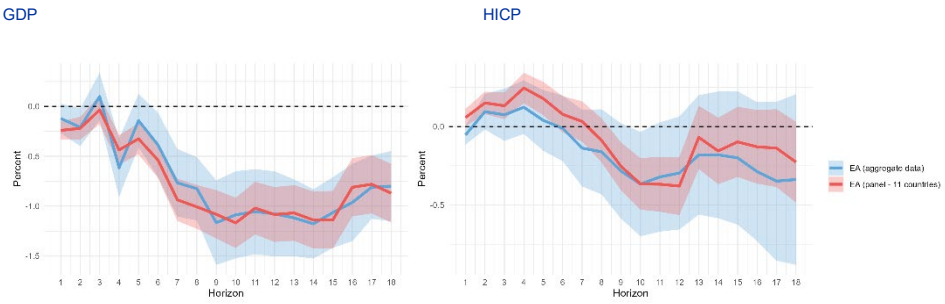
[6] The real GDP has been converted from quarterly to monthly frequency using the Chow-Lin method (1971), a statistical approach that performs temporal disaggregation based on linear interpolation with related indicators available at higher frequency (here industrial production).

[7] Standard errors are computed using the Newey-West estimator to account for heteroskedasticity and autocorrelation in the error terms.

[8] The profile and estimated impact on HICP are similar to the ones found in the literature, e.g. in Jarocinski and Karadi (2020), Holm-Hadulla and Thürwächter (2021) and Holm-Hadulla and Pool (2025). Using a suite of models, Lane (2023) finds that a 1-percentage point monetary policy shock leads, on average, to a decline in year-on-year inflation by around 0.3 percentage points at the peak impact. Since most of the changes in policy rates are expected, the total effect of monetary policy over the last inflation cycle is larger. Banque de France estimates suggest that HICP inflation would have been about 2% higher each year over the period 2023-2026 without monetary tightening, in line with ECB estimates (Lhuissier, 2025).

Chart 8

Impact of the monetary-policy surprise on GDP and inflation – euro area



Sources: Banque de France calculations.
Notes: Impulse response functions to a monetary policy shock normalized to trigger a 25bps increase in the OIS1Y at impact. The estimates rely on standard country-specific and panel local projections following Jorda (2005). The balanced panel contains France, Germany, Italy, Spain, Portugal, Luxembourg, Belgium, Ireland, Finland, Netherlands and Austria. High-frequency financial market data are used to identify exogenous variation in monetary policy interest rates, following Jarociński and Karadi (2020) methodology. The monthly estimation spans from January 2000 to December 2024, excluding the Covid period. The shaded area shows the one standard deviation confidence interval.

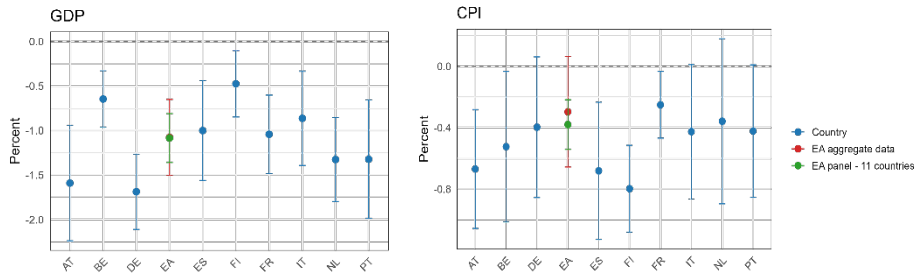
Now, the same regression can be run separately for each country c of the sample:

$$y^{c}_{t+h} = \alpha^{h,c} + \beta^{h,c} * MPS_t + \sum_{k=1\ to\ p} \phi^{h,c}_{k} * X^{c}{}_{t-k} + \epsilon^{c}{}_{t+h} \qquad (3)$$

Chart 9 presents the estimates, for each country, at the 12-month horizon following the shock, alongside the corresponding estimates for the euro area. Each individual estimate is surrounded by its one standard deviation (68%) confidence interval. As expected, country-level IRFs are qualitatively similar: after 12 months, the impact of monetary policy is significant in each country for GDP and almost in each country for inflation. Interestingly, several countries display the same point estimate as the euro area aggregate.

Chart 9

Impact of the monetary-policy surprise on GDP and inflation after 12 months



Sources: Banque de France calculations.
Notes: Impulse response functions at h=12 months to a monetary policy shock normalized to trigger a 25bps increase in the OIS1Y at impact. The estimates rely on standard country-specific and panel local projections following Jorda (2005). The balanced panel contains France, Germany, Italy, Spain, Portugal, Luxembourg, Belgium, Ireland, Finland, Netherlands and Austria. High-frequency financial market data are used to identify exogenous variation in monetary policy interest rates, following Jarociński and Karadi (2020) methodology. The monthly estimation spans from January 2000 to December 2024, excluding the Covid period. Each estimate is surrounded by its one standard deviation confidence interval (68%).

Still, Chart 9 shows some heterogeneities in monetary-policy transmission across the countries of the sample. To what extent do they reflect some of the differences highlighted in Sections 2 and 3? Here I assess the role of loan maturity by

performing monthly state-dependent local projections with country fixed effects, inspired by Ramey and Zubairy (2018).[9] Specifically, the monetary shock is interacted with a dummy variable ($D_{c,t}$) for high share of long-term bank loans to NFCs. Long-term loans are defined as loans with a maturity of five year or more:[10]

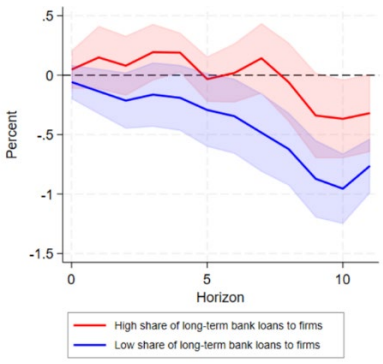
$$X^{c}_{t+h} = \alpha^{h,c} + D_{c,t} * (\beta^{high} * MPS_t) + (1 - D_{c,t}) * (\beta^{low} * MPS_t) + \sum_{k=1\ to\ p} \phi^{h}_{k} * X^{c}{}_{t-k} + \epsilon^{c}{}_{t+h} \quad (4)$$

The IRFs are displayed on Chart 10, with shaded areas representing the 90% confidence interval. The overlap between the two confidence intervals is small. In addition to this observation, a Wald test for the equality of the two states IRFs is shown in the table. The lower the p-value, the stronger the evidence against their equality. The results suggest statistical significance at several horizons, especially after 6 months: CPI inflation slows down quicker and is more marked in countries with a low share of long-term loans to firms. This result is consistent with the idea that a change in the stance of the monetary policy propagates through both the repricing of adjustable-rate loans and new borrowings as debt is rolled-over. It is robust to two alternative specifications. First, it remains broadly consistent when the regression is run on the (highly unbalanced) panel of 19 euro area countries. Second, similar findings emerge when the same exercise is applied to the maturity of bank loans to households instead of firms.

Chart 10

Impact of the monetary-policy tightening surprise on HICP – role of NFC debt maturity

Impulse-response function



Wald test of IRF equality

Horizons	p-value
0	0,362
1	0,151
2	0,092
3	0,072
4	0,054
5	0,223
6	0,145
7	0,016
8	0,038
9	0,089
10	0,041
11	0,076
12	0,099

Sources: Banque de France calculations.
Notes: LHS: State-dependent impulse response to a monetary policy shock. The estimates rely on panel state-dependent local projections inspired from the approach of Ramey and Zubairy (2014). The monetary policy shock is interacted with a dummy variable that distinguishes between high versus low share of long-term bank loans to firms. Long-term bank loans to firms are defined with a maturity equal of five years or more. The high versus low classification is based on the median share of long term bank loans which is equal to 67.7%. The shaded areas show the 90% confidence interval of each IRF. RHS: Wald test of equality of the two-states impulse response functions (H0). The lower the p-value, the stronger the evidence against their equality.

[9] Here, though, non-linearities are allowed only for the monetary policy shock while linearity is maintained for the control variables.

[10] For each country-year, the ratio underlying the dummy is computed based on the monthly outstanding amount of bank loans to NFCs, based on the Balanced Sheet Items dataset. The high versus low classification is then based on the median share of long-term bank loans which is equal to 67.7%.

5 Conclusion

Euro area countries clearly display various forms of structural heterogeneities. We have illustrated two of them that normally matter for monetary-policy transmission: (i) the level and structure of NFCs debt, and (ii) wage stickiness.

However, these heterogeneities do not seem to involve massive differences in monetary-policy transmission. This feature can be observed both over the latest policy-rate cycle and more generally, through local projections involving eleven euro area countries. Although debt maturity seems to matter, the overall response of GDP and inflation to a monetary tightening surprise looks similar qualitatively and even quantitatively for some member states. It may be that different types of structural heterogeneities point in different direction, partially compensating each other.

This result is consistent with Altavilla *et al.* (2024) showing that country-level variance accounts for only half of loan level variance in the external finance premium, the other half being explained by bank and firm level variance. It is also consistent with Gautier et al. (2025) showing that price stickiness varies much more across sectors (e.g. services vs goods) than across countries.

More than 25 years after monetary unification, this result is reassuring for the transmission of the common monetary policy, and it sounds as an encouragement to dig into other dimensions of heterogeneities to better understand monetary-policy transmission.

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