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MARKET POWER AND PROFIT MARGINS IN THE EURO AREA COUNTRIES IN THE POST-PANDEMIC PERIOD

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ABSTRACT

The rise in unit profits has been a major factor driving price inflation in the post-pandemic period, in most euro area economies. In the present study, we attempt to analyze the factors behind this rise. One explanation provided by the literature is that the supply bottlenecks observed in the post-pandemic era, facilitated -probably temporarily- the exercise of market power of firms, who then increased their profit margins. In the paper we investigate empirically whether the degree of competition in the markets of the economies, played any role on the extent to which firms raised unit profits. We also test whether the labor market regulations had any effect on the profit margins rise, by keeping labor costs contained. We use annual panel data for the euro area economies for the post pandemic years 2021 and 2022. The econometric results confirm our theoretical hypotheses. The empirical evidence implies that structural features of the product and labor markets of the euro area economies affected price formation at the euro area, at least at the post supply shocks period, thus rendering ECB's monetary policy against inflation less effective.

Disclaimer: The views expressed in this paper are those of the authors and not necessarily those of the Bank of Greece.

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1. Introduction

Inflation has been significantly high in the post-pandemic period in most major economies despite the low growth. This was initially the result of exogenous factors affecting the supply side of the economies: 1) post-pandemic supply chain disruptions, which were exacerbated by geopolitical shocks (i.e. the war in Ukraine) and accompanied by energy price rises and 2) extreme weather events which led to increases in food prices. Central banks responded by tightening monetary policies to fight inflation, but these policies have been much debated (see, *inter alia*, Stiglitz and Regmi, 2022). The continuation of the war in Ukraine, the crises in the Middle East and the Red Sea, and phenomena related to the climate crisis indicate that the global economy is likely to keep on facing new exogenous supply shocks with negative consequences on inflation and growth. From the perspective of macroeconomic targets, it is essential for the monetary authorities to analyze and identify the domestic sources of inflation pressures.

One of the main domestic factors contributing to price rises in the post- pandemic period has been the rise in profit margins, in most advanced economies. For the euro area (EA) countries in particular, the impact of profit margins is widely acknowledged (see, *inter alia*, Arce et al., 2023; OECD, 2023; Hahn, 2023). Prices initially rose because of energy price rises, given that the euro area imports more than half of the energy it uses. Then, supply chain disruptions and the rise in demand due to pent-up demand supported by government measures and increased savings during the pandemic, further pushed prices upward. Producers attempted to protect their profit margins. Firms in certain sectors might have experienced a temporary increase in their market power and increased their margins more than would have been justified by energy price increases.[1] Workers as well would have liked to share their burden by increasing labor remunerations. However, while price adjustments of firms can take place relatively fast, wage increases need a long negotiation process and depend on the bargaining power of the employees.

The rise in profit margins could lead monetary policy tools being less effective at fighting inflation and stabilizing output than they would otherwise be (Eeckhout, 2022;

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[1] Some of them might have done so in order to recuperate previous losses and /or to build buffers in an environment of high uncertainty.

Duval et al., 2021; Akcigit et al., 2021). Also, the higher increases in profit margins than those of unit labour costs imply distributional changes and growing inequality in the societies: capital share increases at the expense of labour income share.[2] In the euro area, profit margins contributed an average of two thirds to the GDP inflation in 2022, compared to one third in the period 1999-2021 (Arce et al., 2023). In some sectors in particular, profits have grown much more than labor costs.[3]

The role of profit margins to the formation of high inflation in the EA in the post-pandemic period has attracted the attention of policy makers, politicians as well as academics. The ECB president Christine Lagarde (2023a) stated that: the EA economies faced a series of overlapping inflationary shocks since the end of the pandemic, which resulted in severe price rises in 2022. To respond, economic agents tried to pass these increases to other actors in the economies. Firms were the first who defended their profit margins and passed on the cost increases to consumers. Firms raised their prices as they faced large common shocks, which acted as an implicit coordination mechanism. Then, as the transmission of the monetary policy became uncertain, interest rates would need to stay high for longer (Lagarde, 2023a). Given the difficulty of consumers to judge whether price increases were caused by higher costs or higher profits, the pass-through on prices turned out faster and stronger. The phenomenon was strengthened by the mismatch between supply and demand (Lagarde, 2023a, 2023b).

Board members of the ECB often stated that firms have been able to keep or even to increase their profit margins, as their pricing power has been higher in the post-pandemic period, which was characterized by demand - supply imbalances (Lane, 2023; Paneta, 2023; Schnabel, 2022, 2023).[4] Lane (2023) in particular, attributes a significant contribution on the inflation acceleration to the strategic pricing of firms.

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[2] After the profit share increases, as observed in most economies, claims for wage increases are expected to follow. To avoid a wage-price spiral, possible wage rises are expected to be absorbed by firms, reducing their profit margins, in a low demand environment.

[3] These sectors are the agricultural and the energy sector (evidence which has been rather expected, as price increases in these sectors took place initially due to supply chain disruptions), but also the contact-intensive sectors (i.e. trade, transport, accommodation, and food services), manufacturing and construction (Arce et al., 2023).

[4] Isabel Schnabel (2022, 2023) stated that on average profits in the euro area have been a key contributor to total domestic inflation in the post-pandemic period, above their historical contribution. Fabio Paneta (2023) emphasized the role of the increase of profit margins on inflation and particularly on prices of specific sectors, fueled by the demand -supply imbalances observed in 2022. Philip Lane (2023) acknowledged that the post pandemic period characterized by the reopening of contact-intense sectors -such as hospitality and entertainment- and the rise in consumers' savings has been the perfect environment for strategic price increases from the side of firms.

Policy makers in many advanced economies intervened in the markets in an effort to control the price strategy of firms, in order to sustain the large rise in profit margins. For example, the US president Biden called the US oil refinery companies to reduce profit margins (Saenz and Klein, 2022; Stevens, 2022), whereas the French government made a deal with major retailers to cap many food prices, in a bid to make inflationary pressures easier to bear for consumers (Ataman, 2023). More recently, the Greek government has monitored and imposed fines in multinational firms which significantly increased their profit margins (Manifava, 2023).

The present analysis is in the spirit of the statement of Blanchard that "inflation is fundamentally the outcome of the distributional conflict between firms, workers and taxpayers" (Blanchard, 2022). We provide evidence that the observed rise in profit margins indicates mainly the exercise of market power by firms, which took the opportunity to raise prices, following the observed supply disruptions and the uncertainty that they created with respect to price formation. In this, we are in line with Capolongo et al., (2023), Weber and Wasner (2023), Junk and Hayes (2023), Stiglitz and Regmi (2022), OECD, (2023). Our evidence supports the view that market power, probably temporary market power as prevailed by the supply conditions, amplified inflation.[5]

We further argue that the extent to which firms can increase margins, is related to the market structure of each economy; specifically, the degree of competition existing in the market. In competitive markets, there is not much room for firms to increase profits. According to the theory, (when all theoretical assumptions hold) perfectly competitive markets are allocative efficient, as output occurs when marginal cost equals average revenue, i.e. price. In a perfectly competitive market, each firm faces a market price equal to its marginal cost (see, *inter alia*, Arrow and Debreu, 1954). Firms are price takers, and they cannot sell their products at prices higher than the marginal cost.

In the more realistic framework of imperfect competition, producers are able to affect prices. They can sell their goods in prices higher than their cost, by accounting for some markup. The extent to which they can sustain prices above the marginal costs,

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[5] We do not argue that corporate profits were the main driver of inflation or/and that dominant firms are to blame for the supply shock. Instead, we support that corporations' market power exacerbated the supply shocks effects on prices.

depends on the market power they possess via the structure of the market they operate.[6] In other words, the structure of the markets and the regulations that administer them, are of great importance for the formation of prices. Recently, trend changes in market power have elicited interest from macroeconomists following a number of studies that document a rise in the market power of firms since 1980 (see, *inter alia*, De Loecker and Eeckhout, 2017). Such changes in firms' market power at the aggregate level have important macroeconomic implications as they could affect the pricing behavior of firms, the labor share, investment, productivity growth and the natural interest rate, thus affecting the effectiveness of monetary policy (Diez et al., 2018; IMF, 2019).[7]

Hayes and Yung (2022) further argue that the higher profit increases relative to wage increases is a matter of the relative bargaining power of the different groups. In what follows, we support the view that profit margins increased more in economies where labor remuneration did not increase much, reflecting the relatively weak bargaining power of workers due to regulatory constraints in the labor markets, in line with Hayes and Yung (2022). In a highly flexible labour market, where hiring and firing costs are very low and there exist many flexible forms of employment, the bargaining power of the employees is quite limited. This argument becomes stronger, if we consider that the labor markets in most EA economies were quite tight during the years under consideration.

In our empirical analysis, we first apply the standard decomposition of the GDP deflator and compute the contribution of each of its different components, profits, labor costs and taxes, on inflation developments. Then we perform simple panel estimations to investigate the relationship between profit margins and (i) the degree of competition in the product markets and (ii) the different regulations in the labor markets in the euro area economies. The coefficients of the structural features of the markets are estimated conditionally on the impact of the aggregate demand on the unit profits inflation.

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[6] The ability of firms to maintain prices above marginal cost has often been termed as market power. For a long time, market power has been of little interest for macroeconomists. In part, this is because macroeconomic models are generally founded on Kaldor's stylized facts, such as a constant labor share, constant profits and a constant capital-to-output ratio. Such models implicitly assume that there are no trend changes in firms' market power (see Praet, 2019).

[7] Recent studies indicate that the increase in market power may even lead to weak worker bargaining power (IMF, 2019) and that firms with high market power are able to suppress wages (Akcigit et al, 2021).

We indicate that the degree of competition plays a key role for the magnitude of the increase of unit profits observed in the EA members, during the period under consideration. Labor market regulations that restrict the bargaining power for employees, as well as the increase in demand further strengthened the role of firms on shaping profit margins and inflation. A policy implication for the governments is to implement structural reforms in order to transform the structural framework of the product market towards liberalization, and to monitor closely the market so as to ensure competition. In cases where the bargaining power of employees is weak due to the regulations of the labor market, we do not propose reforms in the labor market, as such policies would probably cause wage-price spirals with undesirable consequences on inflation and the competitiveness of the economies, in periods of high demand. We rather propose targeted interventions such as the setting of the minimum wage at a certain level, or controlling profits and prices, in order to control inflation when needed.

The remainder of the paper is structured as follows: Section 2 briefly reviews the nascent literature on profits and market power. Section 3 presents the basic model analyzing the determination of profit margins. Section 4 presents the data, computes the variables of interest, and compares their developments in the EA members. Section 5 presents the results of the econometric analysis. The final section summarizes and concludes.

2. Literature review

Seeking to understand the role of profits in amplifying inflationary shocks, a new literature sprung up. Olivier Blanchard (2022) reminded academics and policy makers that inflation is the outcome of the distributional conflict between firms, workers and taxpayers. Blanchard argues that the ideal way to contain inflation would be through an economy-wide bargain between workers, firms and the state, to fix prices and wages.

Joseph Stiglitz (Stiglitz and Regmi, 2022) supported that the post-pandemic inflation is mostly the result of supply side disruptions, especially in the energy and food markets, amplified by the exercise of market power in some sectors.

Hansen et al. (2023) provide evidence indicating that rising corporate profits (which do not necessarily reflect rise in firms' profitability) account for almost half of the inflation's increase in Europe over 2021 and 2022 as companies increased prices by

more than costs of imported energy. Following the increase in profit margins, wages and other labor costs can be expected to rise. They propose ECB's monetary policy to remain tight to anchor expectations and maintain demand. In such an event, for inflation to decelerate, wage increases should be moderate and absorbed by the firms by the compression of their profit shares.

Hahn (2023) indicates how the broadly unchanged mark-ups contribute largely to price inflation. Price changes arise from both marginal costs and the mark-up. Constant mark-ups indicate an unchanged pricing strategy by the firms. When costs increases are high, even an unchanged pricing strategy would lead to a large contribution from unit profits to inflation. However, the mark-ups should decline if unit profits are to remain unchanged in the event of an input cost shock. In line with Hahn (2023), Colonna et al (2023) show that profit shares can increase even if markups remain constant, i.e., the pricing strategy of the firm does not change. This can occur when intermediate input costs grow faster than labor costs and input substitutability is limited.

Capolongo et al. (2023) attribute the surge in profits and profit margins mainly to the firms' pricing power, which was increased by a generally visible supply shock and high uncertainty about the overall magnitude of the energy shortages. Domestic demand, prolonged by pent-up demand after the pandemic and supported by government fiscal measures also contributed to the rise in profits.

Weber and Wasner (2023) argue that the post-pandemic inflation episode derives from microeconomic origins, namely the ability of firms with market power to increase prices. Their main argument is that: rising prices in significant sectors due to excess demand provide an impulse for further increases. This upward pressure is then amplified to all sectors and eventually to wages responses. They propose price controls for systemically significant sectors.

OECD (2023) also reports that firms which have more market power or operate in non-tradeable sectors are more likely to be able to increase prices. By contrast, firms operating in more competitive markets may have to absorb wage increases by reducing profits.

Akcigit et al. (2021) indicate that corporate market power has increased significantly in advanced economies since the early 1980s. The increase is concentrated among a small group of firms whose market power is increasingly entrenched, and has

been accompanied by a broad-based decline in business dynamism, including a falling share of economic activity accounted for by young firms. The increase in mergers and acquisitions by dominant firms has contributed to rising market power.

Eeckhout (2022) documents the rise in market power showing that mark-ups have increased by about 40% globally since 1980. The rise in dominant firms exerting monopoly power has a direct effect on customers who pay higher prices, but it also has implications for the macroeconomy. Widespread market power leads to wage stagnation and a decline in the labor share, increases wage inequality, slows down business dynamism, reduces the number of startup firms and lowers innovation. These findings suggest that competition authorities should be vigilant and actively enforce prohibitions against the abuse of dominant positions. Taxing profits would help redistribute money that is concentrated in the hands of those who own the firms to those whose wages have stagnated. Finally, an independent international competition authority could apply best-practice guidelines towards a pro-competitive policy that reduces market power and creates competitive markets.

Hayes and Jung (2022) state that inflation is the outcome of the bargain between workers and firms and maintain that the higher profit increases relative to wage increases is a matter of the relative bargaining power of the different groups. In the economies where wages did not increase, despite the tightness of the labor market, firms had the opportunity to raise profits more than in those who witnessed wage rises. They underline the importance of the bargaining power of workers on the formation of unit profits.

Jung and Hayes (2023) carry out detailed firm-level analysis to explore the surge of 'excess profits', with a focus on companies listed on the major stock market exchanges of five large economies and provide evidence that average profitability increased after the pandemic. They give four possible explanations for rising profits: First, the firms pass on the costs from the energy shock amid sufficiently strong demand such that markups can stay constant. Second, companies can find themselves suddenly being akin to a monopolist due to supply bottlenecks (an argument in line with Weber and Wasner, 2023). Third, natural monopolies in certain sectors (i.e. energy transmission and distribution) have high degrees of market power allowing windfall profits. Fourth, the increase in market power witnessed over the last thirty years could have made inflation more persistent. Regarding policy, they claim that there is need for

a global approach towards taxing excess profits. Competition policy should also be directed towards setting the rules of the game before any anti-competitive behavior happens.

3. The theoretical model

The variables

The role of profits in domestic price pressures is typically analyzed in the national account framework exploiting the GDP accounting identity from the income side (see, for instance, Hansen et al., 2023; Arce et al., 2023; Hahn, 2023; OECD, 2023). The income-side approach shows how GDP is distributed among different participants in the production process. It is defined as the sum of the gross value added (GVA) and net taxes (taxes on production and imports less subsidies on production):

GDP = GVA + Net Taxes   (1)

GVA is the sum of gross operating surplus, mixed income, and compensation of employees. Gross operating surplus is the surplus (or deficit) on production activities before account has been taken of the interest, rents or charges paid or received for the use of assets. Mixed income is the remuneration for the work carried out by the owner of an unincorporated enterprise:

GDP = Gross Oper. Surplus + Mixed income + Compensation Employees + Net Taxes   (2)

National accounts define nominal profits as gross operating surplus and mixed income, so (2) becomes:

GDP = Profits + Compensation of Employees + Net Taxes   (3)

From (3) it follows that changes in the GDP deflator (nominal GDP divided by real GDP, GDP_r) are reflected to profits per unit of real GDP (unit profits), compensation of employees per unit of real GDP (unit labour cost), and taxes on production net of subsidies per unit of real GDP (unit taxes):

$\frac{GDP}{GDPr}$ = GDP Deflator = Unit Profits + Unit Labour Cost + Unit Taxes   (4)

The model

In line with the studies mentioned above, the present study assesses a set of potential determinant variables that may influence the unit profits. The variables are classified into three broad categories accounting for the effects of (i) the product market competition conditions, (ii) regulations relating to labor market flexibility regulations and (iii) demand. More specifically: (i) The structure of the product market (Market Structure, MS) implies different degree of market power of the firms who are active in an economy. The less oligopolistic is a market, the lower is the power of the enterprises, who would like to set prices in such a way that increases their profits (see, Weber and Wasner, 2023). (ii) The labor market flexibility as measured by alternative employment protection legislation (EPL) indices implies different levels of bargaining power for the employees. The more flexible is the labor market, the less powerful are workers who would like to minimize the burden of cost increases (Jung and Hayes, 2023). (iii) Domestic demand (D) prolonged by pent-up demand and supported by fiscal measures and increased savings, also contributed to the surge in profits.

The dependent variable in the study is the pattern of the unit profits (UP) of the EA economies in the years 2021-2022. The independent variables in the estimation include the alternative MS and EPL indices, and the variables capturing demand growth. The estimation model is as follows:

$$\text{Log(UP)}_{it} = \beta_1 + \beta_{2k} \text{Log (MS}_k)_{it} + \beta_{3\,k} \text{Log(EPL}_k)_{it} + \beta_{4\,k} \Delta\text{Log(D}_k)_{it-1} + e_{it} \quad (5)$$

where, UP is the unit profit for country i at time t. MS_k stands for any of the two available competitiveness indicators (k takes the values 1 or 2) for country i at time t. EPL_k stands for any of the two employment protection legislation indices for country i at time t. D_k stands for any of the two demand variables for country i at time t, and is included with a lag to account for the effects of increased demand which are assumed to determine prices with the hysteresis of one period. Δ is the difference operator and e_{it} is the error term over time t.

4. The data – some stylized facts

The dataset

The data set consists of yearly observations for the period 2020-2022 for the twenty EA countries when available. The required data set for the macroeconomic

variables which are necessary for the calculation of the variables of interest (the unit profits, the unit labor costs and the unit taxes) are obtained from the national accounts NA data series of the Eurostat for the EA economies and the EA as a whole.

The indices describing the market conditions are obtained by the World Economic Forum (2019).[8] Two main indexes for market structure are used alternatively in the specifications: The domestic market competitiveness index MS1 is the broader index available, which measures the competition conditions of the whole domestic economy: it measures the degree of competition in the corporate sector and in the provided services in the economy and also considers the extent to which fiscal policy measures (taxes and subsidies) distort competition. The market dominance index MS2 indicates the extent to which the corporate activity is dominated by a few business groups. In both indices low values indicate oligopolistic structure.

The indices indicating labor market flexibility are obtained from the employment protection legislation series of the OECD, 2020.[9] They cover mainly the employers' hiring and firing costs and take account of national and sectoral collective bargaining agreements. Two indicators are assumed to be representative for the labor market flexibility and are used on the specifications: EPL1 accounts for the hiring procedures of temporary workers. EPL2 entails assessments based on (i) the hiring terms and conditions of workers and (ii) the firing processes of temporary workers, such as the notification procedures for the end of contract, the severance payments, the dismissals processes, etc. It is constructed with the most updated methodology based on a broad number of sub-indices. The lower the value of the indices, the more flexible the labor market is. The MS and EPL indexes are not available for the economies of Cyprus, Croatia and Malta, so these three countries are not included in the sample.

The effect of the increase in demand is approximated by the gross domestic product (GDP) growth and the private consumption (PC) growth. The data series are extracted from the eurostat NA database.

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[8] See World Economic Forum, The Global Competitiveness Index 4.0 (2019).
[9] See OECD (2020), "Recent trends in employment protection legislation", in *OECD Employment Outlook 2020: Worker Security and the COVID-19 Crisis*, OECD Publishing, Paris.

Stylized facts. The inflation components

The components of the GDP deflators, unit profits, unit labour cost, and unit taxes are computed for the EA as a whole, and all EA members, using the definitions presented in identity (4). In the euro area, domestic price pressures, captured by changes in GDP deflator, increased strongly in 2021 and picked up further in 2022 with all components, unit profits, unit labor costs and unit taxes making a significant positive contribution (Figure 1). More specifically, the GDP deflator increased by 2.2% in 2021 largely due to the positive contribution of unit profits (1.8 pp). It accelerated to 4.6% in 2022 mainly due to a strong positive effect of unit profits (2.0 pp) and unit labor costs (1.7 pp). Unit taxes growth contributed by 0.9 pp.

The phenomenon of the contemporaneous large increases in both unit profits and unit labor costs, is quite unusual as an increase in one often is absorbed by a fall in the other. This indicates workers' and firms' strong reactions to energy and input cost pressures and shows that their intention to offset real income losses became a driver for higher inflation (Arce et al., 2023). Unit profits contributed the largest share of the increase showing that firms have managed to pass on cost shocks associated with the surge in energy and other intermediate production prices to final prices.[10] As regards the contribution of unit taxes, while it is usually stable and small, it was, in most countries, strong and negative in 2020 and has been quite high following the Covid-19 shock reflecting the gradual withdrawal of fiscal measures taken in the context of the pandemic. The same pattern characterizes the GDP deflator developments in most EA economies (see Figure A1 in the Appendix). However, there exists a large degree of heterogeneity among the different economies.

Figure 2 presents the average contribution of unit profits, unit labor costs and unit taxes for the post-pandemic years 2021 and 2022 for each economy. Unit profits contributed the most to inflation (compared to labor costs and taxes) in most EA countries.

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[10] This has likely been possible due to the confluence of post-pandemic pent-up demand, supply bottlenecks and imperfect substitutability between production inputs, which rendered demand relatively price inelastic.
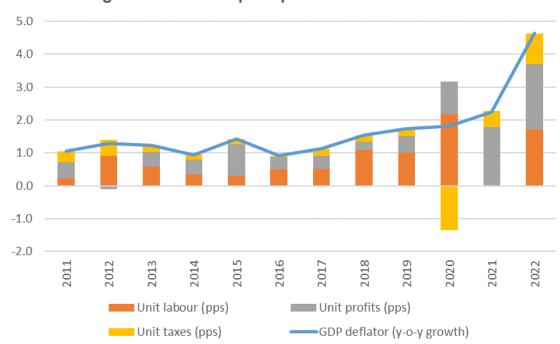
Figure 1: Domestic price pressures in the euro area
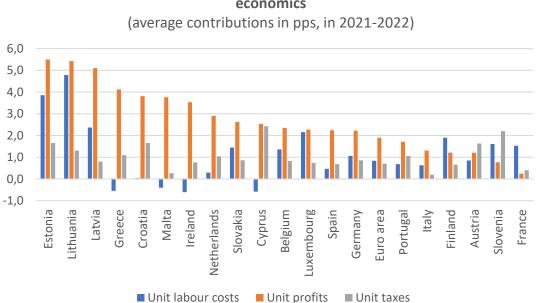

Source: Eurostat and author estimations

Figure 2: Unit profits, Unit labour costs and Unit taxes in the EA economics
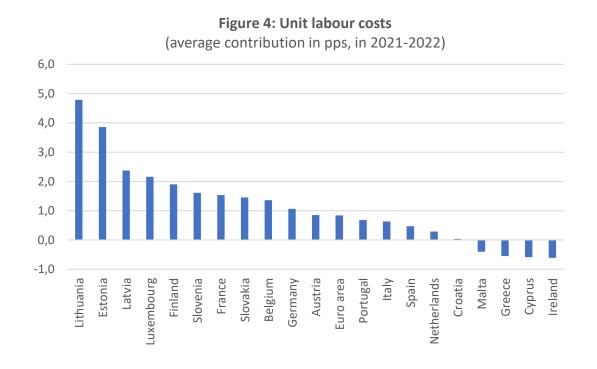(average contributions in pps, in 2021-2022)

Source: Eurostat and author estimations

Unit profits had a positive contribution in all EA economies, although not to the same degree, as shown in Figure 3. High contributions of unit profits are observed in the Baltic countries, who also experienced very high inflation rates, probably because

of the significant dependence of these economies on imported energy and the high uncertainty caused by the Ukrainian war. The lowest contribution is observed in France.

Figure 3: Unit profits
(average contribution in pps, in 2021-2022)

Source: Eurostat and author estimations

Figure 4: Unit labour costs
(average contribution in pps, in 2021-2022)

Source: Eurostat and author estimations

The contribution of unit labor costs to domestic price pressures has been lower compared to unit profits in most economies (in all economies excluding Finland, France and Slovenia), (see Figure 2). They had a limited impact on inflation in Croatia, the Netherlands and Spain; in fact, they had a negative contribution to GDP deflator in Malta, Greece, Cyprus and Ireland (see Figure 4). This probably reflects higher stickiness of wages relative to prices, possibly a result of the low bargaining power of employees and the long negotiation needed for wage increases.
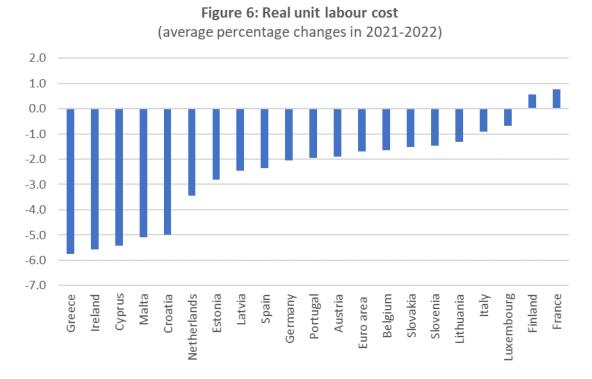
Figure 5: Unit taxes
(average contribution in pps, in 2021-2022)

Source: Eurostat and author estimations

The positive unit taxes contributions reflect the pandemic-related subsidies and tax rate decreases that gradually phased out, as well as the changes that occurred in the composition of private consumption in the post pandemic years. It should be noted that subsidies and tax rate changes were applied mainly to the food and energy products. These products, whose prices rose due to the exogenous supply shocks in 2021 and 2022, make up a significant share of the basket of the representative consumer, and their demand is quite inelastic. The different impact of fiscal policy measures in the EA economies is clearly illustrated in Figure 5, with the highest contribution of unit taxes to GDP deflator registered in Cyprus and Slovenia and the lowest in Italy and Malta. Fiscal authorities should measure regularly and consider the effects of indirect taxation

of particular goods on prices. They should reconsider their tax rates especially when they target inflation and competitiveness.

Figure 6: Real unit labour cost
(average percentage changes in 2021-2022)

Source: Eurostat and author estimations

The higher rises in unit profits than those in the unit labor costs imply that the labor share, which is defined as the part of national income allocated to labor remuneration, fell in most countries. Changes in the real unit labour costs reflect the labour share changes. As depicted in Figure 6, the labour shares fell in all EA countries except for France and Finland. The largest falls are observed in Greece, Ireland, and Cyprus.

The structure of the product and labor markets

The conditions in the product market structure are depicted in Figure 7, where the economies are classified based on the MS1 (domestic competitiveness) index. The most competitive markets are those in the Netherlands, Luxemburg, and Germany. At the other end, the markets in Greece and the Slovak Republic seem to be governed by quite oligopolistic conditions.

Figure 7: Domestic Competition in the EA economies

Source: WEF, 2019

Figure 8: Labour market flexibility
(as indicated by the EPL1 and EPL2 idexes)

Source: OECD, 2021

In Figure 8, the labor markets of the EA economies are classified by their flexibility, as indicated by the indexes EPL1 and EPL2. According to both indices, the most flexible market is that of Ireland; the least flexible is that of Luxemburg.

5. Empirical results

As mentioned, we use panel data estimation methods. The panel least squares method provides consistent and efficient estimates of the parameters β_is. An additional advantage with panel data methods is that they allow to test and relax some of the assumptions, thus allowing for greater flexibility in modeling differences in the behavior across the different groups (countries). A panel data set of N x T dimension essentially refers to samples of the same N cross-sectional units observed at multiple T time points. In the present case, the data set entails cross section observations of seventeen EA economies (N=17) for the two post-pandemic years 2021 and 2022 (T=2).

Three different panel data methods are usually applied in the literature: the panel least squares method (or common constant method), the fixed effects method, and the random effects method. The panel least squares method presents results under the principal assumption that there are no differences among the data matrices of the cross-sectional dimension N. In other words, the method estimates a common constant for all cross-sections, assuming that there are no differences between the estimated cross sections. The fixed effects method treats the constant as section-specific, i.e. it allows for different constants for each cross-section. The random effects method assumes no common constant but handles the constants for each section as random parameters rather than fixed. The fixed effects method requires a relatively large number of time series observations, so that all the N different parameters for the constants can be estimated (T>N), whereas with the random effects model, there are fewer parameters to be estimated.[11]

In the present study the fixed effects method cannot be applied, because of the short time observations length (T=2) relative to the cross-section dimension (N=17) [T<N]. The study therefore applies the common constant and random effects methods to analyze the robustness of parameter coefficient in explaining the factors that determine the unit profits in the EA countries. The random effects method seems to be

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[11] Generally, in the panel data analysis, the fixed effects model assumes that each country differs in its intercept term, whereas the random effects model assumes that each country differs in its error term. When the panel is balanced (i.e., contains all existing cross-sectional data), one might expect fixed effects model to work well. Otherwise, the random effect method will be more appropriate when the sample contains limited observations of the cross-sectional units.

the appropriate method to be applied in the present work, because it is unrealistic to assume that all the estimated constant parameters in the relationships will be equal.

A large number of specifications are performed using the two panel estimation techniques. Their results are presented in tables A.1 and A.2 in the Appendix. The results of selected statistically well-specified models are presented in Tables 1 and 2. The selection adopted the General to Specific methodology (Hendry, 1995) and was based on statistical criteria as well as on the economic significance of the models. The results of the random effects estimation are presented in Table 1; while the results of the common constant technique are reported in Table 2. In the tables, small letters refer to logs of the respective variables. All models presented have a quite general specification as they contain at least one variable which accounts for the economic significance of the product market structure, the labor market flexibility and the demand increase in forming unit profits. The results of both techniques are similar, in terms of their economic intuition. However, given that the random effects method seems to be the appropriate one for the present work, the discussion and analysis is based on the results provided by the random effects method in Table 1.

Table 1: Structural characteristics in the product and labour markets, and unit profits

Random effects estimation. Time period: 2021-2022								
Dependent variable: up								
Models	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**
C	1.697*	1.551*	1.703	1.540	0.336	0.377	0.287	0.332
	(-1.931)	(-1.833)	(-1.346)	(-1.306)	(-0.536)	(-0.614)	(-0.335)	(-0.412)
ms1	-0.54**	-0.512**	-0.536*	-0.502*				
	(-2.573)	(-2.505)	(-1.767)	(-1.763)				
ms2					-0.221	-0.232*	-0.201	-0.214
					(-1.433)	(-1.651)	(-0.958)	(-1.080)
epl1	-0.208*		-0.235**		-0.17**		-0.203*	
	(-2.764)		(-2.182)		(-2.096)		(-1.783)	
epl2		-0.227**		-0.25**		-0.213**		-0.244**
		(-3.176)		(-2.608)		(-2.640)		(-2.314)
Δgdp(-1)	0.598**	0.595**			0.587**	0.583**		
	(-4.829)	(-4.806)			(-4.734)	(-4.701)		
Δpc(-1)			0.491**	0.493**			0.491**	0.491**
			(-4.857)	(-4.877)			(-4.847)	(-4.859)
Cross sections	17	17	17	17	17	17	17	17
Observations	34	34	34	34	34	34	34	34
R^2	0.494	0.520	0.513	0.531	0.453	0.485	0.489	0.510
Adj R^2	0.443	0.472	0.464	0.484	0.398	0.434	0.438	0.461
F-Stat	9.747	10.815	10.528	11.319	8.273	9.425	9.559	10.398

Notes: t-statistics in parentheses; *: significant at 10% level ; **: significant at 5% level.

Models 1.1-1.4 and 1.6 are the statistically most robust models, as they contain explanatory variables which are all statistically significant when tested either individually (at a 5% or 10% significance level, as indicated by the t-statistics) or jointly (as indicated by the F-tests) and enter with the expected signs. Four out of the five models, (models 1.1-1.4) contain the indicator ms1 as explanatory variable; ms1 enters the equations with the expected negative sign, indicating that as the market becomes more oligopolistic, unit profits tend to rise. This variable also seems to exert a large impact on the formation of unit profits as it enters with quite high magnitudes in all four specifications. Labor market conditions as measured by the EPL indicators also play a critical role in unit profit formation. High flexibility in the labor market implies weak bargaining power of workers, which facilitates unit profit increases. Both EPL indicators turn out significant in all five specifications at a 5% significance level. They enter with the expected negative sign and quite reasonable magnitudes. The demand

effects turn out significant at a 5% level, no matter which variable is used (GDP or private consumption) suggesting that, as expected, rising demand leads to higher unit profits in the period under consideration.

Table 2: Structural characteristics in the product and the labour markets, and the unit profits

Panel least squares estimation. Time period: 2021-2022								
Dependent variable: up								
Models	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**	**2.7**	**2.8**
C	1.646**	1.517**	1.706**	1.537*	0.289	0.335	0.297	0.335
	(2.134)	(2.083)	(1.991)	(1.921)	(0.548)	(0.667)	(0.509)	(0.609)
ms1	-0.53**	-0.50**	-0.53**	-0.50**				
	(-2.892)	(-2.885)	(-2.613)	(-2.593)				
ms2					-0.214*	-0.225*	-0.203	-0.214
					(-1.657)	(-1.832)	(-1.418)	(-1.587)
epl1	-0.19**		-0.23**		-0.15**		-0.20**	
	(-2.819)		(-3.226)		(-2.192)		(-2.633)	
epl2		-0.21**		-0.26**		-0.19**		-0.24**
		(-3.336)		(-3.846)		(-2.910)		(-3.422)
$\Delta gdp(-1)$	0.988**	0.947**			0.994**	0.936**		
	(3.117)	(3.104)			(2.897)	(2.857)		
$\Delta pc(-1)$			0.472	0.511*			0.449	0.480
			(1.484)	(1.691)			(1.305)	(1.481)
Cross sections	17	17	17	17	17	17	17	17
Observations	34	34	34	34	34	34	34	34
R^2	0.487	0.527	0.368	0.429	0.399	0.456	0.272	0.356
Adj R^2	0.436	0.480	0.304	0.372	0.339	0.402	0.200	0.291
F-Statistic	9.501	11.139	5.812	7.527	6.645	8.397	3.744	5.521

Notes: t-statistics in parentheses; *: significant at 10% level ; **: significant at 5% level.

The most robust specification based on statistical criteria (t-stats, F-stat, R^2) turns out to be specification 1.4. It indicates that the degree of competition in an economy plays an important role in the formation of unit profits, i.e. a more competitive economy implies lower unit profits. According to the estimated coefficient, measures towards enhancing market competition which would lead to an increase of the index by 1% would result in a fall of unit profits by 0.5%. Labor market flexibility exerts a lower but critical impact on unit profits: an increase in flexibility by 1% would lead to an increase in unit profits by 0.25%. Private consumption also supports unit profits with the hysteresis of one period. The results, thus, verify the theoretical assumptions.

6. Conclusions

Inflation has been significantly high in the post-pandemic period in all euro area economies, initially caused by exogenous factors such as the post-pandemic supply chain disruptions and geopolitical shocks. The expected continuation of geopolitical crises and phenomena related to the climate crisis indicate that the EA economies are likely to keep on facing exogenous supply shocks in the near future, with negative consequences on inflation and growth. It is then essential for policy makers to analyze and identify which are the domestic forces of inflation pressures for the monetary policy to be well targeted, timely and effective.

One of the main domestic factors contributing to inflation in the EA in the post-pandemic period has been the rise in profit margins. In the present paper we support the view that the observed rise in unit profits indicates mainly the exercise of market power by firms, who took the opportunity to raise prices, following the observed supply shortages and the uncertainty that these created with respect to price formation. We further argue that the degree that firms could increase profits, is related to the degree of competition existing in the markets of each economy. We also claim that profit margins increased more in economies where labor remuneration did not increase much, a result of the workers' bargaining power being relatively weak, because of the regulations holding in the labor markets.

The technical work indicates that the contribution of unit profits has been larger than that of unit labor costs in most countries. In the econometric analysis, we perform simple panel estimations to investigate the relationship between profit margins and the degree of competition in the product markets and the different regulations in the labor markets. The empirical evidence indicates that the degree of competition played a key role for the magnitude of the increase of the profit margins observed in the EA members. Labor market regulations implying restricted bargaining power for employees also strengthened the role of firms on shaping profit margins and inflation.

The empirical work indicates that in times of supply side shocks the ECB's monetary policy becomes less effective and thus the ECB should regularly measure and evaluate the strength of the transmission of the monetary policy. Additionally, the ECB should establish and monitor standardized excess profit metrics and develop theoretical models that can capture the contribution of profits on amplifying shocks. The ECB

should further incorporate the information obtained by such models in the econometric methodologies and models used for simulations and forecasting.

From the side of the state, a range of policies could be used to tackle the drivers behind excess profits, especially in economies where the bargaining power of employees is weak. Such policies should comprise: the strengthening of competition laws towards prohibition of businesses from engaging in anticompetitive behavior. This strengthening of competition policies could take place (i) by making adjustments to existing policy frameworks, (ii) by introducing a number of structural reforms in order to transform the structural framework of the product market towards liberalization and (iii) by introducing novel forward-looking competition policies in certain sectors of the economies. These policies should be accompanied by thorough monitoring of the product market, with the aim to prevent actions (e.g. mergers and acquisitions) that would lead to high market concentration in certain sectors.

The state policies should also comprise: the close monitoring of the market so as to prevent strategies violating competition in the price making. In case of high inflation, the policies should involve targeted interventions to control prices and profits to contain inflation, such as price caps. Cooperation of national competition authorities (including by sharing more information with one another) in cross-border issues, such as a merge of two multinational firms is also important.

In cases where the bargaining power of employees is weak due to the regulations of the labor market, the authorities should not reform the labor markets, as such reforms would probably lead to wage-price spirals with undesirable results on inflation and the competitiveness of the economies in periods of increased demand. They should rather interfere with targeted policies such as setting the minimum wage at the adequate for the economy level or controlling profits and prices directly to contain inflation, when needed.

Overall, there is a need to understand competition policy as an instrument for facilitating the effectiveness of the monetary and fiscal policies towards stabilization, and not merely as a tool to microeconomic inefficiencies.

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APPENDIX

Table A1: Structural characteristics in the product and the labour markets, and the unit profits

Models	A1.1	A1.2	A1.3	A1.4	A1.5	A1.6	A1.7	A1.8	A1.9	A1.10	A1.11
Random effects estimations. Time period: 2021-2022											
Dependent variable: up											
C	1.605*	1.120	0.235	-0.529**	-0.540**	-0.705**	-0.697**	1.776	1.606	0.405	0.447
	(-1.867)	(1.186)	(0.266)	(-5.309)	(-6.969)	(-27.711)	(-18.384)	(1.457)	(1.404)	(0.491)	(0.576)
ms1	-0.599	-0.443**						-0.555*	-0.520*		
	(-1.566)	(-1.929)						(-1.897)	(-1.879)		
ms2	0.056		-0.231							-0.231	-0.243
	(-0.226)		(-1.060)							(-1.140)	(-1.276)
epl1	0.023			-0.202*				-0.235**		-0.202*	
	(-0.125)			(-1.823)				(-2.266)		(-1.841)	
epl2	-0.179				-0.237**				-0.256**		-0.241**
	(-0.778)				(-2.283)				(-2.650)		(-2.364)
Δgdp(-1)	2.056**					0.609**					
	(-3.043)					(4.928)					
Δpc(-1)	-1.119*						0.492**				
	(-1.811)						(-4.872)				
Cross sections	17	17	17	17	17	17	17	17	17	17	17
Observations	34	34	34	34	34	34	34	34	34	34	34
R^2	0.591	0.104	0.034	0.094	0.140	0.353	0.434	0.195	0.237	0.131	0.185
Adj R^2	0.499	0.076	0.004	0.066	0.113	0.333	0.416	0.143	0.188	0.075	0.133
F-Statistic	6.475	3.720	1.123	3.324	5.211	17.458	24.492	3.749	4.810	2.345	3.528

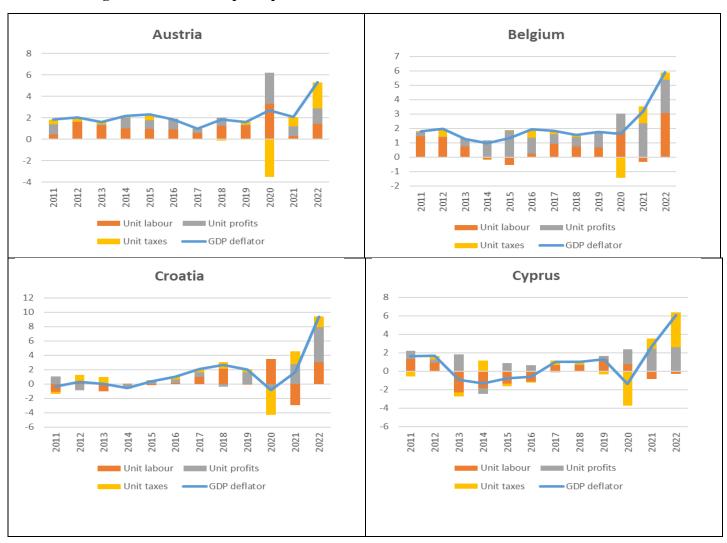Notes: t-statistics in parentheses; *: significant at 10% level ; **: significant at 5% level.

Table A2: Structural characteristics in the product and the labour markets, and the unit profits

Panel least squares estimations. Time period: 2021-2022

Dependent variable: up

Models	A2.1	A2.2	A2.3	A2.4	A2.5	A2.6	A2.7	A2.8	A2.9	A2.10	A2.11
C	1.608	1.119	0.235	-0.529**	-0.540**	-0.711**	-0.697**	1.776**	1.606*	0.405	0.447
	(1.522)	(1.167)	(0.372)	(-7.377)	(-9.636)	(-29.847)	(-18.385)	(2.038)	(1.952)	(0.691)	(0.806)
ms1	-0.655	-0.443*						-0.554**	-0.520**		
	(-1,402)	(-1.898)						(-2.652)	(-2.613)		
ms2	0.129		-0.231							-0.231	-0.243*
	(0.403)		(-1.481)							(-1.607)	(-1.786)
epl1	0.098			-0.202**				-0.235**		-0.202**	
	(-0.343)			(-2.533)				(-3.169)		(-2.595)	
epl2	-0.333				-0.237**				-0.256**		-0.241**
	(-1,221)				(-3.156)				(-3.686)		(-3.310)
$\Delta gdp(-1)$	0.405					1.181**					
	(-1.214)					(3.260)					
$\Delta pc(-1)$	0.171						0.493**				
	(0.592)						(4.873)				
Cross sections	17	17	17	17	17	17	17	17	17	17	17
Observations	34	34	34	34	34	34	34	34	34	34	34
R^2	0.5321	0.101	0.064	0.167	0.237	0.249	0.434	0.321	0.375	0.231	0.309
Adj R^2	0.428	0.073	0.035	0.141	0.214	0.226	0.416	0.277	0.335	0.182	0.264
F-Statistic	5.116	3.603	2.193	6.418	9.963	10.629	24.492	7.333	9.302	4.659	6.917

Notes: t-statistics in parentheses; *: significant at 10% level ; **: significant at 5% level.

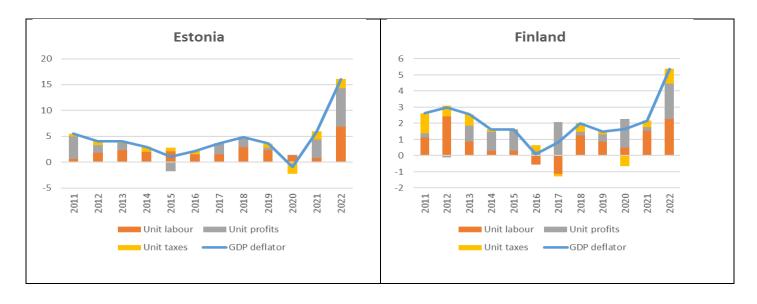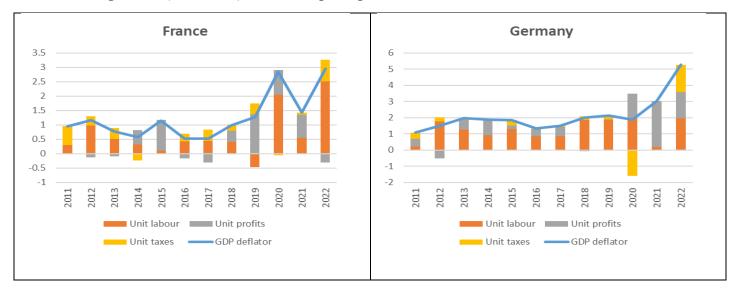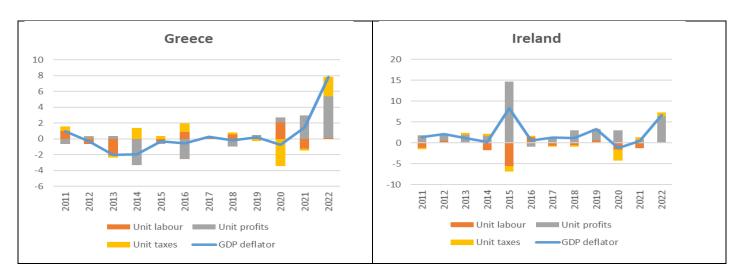**Figure A1: Domestic price pressures in the euro area economies**

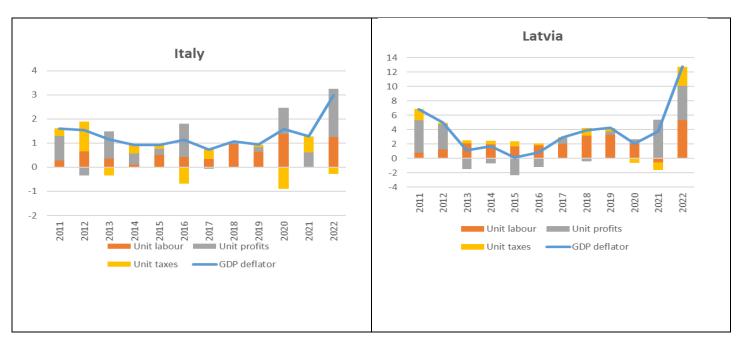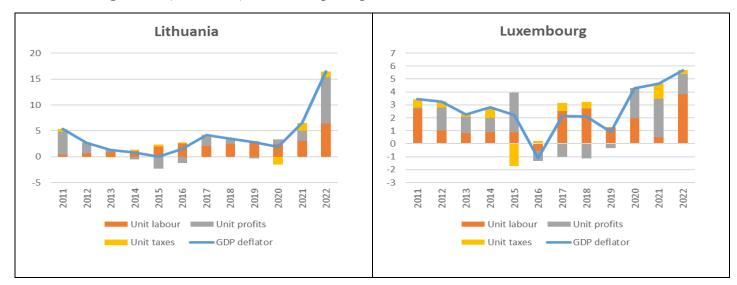**Figure A1 (continued): Domestic price pressures in the euro area economies**

France

Germany

Greece

Ireland

Italy

Latvia

Figure A1 (continued): Domestic price pressures in the euro area economies

Lithuania

Luxembourg

Malta

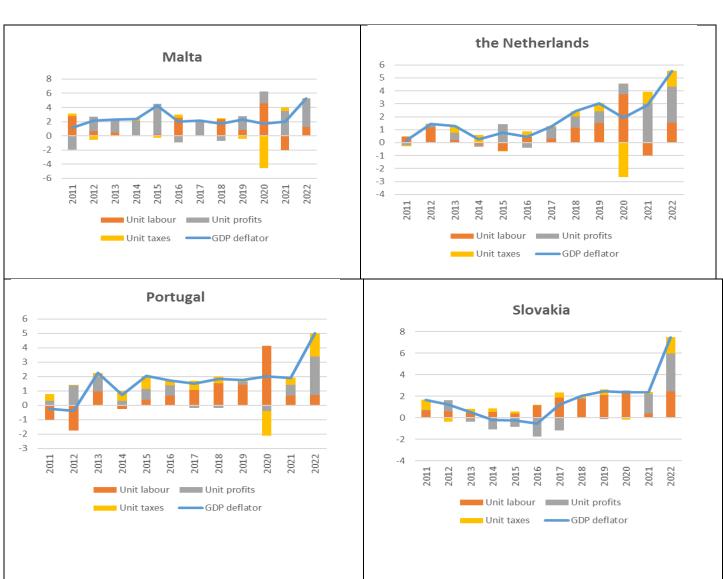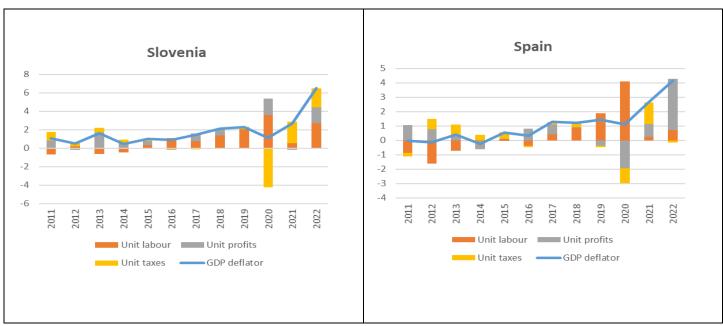the Netherlands

Portugal

Slovakia

Figure A1 (continued): Domestic price pressures in the euro area economies

Source: Eurostat and authors estimations.

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