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The labour market in the euro area: and yet, it moves!

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Abstract

Unlike past high-inflation episodes, the euro area labour market remained surprisingly resilient during the inflation surge of the early 2020s. This paper investigates the drivers of this resilience by combining long-span euro area macroeconomic data (1970–2025) with a structural VAR analysis that disentangles the roles of aggregate demand and supply, monetary policy, and factor-substitution shocks. Our findings show that, in contrast to the 1970s and 1980s, the decline in real wages has supported labour demand and, more broadly, the labour market, thereby helping to explain the decoupling between output and employment. We also find that monetary policy shocks have had a stronger impact on output than on employment, further amplifying the pro-cyclicality of labour productivity.

Keywords: Labour markets, monetary policy, real wages, Bayesian VAR

JEL codes: E24, E32, C32

Non-technical summary

The post-pandemic period has confronted the euro area with the strongest surge in inflation since the creation of the monetary union. Triggered by supply chain disruptions, the energy price shock following the Russian invasion of Ukraine as well as the fiscal stimulus and pent-up demand accumulated from the pandemic period, inflation reached levels not experienced in advanced economies for decades. At the same time, the euro area labour market has displayed an unusual degree of resilience: employment has continued to expand and unemployment has remained close to historical lows, even as output growth stagnated. This disconnect between output and employment calls for a careful reassessment of the hysteresis features of the euro area labour market dynamics in periods of high inflation and monetary tightening.

Historically, such episodes of large energy price increases were associated with output and employment losses and wage increases, as in the recessions of the 1970s and early 1980s. Then, nominal wages rose in line with or above inflation, driven by widespread indexation schemes and strong bargaining power, leading to (downward) rigid real wages that amplified unemployment responses to negative supply shocks. In contrast, the recent episode has seen substantial erosion of real wages, suggesting a different adjustment mechanism at play. Understanding what drove this divergence is central for both research and policy.

Our main findings can be summarised as follows. First, the resilience of employment relative to output is a novel feature of the post-pandemic adjustment and contrasts sharply with past recessions. Second, the erosion of real wages has been key to sustaining labour demand, unlike in the 1970s when real wages rose strongly. Third, the transmission of monetary policy has been asymmetric, with output reacting more forcefully than employment. Taken together, these results point to the central role of real wage adjustment and changing wage-setting institutions in shaping labour market resilience.

Alexis de Tocqueville once wrote: "History is a gallery of pictures in which there are few originals and many copies." In monetary policy, too, we often look to past cycles for guidance, expecting familiar patterns to repeat themselves. But this cycle has proven to be original in striking ways.

— Christine Lagarde, Jackson Hole, 23 August 2025

1 Introduction

The post-pandemic period has confronted the euro area with the strongest surge in inflation since the creation of the monetary union. Triggered by supply chain disruptions, fiscal stimulus and pent up demand from the pandemic period, and the energy price shock following the Russian invasion of Ukraine, inflation reached levels not experienced in advanced economies for decades. At the same time, the euro area labour market has displayed an unusual degree of resilience: employment has continued to expand and unemployment has remained close to historical lows, even as output growth stagnated. This apparent disconnect between output and employment calls for a careful reassessment of labour market dynamics in periods of high inflation and monetary tightening.

Historically, such episodes were associated with output and employment losses and wage increases, as in the recessions of the 1970s and early 1980s. Then, nominal wages rose in line with or above inflation, driven by widespread indexation schemes and strong bargaining power, leading to rigid real wages that amplified unemployment responses to negative supply shocks (see Blanchard and Summers (1986); Ljungqvist and Sargent (1998) for an analysis of the European labour market back then). In contrast, the recent episode has seen substantial erosion of real wages, suggesting a different adjustment mechanism at play. Understanding what drove this divergence is central for both research and policy.

In standard New Keynesian models — absent real wage rigidities — stabilising inflation automatically stabilises the output gap, a result often referred to as the "divine coincidence." This implies that monetary policy faces no trade-off following aggregate supply shocks, such as the recent energy shock. Blanchard and Galí (2007), however, show that when wages fail to adjust fully to changes in economic conditions, this divine coincidence breaks down. In such a setting, stabilising inflation still closes the conventional output gap but does not eliminate deviations in the welfare-relevant output gap — the gap that accounts for distortions in labour markets caused by wage rigidities. This introduces a trade-off for central banks, requiring them to weigh the benefits of accommodating higher inflation against the costs of a smaller decline in the welfare-relevant output gap. The degree to which real wages adjust to macroeconomic conditions thus plays a critical role in determining how effectively central banks can stabilise both inflation and economic welfare.

The recent response of the euro area labour market to the energy shock presents significant implications for monetary policy. The delayed adjustment of real wages to rising prices reflects structural changes in wage-setting mechanisms, including the near disappearance of automatic wage indexation to inflation and the prevalence of multi-year collective agreements.[1] The lack of on-impact adjustments in real wages acted as a shock absorber, supporting job creation through capital-labour substitution that led to a decline in capital deepening. The job retention schemes that were introduced during the pandemic also likely played a role in maintaining employment levels, while containing aggregate job-worker mismatch (see Consolo and Petroulakis (2024). For monetary policy, these developments underscore the importance of understanding the functioning of the euro area labour market to mitigate risks of hysteresis effects (see Lagarde (2025)).

This paper addresses this question by combining quarterly macroeconomic data that span from 1970 to 2025 based on the database described by Fagan et al. (2001) with an econometric analysis based on a structural VAR model. We use this extended quarterly database for the euro area to document stylised facts on output, employment, wages, and productivity, and to compare the recent episode with historical precedents. Empirically, we estimate a structural VAR to disentangle the contributions of aggregate demand and supply, monetary policy and factor-substitution shocks to the euro area labour mar-

[1] A notable example in the euro area is Belgium. For a review, see Koester and Grapow (2021) reporting that in the euro area, general automatic wage indexation schemes only apply to around 3% of private sector employees

ket developments. We closely follow the identification scheme of Foroni and Furlanetto (2022), but we identify the monetary policy shock with the novel identification scheme first proposed by Cook and Hahn (1989) and Kuttner (2001). This method allows us to better identify the monetary policy shock from an aggregate demand shock, which is key for the focus of our paper. We interpret our findings also through the lens of a simple search and matching model with skill heterogeneity following Abbritti and Consolo (2024). This highlights the role of wage negotiations and capital-labour substitution across workers' skill types in shaping the cyclical response of employment and productivity to technological changes. Our work also helps disentangling the role of the labour market in shaping inflationary pressures following the work by Bernanke and Blanchard (2025); Arce et al. (2024); Giannone and Primiceri (2024); Bergholt et al. (2024). We highlight how the strength of employment growth was supported by the downward adjustment of real wages, which led to capital-labour substitution during periods of high energy prices and borrowing costs (Polgreen and Silos, 2009). More broadly, the employment response resulting from factor substitution in the production process should not be fully interpreted as an indication of excessively tight labour markets, but it is more the resulting of resilience via real wages adjustments.[2]

Our main findings can be summarised as follows. First, the resilience of employment relative to output is a novel feature of the post-pandemic adjustment and contrasts sharply with past recessions. Second, the erosion of real wages has been key to sustaining labour demand, unlike in the 1970s when real wages rose strongly. Third, the transmission of monetary policy has been asymmetric, with output reacting more forcefully than employment. Taken together, these results point to the central role of real wage adjustment and changing wage-setting institutions in shaping labour market resilience.

The contributions of this paper are twofold. First, we provide new empirical evidence on the drivers of euro area labour market dynamics during periods of high inflation,

[2] Throughout the paper and from a macroeconomic perspective, *labour market resilience* refers to the capacity of the labour market to absorb and recover from adverse economic shocks, while maintaining high levels of employment and minimizing hysteresis effects. A resilient labour market adjusts primarily through price mechanisms —such as real wages—rather than via quantities. A *resilient* labour market differs from a *tight* labour market, as the latter is characterized by upward wage pressures.

situating the post-pandemic episode within a half-century historical context. Second, from a policy perspective, our findings highlight how changes in wage-setting mechanisms can influence the conduct of monetary policy. Higher real wage flexibility provides a model economy closer to *divine coincidence*, reducing the trade-off for monetary policy. Also, at times when the labour market response is asymmetric with respect to output, leading to wider swings in cyclical productivity, cyclical developments in marginal costs could be the result of monetary policy and may not warrant further policy action.

The remainder of the paper is organised as follows. Section 2 describes the data and the main stylised facts, with a sketch of the search and matching model. Section 3 presents the empirical framework. Section 4 provides the results of the analysis. Section 5 concludes.

2 Euro area labour market developments in the 2020s

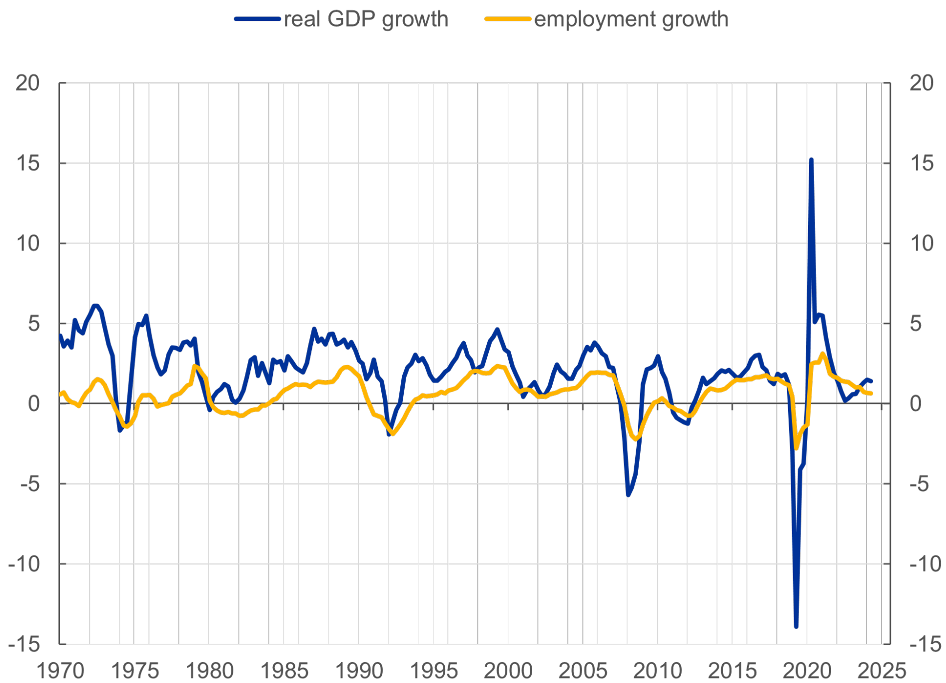
The euro area labour market proved unusually resilient after the pandemic. While economic activity stagnated following the Russian invasion of Ukraine and the subsequent energy price surge, employment growth remained robust (Figure 1).[3] Unemployment stayed near historical lows, and labour force participation increased. This resilience is visible in deviations from Okun's law: in recent quarters, employment growth has consistently exceeded what past GDP–employment dynamics would predict, producing unusually large positive residuals — even relative to the long sample starting in the 1970s. Traditionally, the Okun's law would have indeed suggested employment to grow at roughly half the pace of real GDP. Instead, between the end of 2021 and the mid 2025, the employment elasticity to GDP growth was nearly twice as high, with GDP and employment growing almost at the same rate.

At the same time, real wages declined despite strong employment growth, unlike in the 1970s, when high inflation was accompanied by rising real wages (Figures 2 and 3).[4]

[3] At the end of 2021, both output and employment recovered their respective level since 2019; hence suggesting that the following employment growth was not the result of a catching up process out of the pandemic.

[4] Our analysis wants to explicitly account for a long time span. Therefore we rely on the historical

Figure 1: Output and employment dynamics



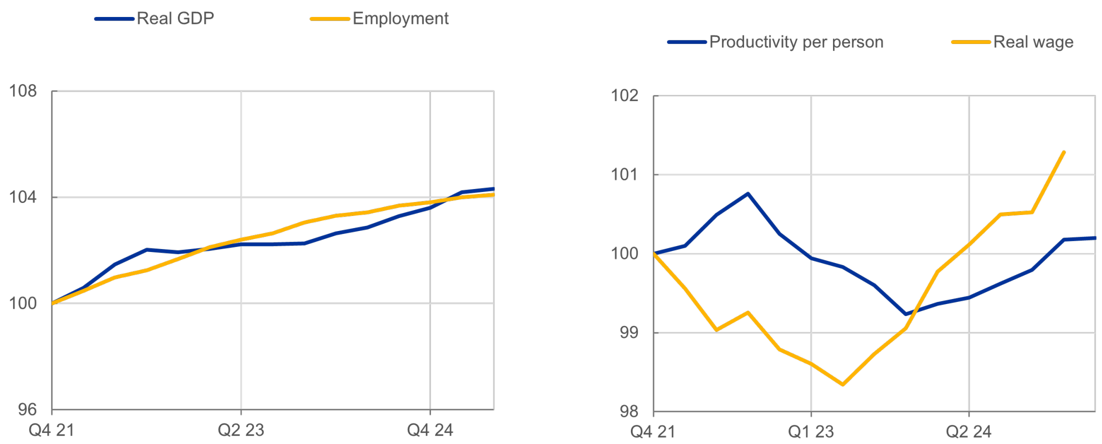
Note: Year-on-year growth rates of real GDP and total employment. Data are extended back to the 1970s by relying on the New Area Wide Model dataset as described in Fagan et al. (2001): for the post-1999 period, euro area aggregates are taken from official ECB statistics, while for earlier decades, euro area series are constructed using historical national data aggregated with fixed country weights.

The recent inflation surge was broad-based, driven by large supply shocks, such as supply bottlenecks, but also fiscal stimulus. Unlike the 1970s though, wage growth lagged behind price growth. Nominal wages did increase, but less than inflation did, with real wages falling. This contrasts with the 1970s, when automatic wage indexation led nominal wages to rise faster than inflation. Today, the limited role of indexation, the growing share of part-time/temporary contracts, and weaker union coverage have contained nominal wage growth, bring to a fall in real wages.

Anchored inflation expectations and stronger central bank credibility further helped containing wage responses. The ECB reacted forcefully, raising policy rates by 450 basis points between July 2022 and September 2023. This contrasts with the 1970s, when expectations were less anchored and wage-price spirals were common.

Labour productivity also behaved differently. In the 1970s, productivity growth continued despite the energy shocks, while employment stagnated. Recently, by contrast, resilient employment growth constrained productivity.

Figure 2: Okun's law, productivity and real wages, index 2021Q4 = 100

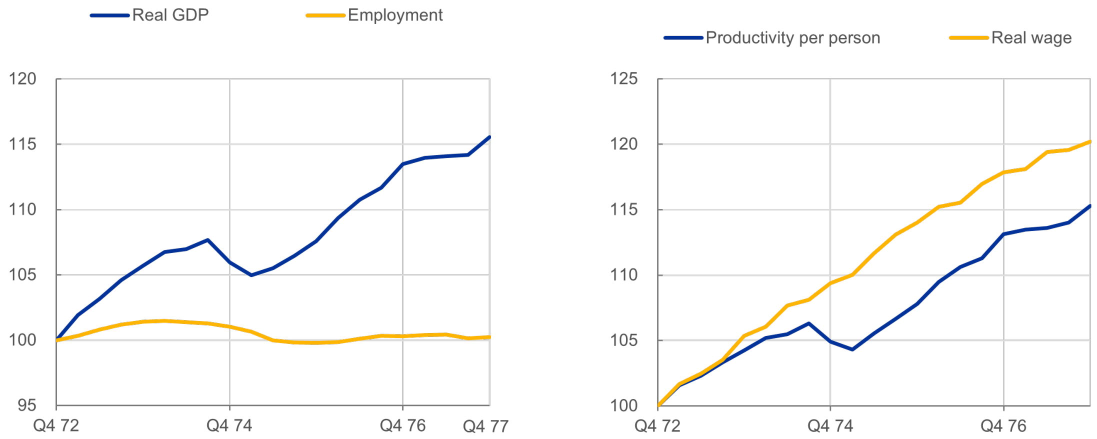


Note: Data are as in the New Area Wide Model dataset as described in Fagan et al. (2001).

The post-pandemic labour market dynamics, characterized by resilient employment

database developed for the ECB's New Area-Wide Model (NAWM). This dataset constructs pre-1999 euro area aggregates by combining national macroeconomic series using fixed country weights and harmonized definitions, ensuring internal consistency across variables and over time. The NAWM database provides quarterly measures of output, prices, and interest rates extending back to the 1970s and is designed to approximate the macroeconomic dynamics of a counterfactual euro area before monetary union. Further details on data construction and aggregation procedures are provided in Fagan et al. (2001).

Figure 3: Okun's law, productivity and real wages, index 1972Q4 = 100



Note: Data are as in the New Area Wide Model dataset as described in Fagan et al. (2001).

alongside falling real wages, can be rationalised through the lens of a simple search and matching (SAM) framework Pissarides (2000); Hall (2005); Abbritti and Consolo (2024). In particular, a key mechanism driving employment dynamics is firms' job creation condition in a context of limited job separations. This framework suggests that, under the free-entry condition for firms into the market, hiring will continue as long as the productivity of a job, exceeds the real wage, net of job posting costs. Therefore, a positive productivity-real wage gap, both currently and in the near term, is expected to result in new job matches and higher employment. Conversely, if real wages were to remain persistently above productivity, job creation would be hindered.

The equilibrium real wage in this economy depends on three key factors. First, the degree of bargaining power between workers and firms. Second, the upper bound of the negotiating set, which is related to job productivity. Third, the lower bound of the negotiating set, defined by the worker's outside option.[5] While relatively simple, this framework provides a useful tool for understanding the potential drivers of real wage adjustments and their decoupling from productivity growth.

The contrast between the 1970s and today is instructive. In the 1970s, automatic wage indexation and relatively stronger worker bargaining power sustained real wage growth

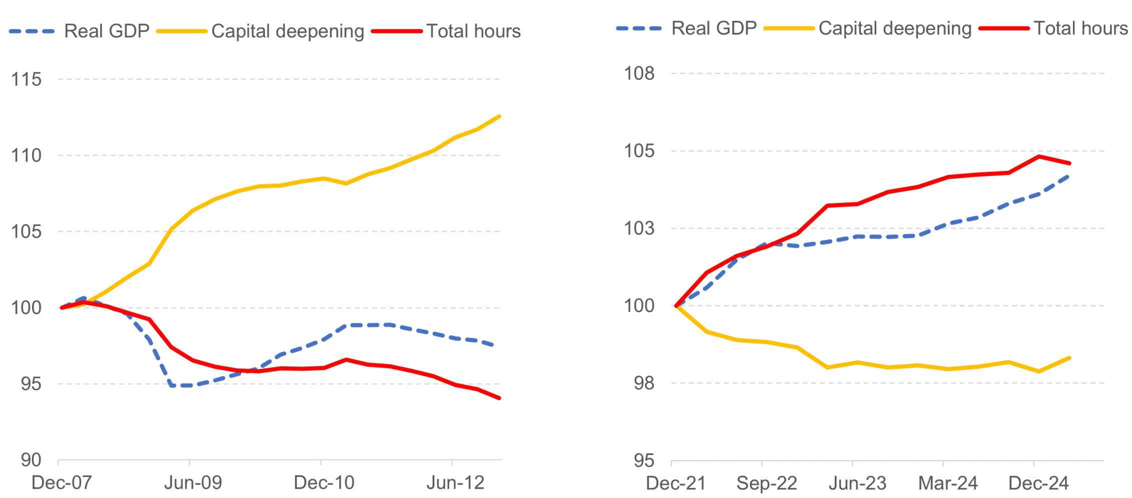
[5]While this typically refers to the real entitlement in terms of unemployment benefits, it may also depend on other non-pecuniary factors (e.g., home production).

even above productivity, reducing job creation and pushing unemployment higher. By contrast, after the 2020s energy crisis, employment expanded while real wages adjusted downward, consistent with downward real wage flexibility (no automatic wage indexation).[6]

A key implication of the on-impact downward adjustment of real wages at times when energy prices and interest rates are increasing is the factor substitution effect between capital and labour in the production process (see Bretschger and Jo (2024); Antoszewski (2019); Baccianti (2013)). Also, following an energy price shock, the use of capital decreases as well as the demand for skilled labour, while the demand for unskilled labour increases - due to the different degree of capital-skill complementarity (Polgreen and Silos (2008)). This results in a lower skill premium and heterogeneous employment effects across sectors and firms.

The response to aggregate shock may thus depend on whether real wages adjust and on the degree of substitutability between capital and labour factors, which can vary across sectors and firms. This is also true when we analyse energy price shocks, usually interpreted as aggregate supply-side shocks, because their impact on the unemployment rate may crucially hinge on the degree or real wage rigidity.

Figure 4: Capital deepening during the Pandemic and Global Financial Crisis.



[6]The Global Financial Crisis is also another episode in which the increase of real wages above productivity - in a persistent manner - led to an increase in unemployment with employment growth underperforming output growth. See Figure 12, 13, 14 and 17 in the annex.

Before turning to the model, it is worth looking at the underlying data on employment and capital deepening during the Global Financial Crisis (GFC) and the post-pandemic recovery, as these trends corroborate the capital-labour substitution channel. Figure 4 illustrates how, during the post-pandemic recovery, capital deepening remained subdued compared to the increase in labour input. In contrast, during the GFC recovery, capital deepening rose while employment hysteresis persisted.

3 Model

We make use of a structural vector autoregression (SVAR) model, where identification is achieved through a combination of sign restrictions, as in Table 1, and an external instrument.

We estimate a $N-$variate SVAR model (where in our case $N = 5$):

$$y_t = C + \sum_{p=1}^{P} B_i y_{t-i} + u_t, \tag{1}$$

where y_t is a $N \times 1$ vector of endogenous variables, C is a $N \times 1$ vector of constants, B_i for $i = 1, ..., P$ are $N \times N$ parameters matrices, with P the numbers of lags of the endogenous variables included in the estimation, in our specific case $P = 4$. u_t is the vector of residuals, with $u_t \sim N(0, \Sigma)$, where Σ is the $N \times N$ variance-covariance matrix.

The model is estimated with Bayesian techniques and we use a Normal-Wishart prior. The model is estimated using quarterly data, on the sample 1970Q1-2025Q1 for the euro area.[7] The data we use include: real GDP growth, inflation (computed on HICP index) employment growth (in terms of total number of employees), real wage growth (computed as growth in compensation of employees deflated with the GDP deflator) and a measure of interest rate (a nominal short term rate)[8].

Our empirical analysis relies on quarterly macroeconomic data for the euro area from

[7]The long sample for the euro area is obtained by using data from the Area-wide Model (AWM) database (see Fagan et al. (2001) for a description of the database.)

[8]A caveat on the interest rate choice, we run the model with alternative measures of the interest rate, as the shadow rate in Wu and Xia (2016), to avoid issues related to the prolongs period at the zero lower bound. Results are robust to that choice.

1970 to 2025. The dataset combines Eurostat national accounts data, available since the mid-1990s, with the ECB's Area-Wide Database as described in Fagan et al. (2001), which reconstructs major macroeconomic series back to the 1970s. We use real GDP, employment, HICP inflation, real wages, and the short-term nominal interest rate. Both real GDP and real wages are deflated by the GDP deflator. The data used to construct the instrumental variable with which the monetary policy shock is identified is from the Euro Area Monetary Policy event study Database (EA-MPD) (Altavilla et al. (2019)). Extending the database back to the 1970s is valuable: it allows us to compare the current episode with past periods of high inflation. A detailed description of the data is provided in Appendix A.

The identification scheme is fairly similar and consistent to the one used in Foroni and Furlanetto (2022). This builds a model for the analysis of deviations in the labour markets from historical regularities. However in this paper, we shift the focus on other aspects which became salient especially in the most recent period. First, we focus on the role of real wages in explaining the recent strength of the labour markets relative to the weakness observed in the economic activity. Second, we include the role of monetary policy in the analysis. Third, we consider the crucial role of energy prices which favour a substitution between capital and labour. Finally, we focus on productivity developments which recently became a prominent aspect in the euro area.

3.1 Shock identification

We use sign restrictions to identify all the shocks, except the monetary policy one where we rely on the external instrument as described later on in this section. This allows us to have a cleaner identification of the monetary policy shock, without relying only on the different sign of interest rate to disentangle it from a general aggregate demand shock.

In order to obtain structural shocks $e_t = Au_t$ through sign restrictions, we restrict the signs on the impact responses of shocks, and consider only those orthonormal A matrices which satisfy the sign that certain shocks should have on certain endogenous variables based on economic theory. One demand shock and three supply shocks are identified using sign restrictions, as reported in Table 1. These are obtained following the algorithm of Arias et al. (2018).

Table 1: Identification scheme based on sign restrictions

	Aggregate demand	Neutral technology	Factor Substitution	Labour Market
Real GDP	+	+	+	+
Inflation	+	-	-	-
Employment	+	+	-	+
Real wages		+	+	-
Interest rate	+			

Note: this table refers to the sign-based identification of four out of five shocks only.

An expansionary demand shock moves output and prices in the same direction. These dynamics are consistent with the effects induced by fiscal policy, marginal efficiency of investment and financial and risk premium shocks.

We include three different types of supply shocks, which generate a negative co-movement between output and prices. In particular, we isolate a neutral technology shock (also called in the literature productivity shock, see Mumtaz and Zanetti (2012) and Mumtaz and Zanetti (2015)), which moves employment and real wages in the same direction. A neutral technology shock represents an increase in productivity, which reduces the marginal costs for firms and, therefore, pushes inflation down. The production expansion creates incentives for increasing hiring and employment, with a positive shift in the labour demand curve, and an increase in output and wage growth. This technology shock is neutral with respect to capital and labour as it affects them in the same direction.

Contrary to a neutral technology shock, a factor-substitution shock incentivises firms to reduce hiring due to the higher productivity of capital, thereby exerting a negative effect on employment. Similarly, a negative impact on relative prices would push capital and labour in opposite directions. Consequently, cheaper labour input—via lower real wages—in the context of higher energy and borrowing costs would favour job creation over private investment, resulting in a negative impact on capital deepening.[9] This shock

[9]The restriction on real wages is not strictly necessary for identification. However, if the model is

can partially capture the effects of an energy price shock in the most recent period, which has led to capital-labour substitution in the aggregate production function. It may also represent an *automation* shock, where labour input is displaced by capital due to higher efficiency. In other words, this is an aggregate supply shock that induces capital-labour substitution. A more granular interpretation of the adjustment in the capital-labour ratio can be derived using a two-sector model. Acemoglu and Guerrieri (2008) demonstrate that capital-intensive sectors generate larger fluctuations in aggregate output, whereas labour-intensive sectors produce larger fluctuations in employment. Consequently, following an adverse aggregate supply shock, output dynamics are primarily driven by the behaviour of capital-intensive sectors. In contrast, the positive change in employment is driven by labour-intensive firms in response to the negative adjustment in real wages. As a result, the dynamics of employment and output decouple, exhibiting a temporary and significant deviation from the standard Okun's law relationship.

Finally a shock originated in the labour market creates an increase in output and employment, and at the same time a decrease in price and wage inflation. This shock bundles together various shocks which are directly a feature of the labour market, such as a labour supply shock or a wage bargaining shock (see Foroni et al. (2018), further disentangling would require the inclusion of the unemployment rate).

An instrumental variable constructed using high frequency data is then used to pin down the effects of monetary policy in addition to the other shocks. This method was pioneered by Cook and Hahn (1989) and Kuttner (2001), and is now used extensively in monetary policy analysis. It exploits changes in the price of an asset that closely follows the policy rate around the time of a monetary policy announcement. The market is assumed to have integrated all available information into the current price. The change in price that occurs in the narrow time window during the announcement, the monetary policy surprise, can therefore be used as a powerful exogenous instrument without requiring a pre-determined relationship between the shock and the dependent variables. The 3-month OIS monetary event surprise from the Euro Area Monetary Policy event-study

run without this restriction, the impulse response of real wage growth to a factor-substitution shock still confirms a positive sign.

Database (EA-MPD) (Altavilla et al. (2019)) between 1999 Q1 - 2025 Q1 is used to construct the monetary surprise series. The poor man's sign restriction (Jarociński and Karadi (2020)) is subsequently applied to the surprise data using changes in the EURO STOXX 50 during the same time window. The series is then aggregated to quarterly frequency before being included as an instrumental variable in the BVAR.

4 What explains euro area labour market resilience

During the post-pandemic recovery, euro area inflation surged above 10% year-on-year, levels unseen since the 1970s and early 1980s. Persistent price pressures reflected a mix of supply and demand shocks, to which monetary policy reacted forcefully. This motivates a comparison of labour market behaviour in these two high-inflation episodes, in order to understand why recent employment dynamics have been so resilient.

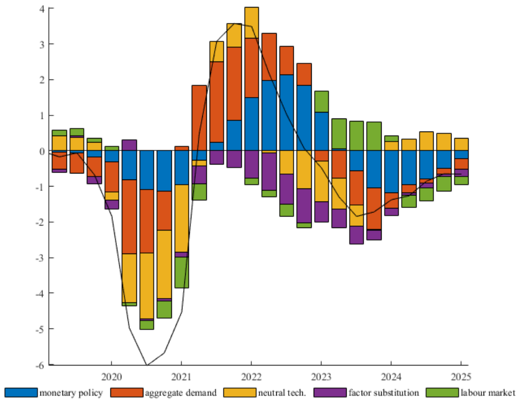
To explain this unusual pattern, we analyse the historical decomposition from the VAR model described in Section 3. Since 2019, shocks have contributed asymmetrically to output and employment, driving them apart (Figure 5). Typically, the employment–output relation reflects demand-driven fluctuations (see Foroni and Furlanetto (2022)). However, in the post-pandemic period, supply and policy shocks played a dominant role.

Post-pandemic expansionary monetary policy and demand recovery supported employment longer than output. Rising energy prices and falling real wages made labour cheaper relative to capital, inducing factor substitution towards labour and consequently sustaining job growth while weighing on output. This effect faded as energy prices normalised and wages caught up, but productivity improvements and higher labour force participation continued to support employment.

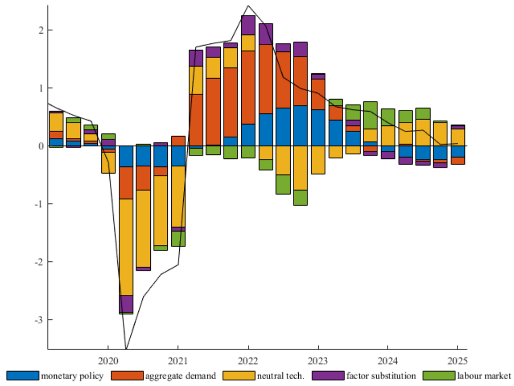
Real wages declined from 2021 as nominal wage growth lagged behind inflation (Figure 6). Anchored expectations and weak productivity growth prevented a wage–price spiral. Lower real wages increased labour attractiveness, supporting hiring but lowering measured labour productivity. As energy prices eased and nominal wages rose, real wages stabilised and labour productivity gradually recovered, though tight monetary policy continued to keep output subdued.

Figure 5: Historical decomposition of output and employment (2019–2025)

(a) Output



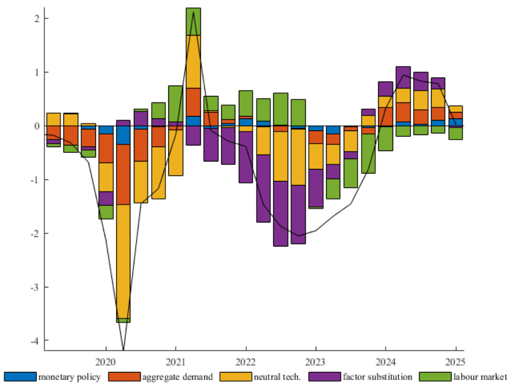
(b) Employment



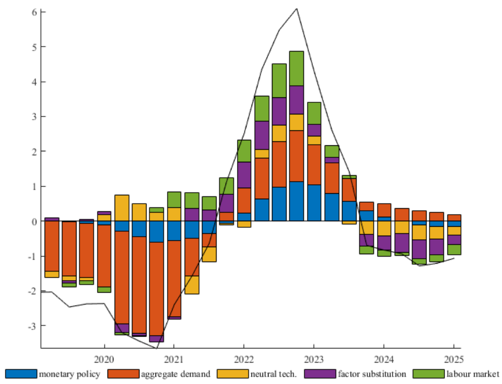
Note: Historical decomposition in deviations from initial conditions and deterministic components. Bars show median shock contributions over 8000 replications.

Figure 6: Historical decomposition of real wages and inflation (2019–2025)

(a) Real wages



(b) Inflation

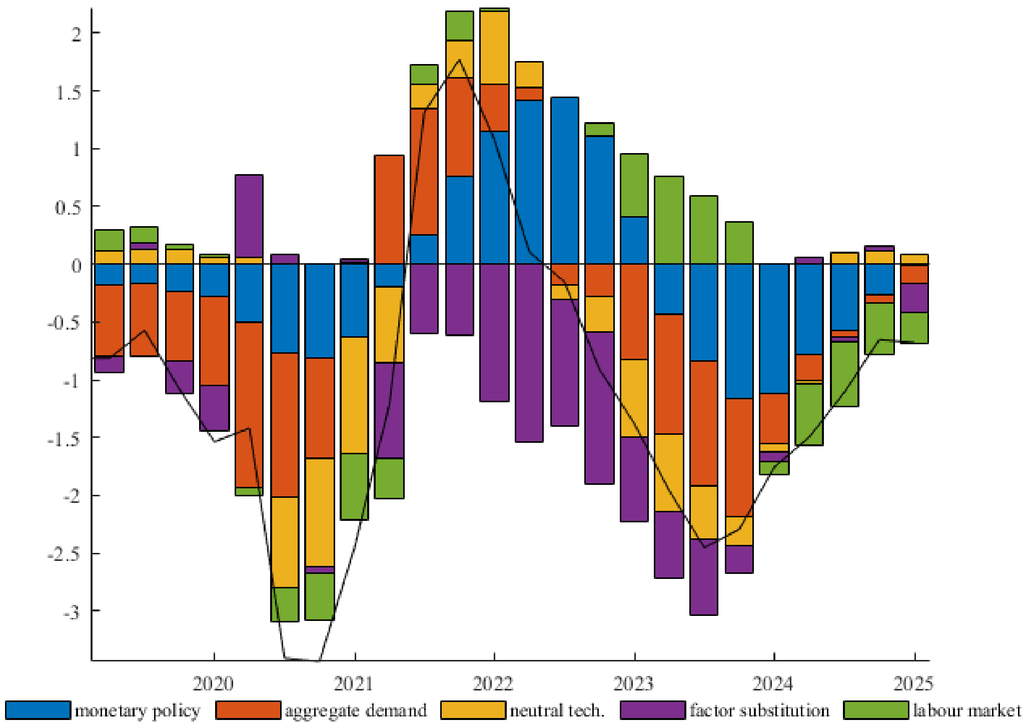


Note: Median shock contributions from VAR decomposition, in annual growth rates at quarterly frequency.

The labour productivity slowdown is further explained by factor substitution shocks. Figure 7 shows that labour productivity is strongly pro-cyclical with respect to capital shocks, more so than with demand or labour market shocks. Hence, factor substitution, capital dynamics and monetary policy transmission jointly explain the unusual labour productivity–employment trade-off observed after 2020.

Figure 7: Historical decomposition: 2019 - 2025

Productivity



Note: the historical decomposition is shown in deviation from initial conditions and deterministic component and reports the median shock contributions over 8000 replications. Employment and output are measured in terms of annual growth rates at quarterly frequency and each bar/shock contribution is in percentage point.

Impulse responses in Figure 8 confirm that labour productivity reacts positively to a factor substitution shock. Further, the impulse responses confirm the procyclical response of labour productivity in the euro area to most of the shocks, with the exclusion of the technology shock.

4.1 Comparison with the 1970s: the role of real wages

The contrast with the 1970s highlights the importance of real wages. Then, inflation was accompanied by nominal wages rising even faster, implying positive real wage growth. As Figure 3 shows, wages rose faster than labour productivity, reducing firms' incentive to hire and producing weaker employment responses in line with Okun's law. Similar dynamics occurred during later recessions such as 2008 and 2011.

By contrast, after 2020s energy crisis real wages fell in cumulative terms relative to labour productivity (Figure 2). This made labour relatively cheap, encouraging firms to hoard and even expand employment despite weak output.

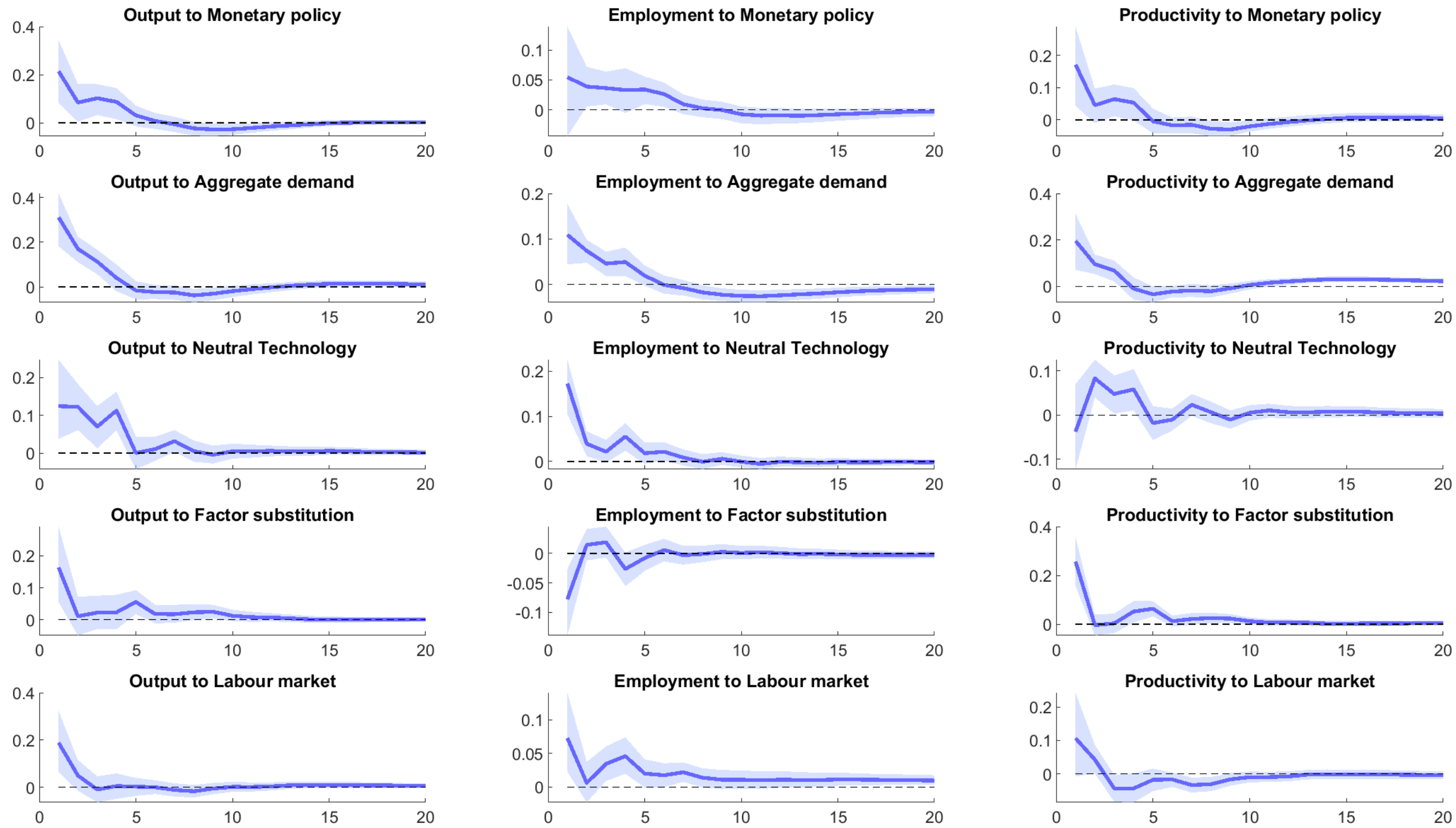
Figure 9 compares historical decompositions across the two periods. In the 1970s, negative demand and labour market shocks played a stronger role, while monetary policy was less prominent. Crucially, factor substitution shocks amplified employment in the 2020s but not in the 1970s: then, rising real wages prevented substitution towards labour, weakening labour market performance.

5 The impact of monetary policy

Given the steep increase in the interest rates in the post-pandemic period, one natural question is to examine what role monetary policy played in the resilience of the euro area labour market.

In Figure 10 we highlight the role of the monetary policy shock in the historical decomposition of output and employment. Some observations are noteworthy: first, the role of monetary policy looks more important in the last part of the sample. This might be due to the large size of non-standard measures implemented especially since the onset

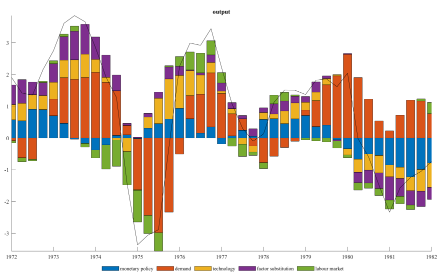
Figure 8: Impulse responses to identified shocks



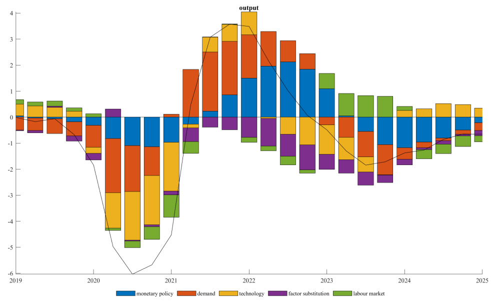
Note: Impulse responses of output (first column) and employment (second column) to identified shocks in the SVAR model. Labour productivity (third column) is obtained as the difference between output and employment responses.

Figure 9: Historical decomposition: 2019 - 2025

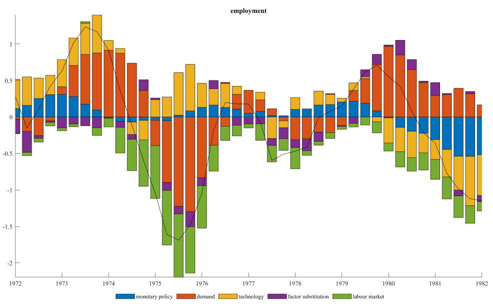
(a) Output: 1970s-1980s



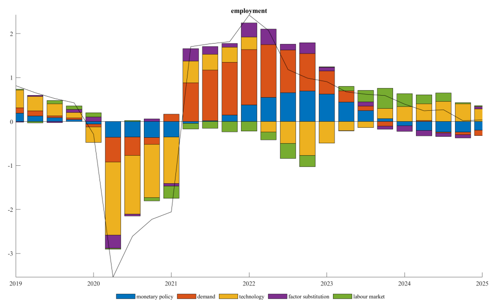
(b) Output: 2020s



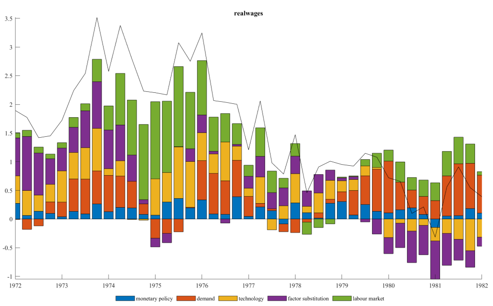
(a) Employment: 1970s-1980s



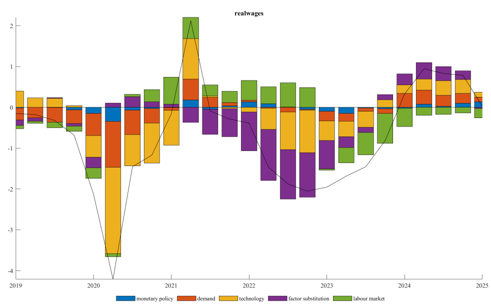
(b) Employment: 2020s



(a) Real wages: 1970s-1980s



(b) Real wages: 2020s



Note: the historical decompositions are shown in deviation from initial conditions and deterministic component and reports the median shock contributions over 8000 replications. Employment and output are measured in terms of annual growth rates at quarterly frequency and each bar/shock contribution is in percentage point. Real wages are measured in annual growth of nominal compensation per employee deflated with GDP deflator.

of the pandemic (although the identification of those non-standard measures is arguably difficult). A stylized time-varying model obtained following the approach of Primiceri (2005) does not suggest in fact a relevant change of the monetary transmission, as shown in Figure 11. The figure plots the reaction of employment growth to a monetary policy shock in the quarters coinciding with the first hike in interest rate decided by the ECB, and previously by the Deutsche Bundesbank.[10] No substantial differences in the responses are noticeable[11] Second, by comparing the contribution to output to the one of employment, the pass through is faster and stronger to output. In both cases though, the positive contribution to economic and employment growth started to reduce fairly soon after the first hikes, and turned into a negative contribution first to output and only very recently to employment. Given the transient nature of monetary policy shocks, their impact could also be interpreted as firms' willingness to delay employment adjustments by controlling for the severity of the economic slowdown, thereby favouring labour hoarding (see Berson et al. (2025)).

6 Conclusion

This paper examined the strength of euro area labour market during the 2020s. Our empirical analysis reveals that the post-pandemic recovery was characterised by an unprecedented resilience of employment, which decoupled from the slowdown in output. This divergence stands in contrast to earlier historical regularities, when employment moved more closely with output in line with Okun's law.

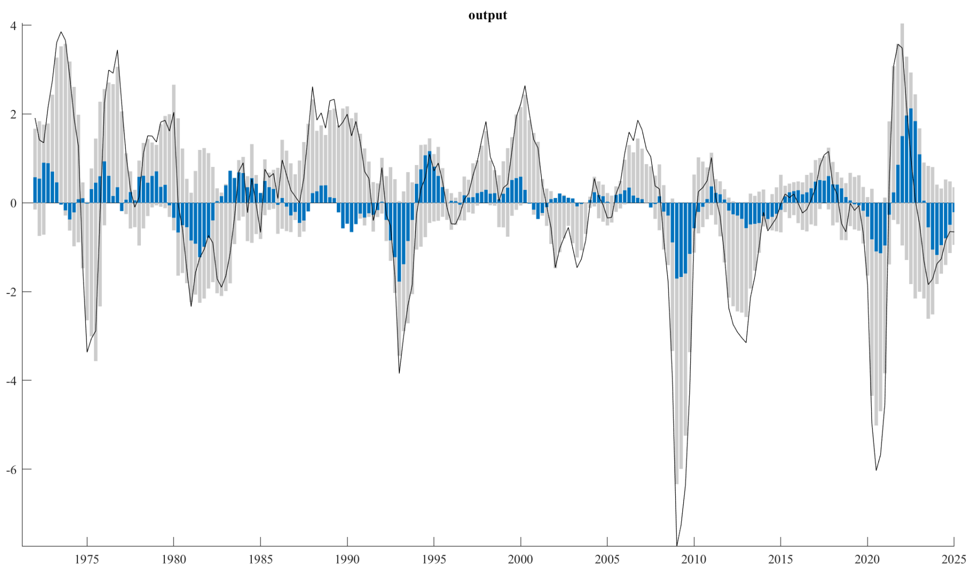
The results from the structural VAR analysis highlight the main drivers of this decoupling. First, relative input price shifts induced substitution towards labour. The surge

[10]We consider the interest rate set by the Bundesbank as proxy for the period before the European Monetary System because, as documented in the literature, the Bundesbank effectively acted as the monetary anchor for European countries, and the other European central banks have followed the leadership of the Bundesbank in setting monetary policy to stabilize their exchange and inflation rates (see di Giovanni et al. (2009) and Cloyne et al. (2022)). As a result, the German policy rate provides a meaningful summary measure of the monetary stance faced by European economies prior to monetary union.

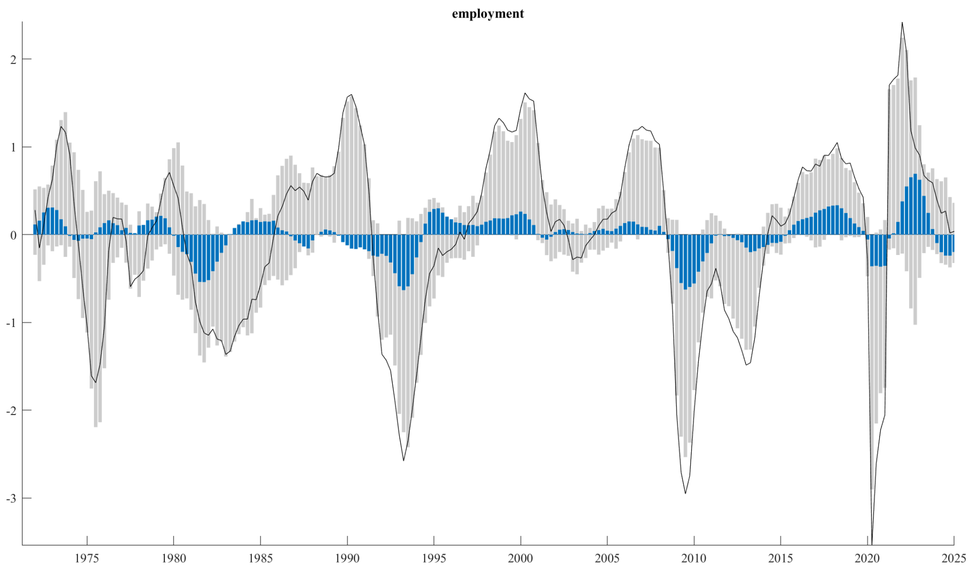
[11]The time-varying model is a simple trivariate VAR model which includes inflation, employment growth and the interest rate, in a similar fashion of the exercise in Primiceri (2005), where the monetary shock is identified with a recursive choleski scheme. This is meant only as an attempt to rule out a change in the monetary policy transmission, with no intention of been an accurate model.

Figure 10: The role of monetary policy shock

(a) Historical decomposition - annual GDP growth

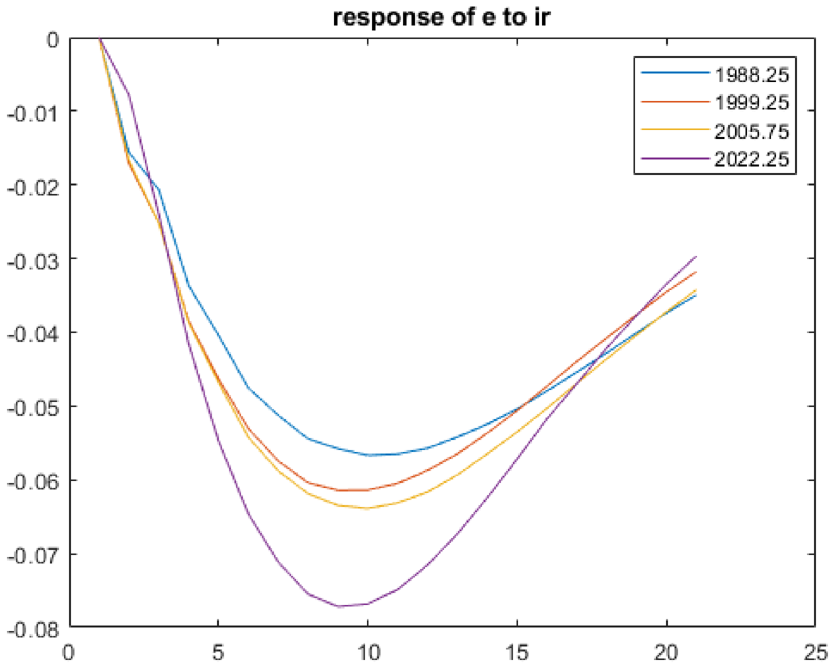


(b) Historical decomposition - annual employment growth



Note: The figures in Panel (a) and (b) report the historical decomposition for GDP growth and employment obtained by the model described in Section 3 and then transformed in y-o-y growth rates. The monetary policy shock contribution is highlighted in blue, while all the other shocks contributions are bundled in the grey bars.

Figure 11: Response of employment growth to a shock to interest rate in selected quarters



Note: The figure reports the impulse response of employment to a shock to the interest rate in selected dates, which coincides with the quarter of first hike from the ECB (and from the Bundesbank in 1988Q2).

in energy prices and the fall in real wages made labour relatively cheaper than capital, supporting employment even as output weakened. Second, the transmission of monetary policy has been asymmetric: output responded more quickly and more strongly to policy tightening, whereas employment continued to expand for longer, reflecting labour hoarding and weaker pass-through to the labour market. Finally, supply-side factors, including recovering productivity and increased labour force participation, further bolstered labour market dynamics.

A key contrast with the 1970s is the adjustment of real wages. Whereas in the earlier period nominal wages more than compensated inflation, lifting real wages and weighing on labour demand, the recent surge in inflation eroded real wages despite rising nominal pay. This helped sustain employment but came at the cost of subdued labour productivity growth. The evidence therefore points to real wage adjustment as a central mechanism behind the current labour market resilience.

Overall, our findings suggest that the euro area labour market proved to react less to output fluctuations in the latest years. The resilience of the labour market has supported incomes and reduced social costs in the recent economic slowdown, although falling real wages can place significant strain on working households. As we look to the future, these dynamics raise questions about the short-term adjustment of labour productivity and the capacity of the euro area economy to restore a sustained long-term productivity growth.

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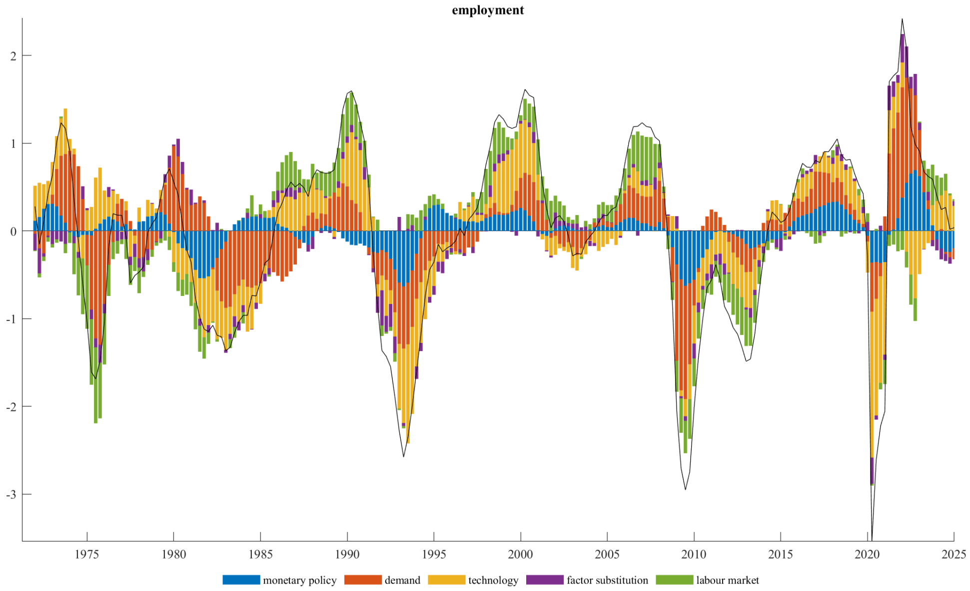
A Data

Table 2: Data description

Series	Description	Transformation	AWM Code
Real GDP growth	Gross Domestic Product (GDP) at mark et prices, Million Euro, Chain linked volume, Calendar and seasonally adjusted data.	q-o-q growth rate	YER
Inflation	HICP - Overall Index, Index (then seasonally adjusted)	q-o-q growth rate	HICP
Employment	Total Employment, Thousands of persons, Calendar and seasonally adjusted data.	q-o-q growth rate	LNN
Real Wages	Compensation of Employees, Millions of euros, Current prices, Calendar and seasonally adjusted data / Employees, Thousands of persons, Calendar and seasonally adjusted data. Deflated by the GDP deflator.	q-o-q growth rate	$\frac{WIN/LEN}{YED}$
Interest rate	Nominal Short-Term Interest Rate, Euribor 3-month, Percent per annum, Last trade price.	level	STN

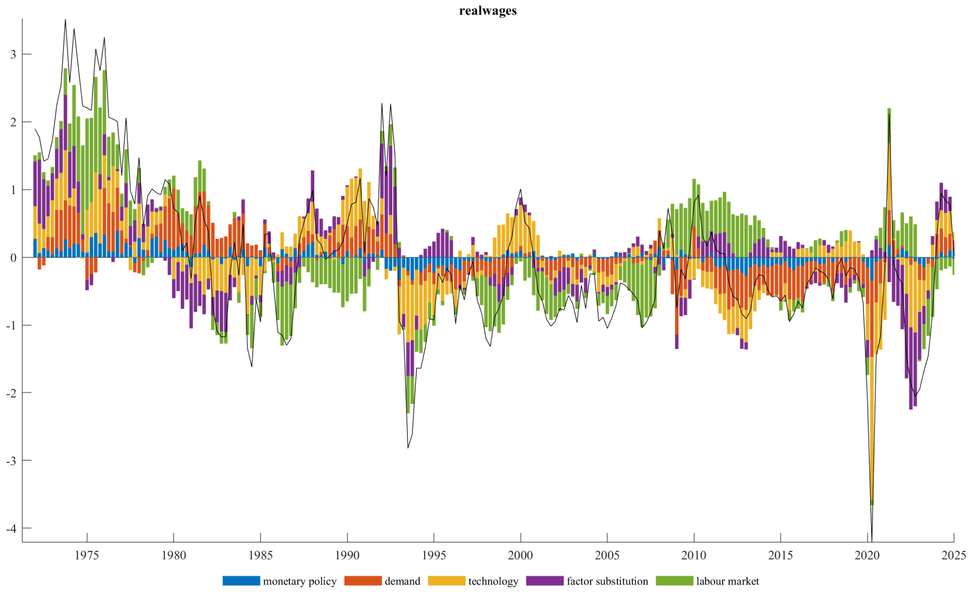
B Historical decompositions over the full sample (1970 - 2025)

Figure 12: Employment



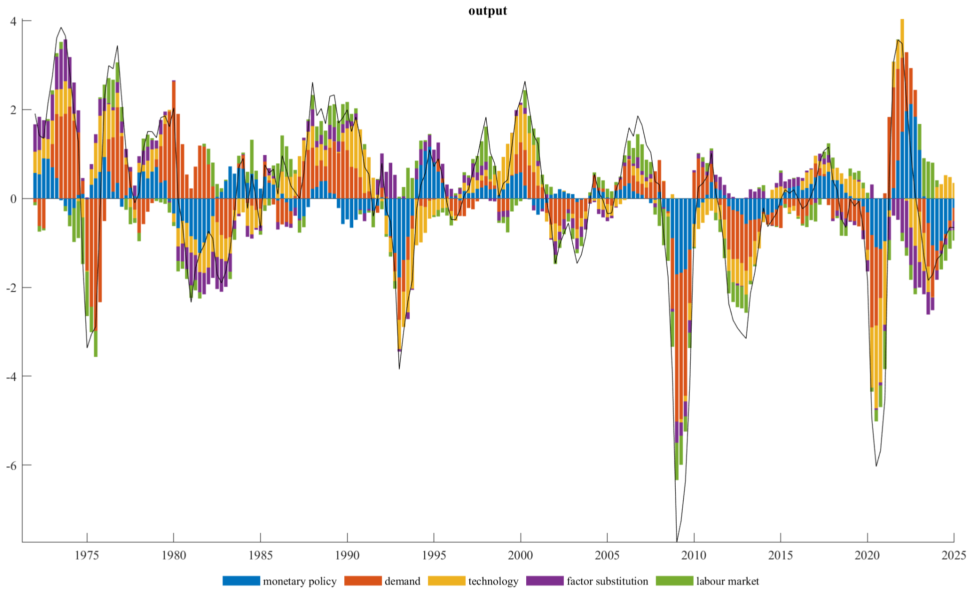
Source: ECB AWM database and Eurostat. Note: historical decomposition (in deviation from initial conditions and deterministic component). Employment is measured in terms of annual growth rates at quarterly frequency and each bar/shock contribution is in percentage point.

Figure 13: Real wage



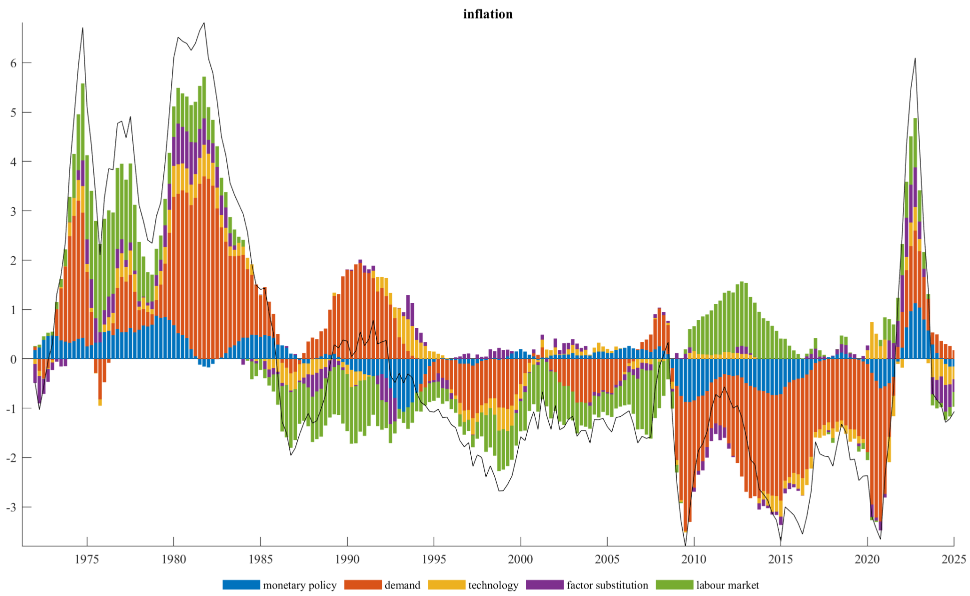
Source: ECB AWM database and Eurostat. Note: historical decomposition (in deviation from initial conditions and deterministic component). Real Wage is measured in terms of annual growth rates at quarterly frequency and each bar/shock contribution is in percentage point.

Figure 14: Output



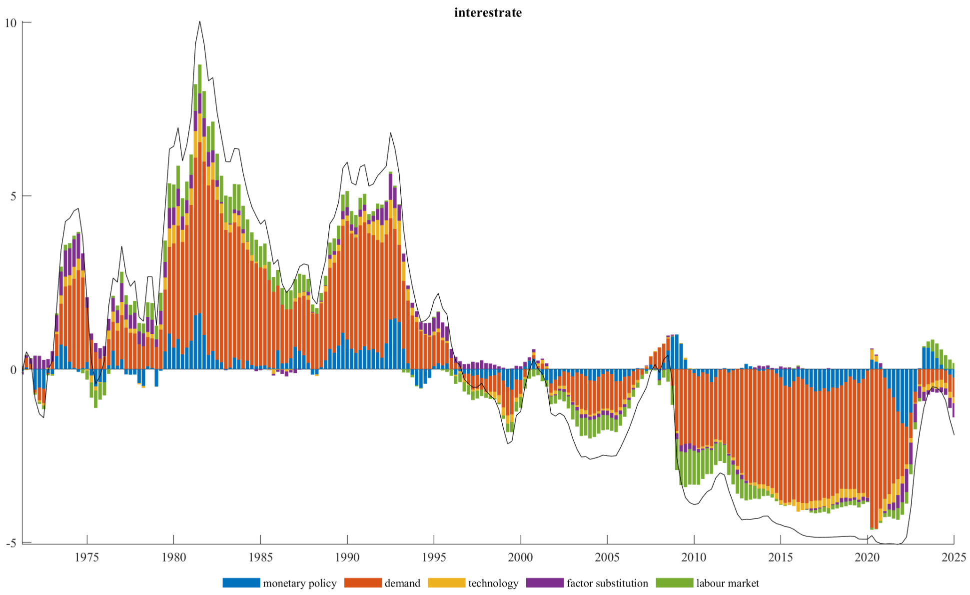
Source: ECB AWM database and Eurostat. Note: historical decomposition (in deviation from initial conditions and deterministic component). Output is measured in terms of annual growth rates at quarterly frequency and each bar/shock contribution is in percentage point.

Figure 15: Inflation



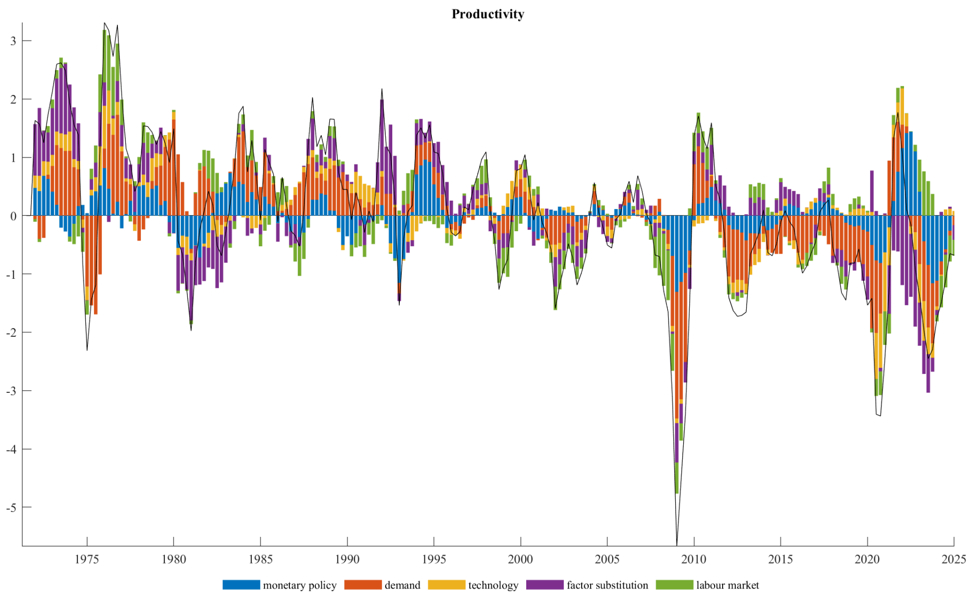
Source: ECB AWM database and Eurostat. Note: historical decomposition (in deviation from initial conditions and deterministic component). Inflation is measured in terms of annual growth rates at quarterly frequency and each bar/shock contribution is in percentage point.

Figure 16: Interest rate



Source: ECB AWM database and Eurostat. Note: historical decomposition (in deviation from initial conditions and deterministic component). Interest rate is measured as STN at quarterly frequency and each bar/shock contribution is in percentage point.

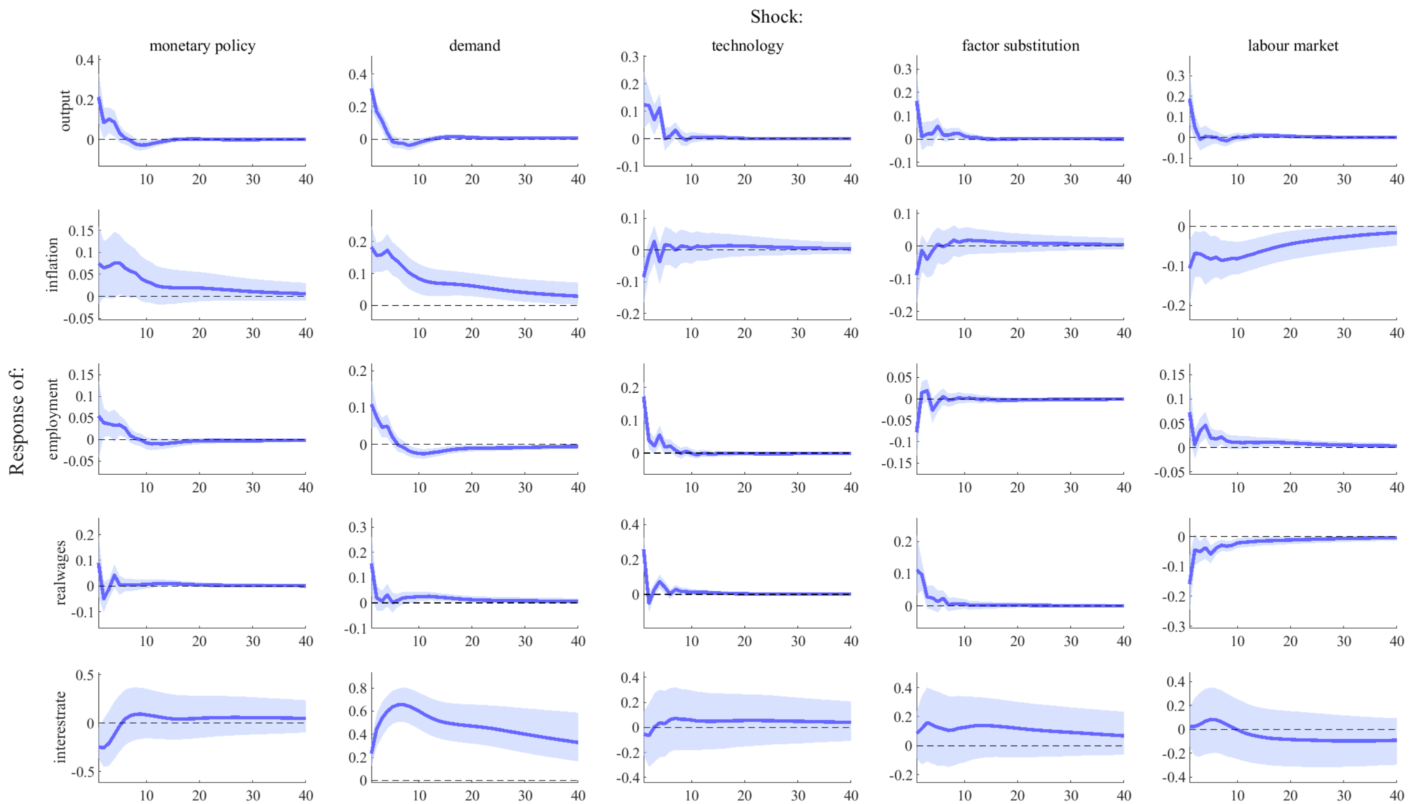
Figure 17: Productivity



Source: ECB AWM database and Eurostat. Note: historical decomposition (in deviation from initial conditions and deterministic component). Interest rate is measured as STN at quarterly frequency and each bar/shock contribution is in percentage point.

C Impulse responses

Figure 18: Impulse responses to identified shocks



Note: Impulse responses of all variables to identified shocks in the SVAR model.

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