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Wage-price dynamics and monetary policy

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Introduction

The ECB follows several criteria to determine the appropriate level of its key policy rates. Against a backdrop of great uncertainty following the pandemic, disruptions to supply chains, and the impact on energy prices from Russia's invasion of Ukraine, the ECB adopted a "data dependent approach", emphasising the increased role that observable data would play in monetary policy decisions. This approach involves assessing the dynamics of core inflation and the strength of monetary policy transmission, further to an assessment of the inflation outlook based on incoming economic and financial data. Since July 2022, the ECB has increased key interest rates several times, raising them by 450 basis points in total, with the deposit facility rate – the main instrument of the ECB – reaching 4 % in September 2023 and remaining at that level since then.

Wage dynamics have recently grown in importance for monetary policymakers aiming to get inflation back to target. While the huge gap between headline inflation in the euro area and the ECB medium-term target (a year-on-year growth rate of 2 %) has diminished as external pressures have softened, domestic inflationary forces have become more prominent. For example, core inflation (which excludes energy and food components from headline inflation) is heavily influenced by services' prices which, in turn, are strongly related to wage costs. Therefore, the ECB is particularly focused on the dynamics of wages and the likelihood that wages and (core) inflation "chase each other", as firms attempt to increase prices in view of increased (wage) costs.

Core inflation remains sticky: it did not begin to fall until 2023, and at the beginning of 2024 it was still around 4 % in Belgium year-on-year and around 3 % in the euro area. Month-on-month inflation rates show, in fact, that core inflation in the euro area picked up at the beginning of 2024 (this is less clear for Belgium). This persistence is even more notable with regard to services inflation where price growth was around 5 % in Belgium on average over the first 4 months of 2024 and 4 % in the euro area. Hence, attention has shifted to wages: persistent wage growth could presage persistent core inflation and, eventually, persistent headline inflation.

The latest wage growth data are historically high and might indeed slow down the convergence of inflation to the ECB's target. Compensation per employee – the ECB's main wage indicator – grew by 4.5 % on average in 2022, and by 5.2 % in 2023 in the euro area (figure 1). In Belgium, where automatic wage indexation is the rule, the growth rate of compensation per employee has been even higher and accelerated from 7.3 % to 7.7 %. Core inflation and this measure of wage costs are highly correlated in both the euro area and Belgium.

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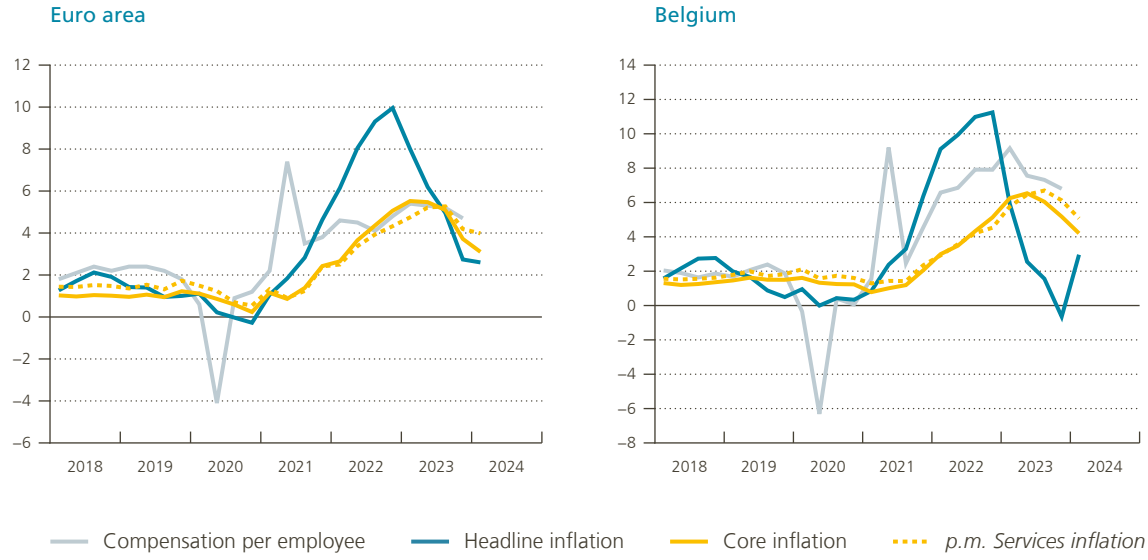
Figure 1

Inflation and wage growth in the euro area and in Belgium[1]

(year-on-year growth rate, in %)



Sources: EC, ECB.

1 Quarterly data: year-on-year growth rate for compensation per employee and year-on-year inflation rate of the HICP index.

In this article, we examine the changing nature of inflation in the euro area and in Belgium; the inter-connections between wage inflation and price inflation; and we look forward, to consider whether wage pressures on inflation will ease, and discuss implications for monetary policy. The article is structured as follows: in section 1, we decompose inflation in the euro area and Belgium to understand the extent to which wage developments have risen in importance. In section 2, we look at how wages have caught up with the surge in inflation. We also examine trends in productivity to see whether these have attenuated unit labour costs. In section 3, we build a wage equation and a price equation to gauge the relative importance of a series of variables in determining wage growth and inflation. We also revisit recent findings in the literature. In section 4, we analyse recent trends in forward-looking indicators to see if wage growth is expected to remain high in the near future, and to continue feeding inflation. We then take a look, in turn, at the latest ECB forecasts. The final section sets out our conclusions.

1. The recent rise in the importance of wages to inflation

1.1 Inflation decomposition

Consumer price inflation was historically high in 2022 but slowed in 2023, notably due to a decrease in energy prices. Headline consumer price inflation reflects increases in final consumer prices. It is usually represented by year-on-year changes to the HICP (Harmonised Index of Consumer Prices)[1], which includes energy goods – that are mainly imported – as well as food products, manufactured goods (so-called "non-energy industrial goods") and

1 But it can also be shown by, for instance, the private consumption deflator from the national accounts. The consumption deflator includes "imputed rents", while the HICP index does not.

services. In 2021, inflation started to increase in the light of the post-pandemic recovery. Demand shot up while supply could not keep pace (see for example De Sloover *et al.*, 2022). Increases in the prices of energy and other commodities implied higher costs for firms at the various stages of supply chains, which were then passed through to final consumer prices. Supply-bottlenecks pushed up the prices of non-energy industrial goods in particular. In 2022, energy inflation picked up further due to Russia's invasion of Ukraine. The peak in gas prices, for instance, was reached in August 2022. Since then, energy prices have come down, and in 2023, price levels were lower on average than in 2022. Due to negative energy inflation in 2023, headline HICP inflation stood, that year, at 2.3 % in Belgium (down from 10.3 % in 2022) and 5.4 % in the euro area (down from 8.4 % in 2022)[2].

However, when excluding energy, inflation actually went up on average in 2023, both in Belgium and in the euro area. Inflation excluding energy was 7.6 % in 2023 in Belgium (up from 5.1 % in 2022), and 6.3 % in the euro area (up from 5.1 % in 2022). This means that an external component (energy) played a major role in driving the downward movement in headline inflation in 2023. As monetary policy steers domestic consumption and investment, the continuing disinflation process mainly relies on the easing of domestic price pressures, while external price developments are essentially beyond the ECB's reach. Typically, services inflation rose to 6.3 % in 2023 in Belgium (against 3.8 % in 2022) and to 4.9 % in the euro area (up from 3.6 %). However, final consumer prices (even of non-energy components such as services) are not perfectly representative of domestic inflation, since they also take into account the prices of imported intermediate or final consumer goods and services.

The GDP deflator can serve as a proxy for domestic inflation, as it represents the price of domestically produced value added. In 2023, the deflator was 6 %, on average, in the euro area, and 3.8 % in Belgium. While domestic cost pressures clearly eased in Belgium, they remained particularly high in the euro area. The GDP deflator only includes price increases of imported goods in an indirect way and not in a direct way (e.g. through energy price increases). For example, if Belgian firms are faced with an external energy price shock, then the GDP deflator only increases if domestic firms increase their selling prices by more than the initial external input price increase (in euros). This notably happens when firms want to keep their markups, as a percentage of their cost, constant (see NBB, 2024). Furthermore, this is also particularly likely to happen should wage costs increase in reaction to the initial energy shock. It is interesting to note that the GDP deflator started growing and declining faster in Belgium than in the euro area. In fact, it seems as if growth in the Belgian GDP deflator has leading properties for euro area GDP deflator growth. A formal lead-lag analysis confirms that over the period 1996-2023, [3] the correlation between Belgian and euro area GDP deflator growth is highest when a two-quarter lag is applied to the former.

Decomposition of the GDP-deflator shows that both wage costs and unit profits have contributed significantly to domestic inflation in the euro area and in Belgium (figure 2). Following the income approach to national accounting, the GDP deflator can be decomposed into unit labour costs, unit profits (i.e. gross operating surplus and mixed income of independent workers) and unit taxes minus subsidies (see annex 1 for more details). The contribution of unit labour costs to deflator growth jumped considerably in Belgium over 2022, reaching a peak at the beginning of 2023. The country's automatic wage indexation system leads to a much faster transmission of inflation to wage costs (see further below). Belgian firms did not fully transmit these higher costs onto their selling prices, so the contribution of their unit profits decreased over the same period, and even fell into negative territory in Q4 2023. [4] In the euro area, in contrast, the

2 Historically, (energy) inflation has been more volatile in Belgium than in the euro area. That is, when energy commodity prices increase (decrease), consumer price inflation of energy – and hence headline inflation – increases (decreases) faster and more profoundly in Belgium. The reason is primarily due to the relatively low level of taxation (e.g. excise duties) levied on gas and heating oil in particular in Belgium, so that commodity price fluctuations are passed through more strongly. Alongside this, Belgian consumers have relatively more variable-rate contracts for gas and electricity (contracts whose prices regularly change) with respect to other countries, where fixed-rate contracts (which guarantee a fixed price for a certain pre-determined period) are relatively more popular.

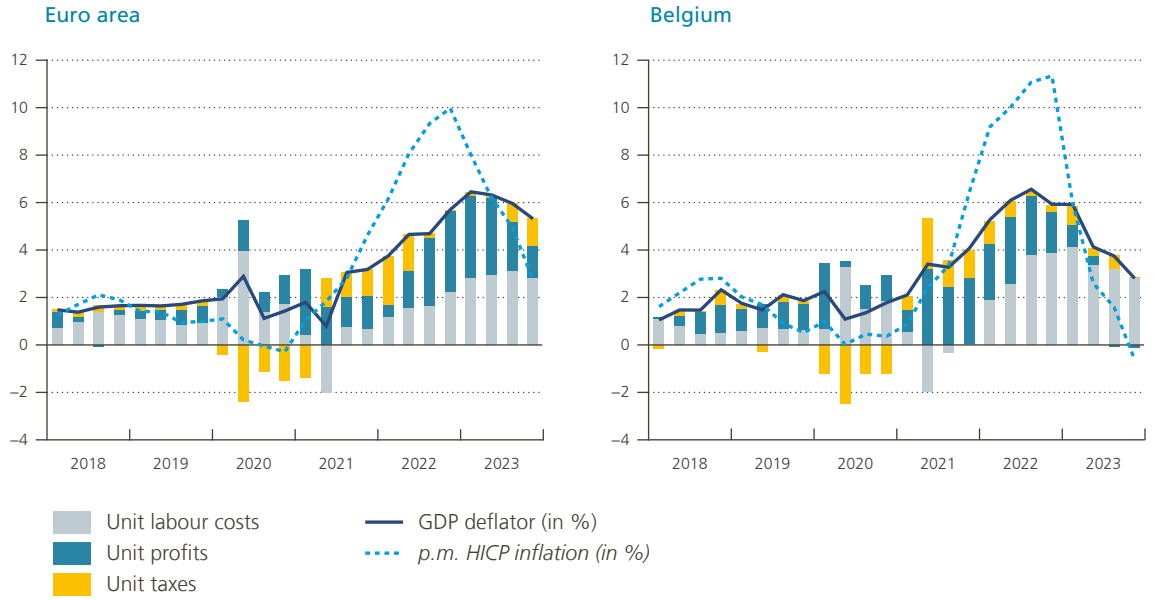
3 The finding is robust since we find the same result even when considering the 1996-2019 pre-crisis period only. However, in general, the correlation is lower for that period.

4 NBB (2024) explains this in detail. The fact that the contribution of unit profits was still positive in 2023 does not necessarily mean that firms expanded their profit margins (as a percentage of the sales price). The positive but shrinking contribution of unit labour costs to GDP-deflator growth can be consistent with declining markups, from a micro-economic perspective.

Figure 2

Decomposition of GDP deflator growth

(contributions in percentage points, unless otherwise stated)



Source: EC.

contribution of unit profits increased in 2022 and at the beginning of 2023, while unit labour costs increased more steadily and more slowly than in Belgium. This phenomenon, whereby both employers and employees aim to be compensated for cost/price increases, has been referred to as "tit-for-tat"-inflation by the ECB (Arce *et al.*, 2023). The fact that firms were able to raise their selling prices and expand their profit margins, rather than use profit margins as a buffer to absorb cost increases, is primarily explained by the fact that demand was outpacing supply; it is also probably related to the high inflation environment that allowed firms to more easily increase their selling prices given that consumers were unaware of whether higher prices were being caused by increased costs or margins (see also Bruine de Bruin *et al.*, 2023). However, as of the second quarter of 2023, the contribution of unit profits started to decline quite sharply in the euro area as well, while unit labour costs continued to increase up to Q3 2023 before dropping slightly in Q4. All in all, labour costs continue to exert upward pressure on domestic prices both in Belgium and in the euro area.

1.2 Heterogeneity across product categories

Wages account for a significant part of firms' total costs, although this is subject to marked differences across sectors and thus across inflation categories. The importance of labour costs means that wage inflation is deeply inter-connected with selling prices. In order to get an idea of the relative importance of labour costs in the prices of goods and services, we proceed in two stages. Firstly, we calculate the share of the compensation of employees in the total inputs[5] required by each product category,[6] based on

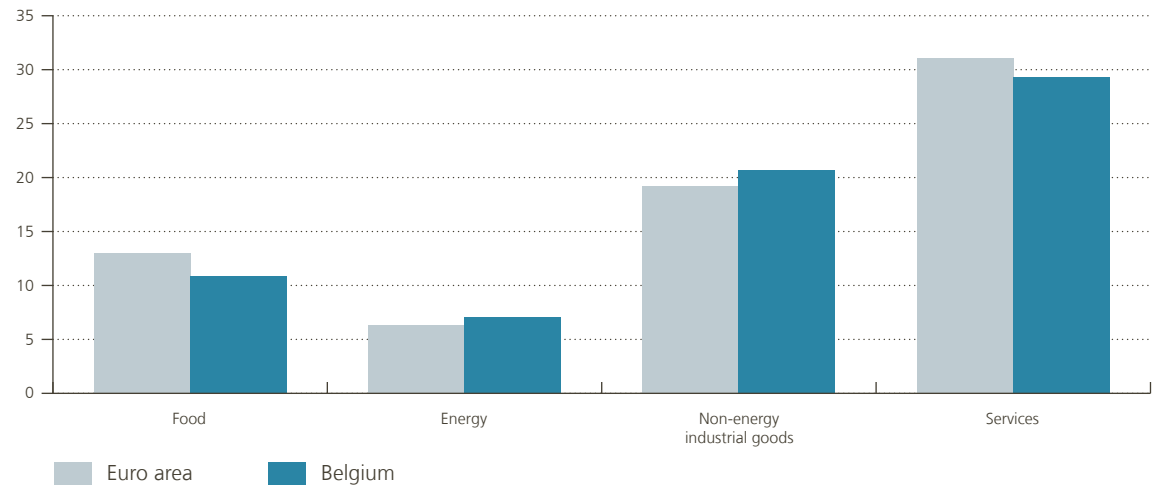
5 Total inputs are to be understood as the sum of intermediate consumption (coming from all the other branches of activity) and value added.

6 These are the CPA (Classification of Products by Activity) product categories, which are related to activities as defined by the statistical classification of economic activities in the European Community (NACE). Each CPA product is assigned to one single NACE activity. This connection to NACE activities gives the CPA a structure parallel to that of the NACE at all levels.

Figure 3

Relative share of compensation of employees in domestic costs[1]

(%)



Source: EC.

1 Based on the domestic part of the input-output table of the euro area in 2019 and of Belgium in 2015. This corresponds to the compensation of employees divided by total output (=intermediate consumption + value added), excluding imports.

the input-output tables of the euro area, on the one hand, and of Belgium, on the other.[7] For example, in the production of motor vehicles and trailers in the euro area, 24 % of input costs are devoted to the compensation of employees. We restrict this analysis to domestic costs only, i.e. imported inputs are not taken into account. Each product category can thus be associated with a share of wages. In a second stage, we match each inflation or HICP category at a granular level with the corresponding product category and thus with a corresponding share of wages.[8] Following the previous example, new motor cars in the HICP basket would be associated with the cost structure related to the production of motor vehicles and trailers.

Aggregating the detailed HICP categories into composite indices for food, energy, non-energy industrial goods, and services, reveals that wages account for the highest share of input costs (around 30 %) for services, followed by non-energy industrial goods (around 20 %). Input costs for food and energy include a share of wages of around 10 %. However, this approach only looks at direct costs. By considering the input costs for each branch of activity, i.e. looking at the "inputs of the inputs" across the production chain, the Belgian Price Observatory finds a more significant wage share in services, of around 43 % for Belgium in 2020 (Price Observatory, 2023).

While core inflation declined strongly over the course of 2023, the contribution of wage-intensive items remained "stickier" (figure 4). The detailed classification of HICP categories according to their wage intensity allows us to distinguish wage-intensive items from other items and calculate their contribution to core inflation – a concept close to domestic inflation. The initial increase of core inflation around the middle of 2021 was mainly driven by non-wage-intensive items. The effects of reopening the economy following the removal of COVID-19 restrictions led to supply shortages, raising the prices of several non-energy industrial

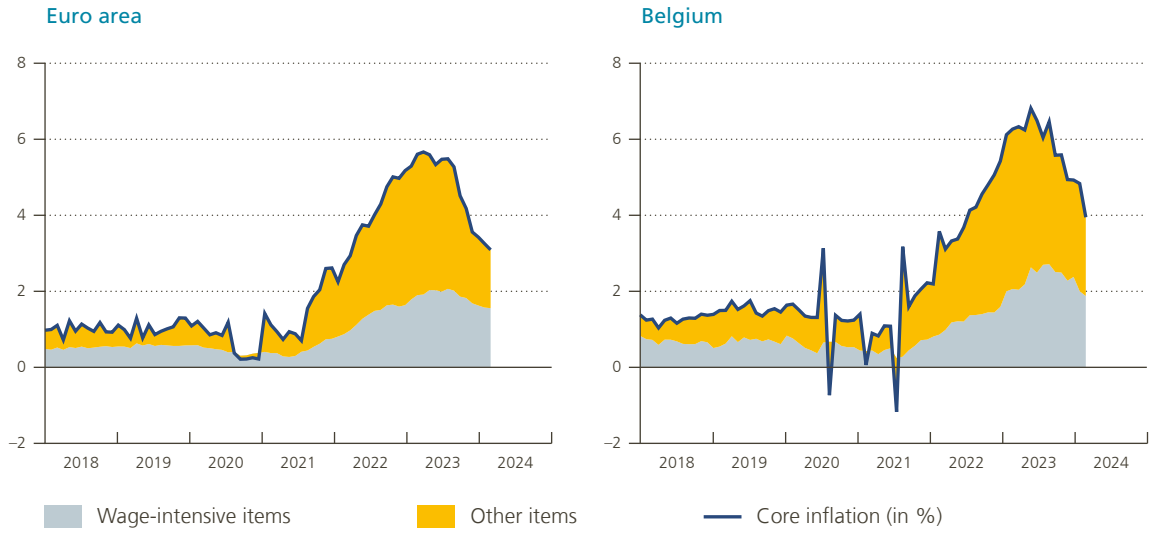
7 We use the 2019 input-output table for the euro area, to avoid distortions in production caused by the pandemic in 2020. As Belgium's most recent input-output table relates to 2020, we opt for use of the previous one, published in 2015, which is a more "stable" year.

8 COICOP (Classification of Individual Consumption According to Purpose) categories are used to define inflation components (or for the HICP). We follow the methodology by Gautier *et al.* (2022) to match NACE products with COICOP products.

Figure 4

Decomposition of core inflation into wage-intensive [1] and other items

(contributions in percentage points, unless otherwise stated)



Sources: EC, own calculations.

1 Wage-intensive items are determined based on the input-output table of the euro area in 2019. As the production cost structure is broadly similar in the euro area as a whole and in Belgium (see figure 3), we use the same classification of wage-intensive items for both. We consider the 20 % of items with the highest wage share as being "wage-intensive". This corresponds to a minimum wage share of 27 % in Belgium and 29 % in the cost structure in the euro area. The thresholds are not exactly the same for both areas, due to the non-availability of some items (which are present in some euro area countries) in Belgium.

goods such as electronic devices used, for instance, in cars. There was a considerable increase in the sales prices of second-hand cars, in particular, because of supply shortages and delivery issues affecting new cars. The easing of past energy price shocks and upstream production chain tensions, as well as the effects of tighter monetary policy, pushed down core inflation as of mid-2023. This decline was thus mainly driven by these less wage-intensive items, as the contribution of wage-intensive items remained more persistent. The latter include, among other things, domestic medical and social services, some cultural activities, and restaurants and cafés. In Belgium, this persistence is not only due to the automatic indexation of wages, but also to the systematic indexation of the prices of some services, such as train tickets, residential rental costs and specific types of insurance (see Jonckheere and Zimmer, 2017). This resulted in a small jump in the contribution of wage-intensive items in January 2023, as the prices of many services are indexed in January each year.

2. Wage developments

2.1 Wages are picking up

Nominal wage growth picked up strongly in Belgium and in the euro area. Wage growth is often determined by measuring the compensation of employees, a variable in national accounting. This equates to the total remuneration payable by employers, so it includes wages and salaries, bonuses, overtime payments, as well as the employers' social security contributions. Dividing this variable by the number of employees shows that nominal compensation per employee grew significantly both in the euro area and in Belgium (figure 5). In cumulated terms, by Q4 2023, nominal compensation per employee clearly exceeded the level recorded

before the spike in inflation (in Q4 2020). When looking at year-on-year growth rates, it is clear that the COVID-19 pandemic greatly affected labour markets and wage growth indicators, mainly due to the effect of job retention schemes implemented in 2020 in Belgium and other euro area countries. Growth in compensation per employee dipped sharply in the second quarter of 2020, as the wages paid by firms greatly diminished (workers were notably compensated by temporary unemployment benefits) while the number of employees fell to a much lesser extent. The base effects of the main one-off measures of the second quarter of 2020 were clearly visible in the growth rates of 2021 (as an "abnormal" period is compared with an "almost normal" period one year later). As of 2022, the major part of the distortion caused by job retention schemes across euro area countries to wage growth had faded.

A tight labour market has facilitated strong nominal wage growth. The unemployment rate has been historically low in the euro area and in Belgium. It began to drop in the euro area as of 2013 and, in Belgium, as of 2016. From 2022, the unemployment rate stabilised somewhat, and in 2023 reached the historically low level of approximately 6.5 % in the euro area and 5.5 % in Belgium.[9] In the meantime, the vacancy rate has been historically high. When companies face difficulties to fill vacancies this typically leads to an increase in the wage bargaining power of workers who are employed.

Belgium's wage-setting system is characterised by automatic indexation and the 1996 "Wage Law" that preserves competitiveness. The faster increase in nominal wages in Belgium compared to the euro area was caused by the system of automatic adjustment of wages to inflation. Hence, pass-through of inflation to wages occurs more quickly in Belgium. Wages are linked to the so-called "health-index" in Belgium : this is the national consumer price index that excludes alcoholic beverages, tobacco products and motor fuels. How quickly indexation occurs is sector-dependent. All public sector employees see their wages rise when the smoothed[10] health-index increases by 2 %. Meanwhile, several mechanisms exist in the private sector : some employees benefit from a similar system to their public sector counterparts ; others see their wages adjusted every 2, 3, 6 or 12 months. About one third of private sector workers see their wages updated once per year (in January). For those employees, wages increased by about 11 % in January 2023. The system protects the purchasing power of employees reasonably well, but comes at a price for employers. Belgian firms have to deal with wage costs that can rise faster than for their main trading partners, given that, in other countries, compensation for inflation is usually demanded in wage negotiations and these take more time and depend on the bargaining power of the various parties. That is why the 1996 "Wage Law" – Law on the Promotion of Employment and Maintaining Competitiveness – (revised in 2017) was put in place. It sets an upper limit on wage increases on top of indexation whenever Belgium is suffering a cumulated "wage handicap" with respect to its three largest neighbouring countries i.e. labour costs are growing more rapidly in Belgium than in these neighbour countries. More precisely, every two years, based on anticipated hourly wage developments in the main trading partner countries (France, Germany, the Netherlands) minus expected indexation in Belgium, the Central Economic Council (CEC) calculates the maximum available margin for wage increases on top of indexations (see for example CEC, 2024). Social partners must negotiate salary increases over the two-year period within the bounds of this upper limit. For the years 2023 and 2024, there was no available margin (see NBB (2024) for more detailed information).

From the perspective of workers or consumers in the euro area, wages had not, by the end of 2023, picked up "enough" to compensate for the spike in inflation, while in Belgium they had already done so by Q1 2023. This can be illustrated by looking at real wage developments, which are calculated by dividing nominal wages by the HICP index (see the orange dotted line in figure 5).[11] In the euro area, the real

9 For comparison, the long-term average (1998-2023) of the euro area is 9.1 %, while for Belgium it is 7.3 %.

10 The four-month moving average of the health index.

11 Note that in Belgium, when one refers to "real wage developments", this often implies nominal wage developments without the indexation component (measured by the health index, rather than the HICP index). This definition however does not allow international comparison.

wage level at the end of 2023 was still lower than the period before the upturn in inflation (Q4 2020).[12] As real wage developments can serve as an approximation[13] for changes in the purchasing power of employees, it is clear that the latter has not yet been restored in the euro area. In Belgium, while there was also a loss of

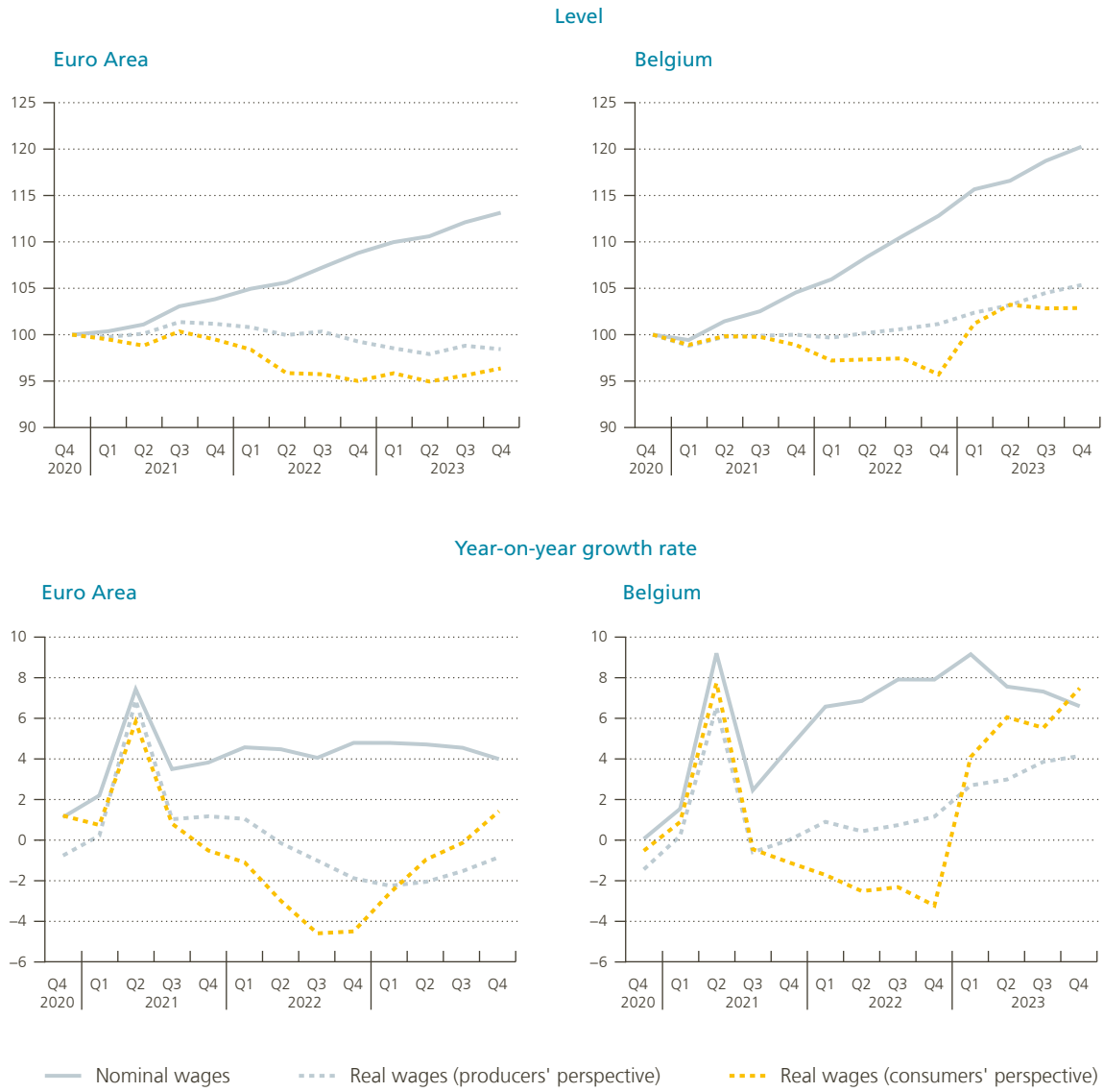
12 Compensation statistics for Q4 2020 are still somewhat blurred by the effects of COVID-19. However, the results still hold when choosing Q4 2019 as a base period.

13 In fact, purchasing power is more correctly represented by adding up all the forms of income – not only labour income, but also capital income, the wage-share of independents, net transfers from the government, etc. All that should then be divided by a consumer price measure, such as the HICP or the private consumption deflator. However, in this article, we are predominantly interested in pure labour income.

Figure 5

Nominal and real wage growth in the euro area and Belgium[1]

(Compensation per employee in levels (Q4 2020 = 100) and year-on-year growth rate, in %)



Source: EC.

1 Based on seasonally adjusted national accounts data, real compensation per employee from the employers' perspective is calculated using item D1 and deflating by the value added deflator. The real compensation per employee from the employees' perspective uses pure "wages and salaries", i.e. D11 (so excluding D12 - employers' social security payments) and is deflated using the HICP index.

purchasing power throughout 2022 – notably due to the somewhat delayed effect of indexation – this had been compensated for by Q1 2023. In addition, given that the HICP index grew much more slowly than wages as of 2023, real wages were pushed further up.

From the producers' perspective, real wage payments in Q4 2023 in the euro area were slightly below the level prior to the spike in inflation in Q4 2020, and in Belgium they were higher. When translating firms' wage costs into "real terms", they need to be deflated using a price index. However, firms do not consider consumer prices, since wages are a production cost. The value added deflator, which measures the prices charged for the production of goods and services in the economy, is a more appropriate deflator (see Haskel, 2021, Bodnár *et al.*, 2022), (see the grey dotted line in figure 5). Real wages declined less than according to consumers' perspectives, since HICP inflation increased more strongly in 2021 and 2022 than the value added deflator. Indeed, the energy price shock is directly visible in HICP inflation data, whereas it is only indirectly perceptible in value added (as is the case for the GDP deflator; see section 1.1).

2.2 Productivity also matters

Improved productivity is essential if economies are to afford higher wages without increasing inflation (IMF, 2023). That implies tempering the actual cost of wage increases for companies, by augmenting production per employee. To evaluate this, unit labour costs (ULCs) can be calculated. They can be decomposed into real growth in compensation per employee [14] (as above) and labour productivity growth (see annex 2). Figure 6 shows that if productivity grows by more (less) than real compensation per employee, real ULCs decline (rise).

Over the last five years (2019-2023), productivity growth was only slightly positive in Belgium and even declined in the euro area (figure 6). The particularly low productivity growth (0.3 % on average in Belgium and –0.1 % in the euro area) may be partly explained by "labour hoarding"; i.e. the phenomenon by which firms hold on to their employees due to labour market tightness (Lagarde, 2024b). [15] During the COVID-19 crisis, government support measures (such as job retention schemes) also attenuated productivity – allowing firms to keep their employees even though production was limited. Due to the more pronounced developments in real wages, ULC growth turned out slightly positive in Belgium over the period 2019-2023 (0.1 %), whereas it fell in the euro area (–0.3 %). Of course, the Belgian figure is strongly influenced by the year 2023, which was marked by large pay increases, and therefore, a strong increase in ULCs. We could expect that ULC growth declines in Belgium in 2024, as the strongest (real) wage increases are behind us. By contrast, ULC growth could be expected to increase in the euro area, since wage dynamics are, on average, more sluggish there.

Looking at a longer period, productivity growth in fact more than compensated for real wage cost increases in both the euro area and in Belgium over the 1996-2023 period, meaning real ULCs declined on average. Labour productivity grew by 0.8 % on average in Belgium and by 0.4 % in the euro area. Note that this contrasts with the high labour productivity growth of the 1970s. [16] The – albeit moderate – productivity growth over 1996-2023 [17] was still somewhat higher than the real growth in compensation per employee, which amounted to 0.7 % on average in Belgium, and 0.2 % in the euro area. Hence, on average over 1996-2023, real ULC growth was slightly negative in both areas. All in all, it should be emphasised that productivity growth is important to help firms contain inflation in unit labour costs. The low productivity figures of recent decades indicate that this could be a challenge.

14 In this case, the compensation per employee (from D1) is deflated by the value added deflator.

15 The European Commission's new Labour Hoarding Indicator (LHI) measures the percentage of managers expecting their firm's output to decrease, but employment to remain stable or increase. In April 2024, at 10.4 %, the LHI was slightly above its long-term average of 9.7 % and pre-pandemic levels, and significantly below the peak reached during the COVID-19 crisis (EC, 2024).

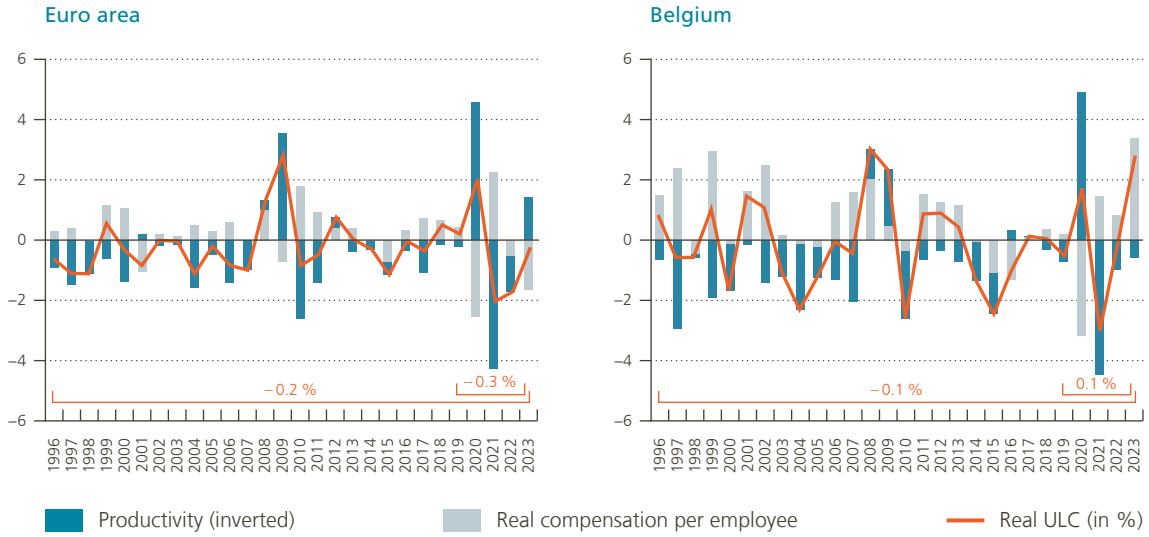
16 4 % on average based on data from "long-term productivity database", by Banque de France.

17 The decline in productivity is trend-like. It can be attributed to various factors (see NBB, 2023), such as the more service-oriented nature of the economy (knowing that productivity grows more slowly in general in the services sector than in the manufacturing sector).

Figure 6

Real unit labour cost growth

(Year-on-year growth rate in %, contributions in percentage points)



Source: EC.

BOX 1

The wage share in Belgium versus the euro area

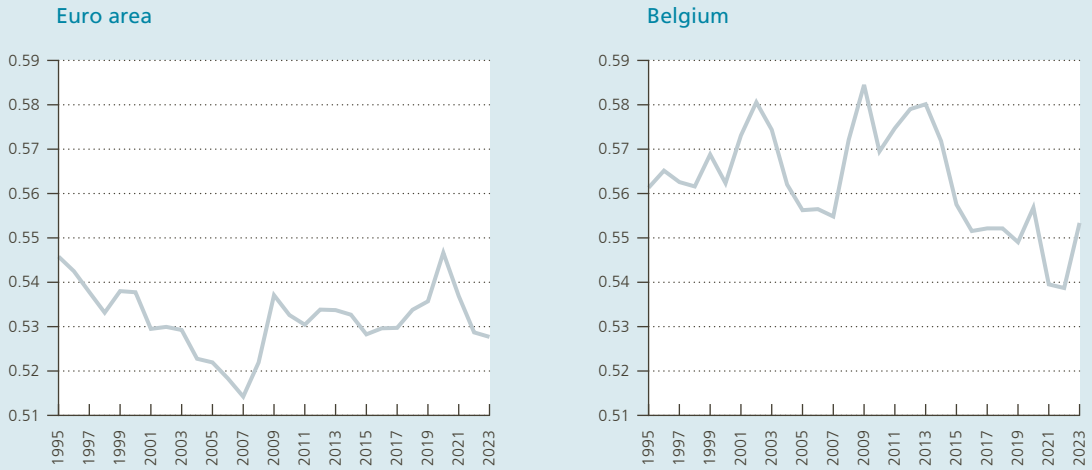
The share of wages in domestic value added is a concept closely linked to real ULC. The wage share is defined by the compensation to employees, divided by the value added (both in current prices). It is a distributive concept, in the sense that it defines the share of value added that remunerates the production factor labour. Its counterpart is the "profit share", which represents the share of value added that remunerates the production factor capital. Note that the latter naturally goes up when capital-intensity of the economic activity increases, so the term "profit share" might be somewhat misleading.[1] That is, the structure of the economy determines a great part of the so-called profit share. The wage share and the real ULC would be equal were there no self-employed workers (i.e. if total employment equalled the number of employees). Further details can be found in annex 2.

The wage share is generally higher in Belgium but has been trending downwards. The higher figure is due to a higher wage cost per employee, and though somewhat attenuated by higher productivity per employee in Belgium, this is not enough to offset the higher wage costs. Hence the higher ULC or wage share in the Belgian economy. The decline in the wage share in Belgium over the years 2014-2021 is inversely related to the increasing profit share, and is partly explained by composition effects, namely the increased importance to GDP of highly profitable industries such as the pharmaceutical industry, and real estate development activities (see De Keyser *et al.*, 2023). Alongside

this, wage moderation policies introduced in 2015 (notably imposing an index jump[2]) reinforced this trend. Overall, in the euro area, the aggregate wage share remained more or less stable over the long run. The spikes in 2007-2009 and in 2020 are explained by counter-cyclicality of the wage share (Bodnár and Mohr, 2023). As the contribution of profits to domestic income usually goes down immediately when economic activity slows down, the wage share increases. Zooming in on the most recent period (2020-2023), the wage share declined. This is in line with the increase in unit profits (see section 1.1) and real wage costs not yet having caught up with the pre-inflation spike level (see section 2.1).

However, in 2023, the wage share increased drastically again in Belgium, while this was not (yet) the case in the euro area. In Belgium, this was due to the high inflation seen the year before and the mechanism of automatic wage indexation. In the euro area, the wage share is expected to climb somewhat more gradually as of 2024.

Wage share in the euro area and in Belgium



Source: EC.

1 See NBB (2024) for more information on different concepts of profitability.
2 In 2015, an indexation by 2 % was skipped once.

3. Determinants of wage and price growth

The escalation in inflation has given rise to numerous economic papers and articles that look at the observed and future importance of wages on inflation and the vice versa, looking at the role of inflation in wages. While labour costs are still generally accepted as drivers of inflation dynamics within the policy debate, the academic literature contains varied and more sceptical views (Bobeica *et al.*, 2019). Shapiro (2023) estimates a model that isolates "surprise" changes in wages and uses it to measure the extent to which

labour-cost growth is driving inflation in the US. He finds that the recent surge in labour costs explains only about 0.1 percentage point of the 3 percentage point increase in core inflation. Andrade *et al.* (2024) find that the transmission of abnormal price shocks to inflation and wage growth in the US has been consistent with historical patterns, indicating that wage growth has not been a major driver of an additional increase in inflation. Blanchard and Bernanke (2023) specify and estimate a dynamic model of prices, wages, and short-run and long-run inflation expectations. They find that most of the inflation surge in the US was the result of shocks to prices and not overheated labour markets. The exercise carried out by Blanchard and Bernanke has been reproduced by central banks in several countries, including Belgium (de Walque and Lejeune, 2024), the UK (Haskel *et al.*, 2023), Japan (Nakamura *et al.*, 2024) and in the euro area (Arce *et al.*, 2024). The euro area model shows that the main drivers of inflation have been supply-side shocks (e.g. the energy shock), with a more limited role for labour market tightness. De Walque and Lejeune (2024) find similar results for Belgium. The main drivers of Belgian inflation in the post-pandemic era are found to be energy, food, and product shortage shocks. Though the model predicts some role for labour market tightness in explaining Belgian wage growth fluctuations, it has a negligible role at the level of price inflation.

In order to gain some formal insights into the relation between wages and prices, we build a wage and a price equation for Belgium and the euro area. The relationship can be formalised in a Phillips-curve model, that is wage or price inflation, typically regressed on its own lag, a slack measure, productivity and an inflation expectations measure. We choose the unemployment rate as a slack measure. We take quarter-on-quarter growth rates of all the variables (except for the unemployment rate and inflation expectations, which we take in levels). The explanatory variables all comprise four lags, except for productivity (for which we take the contemporaneous variable). We add crisis dummies to deal with the sharp decline in wage growth in the second quarter of 2020, and the jump in the following quarter. We estimate our equations on the pre-crisis sample period (up to 2019) and on the full sample period (up to 2023). Despite the fact that the optimal number of lags of the variables can differ between Belgium and the euro area, we depict the results of equal specifications for both regions. This allows a systematic comparison. More formally,

$$\pi_w = c + \alpha_1 L.\pi_w + \alpha_2 L.\pi_p + \alpha_3 L.UR + \alpha_4 ProdE + \alpha_5 crisis\ dummies + \varepsilon,$$

$$\pi_c = c + \beta_1 L.\pi_c + \beta_2 L.\pi_w + \beta_3 L.UR + \beta_4 L.Infl\,exp + \beta_5 ProdE + \varepsilon\,,$$

with π_w denoting the growth of nominal compensation per employee, π_p the growth of the headline HICP index, π_c the growth of the HICP index excluding food and energy (i.e. "core inflation"), UR the unemployment rate, $Infl\,exp$ the short-term (one year ahead) inflation expectations according to Consensus forecast , $ProdE$ the growth of productivity per employee, and ε the error term. L refers to lagged variables. The crisis dummies are only included in the wage equation for the "full sample period".

Our estimation confirms that past inflation plays an important role in wage determination. In Belgium, the impact is much stronger than in the euro area, which is in line with the wage-formation system (automatic indexation). That is, the system implies faster and hence – over the four-quarter horizon of the lags – stronger transmission of inflation to wages. The negative sign of the unemployment rate is expected: when unemployment decreases, higher wages can be negotiated. However, only in the euro area does the unemployment rate play a significant role in explaining wage inflation, as we do not find significant evidence for labour market tightness explaining wage inflation in Belgium. Productivity does lift wages significantly in both areas. All in all, the results do not change drastically if estimated over the pre-pandemic period or over the full sample period.

Wages barely explain core inflation in Belgium, whereas they seem to matter in the euro area. However, the wages coefficient in the euro area is only statistically significant over the full sample period. We find persistence in inflation in both the euro area and in Belgium, as shown by the positive and significant coefficient of the core inflation own lag, when considering the full sample. Turning to the other explanatory

Table 1

Regression results [1]

(dependent variables: nominal compensation per employee and core inflation)

	Compensation per employee				Core inflation			
	Belgium		Euro area		Belgium		Euro area	
	Pre-crisis [2]	Full sample	Pre-crisis	Full sample	Pre-crisis	Full sample	Pre-crisis	Full sample
Constant	0.69	0.98	1.34***	1.02***	0.64**	0.34**	0.06	0.31
Own lag [3]	0.00	–0.02	–0.22	0.00	–0.17	0.23**	0.20	0.49***
Compensation per employee [4]	–	–	–	–	0.01	0.04	0.21	0.21***
HICP inflation [4]	0.99***	0.81***	0.23**	0.36***	–	–	–	–
Unemployment rate [4]	–0.09	–0.11	–0.09***	–0.07***	–0.02	–0.04**	0.00	–0.02
Productivity per employee	0.40***	0.36***	0.22***	0.33***	–0.09**	0.00	–0.03	0.00
Short term inflation expectations [4]	–	–	–	–	0.00	0.13***	0.09	–0.04
Crisis dummy 1 [5]	–	–1.72***	–	–1.92***	–	–	–	–
Crisis dummy 2 [6]	–	3.11***	–	1.79***	–	–	–	–
R^2	0.30	0.87	0.48	0.92	0.25	0.69	0.34	0.72

Sources: Consensus, EC, ECB, own calculations.

1 All regressions are estimated using OLS. *, **, and *** denote joint significance of all the lags together at respectively 10 %, 5 %, and 1 %.

2 The full period is from Q1 2000 to Q4 2023; the pre-crisis period is from Q1 2000 to Q4 2019.

3 1 lag.

4 4 lags. The sum of coefficients and the joint significance is shown.

5 Crisis dummies are Q2 2020 for the euro area; and Q1 2020 and Q2 2020 for Belgium.

6 Q3 2020 for both areas.

variables, the unemployment rate and short-term inflation expectations do not explain much of the core inflation observed in the euro area, as their coefficients are small and insignificant. In Belgium, these two variables mostly matter over the full sample period. Higher productivity seems to bring down core inflation in Belgium in the pre-crisis period. All in all, the core inflation model finds more significant coefficients for the full sample than for the pre-crisis period. The fact that models fail to explain core inflation over the pre-crisis period, is consistent with what has been called the "twin puzzle" in in economic literature, notably explained by Cicarelli and Osbat (2017). Between 2009 and 2011, inflation was higher than expected based on economic indicators (missing disinflation puzzle). As of 2012 (up to the year 2016), inflation was lower than expected.

4. Is the risk of a wage-price spiral behind us?

4.1 The (un)likely emergence of a spiral

We have shown that inflation and wages are interlinked. Naturally, fears of an uncontrolled wage-price spiral emerge. Although there is a clear impact of inflation developments on wages in Belgium and in the euro area and, to a certain extent, of wage developments on inflation in the euro area, it is not easy, on the basis of our regression, to conclude that there is any risk of a wage-price spiral keeping inflation high. To get to the bottom of this, it is useful to check the anchoring of inflation expectations and to look at the institutional framework surrounding wage formation.

There is no unique definition of a wage-price spiral. As underlined by Bolt *et al.* (2022), the main characteristic of such a spiral is a mutual dependency between the rise in wages and the rise in prices. According to Blanchard (1986), the "process of adjustment of nominal prices and nominal wages results from attempts

by workers to maintain or increase their real wage and by firms to maintain or increase their markups of prices over wages." This adjustment is not instantaneous and can take time. This is confirmed by recent evidence following the inflation shock. Alvarez *et al.* (2022) define a wage-price spiral as an episode in which at least three out of four consecutive quarters see accelerating consumer prices and rising nominal wages. According to Boissay *et al.* (2022), once the economy enters the spiral, workers bid up nominal wages more than prices, spurring firms to raise prices further.

The risk of a rampant wage-price spiral can be considered as being contained in Belgium and in the euro area. If both workers and companies are not willing to discharge some of their respective purchasing power or profit margins, then a wage-price spiral might occur. While the GDP deflator decomposition (figure 2) has highlighted workers' and firms' strong reactions to energy and input cost pressures and has shown that the intention to offset real income losses supported higher inflation (Arce *et al.*, 2023), more recently, the contributions of both wages and profits are slowly dampening in both the euro area and in Belgium.

Inflation expectations are an important factor in monetary policy decisions. If employees expect inflation to remain higher for an extended period, they may strengthen their case for higher nominal wages in wage negotiations. If firms expect high inflation, this could prompt them to raise prices further. By anticipating price increases, companies also avoid having to adjust their prices too often. This self-fulfilling prophecy can amplify inflationary pressures and make it more challenging for central banks to control inflation (De Backer *et al.*, 2023). While some studies find a significant role for short-term inflation expectations in explaining wage growth (Glick *et al.*, (2022), Blanchard and Bernanke (2023), Arce *et al.*, (2024)), our evidence is more limited (see section 3). Differences between studies might be due to the sample periods used. In the period on which our analysis is based, inflation expectations (including short-term ones) have remained reasonably well anchored at the ECB objective of 2 % (and hence they cannot explain much of the macroeconomic developments). Today, as most advanced economies' central banks have mandates to achieve a target inflation rate, they have raised policy interest rates significantly, and their public statements reference strong commitments to ensure that inflation returns to target (Suthaharan and Bleakley, 2022). In that sense, monetary policy mitigates the risk of a spiral.

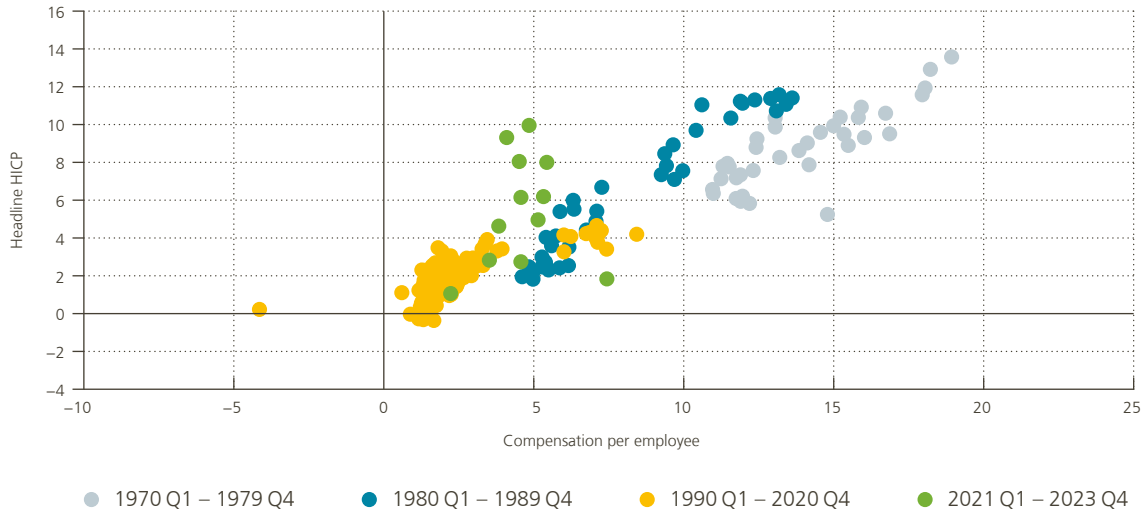
Inflation expectations remain anchored to the 2 % target, helping to contain these risks. Short-term inflation expectations (one-year-ahead) have followed closely on the heels of observed inflation figures. The results of the Survey of Professional Forecasters (SPF) show that expectations peaked at 4.8 % in Q4 2022. They have significantly come down since then. Measures of medium and long-term inflation expectations have sent reassuring signals. Throughout 2023, SPF results pointed to a long-term inflation rate of 2.1 %. At the start of 2024, the figure was 2 %. The range of responses to this survey reveals that in 2023, a significant proportion of respondents (over 10 %) were forecasting inflation of 2.5 % or more in the long term. By the beginning of 2024, this proportion had fallen to 4 % of respondents and to just 3.8 % by Q2 2024. The median of medium-term inflation expectations collected from consumers (Consumer Expectations Survey, CES) rose at the beginning of 2022 to 3 %, and remained at 2.5 % throughout 2023. Although the expected level is higher than that forecasted by professionals and the variation across respondents is larger (as is widely observed in the literature), the median remained at the same level from January to March 2024.

Institutional changes also point to an environment less conducive to wage-price spirals than in the past. Workers' collective bargaining power has eroded in recent decades alongside falling trade union membership in the euro area (Boissay *et al.*, 2022). Only around 3 % of private sector employees in the euro area have their wages and minimum wages automatically indexed to inflation. This is consistent with policymakers trying to weaken the wage-price loop in order to contain the inflationary consequences of the oil shock of 1973 (Grosse Steffen *et al.*, 2023). Indeed, figure 7 shows that while the inflation rate over 2021-2023 was of a similar magnitude to that seen in the 1970s, wage growth has been much more contained. While automatic wage indexation persists in Belgium, the 1996 Wage Law aims to protect the country's competitive position (see section 2.1). Besides the (rare) automatic regimes, indexation regimes with a formal role for inflation developments in wage negotiations applied to around 18 % of employees in the euro area in 2021, against

Figure 7

Historical relationship between inflation and wage growth in the euro area

(year-on-year growth rate in %)



Sources: Area wide model historical database (EABCN), EC.

almost one quarter of employees in 2008 (Koester and Grapow, 2021). Hence, given the prevailing mechanisms, automatic pass-through of recent inflation hikes to wage growth has not happened in most euro area countries.

Nevertheless, it is likely to take several years for wages to adjust fully to the inflation shock because of the infrequent and decentralised nature of wage-setting (Lane, 2022). Indeed, collective wage-setting (which covers the majority of euro area employees) is typically staggered, with agreements having an average duration of two years (Górnicka and Koester, 2024), but a great heterogeneity is observed across countries. How quickly wage growth reacts to changes in macroeconomic conditions depends notably on the average duration of these agreements. In this respect, and to assess the risks surrounding inflationary pressures, it is useful to turn to leading wage indicators and forecasts.

4.2 Forward-looking wage indicators

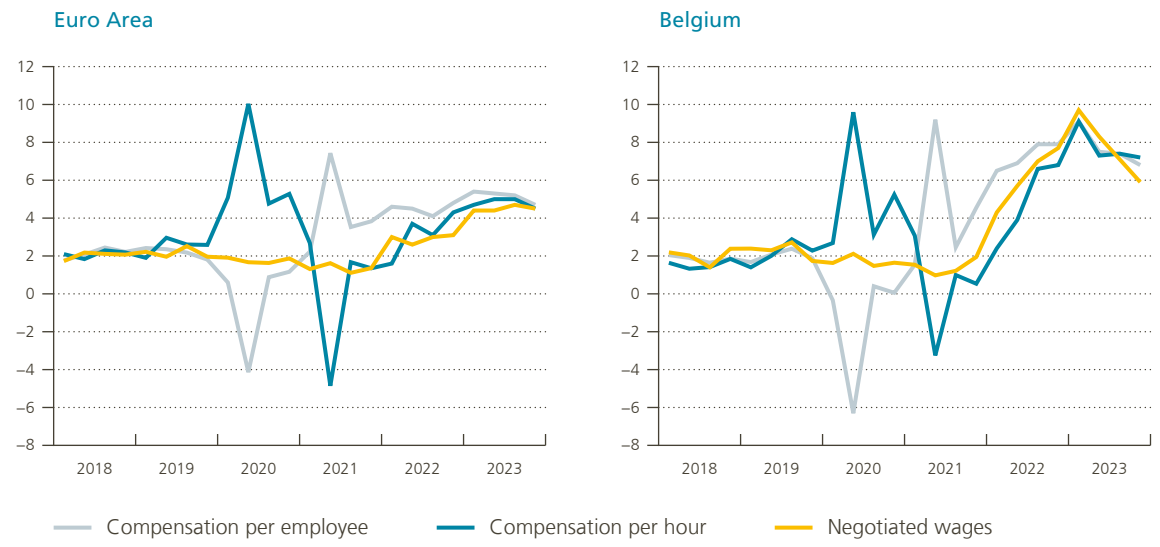
The usual indicators of wage developments are based on the national accounts, available with a considerable time lag.[18] In addition, the indicators of compensation per employee or compensation per hour have been strongly distorted by the pandemic shock (figure 8). In general, the economic downturn caused by the pandemic led to a reduction in hours worked per person rather than reductions in employment (thanks to job retention schemes). As firms' wage costs dropped (with governments offsetting part of the decline in wages through transfers, see Bodnár *et al.*, 2022), compensation per employee generally decreased, while compensation per hour worked increased. Base effects were observed one year later when economic activity normalised. Data on negotiated wages published by the ECB are "purer" as they reflect the results of bargaining processes between workers and employers. This statistical series has been less impacted by government measures in that context. As of the end of 2021, the growth of negotiated wages started to gradually increase in the euro area and plateaued at around 4 % in 2023. In Belgium, the growth rate was much more pronounced and started to decelerate from the beginning

18 No earlier than 65 days before the end of the quarter.

Figure 8

Different measures of wage growth

(year-on-year growth rate, in %)



Sources: ECB, FPS Employment.

of 2023. As is the case for compensation growth, the indicator of negotiated wage growth is a backward-looking measure, showing the "realised" part of wage growth. If most collective wage agreements are set for several years, then the indicator will have a delay in signalling emerging wage pressures (Górnicka and Koester, 2024).

The ECB has developed "wage trackers", based on wage agreements in some euro area countries (figure 9). Collective bargaining agreements set future wage growth. The granular data from seven countries (Germany, France, Italy, Spain, Netherlands, Austria, and Greece)[19] containing the specified wage increases over a given period has allowed the ECB to construct a "forward-looking" wage tracker for the euro area (Górnicka and Koester, 2024). It exploits the agreement-level data to compute the average future year-on-year negotiated wage increases as contained in the collective bargaining agreements in force. Looking at the euro area, the wage trackers signal aggregate negotiated wage growth of 4.2 % in 2023 on average (including one-off payments). The "forward-looking" part of the tracker shows signs of stabilisation in negotiated wage growth in the near term; wage growth should be at 4.2 % in 2024. The share of workers covered by active collective bargaining agreements in the sample is relative to total euro area employment (grey area). The coverage begins to decrease more and more rapidly in the months going forward as an increasing number of agreements expire.

Wage trackers focusing only on recently concluded agreements (as opposed to taking into account all agreements in force) indicate some moderation of wage pressures. These focused trackers have leading properties in signalling turning points for wage growth but need to be interpreted cautiously – particularly due to the limited coverage of employees[20]. For the euro area, preliminary data for contracts signed in Q1 2024 indicates an average growth rate of around 4 % in the next twelve months, against around 5 % in Q3 and Q4 2023.

Another indicator of future trends that is closely watched by the ECB is the Indeed Wage Tracker, which measures developments in salaries posted in job advertisements. The tracker (figure 10) is the result of a

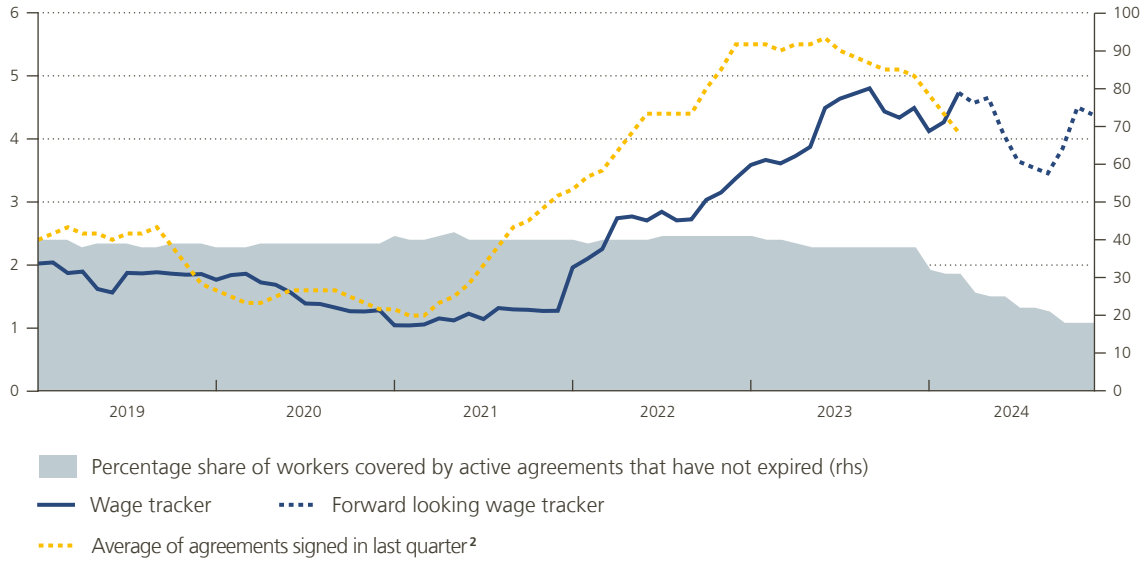
19 National central banks in Belgium, Finland and Portugal are working on gaining access to micro data on wage agreements.

20 The indicator of latest agreements reflects wage growth in the agreements reached in a certain quarter for the 12 months after an agreement.

Figure 9

Euro area negotiated wage growth tracker[1]

(year-on-year growth rate in % and percentage shares)



Source: Górnicka and Koester (2024).

1 Indicator including "one-off payments". The treatment of bonuses, overtime payments and other components of compensation varies across countries. In some countries these payments are included in the negotiated wage growth calculations. To address this issue, some countries (Germany, the Netherlands and Finland) publish, in addition to the baseline series, an indicator of negotiated wages excluding one-off payments (which is closer to the concept of basic pay).

2 The indicator of latest agreements reflects wage growth in the agreements reached in a certain quarter for the 12 months after an agreement.

collaboration between the Central Bank of Ireland and the Indeed online jobs' platform. It monitors wages posted in six euro area countries – France, Germany, Ireland, Italy, Netherlands and Spain – and the UK. While the ECB wage tracker captures the agreed wage growth for employees covered by collective bargaining agreements, the Indeed indicator reflects only changes in wages offered to new hires (Górnicka and Koester, 2024). For the euro area (i.e. the employment-weighted average of these six euro area countries), the Indeed tracker started rising in around mid-2021, as was the case for the ECB tracker of the most recent collective agreements. The Indeed tracker has decreased substantially since its peak in autumn 2022 and was oscillating around the 4 % mark at the beginning of 2024.

The Eurosystem December 2023 forecasts for both the euro area and Belgium do not point towards spiralling wage and price inflation either. On the contrary, wage and price inflation are expected to decelerate (figure 11). In the euro area, although wage growth is expected to remain higher than the long-term average over the entire projection period (2024-2026), it is forecast to decline steadily. This was confirmed in the March 2024 forecasts for the euro area[21]. In addition, inflation is expected to moderate towards the 2 % medium-term target. In Belgium, although wage growth was recently quite robust, it is expected to drop rapidly as of 2024. The upper limit for real wage increases (see section 2.1) was set to zero for the years 2023-2024 and is currently expected to remain zero for the following two years. Belgian inflation should even be somewhat below the ECB medium-term target as of 2025.

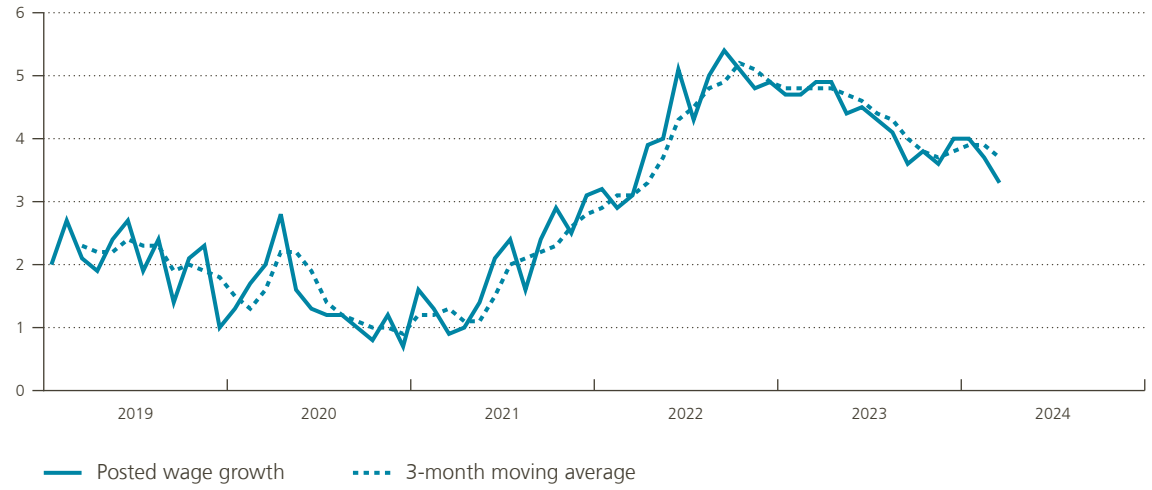
In terms of expectations, the Survey of Professional Forecasters (SPF) also points to a moderation in wage growth, while the Consumer Expectations Survey (CES) points to a stabilisation. According to the Q2 2024 SPF survey, annual growth in compensation per employee should drop from 4 % in 2024 to 3.2 %

21 There was no country-level macroeconomic forecast published in March 2024, hence we do not present updated results for Belgium.

Figure 10

Indeed wage tracker

(year-on-year growth rate, in %)



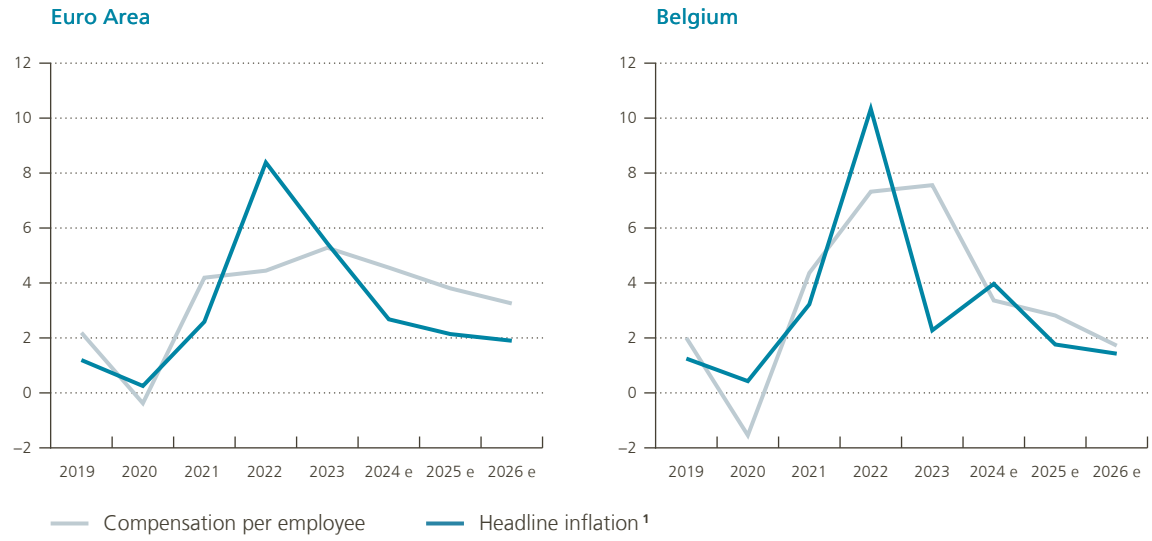
Sources: Central Bank of Ireland and Indeed.

in 2025 and down further to 2.8 % in 2026. According to the CES, the difference between the proportion of respondents expecting their earnings to rise over the next 12 months and the proportion of respondents expecting earnings to decline (the net balance) increased in the second half of 2023 and subsequently stabilised.

Figure 11

Eurosystem December 2023 forecasts

(year-on-year growth rate, in %)



Sources: ECB, NBB.

1 Inflation in Belgium shot up temporarily in 2024, due to the mechanical effect of the disappearance of an energy-measure – a transfer from the government to households – the "basic package". It had exerted downward pressure on Belgian inflation in the preceding year.

Conclusion

As part of its fight against inflation, the ECB has raised its key interest rates several times since July 2022. After the easing of external cost pressures, attention has turned to domestic cost pressures and, in particular, labour costs. This is especially so given that core inflation, which is more sensitive to the dynamics of labour costs, remains historically high. In the ECB's data-dependent approach for monetary policy decisions, wage dynamics have become key; and this is justifiable given that wages make up a large part of the cost structure of services and of certain manufactured goods. Wage-intensive goods and services indeed sustained core inflation in 2023.

Nominal wages have risen substantially in the euro area and in Belgium since the recent surge in inflation. Belgium's particular institutional features explain why it experienced faster wage growth. The automatic indexation of wages ensured that wages corrected for inflation (real wages) were, as of early 2023, above the level seen in Q4 2020, prior to the spike in inflation. At the end of 2023, this was still not the case in the euro area, where in many countries, wage negotiations imply a response to inflation that may be delivered later than indexation in Belgium. As also underlined by the ECB (Lane, 2022), it takes several years for wages to adjust fully to the inflation shock due to the infrequent and decentralised nature of wage-setting in the euro area.

From the point of view of producers, the cost of labour should be considered together with changes in productivity. Data for the most recent years reveals that productivity growth was limited both in Belgium and in the euro area. The use of labour hoarding in a context of labour shortages contributed to this trend. Along with rising real wages, this led to rising unit labour costs in Belgium, predominantly in 2023. A corresponding increase in the euro area can be expected with a time lag.

We build the same wage and price equations (core inflation) for Belgium and the euro area. As would be expected, we find an important role for past inflation in wage determination in Belgium and the euro area, but it is stronger in Belgium. In the euro area, labour market tightness measured by the unemployment rate also plays a significant role in explaining wage inflation. Turning to price inflation, while we observe a certain persistence in core inflation when considering the full sample, i.e. including the high inflation period, wages do not seem to determine core inflation in Belgium, whereas they seem to matter in the euro area.

Several newly developed indicators show some recent moderation of wage pressures. Inopportunely, usual national accounts-based indicators of wage developments are only available with a considerable time lag. The ECB's forward-looking wage trackers, which are based on wage agreements in some euro area countries, do not point to a further acceleration in negotiated wage growth in the near term. In particular, wage trackers focusing only on recently concluded agreements indicate some moderation of wage pressures but should be interpreted with caution due to their limited coverage. Some signs of wage moderation have also emerged from the Indeed wage tracker, which measures movements in the salaries posted in job advertisements. Eurosystem forecasts and professional surveys expect wage moderation in the coming years.

The risk of a continuous wage-price spiral has been contained. The disinflation process is continuing, with the ECB keeping a close eye on core inflation and its determinants, particularly labour costs. Long-term inflation expectations – which are, above all, a signal of the credibility of monetary policy – remain anchored at 2 %, while short-term inflation expectations have fallen sharply. Nevertheless, policymakers need to consider recent observations as well as forward-looking indicators carefully when taking monetary policy decisions, as it will take time for the economy to digest recent shocks.

Annexes

1. Decomposition of the GDP deflator

$$GDP\ deflator = \frac{Nominal\ GDP}{Real\ GDP}$$

Knowing that =

$$nominal\ GDP = Gross\ operating\ surplus + compensation\ of\ employees + net\ taxes$$

We can write:

$$GDP\ deflator = \underbrace{\frac{Gross\ operating\ surplus}{Real\ GDP}}_{Unit\ profits} + \underbrace{\frac{Compensation\ of\ employees}{Real\ GDP}}_{Unit\ labour\ costs} + \underbrace{\frac{Net\ taxes}{Real\ GDP}}_{Unit\ taxes}$$

2. Relationship between wage share and unit labour cost (ULC)

$$Wage\ share = \frac{Compensation\ to\ employees}{Value\ added\ (cur)}$$

$$nominal\ ULC = \frac{\frac{Compensation\ to\ employees}{Number\ of\ employees}}{\frac{Value\ added\ (clv)}{Total\ employment}}$$

With "cur" being current prices and "clv" representing chain linked volumes. Compensation to employees is always expressed in current prices, and number of employees or employment in thousands of persons.

If we suppose that the number of employees equals total employment, then:

$$nominal\ ULC \approx \frac{Compensation\ to\ employees}{Value\ added\ (clv)}$$

Or:

$$nominal\ ULC \approx \frac{\frac{Compensation\ to\ employees}{Value\ added\ (cur)}}{Value\ added\ deflator}$$

If we deflate the compensation to employees by the value added deflator, then we obtain the real ULC:

$$real\ ULC \approx \frac{\frac{Compensation\ to\ employees}{Value\ added\ deflator}}{\frac{Value\ added\ (cur)}{Value\ added\ deflator}}$$

Or:

$$real\ ULC \approx \frac{Compensation\ to\ employees}{Value\ added\ (cur)} = wage\ share$$

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Conventional signs

%	per cent
etc.	*et cetera*
i.e.	*id est*

List of abbreviations

Countries or regions

UK	United Kingdom
US	United States

Abbreviations

CEC	Central Economic Council
CES	Consumer Expectations Survey
COICOP	Classification of Individual Consumption by Purpose
COVID-19	Coronavirus disease 2019
CPA	Classification of Products by Activity
EC	European Commission
ECB	European Central Bank
FPS	Federal Public Service
GDP	Gross domestic product
HICP	Harmonised Index of Consumer Prices
LHI	Labour Hoarding Indicator
NACE	Nomenclature of economic activities of the European Community
SPF	Survey of Professional Forecasters

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