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Profits too high? Assessing inflation in the eurozone using wage and price rules for profit and unit labor costs based on national accounts data

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PROFITS TOO HIGH? ASSESSING INFLATION IN THE EUROZONE USING WAGE AND PRICE RULES FOR PROFIT AND UNIT LABOR COSTS BASED ON NATIONAL ACCOUNTS DATA

Heike Joebges¹, Camille Logeay²

ABSTRACT

The strong increase in inflation rates in Europe at the end of 2022 is in stark contrast to more than a decade of very low developments within the euro area. This time, profit hikes are under more scrutiny than wage increases. As changes in profits in relation to those of wages have the potential to change the functional income distribution, we analyse past and current price developments by decomposing the contributions to domestic prices, measured by the GDP deflator, into those stemming from unit labour costs, those from unit profits, and those from net unit taxes on production. In order to judge those developments as stability-oriented or not, we follow the literature that recommends that national wage developments should be in line with the inflation target of the ECB plus the increase in labour productivity. Such a development, if also applied to profits, would not kick-start an inflationary process and would support a stable functional income distribution. Our descriptive analysis covers annual inflation contributions from unit labour costs and unit profits from 1999 to 2023 in 19 countries of the Euro Area. According to our results, developments have been heterogeneous among the studied countries since the introduction of the euro and continue to show differences in price developments. Yet, it is striking that unit profit increases have recently been far above levels observed in the past in all member countries, and are higher than for unit labour cost increases. Even if it is too early to ignore the possibility of only temporary cyclical profit developments, unit profit developments cannot be explained by developments of GDP, interest rates and terms-of-trade according to our out-of-sample forecast. Yet, more detailed data is necessary for explaining the factors behind this increase in unit profits at an aggregate level.

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Profits too high? Assessing inflation in the eurozone using wage and price rules for profit and unit labor costs based on national accounts data¹

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JEL: E25, E31 E64, F45

Key words:

Inflation, GDP deflator, functional income distribution, wage rule, profit rule, gross operating surplus, unit labour costs

¹ A related previous paper on wage rules has been published as an FMM working paper, https://www.boeckler.de/fpdf/HBS-006893/p_fmm_imk_wp_23_2018.pdf. We are grateful for comments and suggestions from participants of the Euroframe workshop 2023 in Paris and the 27th FMM conference 2023 in Berlin. We thank Janis Jurgeleit for his support in collecting the data.

1 Introduction

The increase in inflation rates in Europe at the end of 2022 even exceeds the levels observed in the wake of oil price shocks in the 1970s. The sudden strong hike in prices is in stark contrast to more than a decade of very low developments, judged by the new ECB target of a y-o-y HICP inflation rate within the euro area of 2% over the medium term.² Inflation increased from 2021 onwards (see Figure 1)³, mainly provoked by price shocks from supply bottlenecks in global value chains during the pandemic (see figure Figure 12 in appendix) and the energy price shocks from the war in the Ukraine (Figure 8 and Figure 9 in appendix).

Several authors discuss that asymmetric price setting (stronger reaction to increasing than to decreasing costs) of firms with market power may contribute to more intense effects of cost shocks to final prices and profits (see Hall 2023 for the effect of big versus small shocks and Benzarti et al. 2020 for asymmetric reactions to VAT taxation). Weber/Wasner (2023) provide an explanation for asymmetric pricing, indicating that the current situation may provide a narrative that allows companies to rollover cost and partly even increase profit mark-ups in reaction to the shocks.

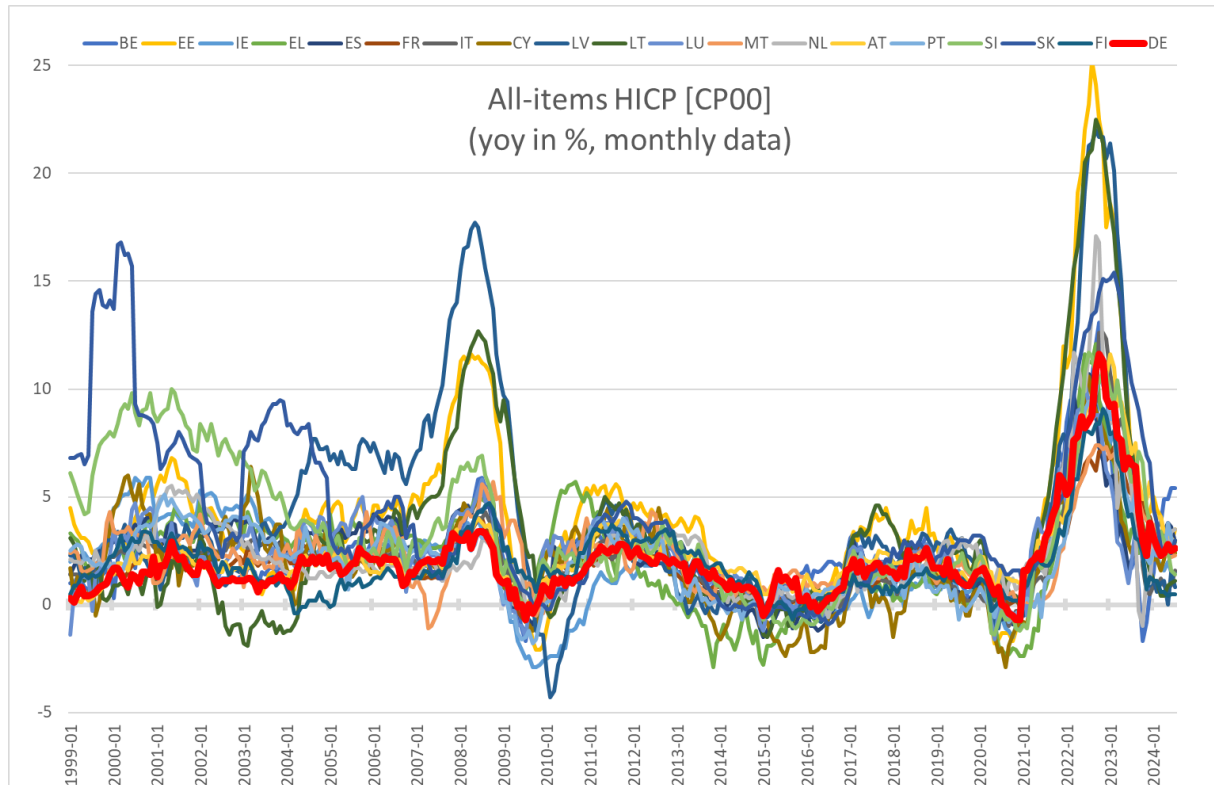
Alternative explanations for inflation in the US blame too-high fiscal spending after the pandemic (Hubbard 2022), while Ferguson and Storm (2023) instead blame distributional changes favouring high income groups, and with it, changed spending patterns. For Germany, Dullien et al. (2023) provide an overview on discussed explanations.

As shocks have first been considered temporary, monetary tightening of the ECB only started from mid-2022 onwards. The repeatedly strong interest rate increases since then are partly provoked by the fear of wage-price spirals that could provoke lasting inflation within the euro area. Yet, so far, wage developments do not appear to signal problematic increases (see Bernanke/Blanchard 2023 for the US). Instead, profit developments are currently under more intense scrutiny (OECD 2023: 26-30, EU Commission 2023: 29-31, IMF 2023: 6-8, Hansen et al. 2023), as research for the US (Bivens 2022, Weber/Wasner 2023) as well as for the euro area (Arce et al. 2023, Lane 2023, Dullien et al. 2023, Hahn 2021) point to unusual developments of profits, at least for certain sectors of the economy, leading some authors to the allegation of "greedflation" (e.g. Lopez 2022). As several papers point to unusual profit developments, one part of the discussion concentrates on the question if profit developments have been driven by (actively) increased profit margins or higher profit shares, or if current profit developments are just the result of (passive) adjustments to higher costs for imports and intermediate goods as well as increased interest rates plus the normal cyclical increase of profits in an upswing (see e.g. Lavoie 2023).

² In 2021, the ECB changed the target to a y-o-y HICP inflation rate of 2% over the medium term, considering too high or too low inflation as equally undesirable (see official ECB websites: <https://www.ecb.europa.eu/mopo/strategy/pricestab/html/index.en.html>).

³ Measured with the y-o-y HICP inflation rate all 19 euro area showed an inflation rate below 2% in February 2021 and all trespassed the ECB-threshold by November. Since then, rates have come down, but not yet to the ECB's target level (time of writing: Feb. 2024).

Figure 1: Inflation rates in % in 10 Euro Area countries



Source: Eurostat (Stand of the data: 25.8.2024)

Even if certain companies in selected sectors could increase profit margins, as data on earning calls seem to indicate for the US (see Weber/Wasner 2023) and as sectoral profit increases for Germany seem to indicate (Dullien et al. 2023), increased profits of some companies/sectors might be compensated by higher losses in others. We therefore focus on identifying problematic domestic wage and/or profit developments in euro area countries at the national level rather than at the sectoral level.⁴

We decompose past and current price changes of the GDP deflator into those stemming from unit labor costs, those from unit profits, and those from net unit taxes. In order to judge the price or cost developments as stability-oriented or not, we follow the idea that national wage developments should be in line with the inflation target of the ECB plus the increase in trend labor productivity (see Horn/Logeay 2004, Herr/Horn 2012, Heine /Herr 2013, 2022, 2023, Onaran/Stockhammer 2016, Lane 2023). Such a rule, if also applied to profits, would not kick-start an inflationary process and would leave the functional income distribution unchanged. Our research question is: Have unit labor cost or unit profit increases been too high in euro area countries if judged by stability-oriented wage and profit rules, respectively?

The decomposition of the GDP deflator based on the distributional approach into unit profits, unit taxes and net unit taxes on production based on national accounting data has also been conducted by Hahn (2019, 2021) and Arce et al. (2023) for quarterly GDP data for the euro area on average. Haskel (2023) similarly provides decompositions for 2022 for the UK, the euro area and the US. We instead

⁴ While the GDP-deflator is available on a sectoral basis based on gross value added by sectors, it does not allow for the decomposition of inflation, as distributional data are only provided for compensation of employees, not for gross operating surplus versus unit taxes.

focus on the decomposition for all euro area member countries. Comparing the developments with recommendations for macroeconomically stable developments follows Feigl/Zuckerstätter (2013) and has been similarly applied by Joebges/Logeay (2018). Such a decomposition is only possible for the GDP deflator, not for the harmonized consumer price index (HICP). Focusing on the GDP deflator has the additional advantage that only domestic sources for inflation are under scrutiny – which are the relevant ones for inflationary processes – not those stemming from external factors, even if higher import price triggered the price increases in the first place. Such a differentiation between imported and domestic price effects is not possible using the HICP.

We mainly stick to analysing these developments at the national, not the sectoral level, as national account data does not allow for a decomposition of inflation rates at the sector level, due to missing data on unit taxes on production and subsidies and gross profits.⁵ In addition, we focus on annual data, as quarterly data is highly volatile and probably subject to revisions (already indicated by Hahn 2021: endnote 1). It neither adds much insight to the analysis.

Based on our analysis, profit increases, less so wages, have been above stability-oriented rules in recent years in almost all member countries, thereby changing the functional income distribution. Yet, one caveat of our focus on aggregate national developments is that we cannot judge if firms actively increased profit margins or if profit developments benefitted more than labor from the changing structure of production cost. We can only show the resulting distributional consequences, not identify the activities in the underlying conflict. As some publications stress the cyclical behaviour of profits over the business cycle that implies an increase in profits in a recovery, we also show in a second step that profits cannot be explained by cyclical developments.

To answer the research question, the paper is structured as follows: the next section 2 provides a brief literature review of theoretical considerations regarding inflation and shortly portrays recommendations for optimal wage (and profit) rules in the euro area. Section 3 discusses data and methodology for the price decomposition and provides information on country differences regarding the size of the import price shock. Section 4 presents annual results for the decomposition of the GDP deflator for subperiods during 1999 to 2022 and analyzes the findings. It also contains out-of-sample forecast for the recent years to show that profit developments are indeed extraordinary and cannot be explained with business cycle developments. The last section 5 presents the conclusions.

2 Literature review

According to Mark Setterfield (2002), theories on inflation can be categorized by whether inflation is demand-pull or cost-push driven (see also Perry 1987a, b for definitions of the two forms). Demand-pull approaches would concentrate on excess demand in goods markets, while cost-push driven approaches focus on an initial cost shock triggering an inflationary process. Monetarists' explanations of inflation based on too expansionary money supply can be considered as demand-pull driven (Setterfield 2002), such that these models will not be presented, even though some few authors also discuss too expansionary monetary policy as a cause for current inflation, especially for the US (see e.g. Rogoff 2022). Supply-chain bottlenecks that decrease supply for a given level of demand could be considered as Keynesian demand-pull approaches.

⁵ It would require to assume that the residual from nominal GDP minus compensation of employees at the sector level reflects profit developments. This is problematic given the highly volatile developments of net unit taxes on production and subsidies since the pandemic.

Setterfield (2002: 347) characterizes cost-push driven approaches by “... the idea that workers and firms possess market power, consequently influencing wages and prices independently of demand”, naming factor price (especially wage) increases as the trigger. Alternatively, temporary cost-push shocks can stem from higher import prices, e.g. for commodities like oil or gas, a devaluation of the domestic currency, higher interest rate costs etc. Triggers for domestic inflation are nowadays mostly seen in external transitory shocks, as e.g. Galbraith (2023) illustrates for the US.

As we are not interested in the triggers of inflation, but rather in the distributional effects caused by such a shock. We will concentrate on New Keynesian and Post Keynesian models as they aim at explaining if and how such shocks can trigger an inflationary process. For both approaches, the reaction of wages is central, as wages are considered as sticky and do not easily adjust downwards, such that wage increases in reaction to shocks have lasting effects on the price level. At the same time, employers’ attempts to roll-over higher costs (be it the initial price shock if it is increasing production costs, or higher wage costs) to prices, can kick-start a wage-price spiral and thereby an inflationary process. Distributional consequences depend on the target of employees and unions (real wage or wage share stabilization) in relation to the target of employers and employers’ associations, as well as the bargaining power of both sides. While Post-Keynesian approaches focus on the distributional conflict and the consequences, New-Keynesian approaches rather focus on the implications for price developments and the challenges for the central bank, only implicitly assuming a distributional conflict.

2.1 Inflation in New- and Post-Keynesian approaches

As mentioned above, supply chain bottlenecks could be considered as a demand shock in New-Keynesian approaches, as they may lead to temporary excess demand in goods markets.⁶ A positive cost-push shock can stem from higher prices for imported goods, a currency devaluation, an increase in wage or profit claims, increased taxation or interest rates. Even if price shocks are considered temporary, they can trigger an inflationary process if distributional conflicts start. If the shock originates in higher import prices for energy, thereby increasing production costs, inflation can arise if firms do not accept lower profits, rolling over the increased costs to final prices. This may lead to wage increases in turn if wage earners do not accept decreasing real wages (or a lower wage share) as a result of higher prices (or an increased profit share). This dynamic is called wage-price spiral and results in persistent eventually ever-increasing inflation.

Traditional New-Keynesian models discuss the long-term effects of such a one-time shock to inflation and (deviations from) potential output and employment. They focus on the resulting challenges for the central bank, as cost-push shocks (in contrast to demand shocks) imply a trade-off between the two conflicting goals of monetary policy: stable inflation and stable output developments (see e.g. the seminal model by Clarida et al. 1999 or the overview on extensions by Galí 2018). Policy recommendations stress the importance of credibly changing interest rates in a way that supports stable inflation expectations close to the target level, in order to bring inflation back to target at the lowest employment and output losses. Influencing expectations in these lines is very important in the models: at core stands the ability of the central bank to persuade economic actors that entering such a distributional conflict game will costs them more than the initial loss of purchasing power due to the external shock.

The underlying distributional conflict between workers, employees and unions on one side, versus companies and employers’ associations on the other is not explicitly modelled in standard New-

⁶ Structural changes could also kick-start an inflationary process, yet, most models rely on modelling stable potential output growth.

Keynesian models, even though labor market institutions and the bargaining power of unions determine in how far deviations from the output gap (or “labor market slack”) translate into the wage setting process. The relationship between prices and output/employment can be modelled by an expectations-augmented Phillips curve (see Clarida et al. 1999) or by the concept of the non-accelerating inflation rate of unemployment (NAIRU). Blecker/Setterfield (2022) for example interpret the structural changes according to estimations of the Phillips-curve over time as a sign for changes in the bargaining power of workers in the US. Similarly, the NAIRU concept implies the underlying distributional concept:

[T]he NAIRU is that rate of unemployment which generates consistency between the target real wage of workers and *the feasible real wage determined by labour productivity and the size of a firm’s mark-up*. Since *the NAIRU is determined by the balance of power between workers and firms*, the microfoundations of the NAIRU relate to theories of imperfect competition in the labour and product markets (...). (Snowdone/Vane 2005: 403, own accentuation)

Only few New-Keynesian approaches explicitly model the distributional conflict, among them e.g. Carlin/Soskice (2009, 2015). Yet, current developments have spurred a discussion about the underlying distributional conflict in macroeconomic models, see e.g. Bernanke/Blanchard (2023). Lorenzoni/Werning (2023) model the conflict explicitly independently of a specific type of macroeconomic model.

Post-Keynesian approaches in contrast have traditionally concentrated on the role of the distributional conflict between workers, employees and unions on one side, versus companies and employers’ associations on the other. According to an overview provided by Eckhard Hein (2023), one strand of traditions goes back to Keynes, Kaldor, Robinson and Marglin, the other to Kalecki, Rowthorn and Dutt. He stresses that in Post-Keynesian models, “*inflation is always and everywhere a conflict phenomenon*” (Hein 2023: 3). Inflation is considered as a result of the “process resulting from a bargaining conflict between firms and employees over the appropriate real wage.” (Prante et al. 2023, ch. 9, n.p.) or the wage share.

Hein (2023) provides an overview of extensions of Post-Keynesian/Kaleckian approaches (the latter of the above-mentioned strands) as these can better explain “the recent correlation of rising inflation and rising profit shares” (Hein 2023:32) and also incorporate inflation expectations: he differentiates between extensions provided by Dutt,⁷ Blecker/Setterfield and Lavoie versus the ones by Rowthorn and Hein/Stockhammer. He extends the latter strand of modelling in order to discuss the effects of imported energy prices and rising mark-ups. In his model, the unexpected inflation (stemming from higher import prices) leads to stagflation and a lower wage share if firms take the opportunity to increase mark-ups (Hein 2023: 25). If the central bank increases interest rates to fight inflation, expected inflation will be lower, but the negative effect on employment and the wage share is higher (Hein 2023: 28). New-Keynesian as well as Post-Keynesian approaches argue that profit mark-ups change over the business cycle. Due to sticky wages, profits increase in an economic expansion (until wages and other costs react) and decrease in an economic contraction. Examples for such effects in New-Keynesian models are Martins/Scarpetta (1999), Carlin/Soskice (2006). A simplified version for cyclical mark-ups is offered by Heine/Herr (2022), according to which prices are determined by unit labor costs (ULC) plus additional costs (including the equilibrium mark-up) and an additional component that depends on the economic cycle (“Marktlagengewinne”): Whenever demand exceeds supply (measured by

⁷ In Dutt (1992), changes in the functional income distribution have repercussions on the bargaining power (with feedback on the income distribution) and may provoke cyclical growth.

planned investment exceeding planned savings), firms can reap extra-profits, decreasing the wage share temporarily, while the opposite would be true for excess supply. As the pro-cyclical behavior of profits only leads to temporary changes, but is not relevant for the general distributional conflict, most textbook presentations abstract from cyclical fluctuations (see e.g. Prante et al. 2023).

Yet, some authors claim that the current debate about too high profits may be due to the missing awareness of these cyclical developments. The discussion is complicated by the fact that the word profits is used in different ways by different authors, referring to total profits, unit profits or profit shares, and without a distinction between gross and net profits. Marc Lavoie points to various theoretical arguments for changes of profits over the business cycle. While he does not claim that these changes can fully explain current profit developments, he stresses that the current surge in profits may be transitory due to the recovery of demand (procyclical profit share) and transitional material unit costs (that increases the profit share too) (Lavoie 2023): First, the nominal profit volume changes with output variations over the cycle even in case of constant mark-ups per unit of output. Second, the profit share (i.e. profits as a share of income generated by production) changes over the cycle even in case of constant mark-ups per unit, as the mark-up is added to marginal costs which also change over the cycle, especially unit labor costs. This can be most easily seen for overhead labor costs that decrease with increasing capacity utilization and vice versa. According to Marc Lavoie (2023), unit profits increase relative to marginal costs as average total unit costs decrease when output increases. In addition, unit profit developments may appear even more procyclical, as they are also driven by the relative composition of unit labor costs to other unit material costs (which are difficult to control for on an aggregate level). If unit material costs increase faster than unit labor costs, the unit profits in relation to unit labor costs will appear to increase just because of an increase in other costs, especially intermediate costs (once the measurement of profits ignores other costs than labor costs). Third, the price elasticity that firms are facing changes over the business cycle. One motivation for such a change is the changing degree of competition over the business cycle that implies cyclical behavior of mark-ups (see e.g. Martins/Scarpetta 2002). Based on his overview on Post-Keynesian/Kaleckian models, Hein (2023) summarizes that the current combination of rising inflation and rising profits can theoretically stem from different constellations, not only from actively increased unit profit mark-ups:

It may be due to rising mark-ups on unit variable costs or on unit total costs at normal capacity utilisation, which many authors seem to have in mind when talking about profit or sellers' inflation. But with constant mark-ups at the firm level, rising profit shares may also arise because of unit overhead labour and fixed cost digression in an economic expansion, rising ratios of unit material to unit direct wage costs, changes in the firm composition of industries or changes in the sectoral composition of the economy as a whole. (Hein 2023: 32)

Our approach cannot really contribute to this discussion as aggregate profit developments based on national accounting data do not inform about underlying causes. Yet, we show that current profit levels cannot be explained with cyclical developments or higher prices for imports and intermediaries (see subsection 4.3).

2.2 Stability oriented wage-rules

Both theoretical perspectives play a role in the ECB practical analyses, albeit with a strong emphasis on the New-Keynesian Phillips curve perspective. In a contribution to the ECB monthly bulletin, Bobeica/Sokol (2019: 92) for example summarize the formal framework used in the central bank as consisting out of three determinants: 1) inflation inertia and expectations, 2) economic slack (usually but not always measured by output gap or unemployment gap), and 3) additional supply side shocks

(mostly transitory external factors. Distributional aspects seem to be important, but the focus seems to be very much on the development of wages compared to labor productivity.

Lane's (2023) speech emphasizes that the ECB is monitoring wage increases along the well-known nominal wage rule where "nominal wages [are expected] to grow at the rate corresponding to the sum of labour productivity growth and the two per cent inflation target." (Lane 2023). That wages should follow trend productivity and the target inflation of the central bank has also been proposed by e.g. Horn/Logeay (2004), Herr/Horn (2012), Heine/Herr (2013, 2022, 2023), Onaran/Stockhammer (2016). Wage developments above that rule could kick-start inflationary wage-price developments. Such a process would require restrictive monetary policy by the central bank, albeit gradually over time, as e.g. Clarida et al. (1999) demonstrate in the stylized DSGE model. Post-Keynesian/Kaleckian approaches in contrast would put more emphasis on the need for income policies that moderate the underlying conflict over distributional effects of the initial shock (Hein 2023: 23-32).⁸

A wage rule would promote nominal stability and address two issues linked to developments within a monetary union: (1) Excessive wage developments harm external price competitiveness (cost aspect) and boost domestic demand (demand aspect) with unsustainable effects on imports. (2) Inflationary pressures resulting from such wage developments have distributional consequences. Too low wage increases that decrease the wage share harm domestic demand. For Germany, those aspects are well analyzed (Feigl/Zuckerstätter 2013 and Horn et al. 2017).

While international institutions identified the cost aspect of too high wages as one of the main problems of "peripheral" EMU countries up to the financial crisis (IMF 2013, Draghi 2013, EC 2013), Post-Keynesians have, by contrast, stressed the relevance of the demand effect for "center" EMU countries of too low wage increases (Hein/Mundt 2012, Onaran/Obst 2016, Onaran/Stockhammer 2016, Stockhammer/Wildauer 2016, Joebges/Logeay 2018). Yet, the focus of this paper is not the demand stabilizing effect on national economic developments, but rather the stabilizing effect on the functional income distribution and the resulting dampening effects on wage-price-spirals: Such a rule, if also applied to profits (see below), would not kick-start an inflationary process and would leave the functional income distribution unchanged.

Some publications suggest additional correcting factors for addressing external trade that we will not discuss. Examples are the suggestion of deviations from the general rule to support corrections of former positive or negative balances of the current account (Hein/Mundt 2012: 47), or corrections for deviations in national unit labor costs from the EU level (Onaran/Stockhammer 2016). In line with the above-mentioned authors, we recommend that such a rule would have to become a policy aim that would need to be supported by adequate institutions in the labor market, as well as national and European economic policies. Onaran and Stockhammer (2016: 10ff) provide an overview of supporting institutions and complementing policies. Hein/Mundt (2012) provide even farer reaching policy recommendations, as they aim at correcting the past increase of functional and personal income inequality.

⁸ Heine/Herr (2022) discuss the parallels of current inflation developments to the ones in Germany in the wake of the 1970s oil price shocks, by discussing interest rate changes as well as income policies to ease the burden on workers and firms ("Konzertierte Aktionen").

2.3 Stability-oriented profit rules

Interesting is the absence of a similar rule for profit, recommended in Joebges/Logeay (2018). For example, even Heine/Herr (2023) concentrate on the dominant role of wages, despite the fact that conflicting claims models stress the interaction between profit and wage developments and despite the current discussion about profit inflation. Underlying reasons might be that equilibrium profits are often assumed as stable in the long-run and the cyclical extra-profits in times of excess demand are assumed to be zero over the cycle (see e.g. Kalecki 1954, but also Heine/Herr 2023). Wages instead are assumed as sticky. As a consequence, any increase in wages has long-lasting effects on price levels.

The 2020-2023 context of multi-crises and the sudden surge of inflation (see Figure 1) that seems to be supported by profit inflation question this framework. Bivens (2022) remarks that profit inflation already played an important role in the first years following the recovery from the financial crisis and the global recession, yet, was camouflaged by wage suppression at that time.

An explanation for the role of profit inflation can be found in two papers: Weber/Wasner (2023) and an old analysis of Okun (1975). In both papers the main point for looking at profits is that in most cases persistent inflation does not start with wages (see Galbraith 2023 for a similar claim). Wages are a lagging indicator, albeit the main factor that permits the accumulative process. Once this process is started, only costly and painful restrictive economic policy can restore price stability. Factors starting the process are typically external costs push stocks (mostly devaluations and/or commodity price hikes).⁹

In both papers, profits are the most reactive components and an indicator for the transition from transitory costs shocks to persistent inflationary dynamic (see below). Weber/Wasner (2023) analyze the surge of inflation 2020-22 and postulate that market concentration is a prerequisite for profit inflation, but is not sufficient. This is a first departure from New-Keynesian Phillips curve explanation, where the markup is rather predetermined and enters the Phillips curve symmetrically. A cost increasing narrative is further needed according to Weber/Wasner (2023) to start inflation dynamics, where profits do not play the buffer role anymore but, on the contrary, the determining role. In line with New-Keynesian Economics is the idea that as soon as labour tries to regain the lost purchasing power and restore the wage share (the "conflict" phase), the first transitory impulse tends to get persistent and leads to inflation dynamics. Because of this, Weber/Wasner (2023) advise policy actors to prevent the impulse stage to go to the second ("propagation and amplification") and third ("conflict") stages.

Interestingly, the analysis of Weber/Wasner (2023) bears strong similarities with the one of Okun (1975) who distinguishes between a customer's market (with price setting firms, relevant for most services and goods in the domestic economy) and an auction's market (with price taking firms, essentially the ones for globally traded goods like food and energy). Okun (1975) argues that customer markets are socially and economically efficient because of the customer-seller relationship, mirrored by the long-term career labor markets, based on custom and fairness, lower transaction and information costs. The social dimension of the relationship between the two types of markets makes it necessary to have a narrative of increasing costs (as in Weber/Wasner 2023) to be able to increase prices (cut wages) without adverse effects in terms of huge drops of sales on the goods markets and quit rates on the labour market. Yet, inflation has the potential to destroy the relationship. Once the actors on those markets try to adjust to inflation and start an accumulative process, restrictive monetary and fiscal policy will lead to costly output and unemployment losses. For this reason, Okun (1975: 387ff) is very

⁹ DeLong (2023) lists inflationary episodes in the US. Other impulses came from the reorganisation of the economy from war to peace and the reverse.

critical regarding indexation policies but rather advocates policies that quickly counteract inflationary impulses from the auction markets to prevent them from propagation and amplification (to reuse the verbs of Weber/Wasner 2023) into the customer markets: measures to dampen the volatility of commodity prices, using "taxes and subsidies to reduce costs without reducing aggregate demand" (Okun 1975: 390).

Both models stress that profit inflation may become a separate source of inflation, independently of wage developments. Such developments (and even just the unfounded impression of profit inflation) may increase conflict inflation: in times of high inflation and perceived unfair increases in profits, the danger that this furthers a wage-price accumulation process is high. For policy makers, it is therefore important to know the stage of the inflation process as discussed in Weber/Wasner (2023), as (monetary) policy should react differently depending on the stage. For our paper, we are rather interested in evaluating if profits were indeed too high: by relating profit developments on the one hand to a stability-oriented rule, and on the other hand to cyclical developments, in order to see if profit increases can be judged as temporary.

3 Data and method

3.1 Price data

Inflation measured by the changes of the harmonized index of consumer prices (HICP) is the best-known indicator for inflation, as it is the target for most central banks, including the ECB. The indicator is constructed based on weighted prices of a basket of retail goods and services (including imported ones) that are consumed by households. It has the advantage of being intuitive and more quickly available than indicators based on national accounting. The corresponding indicator for HICP based on national accounting is the deflator of private consumption (PCPH). This indicator shows the highest correlation with the HICP headline inflation, the target of the ECB, when compared with other price indicators (see Table 1).

The disadvantage of HICP is that it concentrates on consumption goods only, ignoring other goods of the economy, and that it depends on the composition of consumption. Any shift in consumer preferences or in VAT taxation leads to changes in the HICP, independently of price developments for the different consumption goods. Alcidi/Gros (2020) provide evidence of the measurement bias for the period after the GFC and during the Covid-19-pandemic when the basket composition of the HICP was subject to profound changes. Another disadvantage of HICP, at least regarding our interest in domestic inflation processes, is that it does not differentiate between prices of domestically produced versus imported goods.

As we are interested in potential sources of inflation stemming from domestic sources for all goods, we rely on the GDP deflator. In contrast to HICP, the GDP deflator is not constructed based on weighted prices of a basket of retail goods and services, but as the ratio between the nominal GDP and its chain-linked real counterparts. The GDP deflator therefore incorporates the final prices of all goods and services produced in the domestic economy. Imports only play an indirect role through their incorporation as inputs into domestic production (ECB 2016). In that respect the GDP-deflator is a

broad (and therefore more reliable) indicator of price development than the HICP, but has the disadvantage of being only available with time lags and not being the underlying price measure for the inflation target of the ECB.¹⁰

Table 1 shows that the correlation between both inflation indices, HICP and the GDP-deflator, is high: 77% for the group of all 19 EMU-countries and 25 years of EMU existence. The second highest correlation with almost 80% is found for the time before the Global Financial Crisis (GFC) in 2007/8 that has been followed by a world-wide recession in big EMU-countries in 2008/9 and in the pandemic times (2020-23), and the lowest during the years after the GFC up to the recent occurrence of multiple crises with 55%; during the recent crises years, the correlation has increased again to 90%. The GDP deflator can be analyzed based on the three approaches in national accounting for GDP: expenditure approach (consumption, investment, net exports, and government expenditures), income or distribution approach (compensation of employees, gross operating surplus, net taxes on production) or production approach (the sum of all sectoral value added). For the decomposition, we rely on the income or distribution approach. National accounts allow for calculating cost contributions to the price deflator of final domestic demand, subtracting costs for imported inputs. For our analysis, we are interested in how far the temporary price shock may lead to a domestic inflation spiral, be it stemming from wage-price or by profit-price (or tax-price) spirals. Yet, an analysis of wage and profit contributions to inflation based on the GDP deflator can only serve as an ex post analysis of distributional conflicts. Due to the publication delay of the GDP deflator, it cannot be used as a timely instrument to judge if current price developments follow wage or profit rules.

Table 1: Bivariate correlations between selected price developments (in y-o-y%)

	HCPI-FCE	HCPI-GDP	FCE-GDP
1999-2023	87%	77%	85%
1999-2006	93%	79%	86%
2007-2011	89%	69%	82%
2012-2019	91%	55%	68%
2020-2023	96%	90%	92%

FCE=deflator of private final consumption expenditure

GDP=deflator of gross domestic product

HCPI=harmonized consumer price index

Source of the data: AMECO (PCPH, PVGD, ZCPIH), own calculations

3.2 Size of the import price shock

Price shocks from supply bottlenecks in global value chains during the pandemic and the energy shock from the war in the Ukraine (see Figure 8, Figure 9 and Figure 12 in the appendix) had varying effects on euro area countries, due to differences in production structure, energy composition, source countries and differences in energy dependency ratios. As a consequence, the relevance of imported inflation for HICP inflation differs among euro area countries.

The part of (real) income that has to be given up to (or is gained from) the rest of the world in case of negative (positive) external shocks can be measured by the so-called terms-of-trade (t-o-t) effect (see Nierhaus 2022b or Ragnitz 2022). This effect is measured in national accounting statistics by the difference between the growth rates of the GDP deflator (AMECO: PVGD) and the deflator of final internal

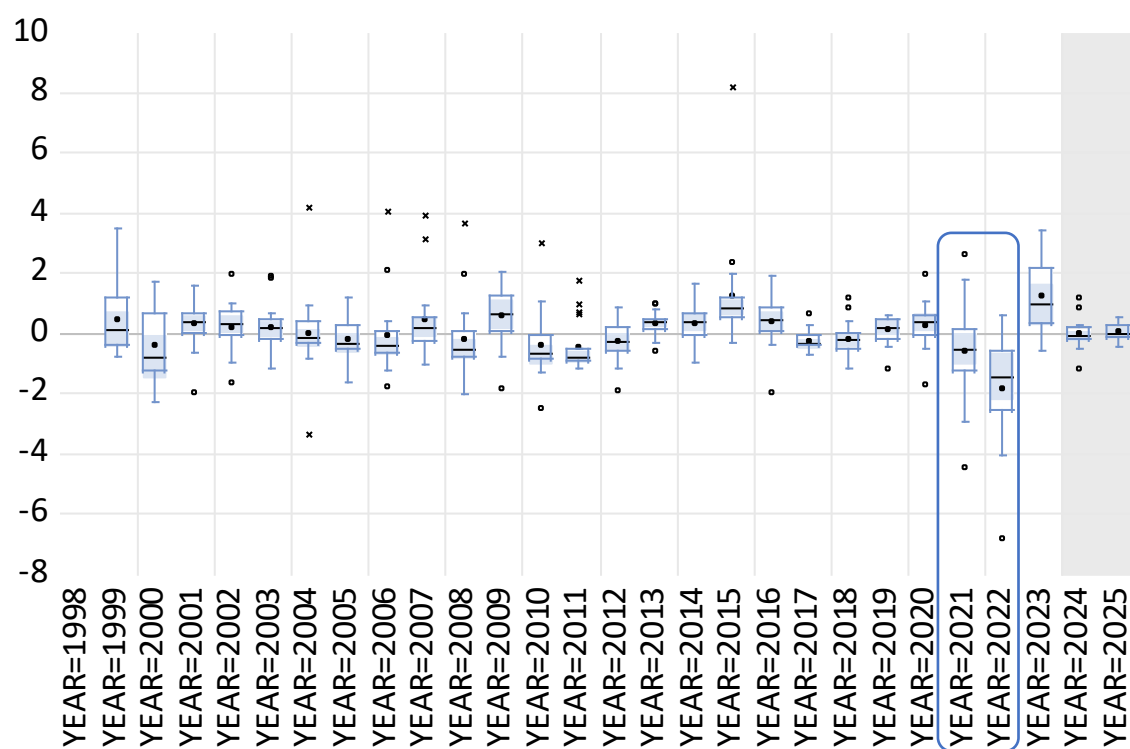
¹⁰ Even more adequate would be the deflator of GNI, as GDP also comprises foreign income stemming from domestic production that may only partly be relevant for domestic distributional conflicts over income claims.

demand (AMECO: PUNT). Comparing the development of the two deflators shows the effect of increased domestic prices and/or decreased profits (if firms are not able to roll-over costs to final prices) in the case of a worsening of terms of trade (higher import prices relative to export prices). Figure 2 plots the distribution of the differences in these two deflators for each year during 1999 to 2023 (2024-25: forecasts of the EC) over the sample of 19 euro-area countries. A negative sign in the figure implies redistribution of (real) income from euro-area economies to the rest of the world. As can be seen in Figure 2, the negative external shock starting in 2021 and continuing in 2022 is quite extraordinary compared to earlier shocks in the past, and the variations over countries are also higher than in the past. 2023 sees an offsetting of the negative shocks of the past and the EU Commission forecast no external shock for the next two years. Negative values imply that firms could not role-over import costs to domestic prices. The distributional implications cannot be seen, but whether the burden of higher import prices was equally shared among the different functional domestic income groups will be analyzed below.

Figure 2: Terms of trade effects in the euro area (19 countries), in %

Terms-of-Trade effects

Growth rate difference between real value of GDP and price adjusted GDP



Notes: Each boxplot shows the distribution of terms-of-trade (t-o-t) effects over the 19 euro-area countries for each year. The black bold dot reflects the average t-o-t effect over all countries, the black line the mean. Upper and lower blue lines of the rectangle reflect the 75% and the 25% quintiles.

Source of the data: AMECO (Autumn 2023 forecasts), own calculations based on UVGD, PUNT and PVGD.

To answer the question which functional income group is bearing the burden of the terms of trade shock, we decompose the GDP deflator into its three income components: unit labor costs (ULC), unit profit (UP) and net unit taxes (UT). Before we show the results, we will briefly point to problems in measuring profits.

3.3 Measuring price contributions from functional income distribution

The distribution approach in national accounting differentiates between compensation of employees (workers' income), gross operating surplus and mixed income (profit income) and taxes on production less subsidies (net tax income). The consumption of capital (depreciation) is included in the profit income as well as interest costs. The balance of primary income from the rest of the world (net foreign income) is excluded from the GDP measure. We decompose the GDP deflator inflation into the contributions to inflation stemming from the three aggregates mentioned above.

As we concentrate on price developments per unit of production, we concentrate on unit labor costs, unit profits and unit taxes. The interpretation of contributions from unit profits may be considered less reliable than the one from unit labor costs. The reason is that gross operating surplus and mixed income, a broad measure of profits, is calculated as a residual based on gross value added minus compensation of employees, minus taxes on production and imports plus subsidies. It is nevertheless an important data source for profit developments at the total economy level.¹¹ According to Hahn (2021), gross operating surplus of nonfinancial companies and the "gross mixed income of the smaller unincorporated enterprises" together account for about three quarters of total economy profits in national accounting.¹² Criticism regarding a potential distortion of profit data from national accounting due to changes in depreciation is discussed in Dullien et al. (2023: 20-21) for Germany, explaining that depreciation in accounting only provides the means for replacement of decaying capital. Recently higher depreciation rates may just reflect accounting rules: the recent increase in prices also implies higher prices for new investment. As replacement prices for new investment are used for calculating the nominal depreciation in accounting, nominal depreciation in accounting increases even for stable volumes of depreciation.

This kind of decomposition of inflation experiences a strong revival (see the literature cited in the introduction, esp. OECD 2023: 26-30, EU Commission 2023: 29-31, IMF 2022: 30-32 and IMF 2023: 6-8, Haskel 2023 for the BoE). Hahn (2019, 2021) from the ECB uses the same decomposition of inflation as we do, based on the GDP-deflator with unit profit, unit labor costs and unit taxes. She finds that unit profits are driven by two main factors: economic cycle and the terms of trade. When the economy booms, firms have more scope to raise prices in anticipation of the rise in unit labor costs, expanding profit margins. In a downturn this is the reverse as wages are contractually set and can only adjust with delay. Firms must decrease profits to accommodate the pressure to decrease prices or at least refrain from increasing prices once they face decreasing demand. Therefore, unit profits are procyclical, as Hahn (2019, 2021) shows for quarterly euro area data. This is in line with New-Keynesian and Post-keynesian/Kaleckian ideas of procyclical profit developments. Yet, a more detailed analysis (scrutinizing the form of mark-ups and the motives behind it) is impossible due to the aggregated level of analysis.

Strong variations in the terms of trade have similar effects: if a strong decrease in import prices measured in the domestic currency and/or a depreciation of the domestic currency is only partly passed

¹¹ Our analysis may be subject to future data revisions: Hahn (2021: footnote 1) points to special difficulties in calculating non-market output during the pandemic that may lead to data revisions and thereby slightly different profit developments.

¹² Alternative methods for calculating mark-ups relying on firm's data are sparse and need assumptions about the production function. De Loecker et al. (2020) developed a method for the US from official firm documentation. Weber/Wasner (2023) find evidence for profit hikes in selected sectors from US earning calls that they relate to firm data. While the profit data from national accounting could also inform about the stage of profit inflation in the process (see the stages in Weber/Wasner 2023), it can only be used ex post, due to the delay in publication.

through to home prices and/or export prices in foreign currency, the profits of importers/exporters will raise (Hahn 2021: 66). The unit profits correlates in that case positively with the terms of trade. For the years 2020 to 2021, Hahn (2021) points to new profit developments in euro-area countries: less affected by recessions, and at higher levels than in the past. Arce et al. (2023) similarly point to extraordinary profit developments in the recent past, and especially in 2022. This too is in line with Postkeynesian decomposition expliciting imported material into the distribution equation (Lavoie 2023).

3.4 Inflation decomposition and wage and price rules

The actual inflation rate can be decomposed along the formula (1):

$$\text{Actual: } \frac{\Delta P_t}{P_{t-1}} = \frac{\Delta ULC_t}{ULC_{t-1}} \cdot \frac{COE_{t-1}}{nGDP_{t-1}} + \frac{\Delta UP_t}{UP_{t-1}} \cdot \frac{GOS_{t-1}}{nGDP_{t-1}} + \frac{\Delta UTAX_t}{UTAX_{t-1}} + \frac{TAX_{t-1}}{nGDP_{t-1}} \quad (1)$$

With P =GDP-Deflator, ULC = unit nominal labour costs, UP =unit profits, $UTAX$ = unit taxes, COE =Compensation of employees, GOS =Gross operating surplus and mixed income, Tax = taxes minus subsidies on imports and production, $nGDP$ = GDP at current prices. The unit components are defined as the nominal component/real GDP.

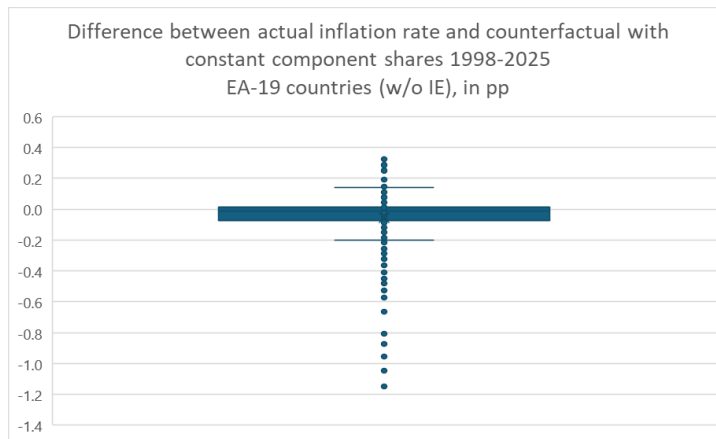
Equation (2) provides the inflation- and distribution-neutral rule that is based on assuming constant functional income shares relative to GDP¹³ (constant wage and profit shares) and by setting inflation to the ECB target of 2%:

$$\text{Target: } 2\% = 2\% \cdot \frac{COE}{nGDP} + 2\% \cdot \frac{GOS}{nGDP} + 2\% \cdot \frac{TAX}{nGDP} \quad (2)$$

Both formulae for actual and target inflation are cumulated over time, as the inflation target is a medium run objective. Usually half a business cycle length can be thought of as medium run. As can be seen from equation 1, inflation can stem from one of the three functional income components (if not compensated by a matching decrease in another component). When actual values of a component are above target values, inflationary pressure arises from this component (and/or a shift of its share in GDP). However, the variations from shifting shares are second order (and therefore negligible) compared to deviations from the target growth rate for this component (i.e. the 2% inflation of the ECB). This can be seen in Figure 3. Therefore, we neglect this aspect as the question on the target share is controversial and take past shares as actual (= correct) ones.

¹³ $\left(\frac{X_{i,\tau}}{GDP_{\tau}^{nominal}}\right)$, with (X_i) referring to compensation of employees, gross operating surplus and mixed income and taxes on production less subsidies

Figure 3: Inflation effects from varying shares



Source: Data from AMECO (Autumn 2023 forecast vintage), own calculations. The shaded area is the interquartile range (IQR) Q1-upper and Q3-upper limits, the bars denote the ends of the whiskers marking the lower/upper extreme limits i.e. $1.5 \times \text{IQR}$ below/above the IQR, circles are outliers. The two extreme values are -1.2pp and $+0.6\text{pp}$. 95% of the obs. lie between -0.6pp and $+0.3\text{pp}$.

4 Empirical findings

4.1 Wage and profit rules for 1999 to 2019 in two selected groups of countries

We decompose price developments measured by the GDP deflator into unit labor costs (ULC, defined as compensation of employees per unit of real GDP), unit profits (UP, defined as gross operating surplus and mixed income per unit of real GDP) and net unit taxes (UTAX, defined as taxes net of subsidies on imports and production per unit of real GDP).

Figure 13 in the Appendix presents yearly contributions for all 19 EA countries. Red bars show the contribution of profit and the blue bars the contribution of wages. Two main observations can be made: The GFC marks a radical break, and again the years 2020-22 mark a new era. The radical change in profit and wage patterns can be more easily illustrated by comparing actual developments with the wage-price rule. We will therefore contrast actual developments with those based on the rule. For the sake of clarity, we will compare developments for two different groups of countries only: First the group called “crisis countries”, consisting of Greece, Spain, Italy and Portugal, and second, the group called “deflation countries”, consisting out of Belgium, Germany, the Netherlands and Austria.

The group of “crisis countries” (Greece, Spain, Italy and Portugal) were characterized by very dynamic wage and profit developments before the GFC as can be seen in Figure 4. Inflation trespassed the ECB-target almost every year between 1999 and 2007 for every country (black lines in Fig. 4). The high inflation rates were a source of great concern at that time (see literature cited in Logeay/Joebges 2018) and the countries were suspected to allow for too-high wage increases (above productivity, leading to excessive unit-labor cost developments). Yet, already Figure 4 indicates that the resulting inflation stemmed from the combined effect of unit labor costs (blue columns) as well as unit profit (red columns) developments. After the GFC, wage developments were extremely moderate as the countries embarked into competitive disinflation through wage restraint. Profits were depressed too.

Table 2 helps in judging the size of inflation (measured by the GDP deflator) and the contributions of wages and profits, measured by comparing actual growth rates with the target rates for these components. In the period before the GFC (1999-2007), actual inflation (first line, “Actual”) was well above

the implied cumulative growth calculated for the 2%-target (second line, "target" below): Cumulated inflation of 2% over 9 years (1999-2007) should have accumulated to 17.2% for all countries, yet, all countries had experienced higher cumulated inflation. And in all countries, both components (wages and profits, violet figures) were well above stability-oriented developments (identified by comparing actual rates with target rates). During the GFC and the following "euro crisis" (2008-2013), the strong wage depression with even negative contributions in two of the four countries dampened price development dramatically. Profits showed a comparable deflationary tendency to wages, with the exception of Italy. After the GFC and "euro crisis" period, the depressed pattern continued during the following years (2014-2019): wages and profits developed below stability-oriented rates. This lingering competitive disinflation (except in Portugal) is the contrary of a wage-price spiral process but equally problematic for the concerned economies and for the monetary union.

Concentrating on the other group of countries, the "deflation countries" with low inflation before the GFC (Belgium, Germany, France, Austria, in Figure 5) the picture is different: Before the GFC, wage developments (blue bars) were too low, whereas profits (red bars) were positively contributing to inflation, at least in some years. Bivens (2022) calls this the shift of power, away from workers ("wage suppression"). After the GFC, patterns are more difficult to detect, but the bargaining power of workers seems to recover, although inflation rates remain quite stable around the target. The wage rule helps in judging the pattern (see table 3): Before the GFC, only Germany showed too low inflation (with a cumulated 7,4% instead of a targeted 17,2%). The other three countries had inflation rates close to the target. Stable inflation developments in Belgium and France were supported by sound wage developments (i.e. neither inflationary nor deflationary), whereas wage increases in Austria and Germany were too low. Contribution of profits were at or above target in all countries. During the period of the GFC and the euro crisis (2008-2013) profits suffered (actual developments were below the target), but not wages (actual developments were more or less in line with targets). In the last sub-period, wages were depressed in Belgium and France, profits were below (Germany and France), near (Austria) or above (Belgium) target. On the whole all countries remained disinflationary, undermining the competitive disinflationary efforts of the former presented crisis countries.

Figure 4: Contributions to inflation in the “crisis countries”

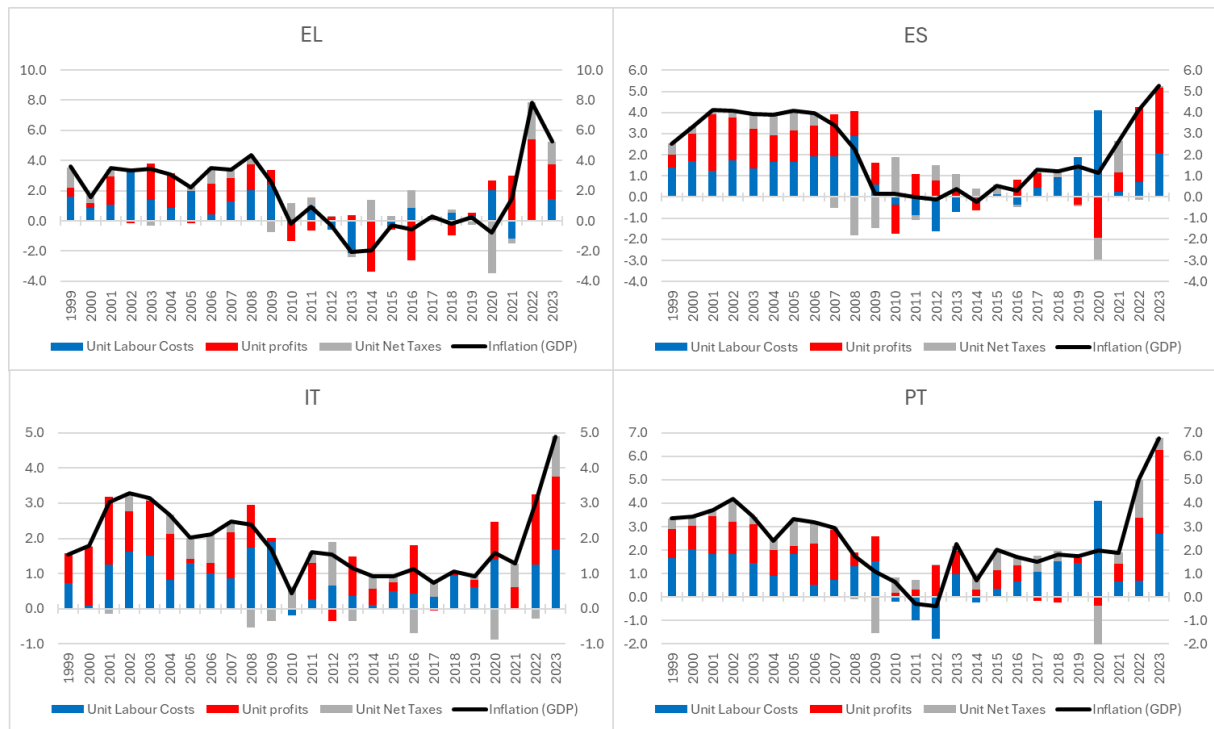


Table 2: Actual GDP-Deflator inflation vs. Wage-Profit rule for “crisis countries”

		Greece	Spain	Italy	Portugal
1999-2007	Actual	26.8%	35.3%	22.5%	29.9%
	Target	17.2%	17.2%	17.2%	17.2%
2008-2013	Actual	1.0%	0.6%	6.6%	3.4%
	Target	10.4%	10.4%	10.4%	10.4%
2014-2019	Actual	-0.5%	4.9%	4.9%	9.1%
	Target	10.4%	10.4%	10.4%	10.4%
Contributions of Wages					
1999-2007	Actual	11.7%	14.0%	8.8%	11.7%
	Target	5.3%	7.9%	6.2%	7.9%
2008-2013	Actual	0.7%	-2.9%	3.0%	-0.5%
	Target	3.6%	4.9%	4.0%	4.7%
2014-2019	Actual	1.5%	2.9%	2.9%	5.2%
	Target	3.6%	4.6%	4.0%	4.5%
Contributions of Profits					
1999-2007	Actual	10.5%	15.0%	9.7%	11.5%
	Target	9.5%	7.0%	8.3%	6.6%
2008-2013	Actual	-0.4%	1.8%	1.9%	4.0%
	Target	5.4%	4.4%	4.9%	4.2%
2014-2019	Actual	-3.5%	1.2%	1.9%	1.3%
	Target	5.1%	4.5%	4.9%	4.3%

Notes: The table provides cumulated values for inflation contributions for the respective period. Target would refer to stability-oriented developments based on wage- and profit-rules. Actual are measured developments based on national accounting data. Bold black figures signal slight deviations, bold red figures signal strong deviations of actual figures from target.

Figure 5: Contribution to inflation in the “deflation countries”

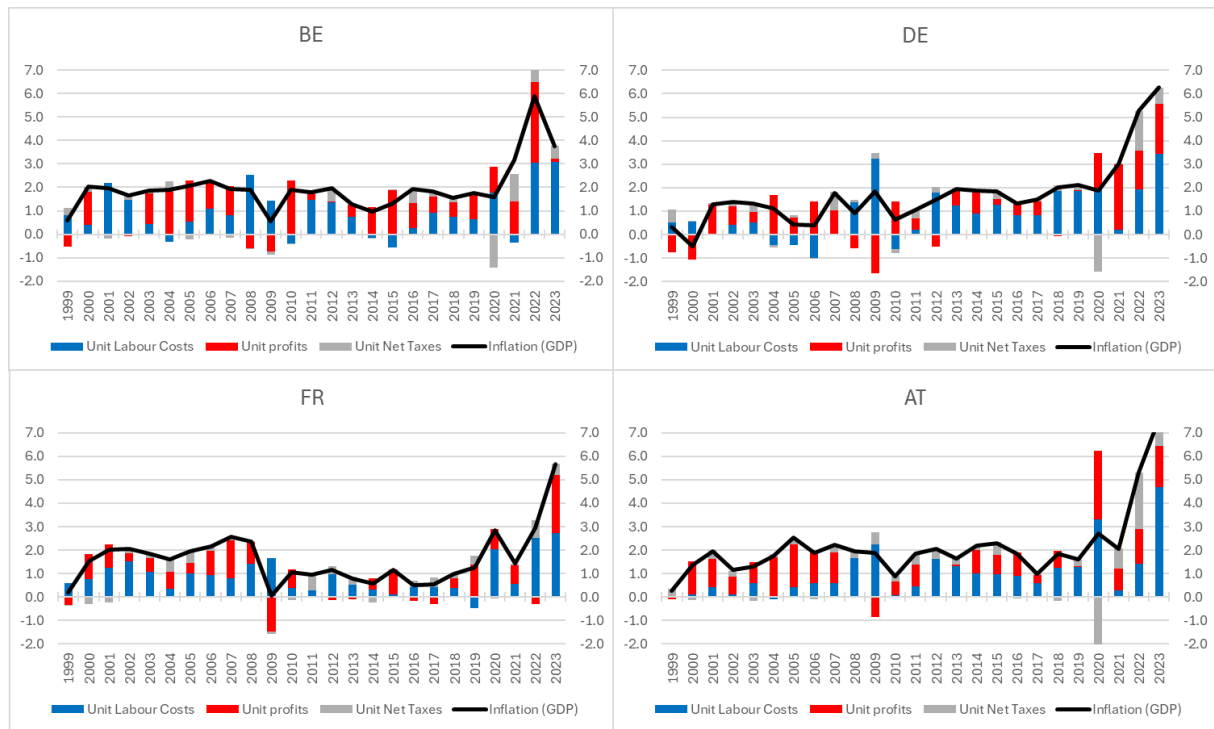


Table 3: Actual GDP-Deflator inflation vs. Wage-Profit rule for “deflation countries”

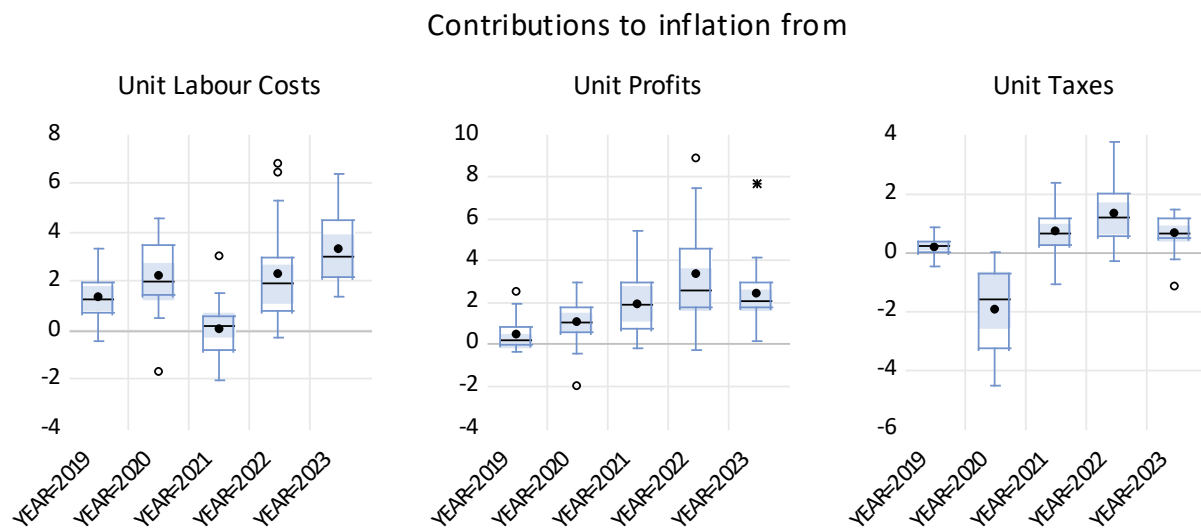
		Belgium	Germany	France	Austria
1999-2007	Actual	16.8%	7.4%	16.9%	15.1%
	Target	17.2%	17.2%	17.2%	17.2%
2008-2013	Actual	7.7%	7.2%	4.1%	8.5%
	Target	10.4%	10.4%	10.4%	10.4%
2014-2019	Actual	8.7%	9.1%	4.5%	8.8%
	Target	10.4%	10.4%	10.4%	10.4%
Contributions of Wages					
1999-2007	Actual	6.8%	-0.5%	7.9%	2.8%
	Target	8.4%	8.5%	8.5%	7.8%
2008-2013	Actual	4.7%	5.9%	3.9%	5.8%
	Target	5.3%	5.1%	5.3%	4.8%
2014-2019	Actual	2.0%	6.8%	0.9%	5.1%
	Target	5.1%	5.3%	5.3%	4.9%
Contributions of Profits					
1999-2007	Actual	8.9%	6.4%	7.0%	11.0%
	Target	6.3%	6.5%	5.8%	6.6%
2008-2013	Actual	2.4%	0.3%	-0.9%	0.7%
	Target	3.9%	4.0%	3.6%	4.1%
2014-2019	Actual	5.4%	1.2%	2.4%	3.0%
	Target	4.1%	3.9%	3.5%	4.0%

Notes: The table provides cumulated values for inflation contributions for the respective period. Target would refer to stability-oriented developments based on wage- and profit-rules. Actual are measured developments based on national accounting data. Bold black figures signal slight deviations, bold red figures signal strong deviations of actual figures from target.

4.2 2020-2023 in light of the wage and profit rule

Inflation developments changed again for all 19 member countries during the years 2020-23. Results for the year 2023 should be interpreted with caution, as they rely on AMECO estimates from autumn 2023. Interestingly, developments in single countries are quite similar, such that we first present an overview on inflation decomposition for all member countries for each year 2019-2023 as box plots in figure 6, before again presenting the results for the selected crisis countries and deflation countries. As can be seen in the figure, unit labor cost developments during 2019-2022 seem to be in line with the wage rule (increases in 2020 stem from labor retention schemes), whereas the profit component contributes very strongly to inflation in the years 2021 and 2022. The contribution of taxes mirrors the expansive fiscal policy measures to dampen the corona crisis (decreases in 2020 stem from temporary tax cuts). The much-debated issue of greedflation has its root in the extraordinary development of the profit component in 2022, seeming to indicate an increasing trend since 1999.

Figure 6: Contribution of the income components across the 19 EA countries



We analyze these recent developments from two perspectives: first by comparing actual developments with the ones provided by wage and profit rules for the formerly selected countries, and second by analyzing in how far recent developments imply a departure from historical trends.

In the year 2022, inflation was well above the ECB target of 2% in all countries and is forecasted to stay above the target in 2023 (red figures in the top panel in Table 4). Concentrating on the contribution of wages, job retention schemes and low productivity partly provoked wages developments above target during 2020, but faded in 2021 (with the exception of Greece, see red figures in the second panel “contribution of wages”). Yet, according to the figures for 2022, some of the “crisis countries” experienced quite dynamic wage increases in 2022 that are forecasted to last in 2023 (shaded grey lines), whereas wages in “deflation countries” developed moderately (with the exception of Belgium). The European Commission forecasts strong increases for 2023 (AMECO) that cannot be due to base effects as in 2020/21.

In all countries, profits clearly contributed strongly to inflation in 2021, something that may reflect the transition from the amplification/propagation phase to the conflict phase as discussed in Weber/Wasner (2023). However, the effect of profit hikes seems to be fading in some countries (IT, PT, DE and FR) in 2022.

Table 4: Actual GDP-Deflator Inflation vs. Wage-Price rule 2020-23

	Greece	Spain	Italy	Portugal		Belgium	Germany	France	Austria
2020 Actual	-0.8%	1.1%	1.6%	2.0%		1.6%	1.9%	2.8%	2.7%
Target	2.0%	2.0%	2.0%	2.0%		2.0%	2.0%	2.0%	2.0%
2021 Actual	1.5%	2.7%	1.3%	1.9%		3.2%	3.0%	1.4%	2.1%
Target	2.0%	2.0%	2.0%	2.0%		2.0%	2.0%	2.0%	2.0%
2022 Actual	7.8%	4.1%	3.0%	5.0%		5.9%	5.3%	2.9%	5.3%
Target	2.0%	2.0%	2.0%	2.0%		2.0%	2.0%	2.0%	2.0%
2023 Actual	5.3%	5.3%	4.9%	6.8%		3.8%	6.3%	5.7%	7.6%
Target	2.0%	2.0%	2.0%	2.0%		2.0%	2.0%	2.0%	2.0%
Contributions of Wages						Contributions of Wages			
2020 Actual	3.7%	3.3%	2.1%	2.0%		1.8%	2.0%	2.0%	3.3%
Target	0.9%	0.9%	1.0%	1.1%		1.0%	1.1%	1.0%	1.0%
2021 Actual	2.0%	1.2%	-0.6%	0.2%		-0.3%	0.2%	0.6%	0.3%
Target	0.9%	0.9%	1.0%	1.1%		1.0%	1.1%	1.0%	1.0%
2022 Actual	4.5%	2.5%	2.2%	1.9%		3.1%	1.9%	2.5%	1.4%
Target	0.9%	0.9%	1.0%	1.1%		1.0%	1.1%	1.0%	1.0%
2023 Actual	4.5%	4.1%	1.6%	3.4%		3.1%	3.4%	2.7%	4.7%
Target	0.8%	0.9%	1.0%	1.0%		1.0%	1.0%	1.0%	1.0%
Contributions of Profits						Contributions of Profits			
2020 Actual	1.1%	2.0%	1.9%	1.5%		1.3%	1.5%	0.9%	2.9%
Target	0.9%	0.9%	0.7%	0.7%		0.8%	0.7%	0.7%	0.8%
2021 Actual	5.7%	2.0%	2.8%	2.8%		2.4%	2.8%	0.8%	0.9%
Target	0.9%	0.9%	0.7%	0.8%		0.8%	0.8%	0.7%	0.8%
2022 Actual	9.2%	4.4%	4.9%	1.6%		2.3%	1.6%	-0.3%	1.5%
Target	0.9%	0.9%	0.7%	0.8%		0.9%	0.8%	0.7%	0.8%
2023 Actual	3.4%	5.8%	-4.1%	2.1%		0.1%	2.1%	2.5%	1.8%
Target	1.0%	0.9%	0.8%	0.8%		0.8%	0.8%	0.7%	0.8%
Contributions of Net Taxes						Contributions of Net Taxes			
2020 Actual	-0.6%	-1.0%	-1.1%	-1.6%		-1.4%	-1.6%	-0.1%	-3.5%
Target	0.2%	0.2%	0.3%	0.2%		0.2%	0.2%	0.3%	0.2%
2021 Actual	-0.6%	0.2%	0.7%	0.0%		1.2%	0.0%	0.1%	0.8%
Target	0.2%	0.2%	0.3%	0.2%		0.2%	0.2%	0.3%	0.2%
2022 Actual	2.5%	1.6%	1.0%	1.7%		0.5%	1.7%	0.7%	2.4%
Target	0.2%	0.2%	0.3%	0.2%		0.2%	0.2%	0.3%	0.2%
2023 Actual	0.9%	-0.4%	0.0%	0.7%		0.6%	0.7%	0.5%	1.2%
Target	0.2%	0.2%	0.3%	0.2%		0.2%	0.2%	0.3%	0.2%

Notes: The table provides cumulated values for inflation contributions for the respective period. Target would refer to stability-oriented developments based on wage- and profit-rules. Actual are measured developments based on national accounting data. Bold black figures signal slight deviations (less than 1 pp -for the taxes 0.5pp- from target), bold red (violet) figures signal strong deviations of actual figures above (below) target.

4.3 Are profits developments extraordinary since 2020?

As Post-Keynesian/Kaleckian approaches discuss the cyclical behaviour of profits, the question is if the recent strong increases in profits only reflect temporary developments or rather profit inflation, may be motivated by developments discussed in Weber/Wasner (2023) or in Okun (1975), as the pandemic

and global-value-chain interruptions might have provided a narrative that allowed for increasing profit margins. While we cannot analyze the motives behind recent profits developments with the aggregate data, we can assess in how far recent profit developments are in line with historical developments.

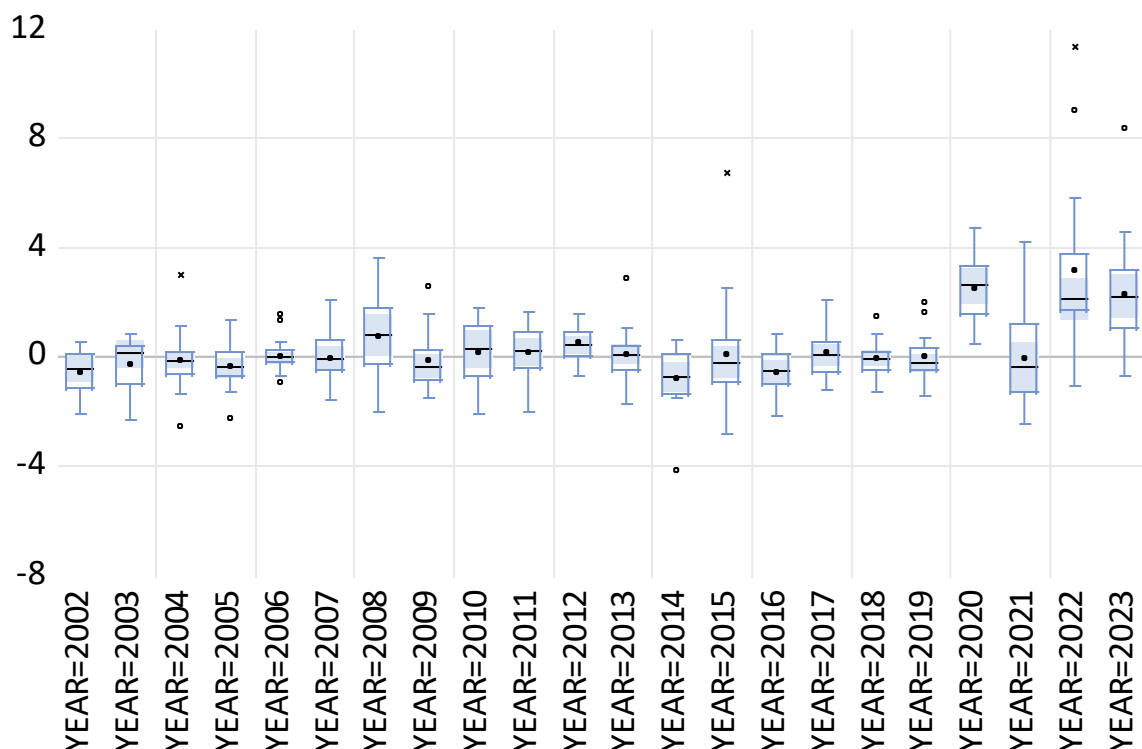
Based on the Post-Keynesian/Kaleckian literature cited above (Heine/Herr 2022, Lavoie 2023, Hein 2023) and the practical analysis of the ECB (Hahn 2021), we regressed the (growth rate of) unit profits on relevant determinants mentioned in the literature: economic activity (growth rate of real GDP), Terms-of-Trade and the national short-term nominal interest rates.

Various specifications with fixed effects were tested: static, ARDL, VAR; in growth rates or in levels (except for the GDP-growth which was not transformed). The max. number of lags was set to three (therefore to two for models in differences). This is quite a long lag structure for yearly data. All 18 models were estimated over 1998-2019. In terms of the RMSE of the forecasting in-sample-errors (2002-2019), as well as the goodness of fit measured by the squared correlation between the unit profit and their forecasted values, the ARDL models performed best, followed by the VAR-models. Static models perform worst. Therefore only the results of the best model (the ARDL(3)) are presented. As shown in Figure 7, recent profit developments are extraordinary, they cannot be explained by “normal” (historical) reactions to the business cycle, terms of trade and interest rate. The out-of-sample forecast for 2020-2023 again confirms unusual profit developments: They are on average higher than expected in 2020 and 2022-23, and variation over countries is higher than in the past.

As this finding is in line with the narrative by Weber/Wasner (2023), Okun (1975), as well as with Post-Keynesian/Kaleckian models of intensified conflict inflation, this finding contributes to the fear of a potential wage-price conflict phase.

Figure 7: Forecast errors as sign of extra-profits

Static forecasts from ARDL(3) with FE for unit profits
explained by GDP-growth rate, Terms-of-Trade, short term interest rate



5 Conclusions

The paper presents inflation developments in euro area countries for the period 1999-2023. It decomposes inflation by three sources, unit labor costs, unit profits, and net unit taxes. In order to judge the developments, they are compared to wage- and price-rules proposed by several authors according to which wages should grow in line with target inflation of the ECB and national productivity over the medium term. This paper argues that a similar rule should be applied to profits.

Using such rules for price developments since the introduction of the euro, we show that the patterns of profit and wage development differed between selected groups of countries and resulted in different inflation patterns. In the context of high inflation (2022-23), the fear of a starting wage-price spiral provoked the ECB to increase interest rates quite sharply. Yet, recent inflation developments since the year 2019 are not just striking in size among all member countries, but also show striking similarities regarding the composition. Wage increases were indeed above target in 2019 and 2021-2022 provided by the wage rule, but only slightly. In contrast to wages, unit profit developments were much more worrisome, showing extraordinary developments for almost all member countries. Data for 2023 point to continuing worrisome developments for wages and profits, but has to be taken with caution as it relies on AMECO forecasts. If forecasts are close to actual developments, they seem to indicate still high, yet dampened profit developments, coupled with strong wage growth.

Post-Keynesian theoretical approaches focus on the underlying distributional conflict, yet, also discuss several arguments for the cyclicity of unit profits. In addition, theoretical considerations and empirical findings point to the role of interest-rates and terms-of-trade. We therefore also evaluate, in how far profit developments are "normal" in an expansion of economic activity, i.e. can be explained by GDP growth rates, terms- of trade and interest rate developments. According to our analysis, we cannot explain recent profit developments based on regression results for past cycles. The unexplained part assessed by forecast errors from ARDL models is huge, whatever the specification. From this it cannot be ignored that a part of increasing profits in 2022 was abnormal compared to historical developments, and cannot be explained by cost increases and/or business cycle swings.

Yet, one caveat of our focus on aggregate national developments is that we cannot judge if firms actively increased unit profit margins or if profit developments benefitted more than labor from the changing structure of production cost. We can only show the resulting distributional consequences, not identify the activities in the underlying conflict. Our findings nevertheless indicate potentially problematic effects of the underlying distributional conflict.

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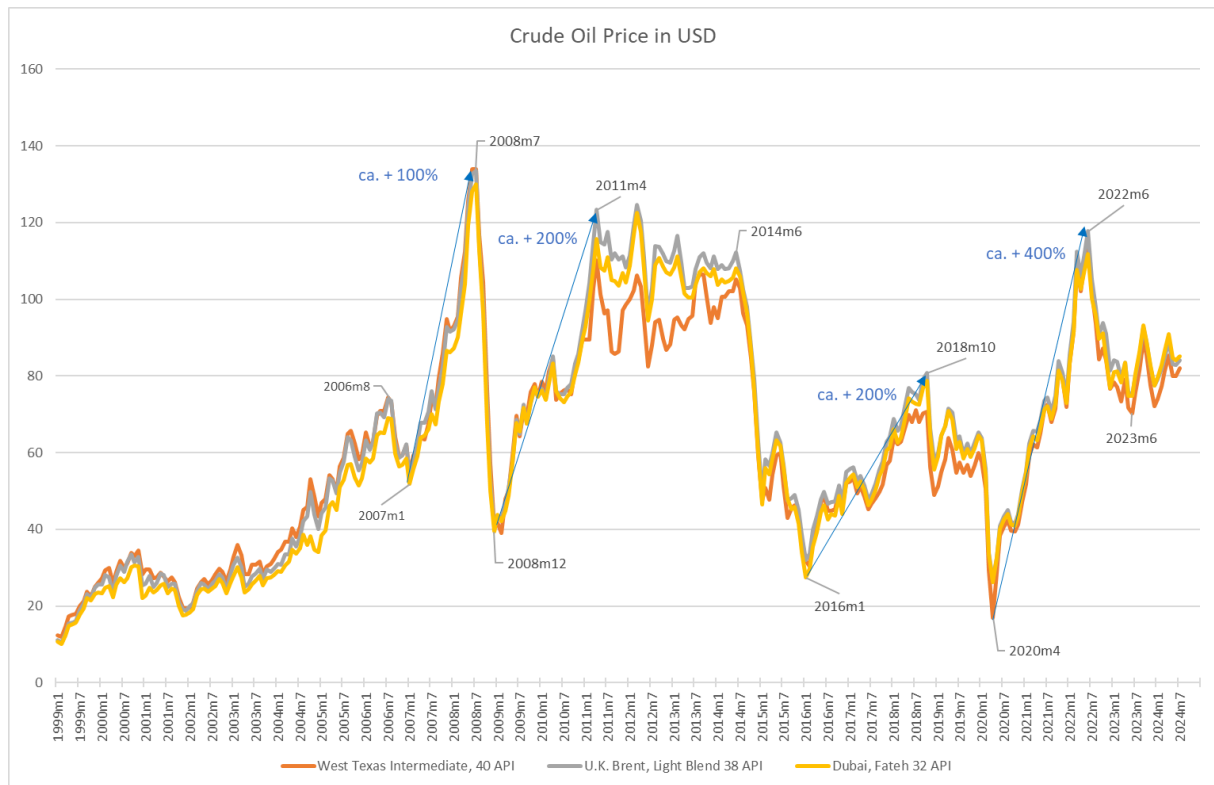
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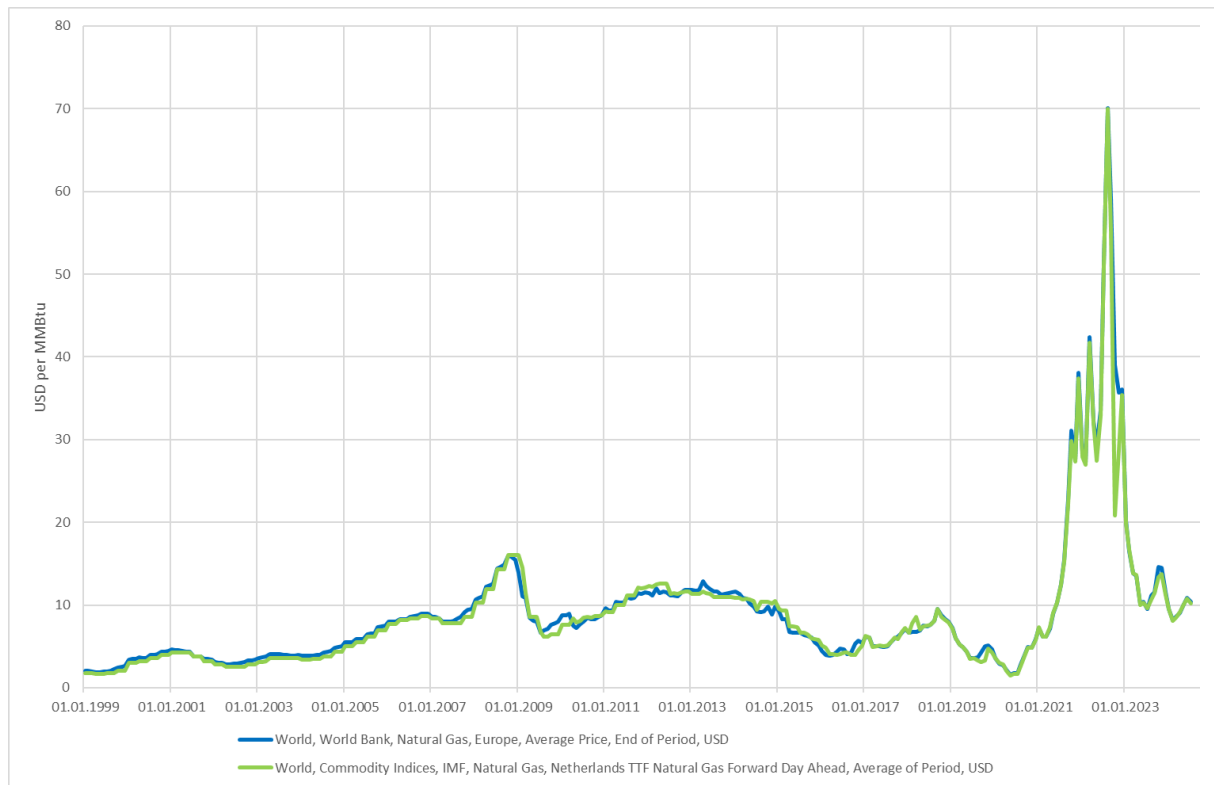
Appendix

Figure 8: Oil Prices in EUR



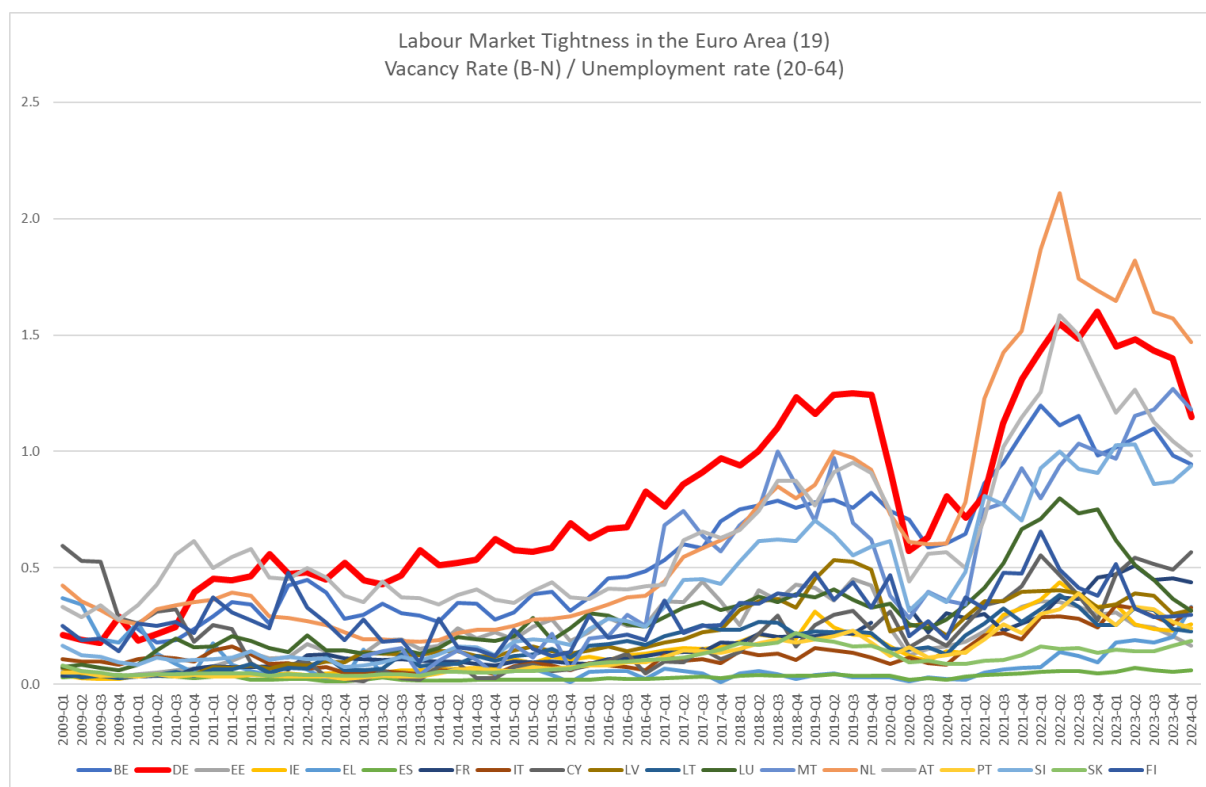
Source: Macrobond (FRED, iea), own calculations

Figure 9: Natural Gas Price (Europe)



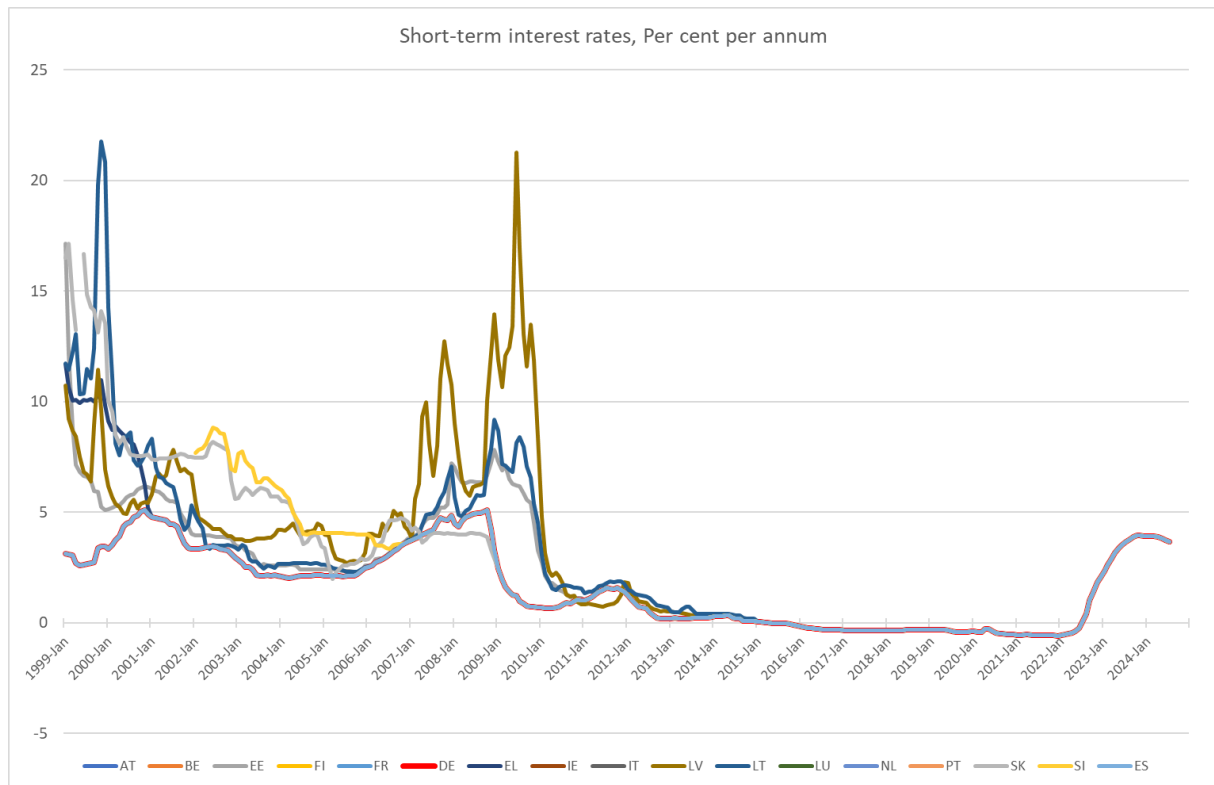
Source: Macrobond (World Bank)

Figure 10: Labour Market Tightness



Source: Eurostat, Own calculations (sparse data before 2009 and none before 2001; Vacancy rate for the business economy B-N, for all firms except for FR, IT and MT only for those with more than 10 employees; Unemployment rate for 20-64 years old; both not seasonally adjusted due to data availability for seas. adj. data.).

Figure 11: Interest rates (Short term)

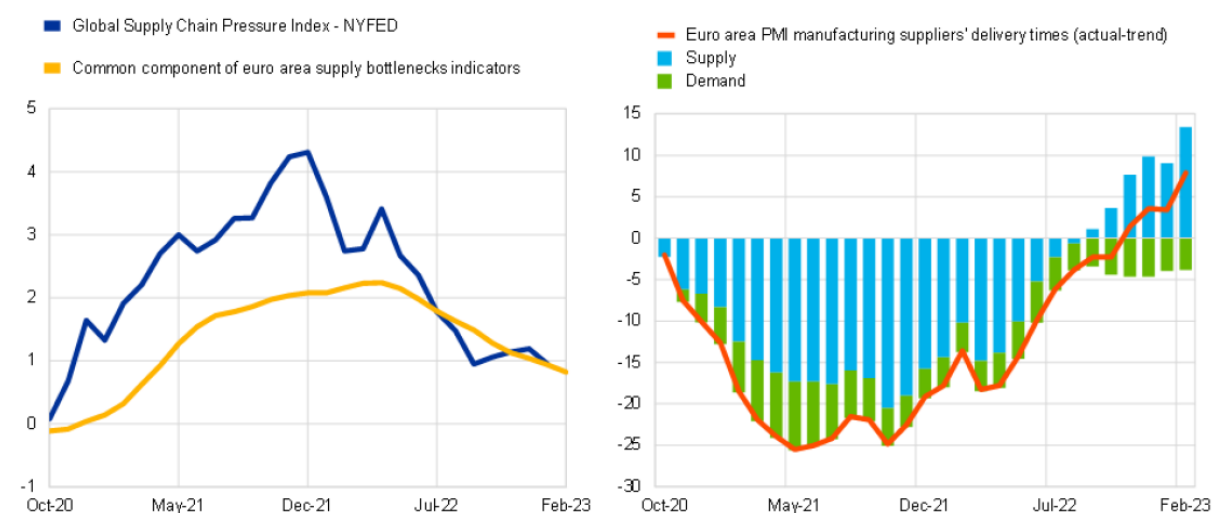


Source: OECD (MEI), monthly data

Table 5: Bivariate correlations between price developments

	CPI, Harmonised (ZCPIH)	Private FCE, price deflator (PCPH)	Domestic Demand, price deflator (PUNT)	Final demand, price deflator (PUTT)	Imports, price deflator (PMGS)	Exports, price deflator (PXGS)	GDP, price deflator (PVGD)	Nominal unit labour costs (PLCD)
ALL 19 EA Countries								
1999-2022	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	93%	85%	84%	67%	68%	77%	23%
D_PCPH	93%	1	93%	87%	65%	65%	85%	24%
D_PUNT	85%	93%	1	91%	67%	65%	90%	23%
D_PUTT	84%	87%	91%	1	85%	89%	85%	15%
D_PMGS	67%	65%	67%	85%	1	92%	49%	4%
D_PXGS	68%	65%	65%	89%	92%	1	62%	4%
D_PVGD	77%	85%	90%	85%	49%	62%	1	22%
D_PLCD	23%	24%	23%	15%	4%	4%	22%	1
1999-2007	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	88%	79%	75%	41%	53%	78%	20%
D_PCPH	88%	1	91%	80%	44%	49%	86%	20%
D_PUNT	79%	91%	1	87%	51%	52%	92%	19%
D_PUTT	75%	80%	87%	1	75%	84%	87%	15%
D_PMGS	41%	44%	51%	75%	1	82%	37%	7%
D_PXGS	53%	49%	52%	84%	82%	1	58%	10%
D_PVGD	78%	86%	92%	87%	37%	58%	1	19%
D_PLCD	20%	20%	19%	15%	7%	10%	19%	1
2007-2010	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	90%	75%	70%	44%	52%	70%	24%
D_PCPH	90%	1	91%	83%	52%	58%	83%	24%
D_PUNT	75%	91%	1	92%	52%	63%	95%	23%
D_PUTT	70%	83%	92%	1	75%	87%	88%	11%
D_PMGS	44%	52%	52%	75%	1	90%	38%	-8%
D_PXGS	52%	58%	63%	87%	90%	1	61%	-5%
D_PVGD	70%	83%	95%	88%	38%	61%	1	22%
D_PLCD	24%	24%	23%	11%	-8%	-5%	22%	1
2011-2019	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	92%	76%	75%	69%	66%	54%	7%
D_PCPH	92%	1	87%	79%	63%	63%	68%	5%
D_PUNT	76%	87%	1	87%	64%	64%	80%	5%
D_PUTT	75%	79%	87%	1	84%	91%	77%	6%
D_PMGS	69%	63%	64%	84%	1	92%	35%	8%
D_PXGS	66%	63%	64%	91%	92%	1	54%	8%
D_PVGD	54%	68%	80%	77%	35%	54%	1	-4%
D_PLCD	7%	5%	5%	6%	8%	8%	-4%	1
2020-2022	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	97%	92%	94%	81%	78%	90%	14%
D_PCPH	97%	1	95%	93%	78%	74%	90%	18%
D_PUNT	92%	95%	1	92%	75%	69%	92%	19%
D_PUTT	94%	93%	92%	1	91%	90%	89%	3%
D_PMGS	81%	78%	75%	91%	1	95%	65%	-9%
D_PXGS	78%	74%	69%	90%	95%	1	68%	-13%
D_PVGD	90%	90%	92%	89%	65%	68%	1	20%
D_PLCD	14%	18%	19%	3%	-9%	-13%	20%	1
ONLY BIG COUNTRIES (14 out of 19)								
1999-2022	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	93%	89%	84%	67%	68%	74%	15%
D_PCPH	93%	1	95%	85%	65%	64%	79%	14%
D_PUNT	89%	95%	1	87%	64%	64%	85%	16%
D_PUTT	84%	85%	87%	1	86%	91%	77%	4%
D_PMGS	67%	65%	64%	86%	1	93%	39%	-2%
D_PXGS	68%	64%	64%	91%	93%	1	53%	-5%
D_PVGD	74%	79%	85%	77%	39%	53%	1	14%
D_PLCD	15%	14%	16%	4%	-2%	-5%	14%	1
1999-2007	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	93%	89%	74%	33%	49%	83%	19%
D_PCPH	93%	1	93%	74%	33%	46%	85%	15%
D_PUNT	89%	93%	1	77%	37%	47%	89%	17%
D_PUTT	74%	74%	77%	1	74%	89%	79%	8%
D_PMGS	33%	33%	37%	74%	1	87%	23%	4%
D_PXGS	49%	46%	47%	89%	87%	1	51%	2%
D_PVGD	83%	85%	89%	79%	23%	51%	1	12%
D_PLCD	19%	15%	17%	8%	4%	2%	12%	1
2007-2010	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	82%	77%	69%	48%	54%	62%	6%
D_PCPH	82%	1	93%	82%	55%	58%	73%	3%
D_PUNT	77%	93%	1	81%	47%	49%	80%	4%
D_PUTT	69%	82%	81%	1	79%	87%	63%	-11%
D_PMGS	48%	55%	47%	79%	1	91%	10%	-17%
D_PXGS	54%	58%	49%	87%	91%	1	30%	-20%
D_PVGD	62%	73%	80%	63%	10%	30%	1	8%
D_PLCD	6%	3%	4%	-11%	-17%	-20%	8%	1
2011-2019	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	90%	69%	68%	68%	62%	32%	13%
D_PCPH	90%	1	85%	73%	63%	57%	48%	10%
D_PUNT	69%	85%	1	82%	58%	56%	70%	14%
D_PUTT	68%	73%	82%	1	82%	90%	68%	8%
D_PMGS	68%	63%	58%	82%	1	93%	21%	7%
D_PXGS	62%	57%	56%	90%	93%	1	42%	7%
D_PVGD	32%	48%	70%	68%	21%	42%	1	0%
D_PLCD	13%	10%	14%	8%	7%	7%	0%	1
2020-2022	D_ZCPIH	D_PCPH	D_PUNT	D_PUTT	D_PMGS	D_PXGS	D_PVGD	D_PLCD
D_ZCPIH	1	95%	95%	93%	85%	79%	83%	-10%
D_PCPH	95%	1	97%	90%	81%	74%	80%	-4%
D_PUNT	95%	97%	1	92%	80%	74%	85%	-3%
D_PUTT	93%	90%	92%	1	93%	93%	85%	-22%
D_PMGS	85%	81%	80%	93%	1	95%	65%	-28%
D_PXGS	79%	74%	74%	93%	95%	1	71%	-33%
D_PVGD	83%	80%	85%	85%	65%	71%	1	1%
D_PLCD	-10%	-4%	-3%	-22%	-28%	-33%	1%	1

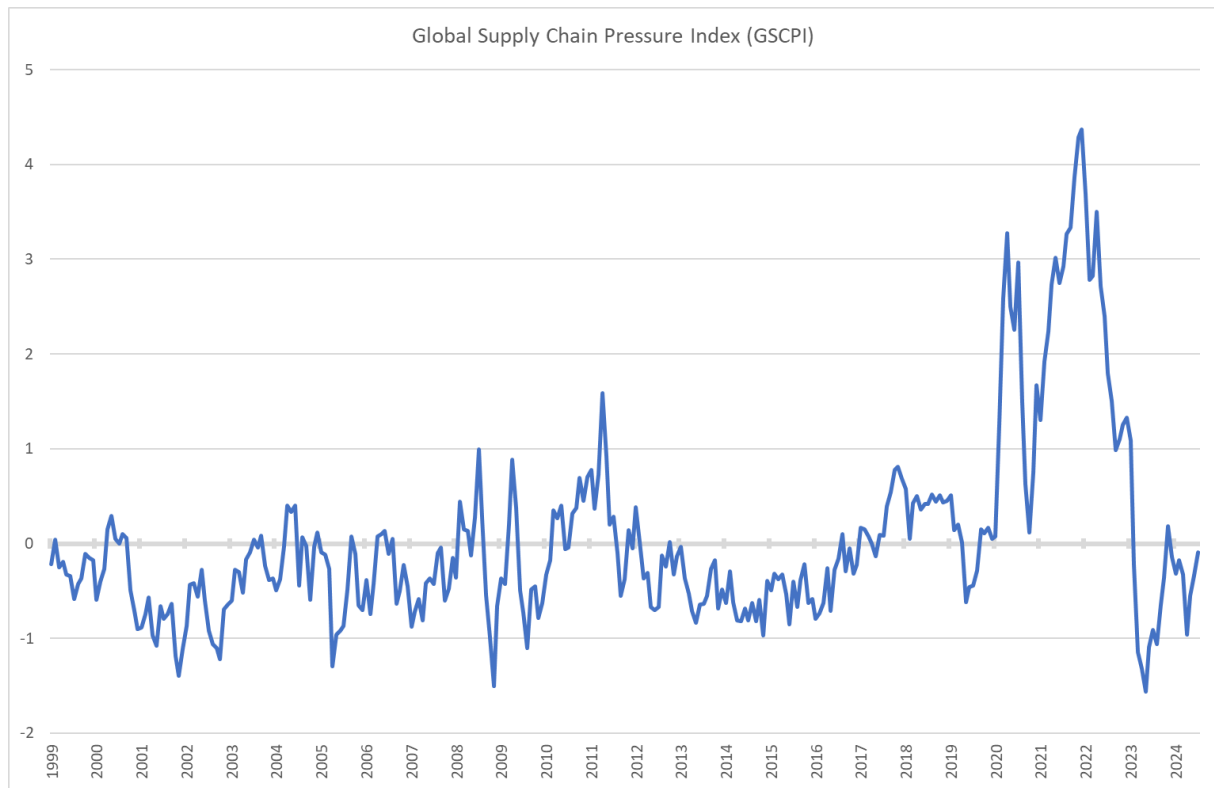
Figure 12: Supply constraints



Source: Lane (2023: Fig. 4). left: standard deviations; right: diffusion index in deviation from trend)

"Federal Reserve Bank of New York (NYFED), S&P Global, Harper Petersen (HARPEX) shipping cost index, European Commission, Eurostat and ECB calculations. Notes: The common component in the left-hand side panel is computed using a dynamic factor model analysis on a range of supply bottlenecks indicators (see "Supply chain bottlenecks in the euro area and the United States: where do we stand?", Economic Bulletin, Issue 2/2022). The SVAR model in the right-hand side panel shows

the contribution of aggregate demand (due to demand and interest rate shocks) and aggregate supply (due to supply-chain disruption, energy and other cost-push shocks) forces (see also De Santis, *Economic Bulletin*, Issue 8/2021). The model is identified using sign and narrative restrictions as in Antolín-Díaz, J. and Rubio-Ramírez, J.F., "Narrative Sign Restrictions for SVARs", *American Economic Review*, Vol. 108, No 10, 2018, pp. 2802-2829. " (Lane 2023)

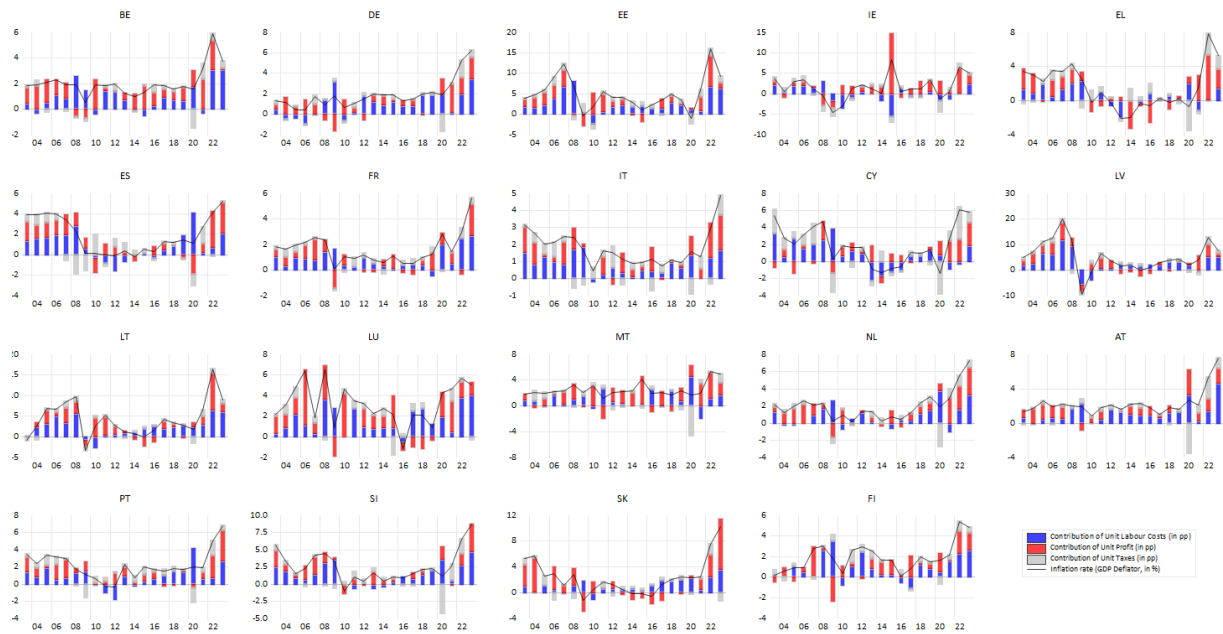


Source: Federal Reserve Bank of New York, Global Supply Chain Pressure Index, <https://www.newyorkfed.org/research/gscpi.html>.

Table 6: Departures from the Wage-Profit-Tax rule (EA19)

		BE	DE	EE	IE	EL	ES	FR	IT	CY	LV	LH	LU	MT	NL	AT	PT	SI	SK	FI
Total																				
1999-2007	ACT	17.5%	7.4%	63.8%	35.4%	26.8%	35.3%	16.9%	22.5%	26.6%	88.0%	27.8%	28.2%	21.1%	23.4%	15.1%	29.9%	45.7%	42.1%	11.8%
	TAR	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%
2008-2013	ACT	7.7%	7.2%	15.8%	-3.1%	1.0%	0.6%	4.1%	6.6%	4.6%	1.1%	8.7%	15.3%	11.2%	4.1%	8.5%	3.4%	5.6%	2.8%	10.7%
	TAR	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%
2014-2019	ACT	8.7%	9.1%	16.2%	15.3%	-0.5%	4.9%	4.5%	4.9%	2.0%	12.6%	12.7%	6.4%	13.0%	8.2%	8.9%	9.1%	8.0%	5.1%	6.2%
	TAR	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%
2020	ACT	1.6%	1.9%	-0.9%	-1.2%	-0.8%	1.1%	2.8%	1.6%	-1.4%	2.1%	1.9%	4.3%	1.7%	1.9%	2.7%	2.0%	1.1%	2.4%	1.6%
	TAR	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
2021	ACT	3.2%	3.0%	6.0%	0.5%	1.5%	2.7%	1.4%	1.3%	2.7%	3.8%	6.5%	4.6%	2.0%	2.9%	2.1%	1.9%	2.7%	2.4%	2.2%
	TAR	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
2022	ACT	5.9%	5.3%	16.1%	6.6%	7.8%	4.1%	2.9%	3.0%	6.1%	12.8%	16.5%	5.7%	5.3%	5.5%	5.3%	5.0%	6.5%	7.5%	5.4%
	TAR	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
2023	ACT	3.8%	6.3%	9.2%	5.1%	5.3%	5.3%	5.7%	4.9%	5.8%	7.7%	8.9%	5.0%	5.0%	7.3%	7.6%	6.8%	8.7%	10.2%	4.8%
	TAR	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Wages																				
1999-2007	ACT	7.2%	-0.5%	23.7%	13.4%	11.7%	14.0%	7.9%	8.8%	14.2%	31.7%	10.3%	11.9%	7.2%	7.7%	2.8%	11.7%	21.1%	9.1%	4.4%
	TAR	8.4%	8.5%	7.3%	6.3%	5.3%	7.9%	8.5%	6.2%	6.8%	6.6%	6.6%	7.9%	7.3%	8.2%	7.8%	7.9%	8.3%	6.3%	7.7%
2008-2013	ACT	4.7%	5.9%	2.5%	-5.9%	0.7%	-2.9%	3.9%	3.0%	4.5%	-6.3%	-1.6%	7.4%	5.1%	3.7%	5.8%	-0.5%	2.4%	2.5%	7.4%
	TAR	5.3%	5.1%	4.8%	4.2%	3.6%	4.9%	5.3%	4.0%	4.8%	4.4%	4.2%	4.8%	4.4%	5.0%	4.8%	4.7%	5.2%	3.7%	5.0%
2014-2019	ACT	2.0%	6.8%	10.6%	-4.8%	1.5%	3.0%	0.9%	2.9%	0.1%	12.6%	12.3%	7.0%	6.0%	2.8%	5.1%	5.2%	5.7%	7.5%	0.7%
	TAR	5.1%	5.3%	4.8%	3.1%	3.6%	4.6%	5.3%	4.0%	4.5%	4.6%	4.4%	4.8%	4.3%	4.9%	4.9%	4.5%	5.0%	4.0%	4.8%
2020	ACT	1.8%	2.0%	1.3%	-1.7%	2.1%	4.1%	2.0%	1.4%	0.7%	2.1%	2.4%	1.9%	4.6%	3.7%	3.3%	4.1%	3.6%	2.3%	0.5%
	TAR	1.0%	1.1%	1.0%	0.6%	0.7%	0.9%	1.0%	0.8%	0.9%	1.0%	0.9%	1.0%	0.9%	1.0%	1.0%	0.9%	1.0%	0.9%	0.9%
2021	ACT	-0.3%	0.2%	0.8%	-1.3%	-1.2%	0.2%	0.6%	0.0%	-0.9%	-0.5%	3.1%	0.5%	-2.0%	-1.0%	0.3%	0.7%	0.5%	0.4%	1.5%
	TAR	1.0%	1.1%	1.0%	0.5%	0.8%	1.0%	1.0%	0.8%	0.9%	1.0%	1.0%	1.0%	0.9%	1.0%	1.0%	1.0%	1.1%	0.9%	0.9%
2022	ACT	3.1%	1.9%	6.9%	0.0%	0.1%	0.7%	2.5%	1.3%	-0.3%	5.3%	6.5%	3.8%	1.2%	1.6%	1.4%	0.7%	2.7%	2.5%	2.3%
	TAR	1.0%	1.1%	1.0%	0.5%	0.8%	1.0%	1.0%	0.8%	0.9%	1.0%	1.0%	1.0%	0.9%	1.0%	1.0%	1.0%	1.1%	0.9%	0.9%
2023	ACT	3.1%	3.4%	6.4%	2.4%	1.4%	2.1%	2.7%	1.7%	1.9%	5.3%	6.0%	4.1%	1.7%	3.2%	4.7%	2.7%	4.6%	3.7%	2.6%
	TAR	1.0%	1.0%	1.0%	0.5%	0.7%	1.0%	1.0%	0.8%	0.8%	0.9%	0.9%	1.0%	0.9%	0.9%	1.0%	0.9%	1.0%	0.9%	0.9%
Profits																				
1999-2007	ACT	9.1%	6.4%	24.2%	15.4%	10.5%	15.0%	7.0%	9.7%	-0.3%	37.1%	16.2%	11.5%	8.0%	11.8%	11.0%	11.5%	16.8%	26.0%	6.7%
	TAR	6.3%	6.5%	7.3%	8.3%	9.5%	7.0%	5.8%	8.3%	7.7%	8.1%	8.1%	6.6%	7.3%	6.6%	6.6%	6.6%	6.0%	8.6%	6.9%
2008-2013	ACT	2.4%	0.3%	9.7%	5.2%	-0.4%	1.8%	-0.9%	1.9%	2.6%	5.9%	10.5%	5.5%	4.9%	0.5%	0.7%	4.0%	1.3%	-0.5%	-0.2%
	TAR	3.9%	4.0%	4.2%	5.0%	5.4%	4.4%	3.6%	4.9%	4.0%	4.8%	5.0%	4.3%	4.5%	4.2%	4.1%	4.2%	3.7%	5.6%	4.0%
2014-2019	ACT	5.4%	1.2%	2.4%	21.5%	-3.5%	1.2%	2.4%	1.9%	1.8%	-2.7%	-1.3%	-0.3%	6.8%	3.7%	3.0%	1.3%	1.8%	-3.7%	4.5%
	TAR	4.1%	3.9%	4.0%	6.3%	5.1%	4.5%	3.5%	4.9%	4.3%	4.4%	4.8%	4.3%	4.8%	4.2%	4.0%	4.3%	3.8%	5.2%	4.0%
2020	ACT	1.3%	1.5%	0.1%	3.0%	0.7%	-1.9%	0.9%	1.1%	1.6%	0.6%	1.0%	2.4%	1.7%	0.9%	2.9%	-0.4%	1.8%	0.2%	1.8%
	TAR	0.8%	0.7%	0.8%	1.3%	1.0%	0.9%	0.7%	0.9%	0.8%	0.8%	0.9%	0.8%	0.9%	0.8%	0.8%	0.8%	0.7%	0.9%	0.8%
2021	ACT	2.4%	2.8%	3.6%	0.8%	3.0%	0.9%	0.8%	0.6%	2.5%	5.4%	2.0%	3.0%	3.5%	3.0%	0.9%	0.8%	-0.2%	1.8%	0.2%
	TAR	0.8%	0.8%	0.8%	1.4%	1.0%	0.8%	0.7%	1.0%	0.9%	0.8%	0.9%	0.8%	1.0%	0.8%	0.8%	0.8%	0.8%	0.9%	0.8%
2022	ACT	2.3%	1.6%	7.4%	6.3%	5.3%	3.6%	-0.3%	2.0%	2.6%	4.8%	8.9%	1.6%	4.0%	2.8%	1.5%	2.7%	1.7%	3.5%	2.2%
	TAR	0.9%	0.8%	0.8%	1.4%	1.0%	0.8%	0.7%	1.0%	0.9%	0.9%	0.9%	0.8%	1.0%	0.9%	0.8%	0.8%	0.7%	0.9%	0.8%
2023	ACT	0.1%	2.1%	1.4%	2.2%	2.3%	3.1%	2.5%	2.1%	2.7%	1.2%	2.1%	1.2%	1.9%	3.3%	1.8%	3.6%	4.1%	7.7%	1.8%
	TAR	0.8%	0.8%	0.8%	1.4%	1.0%	0.8%	0.7%	1.0%	0.9%	0.8%	0.9%	0.8%	1.0%	0.9%	0.8%	0.8%	0.7%	0.9%	0.8%
Taxes																				
1999-2007	ACT	0.5%	1.4%	7.8%	4.3%	2.8%	3.6%	1.3%	2.7%	11.3%	6.0%	-0.1%	2.9%	4.6%	2.7%	0.9%	4.6%	3.7%	3.8%	0.4%
	TAR	1.8%	1.5%	1.8%	1.7%	1.7%	1.6%	2.1%	2.0%	2.0%	1.8%	1.8%	1.9%	1.8%	1.7%	2.0%	2.0%	2.2%	1.6%	1.9%
2008-2013	ACT	0.5%	0.8%	2.9%	-1.4%	0.6%	1.7%	1.1%	1.5%	-2.6%	2.1%	-0.1%	1.8%	0.8%	-0.1%	1.9%	-0.2%	1.8%	0.7%	3.2%
	TAR	1.0%	1.0%	1.2%	0.9%	1.1%	0.8%	1.3%	1.2%	1.4%	0.9%	1.0%	1.1%	1.2%	1.0%	1.3%	1.2%	1.2%	0.9%	1.2%
2014-2019	ACT	1.1%	0.9%	2.6%	-1.4%	1.5%	0.7%	1.2%	0.1%	0.1%	2.8%	1.7%	-0.4%	-0.1%	1.5%	0.6%	2.5%	0.4%	1.4%	0.9%
	TAR	1.0%	1.0%	1.2%	0.9%	1.1%	0.8%	1.3%	1.2%	1.4%	0.9%	1.0%	1.1%	1.2%	1.0%	1.3%	1.2%	1.2%	0.9%	1.2%
2020	ACT	-1.4%	-1.6%	-2.3%	-2.6%	-3.5%	-1.0%	-0.1%	-0.9%	-3.7%	-0.6%	-1.5%	0.0%	-4.6%	-2.6%	-3.5%	-1.7%	-4.3%	-0.2%	-0.6%
	TAR	0.2%	0.2%	0.3%	0.1%	0.3%	0.2%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.2%	0.3%
2021	ACT	1.2%	0.0%	1.5%	0.6%	-0.3%	1.5%	0.1%	0.7%	1.1%	-1.1%	1.5%	1.2%	0.5%	0.9%	0.8%	0.5%	2.3%	0.2%	0.4%
	TAR	0.2%	0.2%	0.2%	0.1%	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
2022	ACT	0.5%	1.7%	1.8%	1.0%	2.5%	-0.1%	0.7%	-0.3%	3.8%	2.7%	1.1%	0.3%	0.0%	1.2%	2.4%	1.6%	2.1%	1.5%	0.9%
	TAR	0.2%	0.2%	0.2%	0.1%	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
2023	ACT	0.6%	0.7%	1.5%	0.6%	1.4%	0.1%	0.5%	1.1%	1.2%	1.1%	0.8%	-0.3%	1.3%	0.7%	1.2%	0.5%	0.0%	-1.2%	0.5%
	TAR	0.2%	0.2%	0.2%	0.1%	0.3%	0.2%	0.3%	0.2%	0.3%	0.2%	0.2%	0.2%	0.1%	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%

Figure 13: Three-Components contribution to GDP-deflator inflation in the EA19



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