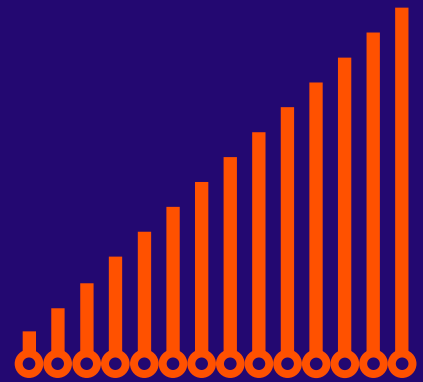
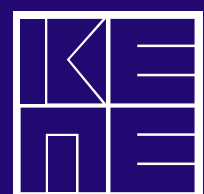


GREEK ECONOMIC OUTLOOK



- Recent (macro-)economic developments
- Fiscal developments
- Human resources and social policies
- Reforms-Economic development
- Special topics



GREEK

Economic Outlook

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Editor:

Panagiotis G. Liargovas

Managing editor:

Nikolaos Rodousakis

Editorial Board:

Fotini Economou
Konstantinos Loizos
Vlassis Missos

Editing:

Helen Soultanakis

Publications Department

Information:

Voula Dafnia
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CENTRE OF PLANNING
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11, Amerikis str., 106 72 Athens, Greece
Tel.: +30-210-3676.300, 210-3676.350
Fax: +30-210-3630.122, 210-3611.136
Website: www.kepe.gr

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Executive Summary

The Greek economy is still on a steady growth path

In the aftermath of the recent elections, a plethora of international reports and analyses from various institutions (e.g., CNBC, Die Welt, the European Commission) have come to the same conclusion: in the coming years, Greece has a unique opportunity to emerge as a “model” country for the rest of Europe, with its economy leading the way and showing excellent dynamics. The electorate has given its own message by giving the New Democracy party a clear majority and thus removing the possibility of political instability. In turn, political stability confirms the stable growth trajectory of the Greek economy. According to the estimates of KEPE’s structural factor model (see section 1.3), the average annual rate of change in real GDP for the whole of 2023 is projected at 2.2%, and the relative rates of change for the first and second halves of 2023, relative to the corresponding periods of 2022, are estimated at 1.9% and 2.5%, respectively. Greece is now in a phase of normalisation of its economic activity, having recovered from the shock of the pandemic and having shown remarkable resilience to the significant turbulence in the European economy caused by the war in Ukraine.

The stock market moves positively

Despite the ongoing challenges for the market, the first quarter of 2023 ended with positive returns for both large, mid and small caps, as well as for the majority of sectoral indices (see section 1.4). An increase in market capitalisation and transaction value was recorded for the same period. At the same time, although successive increases in key interest rates by central banks have affected the bond market, the rate of increase in yields observed in 2022 appears to have halted, and there is a relative stabilisation of bond yields, according to the data examined for the first quarter of 2023. On 21 April 2023, the international rating agency Standard & Poor’s upgraded Greece’s outlook from stable to positive, maintaining the rating at BB+, just one notch below investment grade. According to Standard & Poor’s, the positive outlook is based on “the recent strong track record of implementing structural reforms” and the fact that “the government has closed the fiscal deficit faster than expected, through improvements that

[the rating agency] considers broadly sustainable”. At the same time, Standard & Poor’s links the potential upgrade of the country to the maintenance of fiscal discipline and to the sustained pace of structural reforms resulting in a strengthening of the competitiveness of the Greek economy.

The recession in Germany does not affect the Greek economy

The central banks in the US and the Eurozone, in order to tame inflation, have put interest rates into battle. The rise in interest rates was deemed necessary as it was found that inflation was not a transient, but a persistent phenomenon. It is well known, however, that rising interest rates, together with inflation, also damages the economy. This has already been seen in Germany, where the GDP fell by 0.3% in the first quarter, recording its second consecutive quarter of contraction; it could also occur in the United States, where the economy is facing a huge public debt in addition to the effects of interest rates. However, the Fed has announced that it will not raise rates any further and the ECB will do the same at a later time. In that case, the recession will not be deep, will be temporary and will drive inflation to the desired levels, around 2%. The question, of course, is whether Greece will be affected by these developments. Germany and the United States are important trading partners of Greece, and the recession that these countries are facing or will face is a cause for concern about the potential impact on the Greek economy. Economic ties, such as exports and investment, may be affected by the uncertainty created globally by the recession. However, the Greek economy has shown considerable resilience and dynamism after successive crises. It has managed to diversify its economy and boost its exports to other emerging markets. Tourism is an important pillar of the Greek economy. Despite the difficulties arising from the COVID-19 pandemic, Greece successfully coped with the situation and showed flexibility and adaptability. The country has taken measures to ensure the safety of tourists and to promote domestic tourism. The results are encouraging, with an increase in the number of tourists and tourism revenues. First quarter figures may show a decline in arrivals from Germany and France, but there was a 159% increase in arrivals from non-Eurozone countries and the US. In addition, Greece

has benefited from the global trend towards sustainable development and the transition to green technologies. Significant investments have been made in the areas of renewable energy, energy decentralisation and energy efficiency. This has strengthened the competitiveness of the Greek economy globally. In addition, there have been investments in infrastructure renewal, such as energy sectors and digital technologies, making Greece more resilient to global economic crises.

The prospects of the labour market are inextricably linked to the prospects of the Greek economy

Traditionally, in the last quarter of the year, the number of the unemployed and, usually, the unemployment rate, increases due to seasonality, while the number of employed persons decreases (see section 3.1). The fourth quarter of 2022 was no exception. However, the picture is different on an annual basis. Most new jobs were occupied by men, over 25 years old, with Greek citizenship. In relative terms, however, the largest increases were recorded by young employed persons aged 15-24 and foreigners. Also, the largest percentage increase was recorded among employed high school graduates, followed by those with a master's and/or doctoral degree. In contrast, the number of employed graduates from higher technical vocational education and training decreased. Significant annual losses were recorded in sectors that are prominent in the Greek economy, such as trade and tourism, while those employed in education, which is linked to the public sector, showed the largest increase. Payroll employment set a new record in the first months of 2023, as the balance was positive by 61.9 thousand positions in March, while the first quarter overall performance also set a new maximum. On the negative side, the systematic increase in the conversion of full-time contracts into rotational contracts without the employee's consent is a negative factor, although it is still far from the levels of the past. In the first quarter of 2023, the signals are mixed for the labour market as a

whole. The employed in March are fewer than a year ago, but so are the unemployed. Otherwise, the labour market outlook is inextricably linked to the outlook for the Greek economy. The performance of the tourism industry so far leaves much room for optimism, but is overshadowed by vacancies in various sectors, including tourism. *Overall, unemployment remains a major problem and its reduction remains a high policy priority.*¹ Despite a systematic decline in unemployment in recent years, the overall unemployment rate stood at 10.9% in March 2023. At the same time, employment prospects in Greece are still significantly below the EU27 average, and the situation is worse for some social groups such as women, young people aged 15-24 and foreigners. In this context, the labour market reforms and actions implemented in recent years and those planned in the medium term are important and have as their main objectives the creation of new jobs, the strengthening of the resilience of existing jobs in times of crisis and the reform of active² and passive³ employment policies in order to improve protection against unemployment. These objectives are pursued firstly through targeted interventions to support employment and the systematic integration of people into the labour market, alongside the upgrading of employment support and labour market monitoring services and systems. In addition, these objectives are reinforced through a range of other actions that indirectly benefit human resources by improving their employment prospects. These include interventions related to training and skills development of human resources, including digital skills, as well as actions to support and promote Research and Technology in the context of increasing demand for highly skilled human resources.

The three main challenges of the Greek economy

First challenge: Safeguarding economic stability

In recent years, Gross Domestic Product has been growing continuously and at twice the rate of the Euro-

1. See *KEPE Reform Observatory Bulletin*, No 2/2023 [in Greek].

2. Active employment policy is any (selective) policy that aims to motivate the unemployed (less often the underemployed and employed) to find work and/or improve their chances of finding work (See Karamesini, M., 2005, *Employment Policy as a Coupling Field of Economic and Social Policy*, in Karamesini, M. and G. Kouzis (eds), *Employment Policy: Field of Coupling of Economic and Social Policy*, Athens: KEKMOKOP/Gutemberg, pp. 21-68 [in Greek]). These policies include vocational training programmes for the unemployed and employed, subsidies for employers to employ the unemployed and subsidies for the unemployed to set up their own self-employment.

3. Passive employment policy is any (universal) policy aimed at supporting the unemployed, i.e., relieving them from the effects of unemployment. Thus, the aim is to keep the unemployed in the labour force and, subsequently, to maintain the value of human capital (See Lalioti, V., 2019, *Planning and Evaluation of Active Employment Policies. Literature Review*. EIAED. Series: Diagnosis of the Labour Market Needs 4 [in Greek]). The most typical example of passive employment policy is the unemployment benefit.

zone. In 2022, for example, the growth rate was 6% in Greece compared to 3% in the Eurozone. Greece has shown great resilience during the pandemic period. Primary deficits were, of course, created due to force majeure. However, from 2022, the country returned to a primary surplus. The increase in tax revenues is the result of higher prices due to price inflation, but it is also linked to the fact that economic activity is expanding. Public debt, after soaring as a share of GDP above 200% in 2020, is rapidly declining to 170% with prospects for further reduction. As a result, international rating agencies have carried out 12 upgrades of the Greek economy in the last 4 years or so, despite successive exogenous crises. Essentially, conditions are ripe for obtaining an investment grade rating within the year. Moreover, a record level of foreign direct investment has been achieved in recent years. Similarly, exports reached 54.9 billion in 2022, from 33 billion in 2018, an increase of 66.3%. Greece is now a champion in improving the business climate, rising 16 places among 34 wealthy European countries. In terms of absorption of EU funds, in these 4 years, the country has been among the top performers among EU member states. The absorption reached 85% at the end of 2022 compared to 24% in 2019, and this figure translates into an amount of €12 billion in the real economy. In the area of innovation and entrepreneurship, 1,500 companies are now implementing research and innovation actions, 1,400 companies are collaborating with research institutes, while 2,500 companies are being supported to introduce new products, and creating 14,200 new jobs. Tourism is also expected to set a double record this year, both in terms of arrivals and receipts. All this has resulted in a reduction in unemployment from 17% in 2019 to 11.4% in 2022. There was an increase of 300 thousand workers in the private sector, which means that a whole world that was on the margins with no income has joined the productive economy and has a salary and income. Many young people who left to go abroad during the memoranda have started to return. The above was neither easy nor self-evident. It took sustained effort and strong political will. *It is the duty of the new government, through its policies, to continue the country's path of economic stability.*

Second challenge: Fighting poverty and social exclusion

The latest available data from Eurostat's European Survey of Income and Living Conditions are not encouraging for Greece (see section 3.2). According to these, Greece is ranked as the country with the third highest rate (28.3%) of poverty or social exclusion in the EU, after Romania (34.5%) and Bulgaria (31.7%).

It is necessary to reverse the trend of worsening poverty and social exclusion in Greece before it becomes permanent.

Third challenge: The continuation of reforms

Reforms will be needed to make economic stability sustainable and to reverse poverty and social exclusion. Three stand out:

(a) Speeding up the time to justice. In Greece, the final resolution of a legal dispute for businesses takes more than 4.5 years (2020 data). This is the longest time in the EU-27, more than double even compared to Portugal and Slovakia, which have modernised their systems. These two countries are now approaching the European average (455 days). The fact that the judiciary is still in the "paper age" limits its capacity to handle the necessary number of cases, with the result that the rate of resolution of civil and commercial cases is 24th in the EU. The delays generated in the courts of first instance translate into three pending cases for every 100 citizens at the end of each year (21st in the EU), given that it often takes 18 months for a civil or commercial case to resolve. *The long waiting time for a case to be heard makes it difficult for Greek businesses to function and for the investment competitiveness of the economy. It works against the poor and in favour of the rich as one needs to have the time, money and stamina to pay lawyers.*

(b) Tax reform with a simultaneous "declaration of war" on tax evasion. The current tax system is unfair and inefficient. It overtaxes wage labour, from which it derives most of its tax revenue, while failing miserably to raise revenue from the self-employed. It also relies on very high indirect tax rates, while tax evasion has become a building block for getting rich (rather than surviving).

(c) State reform. Decisive steps have been taken in recent years to accelerate the digitisation of the public sector. However, more targeted actions are needed in Health, Education and Institutions. Improving Health does not only mean better quality services to citizens, but also creating a resilient state that can secure billions in Greek GDP. The reform of Education, by strengthening the independence of public universities and exploiting the knowledge triangle (education-research-innovation), can bring a new generation of scientists to the country and give a significant boost to GDP. Upgrading the country's low level of institutional development by fighting regressive clientelistic attitudes and forming strong and reliable institutions that guarantee meritocracy, transparency and social justice can also bring more investment.

Conclusion

Greece's opportunity for the coming years is unique. The political stability that emerged after the elections is a first positive step for the economy. Investment grade is just around the corner. A "tsunami" of investment could flood the country, providing new jobs and raising wages. The financial instruments, NSRF and the Recovery and Resilience Fund are in place and ready

to finance mature investment projects. The new government should focus on reforms. If necessary, it will have to take aim at a few but powerful interest groups that prefer immobility to continue to speculate at the expense of the many.

*Professor PANAGIOTIS LIARGOVAS
Chairman of the Board and Scientific Director,
Centre of Planning and Economic Research (KEPE)*

1. Recent (macro-)economic developments

KEPE, *Greek Economic Outlook*, issue 51, 2023, pp. 7-14

1.1. The evolution of aggregate demand components as we return to normality

1.1.1. Introduction - Domestic and foreign demand for 2022

Yannis Panagopoulos

This section records the macroeconomic trends in domestic demand up to the end of 2022 as well as the economic climate up to mid-2023. Consequently, the analysis of the data depicted here refers to the previous year (2022), where the negative effects of the *Covid-19* pandemic have gradually been eliminated, but additionally there are still the negative effects of the energy price upturn and, consequently, the inflationary problem.

Based on the annual data of ELSTAT's *National Accounts*, as they appear in Table 1.1.1, for 2022, we observe a positive change in the growth rate of the economy, compared to 2021. More specifically, in contrast to the high growth of 2021 (8.43%), in 2022 we have a significant but smaller growth of 5.91%. In fact, we could briefly point out here that the main macroeconomic factor for this growth in 2022, compared to 2021, was the relatively decreasing but positive fixed capital investment factor (from 19.98% to 11.67%). The trend of private consumption growth was also positive and upward (from 5.77% to 7.78%), while the country's total exports growth also moved at a positive but very downward pace in 2022 (from 24.10% to 4.88%). The only exception to this positive picture was public consumption, which turned from positive to negative growth for 2022 (from 2.18% to -1.62%).

As regards to the existing components of *domestic demand*, which are also recorded in Figure 1.1.1a, the positive contribution of both *gross fixed capital formation* and *private consumption* is demonstrated. More specifically, private consumption contributed with 2.73, while gross fixed capital formation contributed with 2.01. On the other hand, public consumption, contributed negatively with -0.66. In conclusion, as presented

in Table 1.1.1 and Figure 1.1.1a, the overall contribution of domestic demand for 2022 is positively valued as a contributing factor upon the GDP growth (8.75).

As regards the participation of the internal and the external sectors of demand (i.e., domestic demand and the balance of goods and services), for 2022, they are respectively valued positive and negative (Figure 1.1.1.b) in the GDP growth. Specifically, the contribution of the balance of goods and services in the last quarter of 2022 was negative (-3.44), while the contribution of domestic demand to GDP growth was positive in the same quarter (8.29). However, the largest positive contribution to GDP was the *Change in Inventories* (12.85).

Regarding the trend of the Economic Sentiment Index (ESI), as the future "proxy" of aggregate demand, the expectations of households and businesses for the period 1/2022-4/2023 are recorded in Figure 1.1.2. It is obvious that the gradual end of the *Covid-19* pandemic has played a positive role in the recovery of this Index, especially after October 2022. Thus, while in January 2022 the ESI stood at 114.1 points, in October of the same year it reduced as low as 99.1 points before recovering to 108.8 points in April 2023. In conclusion, the expectations of households and businesses for the current year (2023) seem to be on a clearly positive trend.

Below is a more detailed discussion on the contribution of the country's balance of goods and services to GDP for the last quarter of 2022.

Balance of goods and services

The contribution of the external sector (exports minus imports) to GDP growth for 2022Q4, as already mentioned above, was broadly negative (-3.44, Figure 1.1.3). This is mainly produced by the general trend of exports and imports during that period. In more detail, we will refer here separately to the rate of change of goods and separately to the rate of change of services. Starting with exports, it should be noted that as far as services are concerned, which constitute the relatively smaller part of exports, they showed an annual increase, for 2022Q4, of 9.87%, while goods, which are usually the largest part of exports, showed a much smaller average annual increase of 0.40%. On the other hand, imported services had an average annual in-

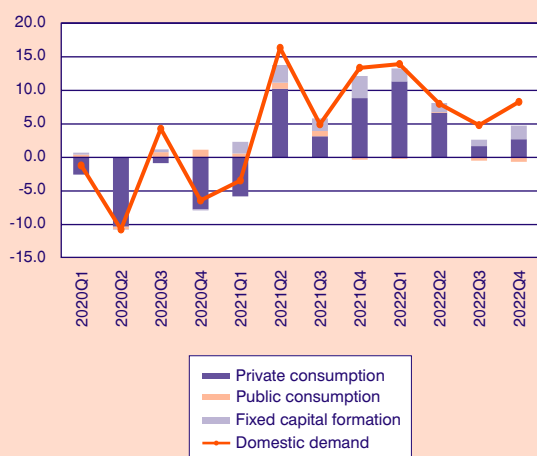
TABLE 1.1.1 Basic macroeconomic variables
(non-seasonally adjusted data)

	In million euros (current prices)	Annual % change (constant prices)	
	2022	2021	2022
Private consumption	142,977	5.77	7.78
Public consumption	40,154	2.18	-1.62
Fixed capital investment	16,037	19.98	11.67
Domestic demand*	199,168	6.62	6.30
Exports of goods and services	101,388	24.10	4.88
Exports of goods	53,614	13.83	0.40
Exports of services	47,774	37.67	9.87
Imports of goods and services	121,033	17.65	10.22
Imports of goods	92,793	16.83	11.24
Imports of services	28,240	20.24	7.19
Balance of goods and services (% , GDP)	-9.44		
GDP	208,030	8.43	5.91
Contribution to the GDP			
Domestic demand*		7.80	8.75
Balance of goods and services		0.80	-0.94
Change of inventories		5.88	6.18

Source: National Accounts, ELSTAT.

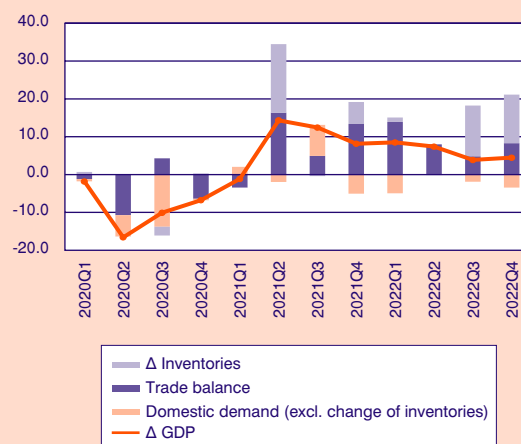
* Without change of inventories.

FIGURE 1.1.1a
Components of domestic demand



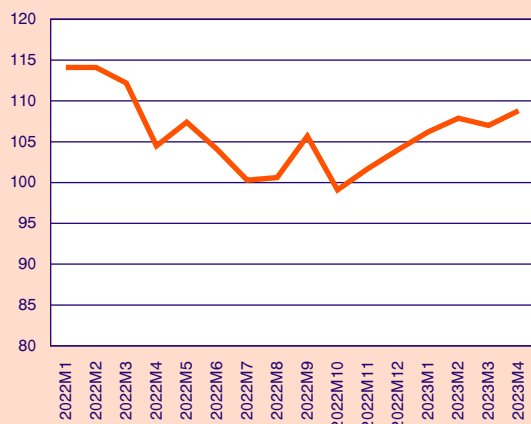
Source: National Accounts, ELSTAT, data processing by the author.

FIGURE 1.1.1b
Domestic and net external demand
(components)



Source: National Accounts, ELSTAT, data processing by the author.

FIGURE 1.1.2
Economic Sentiment Index (2022/1-2023/4)



Source: Eurostat.

FIGURE 1.1.3
Components of external demand



Source: National Accounts, ELSTAT, data processing by the author.

crease of 7.19%, while imported goods had a larger average annual increase of 11.24%.

As far as the contribution of the balance of goods and services to the rate of change of GDP for 2022, we should report that it was measured at -0.94 points in contrast to 0.80 points in 2021 (Table 1.1.1). More specifically, we observe an unexpected negative contribution of exports to GDP, which was estimated at -1.04 points, while on the other hand, the (negative) contribution of imports to GDP was estimated at -2.40 points (Figure 1.1.3). In simple words, during the last quarter of 2022, a slight deviation from the “normality” in terms of exports’ contribution was recorded, which had not been observed since the first quarter of 2021. This abnormal event, as far as the contribution of exports to GDP is concerned, is not expected to continue during the next quarters of 2023.

1.1.2. Private consumption and investment

Konstantinos Loizos

1.1.2.1. Private consumption

Fluctuations in private consumption expenditure

According to the quarterly seasonally adjusted *National Accounts*,¹ private consumption of households

and NPISH² showed a rising trend during 2022, since it was 34,681 million euros in current prices in the first quarter of 2022, 35,576 million euros in the second quarter, 36,108 million euros in the third quarter and 36,876 million euros in the last quarter of 2022. In terms of chain-linked volumes (reference year 2015), private consumption fluctuated since it increased from 33,451 million euros in the first quarter to 33,483 million euros in the second quarter of 2022. However, in the third quarter it decreased to 33,344 million euros, only to rise again to 33,957 million euros in the fourth quarter of 2022. Additionally, percentage changes³ with respect to the preceding quarter, based on seasonally-adjusted chain-linked volumes were positive in the first (2.6%), in the second (0.1%) and in the fourth quarter of 2022 (1.8%), but negative in the third one (-0.4%). On the other hand, we observe positive but falling values in the evolution of percentage changes during 2022 with respect to the corresponding quarter of the previous year (13.6%, 8.7%, 5.6% and 4.2%).

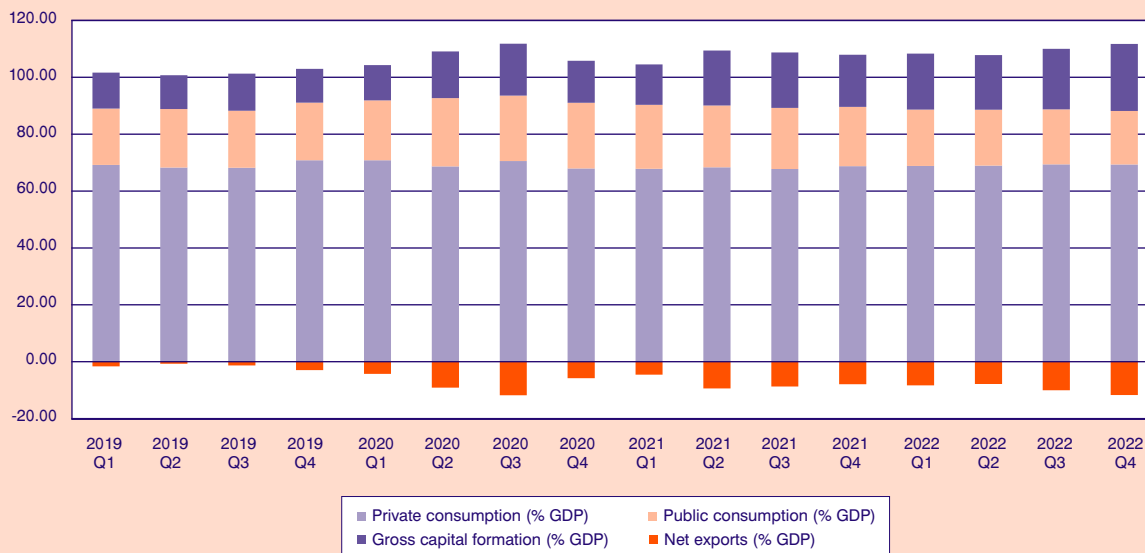
Private consumption, as a percentage of GDP, was 69.14% on average during 2022, close to its mean value for 2021 (68.18 of GDP). Public consumption accounted for an average of 19.41% of total expenditure (21.64% of GDP in 2021), while gross capital formation (fixed capital and changes in inventories) was on average 20.94% of GDP, clearly higher than its average of 17.83% of GDP during 2021. Finally, the trade balance

1. *Quarterly National Accounts*, Press release, ELSTAT, March 7, 2023.

2. Non-profit institutions serving households.

3. Percentage changes are calculated using the formula $\frac{X_t - X_{t-1}}{X_{t-1}}$.

FIGURE 1.1.4
Evolution of private consumption and other components of demand as a percentage of GDP
(expenditure approach) (seasonally adjusted data in current prices)



Source: ELSTAT, data processing by the author.

deficit rose on average, as a percentage of GDP, from -7.65% in 2021 to -9.48% of GDP in 2022. Therefore, except for the observed fluctuations in private consumption, the year 2022 was characterized by falling public consumption, the deterioration of the external trade balance and, chiefly, an improving situation in gross investment as a percentage of GDP, as it is evident by Figure 1.1.4.

Positive developments in retail trade except food items

The evolution of retail trade in terms of percentage changes of the overall volume index was positive on average during 2022 with respect to the corresponding months of the previous year, marking a 3.26% change based on ELSTAT monthly data, as depicted in Figure 1.1.5. The mean percentage changes per quarter were positive for the first three quarters (10.40%, 0.53% and 2.62% respectively for the first, second and third quarter) but negative in the fourth quarter (-0.50%). Concerning food items, we observe negative average percentage changes both in the whole year 2022 (-1.45%) and in the average values in the first (-1.11%), second (-2.48%) and fourth quarters (-3.99%), but positive percentage changes in the third quarter of 2022 (1.79%). However, as far as automotive fuel and other items are concerned, average percentage changes are positive

for the entire year of 2022 (3.46% and 7.27% respectively). The same holds true for the respective quarters of 2022, except for the second quarter for automotive fuel (-3.84%). Therefore, barring food items, retail trade showed positive trends during 2022, both in terms of overall volume index and most of its components.

Expectations in retail trade fluctuate following a rising trend

Looking at the confidence indicators published by Eurostat (see Figure 1.1.6), we notice a reversal, starting from the autumn of 2022, of the pessimistic climate which dominated retail trade as of the beginning of that year. This holds for both consumers and businesses, though the positive response of businesses seems to be more profound than that of consumers. The above depict the entrenchment of a rather optimistic mood in the industry that extends to 2023, despite observed fluctuations.

1.1.2.2. Investment

Rising trends in gross investment continue

Gross fixed capital formation increased from 6,535 million euros in current prices during the first quarter of 2022 to 6,855 million euros in the second quar-

FIGURE 1.15
Percentage changes in the seasonally adjusted overall volume index and the main sector indices in retail trade

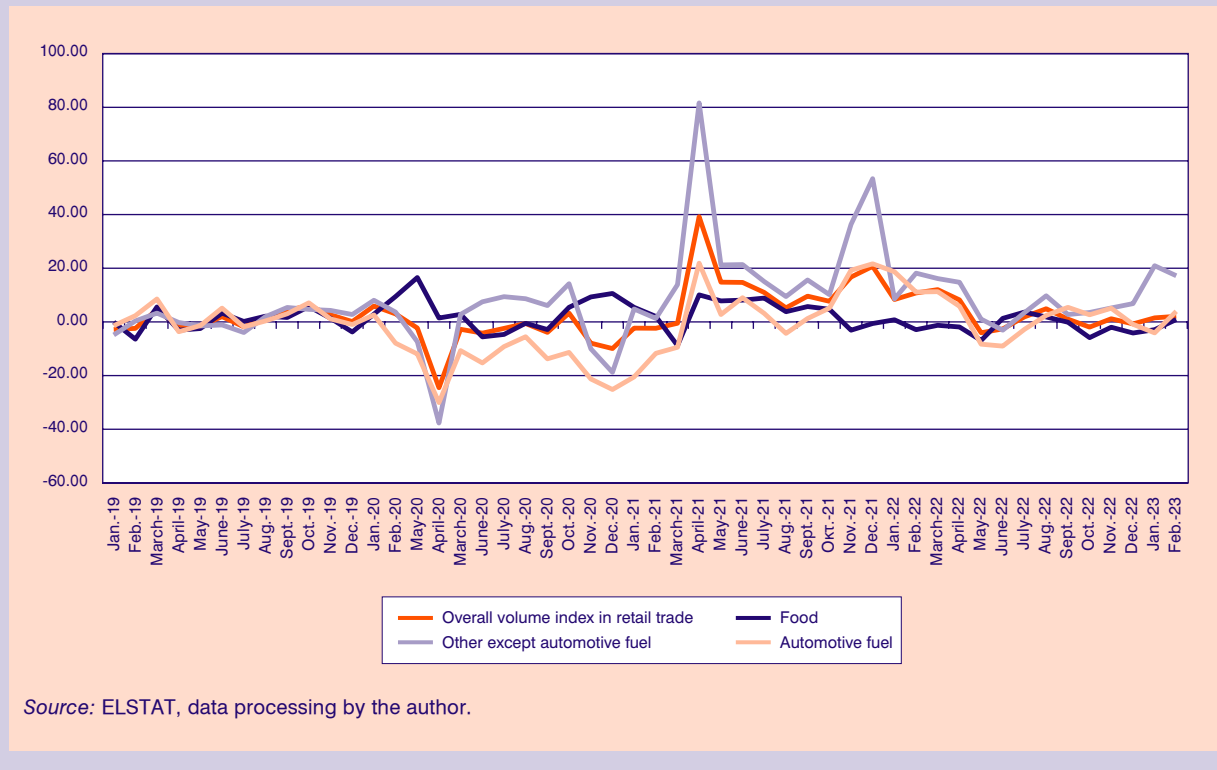


FIGURE 1.16
Confidence indicators in retail trade

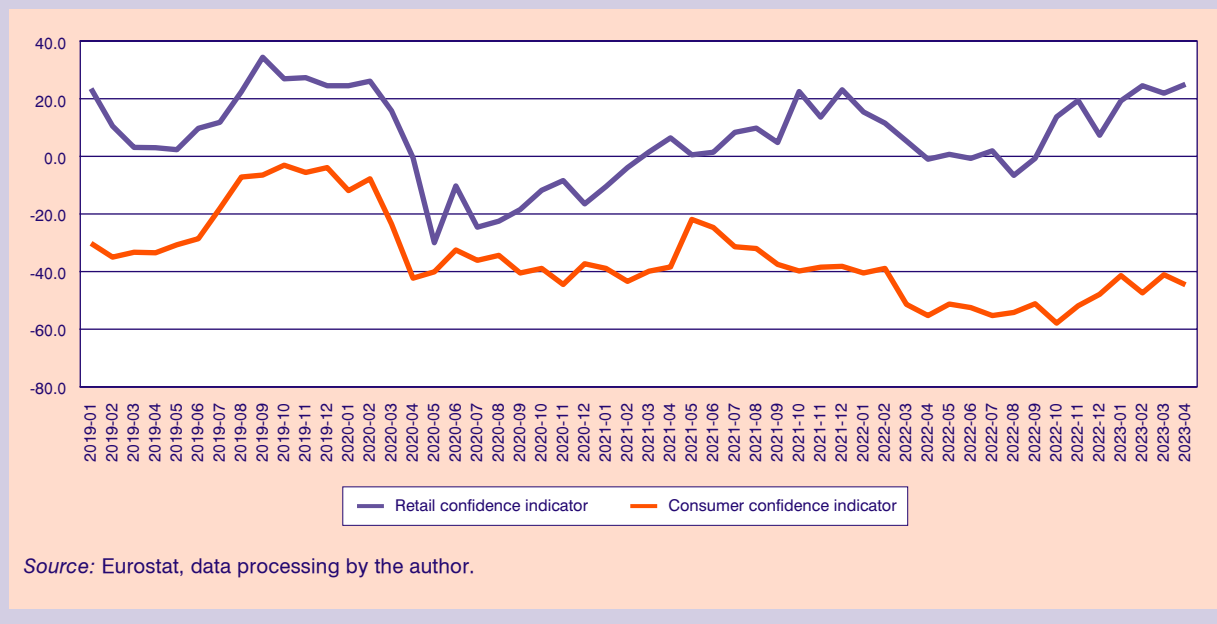
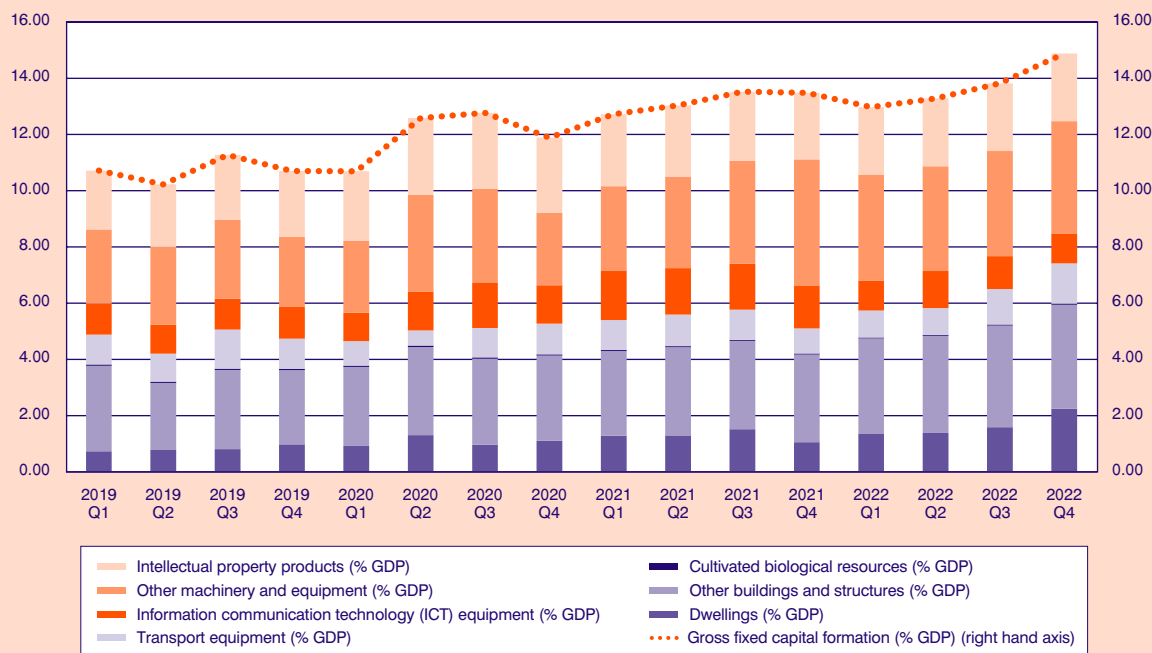


FIGURE 1.1.7
Gross fixed capital formation as a percentage of GDP
(overall and by asset) (seasonally adjusted data in current prices)



Source: ELSTAT, data processing by the author.

ter, 7,189 million euros in the third quarter and 7,913 million euros in the fourth quarter of that year. Correspondingly, in terms of chain-linked volumes, gross fixed capital formation rose from 6,481 million euros in the first quarter of 2022 to 6,520 million euros in the second quarter, 6,579 million euros in the third quarter and 7,139 million euros in the fourth quarter of 2022. In terms of percentage changes with respect to the corresponding quarter of the preceding year, we observe a rising trend with fluctuations among quarterly periods (13.3% in the first quarter, 10.1% in the second quarter, 8.3% in the third quarter and 14.8% in the last quarter of 2022). A similar pattern exists in the case of percentage changes with respect to the previous quarter, with quarterly values of 4.3%, 0.6%, 0.9% and 8.5% respectively, according to the seasonally adjusted data on chain-linked volumes.

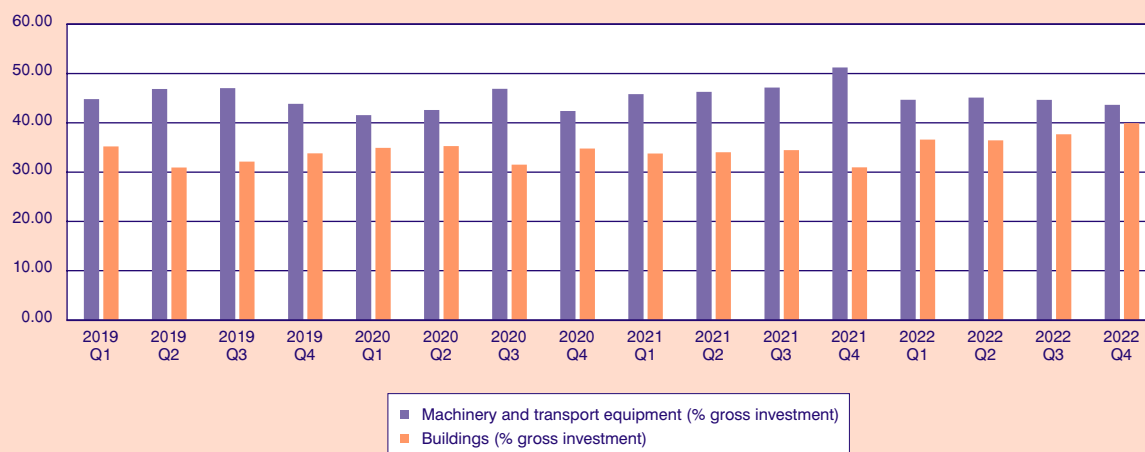
The evolution of investment (gross fixed capital formation) as a percentage of GDP (Figure 1.1.7), despite its falling trend in the first quarter of 2022 with respect to the previous quarter (rate of change -3.77%), subsequently recovered with positive percentage changes of 2.40% in the second quarter, 4.03% in the third quarter and 7.7% in the last quarter of 2022. In terms of

the main components of gross investment, the same pattern as above is followed by machinery and transport equipment as a percentage of GDP, with a negative percentage change of -16.11% in the first quarter of 2022, but positive changes in the next three quarters (3.46%, 2.96% and 5.24% respectively). On the contrary, buildings as a percentage of GDP showed positive percentage changes during all of 2022 (13.72%, 1.92%, 7.55% and 14.16% per quarter).

The share of machinery and transport equipment is dominant in gross investment but the share of buildings is rising

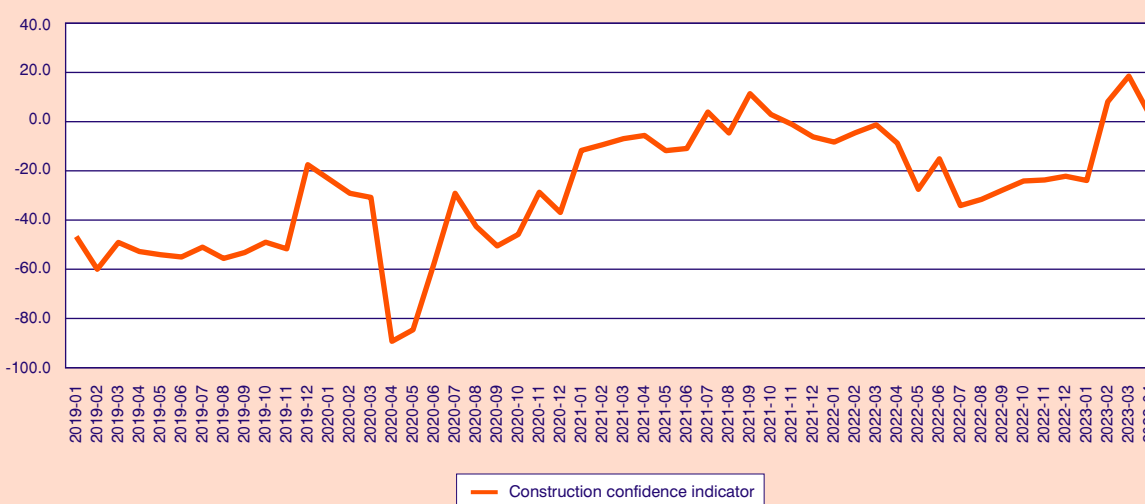
As depicted in Figure 1.1.8, the share of machinery and transport equipment in total gross fixed capital formation remains higher than that of buildings. The share of machinery and transport equipment was, on average, 44.53%, during the four quarters of 2022, while that of buildings was, on average, just 37.66% for the same period. On the other hand, the share of buildings rose from 36.61% of gross fixed capital formation in the first quarter of 2022 to 39.93% in the fourth quarter of 2022.

FIGURE 1.1.8
Machinery, transport equipment and buildings as a percentage of gross fixed capital formation



Source: ELSTAT, data processing by the author.

FIGURE 1.1.9
Construction confidence indicator



Source: Eurostat, data processing by the author.

Optimism in the construction sector

The evolution of business expectations in the construction sector is characterized as improving from August 2022, despite observed fluctuations. This improvement is even more pronounced just after January 2023. Therefore, the “cautious optimism” that dominates until the end of 2022 becomes strong optimism in 2023. However, there is a reversal in April of the same year, which raises questions about its sustainability.

1.1.2.3. Conclusions

The above analysis pointed out that the Greek economy during 2022 was characterized by positive developments in almost all components of expenditure despite the consequences of an adverse international environment and of rising inflation and energy costs. Private consumption expenditure fluctuated, but retail trade indices in general and those of gross fixed capital formation showed a strong rising trend. Moreover, expect-

tations both in retail trade and in construction improved during the last months of 2022, indicating a possible reversal of the previous pessimistic mood. Therefore, the Greek economy, both in terms of expectations and in terms of consumption and investment demand during 2022, marked a positive performance despite geopolitical and energy uncertainties. To this result, one must

not disregard the contribution of the tourist season along with the measures taken at the European level against the fallout of the war in Ukraine and the energy crisis. However, the Greek economy will prove its resilience in the future when the above measures will have been lifted and the economy will have to cope with the international adversities on its own.

1.2. Recent developments of the inflation in Greece and the euro area: De-escalation of energy inflation – Food inflation remains high

Emilia Marsellou

Introduction

Inflation continues to fall in Greece and the Eurozone. Greece records the fifth lowest inflation (HICP: 4.1% and National CPI: 2.8%) in the Eurozone (6.1% Eurostat preliminary estimates) and the European Union (8.1%, April 2023). The de-escalation, however, in overall inflation takes place less quickly than the ongoing decline in international energy prices that started in October-November 2022, due to the secondary inflation in the remaining components of the CPI. Prices of Food and non-alcoholic beverages record the highest and most persistent increases, maintaining a double-digit growth rate for fourteen months. Inflation in Clothing and footwear, Household equipment and Health also remains high.

1.2.1. Greece

The National CPI continues to decelerate for the eighth consecutive month, recording an annual increase of 2.8% in May 2023 following a 3.0% increase in April and 4.6% in March. The CPI increased 0.4% m-o-m in May 2023, down from 0.6% and 1.2% in April and March, respectively. On the other hand, core¹ inflation (based on the National CPI) continues an upward trend, showing that the impact of the rise in prices in energy products on the other categories of goods and services is not yet exhausted. Specifically, in May 2023, the core inflation was 6.7%, compared to 6.1% in April and 6.7% in March.

The evolution of the Harmonized CPI (HICP) is similar. Specifically, in May 2023, HICP inflation fell to 4.1%, down from 4.5% and 5.4% in April and March 2023,

respectively. Meanwhile, core inflation remained for a second month at the high rate of 7.2%, against 7.0% in March.

The largest contribution to the annual percentage increase of the National CPI in May 2023 had the group of Food and non-alcoholic beverages with 2.43 percentage points, followed by Hotels-Cafés-Restaurants with 0.77 p.p., Clothing and footwear with 0.66 p.p. and Health with 0.57 p.p.

More specifically, the annual increase of the National CPI in May 2023 by 2.8% is a combined result of the following changes in the price indices of sub-groups of goods and services. More specifically, increases were recorded by:

- 11.6% in the group Food and non-alcoholic beverages. This increase is due to the rise, mainly, in the prices of bread and cereals (11.1%), meat (11.9%), fish (5.2%), milk and cheese and eggs (18.0%), oils and fats (15.8%), fruit (2.6%), vegetables (9.7%), sugar-chocolates-sweets-ice creams (10.3%), food n.e.c. (14.2%), coffee-cocoa-tea (13.2%) and mineral water-refreshments-fruit juices (12.9%).
- 3.5% in the group Alcoholic beverages and tobacco, due to the increase, mainly, in the prices of non-served alcoholic beverages (8.3%).
- 11.8% in the group Clothing and footwear, due to the increase in the prices of clothing and footwear.
- 9.9% in the group Household equipment. This increase is due to the rise, mainly, in the prices of furniture and furnishings (6.5%), household appliances and repair (6.1%), glassware-tableware and utensils of domestic use (7.6%), non-durable household articles (13.9%) and domestic services (7.6%).
- 7.8% in the group Health. This increase is due to the rise, mainly, in the prices of pharmaceutical products (18.6%), medical-dental and paramedical services (4.9%) and hospital care (1.5%).
- 3.3% in the group Recreation and culture. This increase is due to the rise, mainly, in the prices of major durables for recreation and culture (3.2%), small recreational items-flowers-pets (6.6%), cinemas-theatres (5.6%) and package holidays (7.1%).

1. The Core Inflation Index is calculated from the Overall Consumer Price Index excluding the divisions of Food and non-alcoholic beverages, Alcoholic beverages and tobacco and Energy prices.

TABLE 1.2.1 Inflation in Greece (%)

	National CPI	CPI (m-o-m, %)	Headline inflation CPI (y-o-y, %)	Core inflation (y-o-y, %)	Harmonized inflation (y-o-y, %)	Core HICP (y-o-y, %)
2022M01	104.7	-0.3	6.2	1.3	5.5	1.5
2022M02	105.8	1.1	7.2	1.2	6.3	1.5
2022M03	108.8	2.7	8.9	1.8	8.0	2.5
2022M04	111.1	2.1	10.2	1.9	9.1	2.6
2022M05	111.8	0.7	11.3	2.5	10.5	3.7
2022M06	113.6	1.6	12.1	3.6	11.6	5.5
2022M07	111.5	-1.8	11.6	3.6	11.3	5.5
2022M08	111.2	-0.3	11.4	4.2	11.2	5.8
2022M09	114.5	2.9	12.0	4.9	12.1	6.9
2022M10	113.2	-1.2	9.1	5.2	9.5	6.6
2022M11	113.1	0.0	8.5	5.9	8.8	6.8
2022M12	112.5	-0.5	7.2	5.2	7.6	5.9
2023M01	112.0	-0.5	7.0	6.0	7.3	6.5
2023M02	112.3	0.3	6.1	6.6	6.5	6.8
2023M03	113.7	1.2	4.6	6.7	5.4	7.0
2023M04	114.5	0.6	3.0	6.1	4.5	7.2
2023M05	114.9	0.4	2.8	6.7	4.1	7.2

Source: ELSTAT, Eurostat.

- 2.2% in the group Education. This increase is due to the rise, mainly, in the prices of fees of primary education (2.6%) and fees of secondary education (2.7%).
- 7.4% in the group Hotel-Cafés-Restaurants. This increase is due to the rise, mainly, in the prices of restaurants-confectioneries-café-buffets (7.4%) and hotels-motels-inns (14.4%).
- 6.8% in the group Miscellaneous goods and services. This increase is due to the rise, mainly, in the prices of hairdressing salons and personal grooming establishments (4.5%), other appliances and articles for personal care (11.5%), other personal effects (5.0%), private insurance connected with health (5.7%), motor vehicle insurance (2.1%).

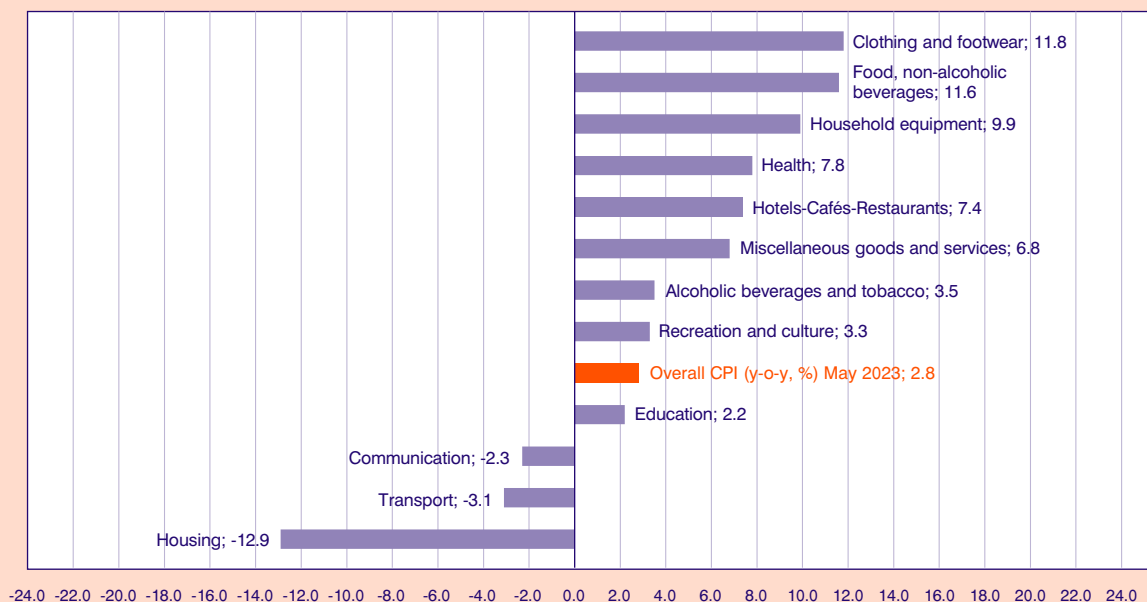
On the other hand, prices decreased in the following groups of goods and services:

- -12.9% in the group Housing. This decrease is due to the fall, mainly, in the prices of electricity (-24.1),

natural gas (-49.6%) and heating oil (-20.7%). This decrease was partly offset by the increase, mainly, in the prices of rentals for dwellings (4.1%), services for the repair and maintenance of the dwelling (5.5%), co-proprietor charges (2.1%), liquefied oil (14.2%) and solid fuels (28.9%).

- -3.1% in the group Transport. This decrease is due to the fall, mainly, in the prices of fuels and lubricants (-16.8%), which was partly offset by the increase, mainly, in the prices of new motor cars (7.5%), second hand motor cars (10.5%), motor cycles (7.5%), spare parts and accessories for motor cars (11.9%), maintenance and repair of motor cars-motorcycles (4.9%), passenger transport by taxi (32.9%), tickets for passenger transport by air (27.4%) and tickets for passenger transport by sea (11.2%).
- -2.3% in the group Communication, due to the decrease, mainly, in the prices of telephone services (-2.2%).

FIGURE 1.2.1
Annual % changes in National CPI sub-categories (May 2023)



Source: ELSTAT.

TABLE 1.2.2 Annual % changes in National CPI sub-categories, January-May 2023

Groups of goods and services	Jan.	Feb.	Mar.	Apr.	May
1 Food and non-alcoholic beverages	15.4	14.8	14.3	11.4	11.6
2 Alcoholic goods and tobacco	3.0	2.9	3.7	4.0	3.5
3 Clothing and footwear	6.5	7.1	14.4	5.6	11.8
4 Housing	-0.1	-4.9	-10.4	-13.4	-12.9
5 Household equipment	10.6	10.5	11.0	10.9	9.9
6 Health	2.9	5.3	5.6	6.5	7.8
7 Transport	8.1	6.5	1.9	1.4	-3.1
8 Communication	-1.3	-1.6	-1.9	-1.8	-2.3
9 Recreation and culture	3.4	3.5	2.9	3.7	3.3
10 Education	2.2	2.2	2.2	2.2	2.2
11 Hotel-Cafés-Restaurants	7.8	8.1	7.5	8.5	7.4
12 Miscellaneous goods and services	5.4	5.8	6.2	6.4	6.8
General Index	7.0	6.1	4.6	3.0	2.8

Source: ELSTAT.

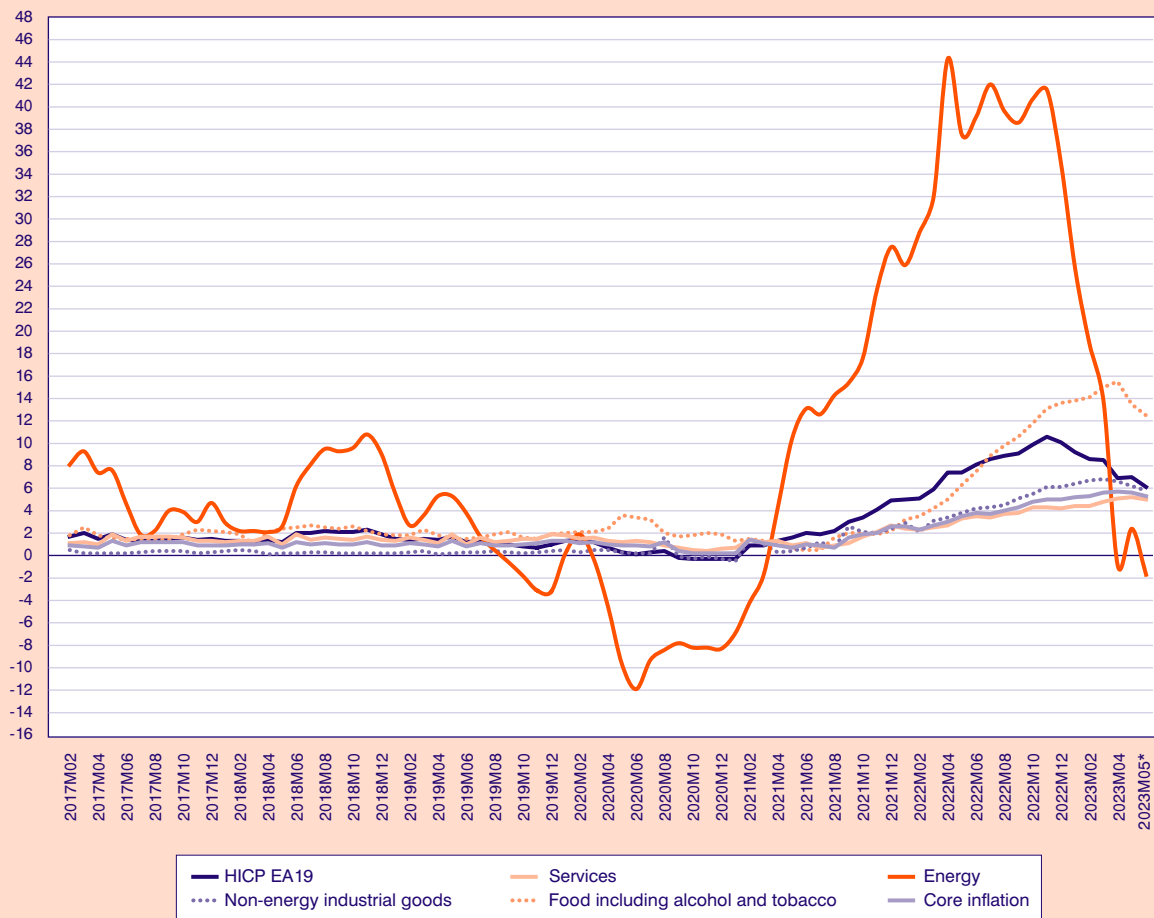
1.2.2. The euro area

According to Eurostat's flash estimates, in May 2023 inflation in the Eurozone showed further deceleration and reached 6.1% compared to 7.0% and 6.9% in April and March 2023, respectively. Based on the same estimates, core inflation in May remains at a lower level than the general index, yet it is still at high levels despite the decline to 5.3% from 5.6% and 5.7% in April and in March 2023, respectively.

The highest annual rate of HICP inflation in the euro area is still recorded in the Food sector (+12.5%), which since February 2023 has exceeded the price increases in Energy, followed by the group of Non-energy industrial products (5.8%) and the group of Services (5.0%). On the contrary, the Energy sector recorded a decrease of -1.7%.

Among the euro area countries, the highest annual rates of inflation are recorded in Latvia and Slovakia (12.3%) and Estonia (11.2%), while the lowest annual rates of inflation are in Luxembourg (2.0%), Belgium (2.7%) and Spain (2.9%).

FIGURE 1.2.2
HICP in the euro area, monthly data, annual % change



Source: Eurostat.

*Flash Estimates.

1.3. Factor model forecasts for the short-term prospects in GDP

Factor Model Economic Forecasting Unit Ersi Athanassiou, Aristotelis Koutroulis, Emilia Marsellou, Theodore Tsekeris

The current section presents the updated forecasts of KEPE concerning the evolution of the rate of change of real GDP in Greece in year 2023.¹ The forecast is conducted using KEPE's dynamic structural factor model.² The underlying time series database used to estimate the model and produce the forecasts includes 126 variables,³ covering the main aspects of economic activity in the country on a quarterly basis and spanning the period from the first quarter of 2000 up to the first quarter of 2023.

In the current conjuncture, Greece is in a phase of normalization of its economic activity, having recovered from the shock of the pandemic and having demonstrated remarkable resilience to the significant turbulence in the European economy due to the war in Ukraine. According to the latest data incorporated in the updated forecast of KEPE and referring to the last quarter of the year 2022 and the first quarter of 2023, the Greek economy remains on a stable growth trajectory, with rates of expansion turning back to levels reflecting the post-pandemic return to normality. At the same time, the European economy seems to have avoided the scenario of a deep recession, which would have considerable implications for Greece as well, and presents a more favorable outlook for 2023, with energy prices having fallen sharply and inflation showing significant deceleration.

The above developments, and the overall trends reflected in the data incorporated in the forecast, are generally in line with the prospects identified at the

beginning of the year. The same applies to the factors expected to have a significant impact on the course of the Greek economy in the period ahead, many of which are a function of international geopolitical and economic developments. These developments, for which the degree of uncertainty remains high, will have a decisive impact on trends in the energy market, the operation of supply chains and the path of inflation and interest rates, while also being of particular importance for the export performance of the Greek economy.

In the above context, Table 1.3.1 presents the updated econometric estimates for the rate of change of Greece's real GDP in 2023, based on KEPE's factor model and incorporating data up to the first quarter of the year.⁴ According to the estimates, the average annual rate of change of real GDP for the whole of 2023 is projected at 2.2%, and the rates of change for the first and second halves of 2023, compared to the corresponding periods of 2022, are estimated at 1.9% and 2.5%, respectively. Forecasts on a quarterly basis show a stable growth outlook throughout the year (1.8% in the second quarter, 2.6% in the third quarter and 2.4% in the fourth quarter). The current estimate for the average annual growth rate in 2023 is identical to the corresponding previous forecast of KEPE (2.2%), given that there were no developments in the interim period that would overturn the positive course of most of the economic indicators included in the forecast.

More specifically, for the first quarter of 2023, the observations on a non-seasonally and calendar-adjusted basis compared to the corresponding quarter of 2022 show that private consumption increased considerably, while fixed capital investment continued to grow at a high rate. At the same time, exports of services recorded a significant increase, with developments also being positive with regards to goods exports, which had registered a small decline in the second half of the previous year. In the industry sector, the overall industrial production index registered an increase, reflecting a strengthening in the

1. The date of the forecast is June 20, 2023.

2. A detailed description of the model can be found in Issue 15 (June 2011, pp. 19-20) of KEPE's scientific journal entitled *Greek Economic Outlook*. See <https://www.kepe.gr/images/oikonomikes_eksellikseis/issue_15enb.pdf>.

3. The database incorporates both real economy and nominal variables, as well as a considerable number of variables reflecting expectations and assessments of economic agents, as reported in earlier issues of the *Greek Economic Outlook*. The seasonal adjustment of the time series is carried out by use of the Demetra+ software, using the TRAMO/SEATS filter.

4. According to the most recent ELSTAT *Quarterly National Accounts* publication, dated June 7, 2023.

TABLE 1.3.1 Real GDP rate of change in year 2023 (% , y-o-y)

Quarters	2023		
	2023Q2	2023Q3	2023Q4
Quarterly rate of change	1.81 [1.64 , 1.98]	2.64 [2.31 , 2.98]	2.40 [1.92 , 2.87]
Mean rate of change, 1st half*	1.94 [1.86 , 2.02]	-	-
Mean rate of change, 2nd half	-	2.52 [2.12 , 2.93]	-
Mean annual rate of change*	-	2.23 [1.99 , 2.48]	-

Note: Values in brackets indicate the lower and upper boundaries of the 95% confidence interval of the forecasts. *The mean rate of change for the first half of 2023 and the mean annual rate of change for 2023 incorporate the officially available (provisional) data for the first quarter of 2023, on a seasonally adjusted basis.

relevant sub-indices concerning capital goods, and consumer durables and non-durables, while the turnover index in industry increased significantly with respect to both the domestic and the foreign market, a development which is, however, largely related to the rise in the prices of industrial products. In the retail trade sector, the volume index increased in five of the eight relevant subcategories, namely *department stores, food-beverages-tobacco, clothing-footwear, furniture-electrical and household equipment and books-stationery-other goods*, while in wholesale trade, the turnover index showed a further significant increase, a development that is, again, linked to the rise in prices. A strong recovery was observed for yet another quarter in the tourism sector, with travel receipts rising by 55.0% compared to the corresponding quarter of the previous year, while developments were also particularly favorable with regard to the production index in construction and the relevant two sub-indices referring to *building construction and civil engineering*. Concerning the course of the domestic labor market, in the first quarter of 2023, a further improvement in conditions was observed, as the number of persons employed increased by 1.3% compared to the first quarter of the previous year and the number of unemployed persons decreased by 14.9%, respectively.

Concerning price data for the first quarter of 2023, developments were indicative of a considerable decline in energy costs, as the Brent oil price index registered a significant reduction compared to the previous quarter, while a further decline was observed in the Euro-

pean harmonized energy price index for Greece. At the same time, there was a gradual decline in inflationary pressures, which, however, concerned part and not all of the basic categories of the consumer price index. In particular, a fall in prices or a slowdown in their rate of increase was observed in certain categories, such as those significantly affected by energy prices (housing, transport), while high inflationary pressures continued to be recorded in basic consumer good categories, such as *food and non-alcoholic beverages, clothing and footwear and durable goods, household appliances and services*.

The above developments seem to have, overall, resulted in a slight fall in uncertainty in Greece, despite the fact that in this particular conjuncture there was also the usual uncertainty surrounding pre-election periods. Indicative of a fall in uncertainty was the small decrease in the yield of Greece's ten-year government bond compared to the last quarter of 2022, as well as the notable reduction in the relevant spread against the corresponding German bond. In relation to the indicators reflecting agents' expectations and assessments regarding the economic climate in the country, developments in the first quarter of 2023, compared to the last quarter of the previous year, demonstrate an improvement of the economic climate in Greece and the EU, and a significant strengthening in business expectations in Greece in all main categories (industry, retail trade and construction).

The overall favorable outlook for the Greek economy, based on the course of the above-mentioned data and indicators, is certainly faced with several

challenges and uncertainties in relation to the international environment and geopolitical developments, as well as regarding the course of inflation and the relevant effects on household purchasing power, production costs and interest rates. On the other hand, upside risks to the forecast include a further decrease

in uncertainty and a positive outcome with respect to the recovery of an investment grade rating for Greek government bonds, combined with the systematic implementation of reforms and projects within the context of the Recovery and Resilience Fund and the new NSRF 2021-2027.

1.4. A positive start to 2023 for the Greek stock market

Fotini Economou

1.4.1. Introduction

The year 2023 started on a positive note for the Greek stock market, recording positive returns during the first four months of the year. Despite the ongoing market challenges related to inflationary pressures, interest rate increases, as well as the turmoil and uncertainty witnessed by the global financial system in March 2023, positive returns are recorded, both for the large and for the medium and small capitalization as well as for the majority of the sectoral indices, while the capitalization and transactions value for the first four months of 2023 also increased.

In addition, successive increases in key interest rates by Central Banks have inevitably affected bond prices and yields, increasing the cost of borrowing. However, the rate of interest rate increases recorded in 2022 appears to be interrupted, according to the data under examination for the first four months of 2023.

This article presents the course of the Greek stock market during the first four months of 2023 with an emphasis on key stock market indices and data. Then, the course of the bond market is presented for the same period. The last section of the article summarizes and concludes.

1.4.2. The course of the stock market during the first four months of 2023

According to Athens Stock Exchange (ATHEX) data for the first four months of 2023 (Table 1.4.1), the Athex Composite Share Price Index recorded a positive return of 16.70%, reaching 1,085.11 points on 28/4/2023, from 929.79 points at the end of December 2022. The turmoil and uncertainty experienced by the global financial system in March 2023, following the collapse of Silicon Valley Bank and Signature Bank in the US and the developments regarding Credit Suisse, inevitably affected the stock market as well, with the Athex Composite Share Price Index recording losses of -6.61% in March 2023 and the market recovering to record a positive return of 2.89% in April 2023.

The course of the other indices was correspondingly upward during the first four months of 2023, with the FTSE/Athex Large Cap recording a return of 16.55%, the Athex ESG Index a return of 16.32%, while mid and small capitalization followed with the Hellenic Mid & Small Cap Index, FTSE/Athex Mid Cap Index, and FTSE/ATHEX Mid & Small Cap Factor-Weighted Index recording returns of 14.95%, 14.76%, and 12.04%, respectively. The course of the sectoral indices of the ATHEX was also upward, with the FTSE/Athex Financial Services, FTSE/Athex Consumer Goods & Services, FTSE/Athex Industrial Goods & Services, FTSE/Athex Retail, FTSE/Athex Banks, and FTSE/Athex Food & Beverage standing out with returns of over 20% (i.e., 45.86%, 29.65%, 29.38%, 27.11%, 24.09%, and 21.07%, respectively). Note that the banking sector continues to record a positive course. Although the March 2023 uncertainty related to the global financial system led the FTSE/Athex Banks in losses of -18.28% for the specific month, the index returned to positive returns, like the Athex Composite Share Price Index, and recorded a positive return of 4.60% in April 2023. Finally, regarding the sectoral indices, only the FTSE/Athex Energy, FTSE/ATHEX Real Estate, FTSE/Athex Insurance, and FTSE/Athex Telecommunications recorded negative returns of -2.08%, -5.97%, -8.85% and -9.08%, respectively.

According to ATHEX (2023) data, the market capitalization of the ATHEX (assets under custody of domestic and foreign investors in total listed equities with the participation of the Financial Stability Fund) reached €67.41 billion at the end of April 2023, increased by 12.69% compared to the end of December 2022, which was €59.82 billion. The participation of foreign investors (with the participation of the Financial Stability Fund) remained high, reaching 63.28% at the end of April 2023, with foreign investors recording outflows of €72.54 million and 57.2% of total transactions in April 2023. The cash value of settled transactions reached €1,267.77 million in April 2023, increased by 9.97% compared to December 2022, which was €1,152.80 million, but reduced by 12.62% compared to April 2022, which was €1,450.92 million. In addition, the cash value of settled transactions of equities recorded an increase, reaching €1,245.31 million compared to the end of December 2022, which was €1,130.74 million, and a decrease compared to April 2022, which was €1,433.35 million. Moreover, the total cash value of settled transactions of equities for the first four months of 2023 reached €8,234.05 million, increased compared to the first four months of 2022, which was €7,023.25 million.

TABLE 1.4.1 Prices and returns for selected indices of the ATHEX (28/4/2023)

	28/4/2023	Year min	Year max	Year change (%)
Athex Composite Share Price Index	1,085.11	929.79	1,140.96	16.70%
FTSE/Athex Large Cap	2,624.08	2,250.77	2,795.71	16.55%
Athex ESG Index	1,230.33	1,057.52	1,311.72	16.32%
Hellenic Mid & Small Cap Index	1,569.17	1,365.14	1,599.85	14.95%
FTSE/Athex Mid Cap Index	1,619.73	1,411.43	1,660.73	14.76%
Athex All Share Index	261.95	231.11	271.62	13.77%
FTSE/ATHEX Mid & Small Cap Factor-Weighted Index	4,924.81	4,353.12	4,965.04	12.04%
FTSE/Athex Financial Services	999.73	672.72	1,375.02	45.86%
FTSE/Athex Consumer Goods & Services	11,873.45	8,974.47	12,337.62	29.65%
FTSE/Athex Industrial Goods & Services	6,001.05	4,603.86	6,374.93	29.38%
FTSE/Athex Retail	1,145.50	901.21	1,154.60	27.11%
FTSE/Athex Banks	794.86	640.09	954.15	24.09%
FTSE/Athex Food & Beverage	10,250.02	8,101.49	10,291.92	21.07%
FTSE/Athex Travel & Leisure	2,639.54	2,196.17	2,671.63	19.04%
FTSE/Athex Construction & Materials	3,760.56	3,204.90	3,846.65	17.34%
FTSE/Athex Basic Resources	7,604.50	6,463.31	7,812.43	17.18%
FTSE/Athex Technology	2,311.64	2,047.81	2,372.79	12.53%
FTSE/Athex Utilities	5,009.01	4,598.77	5,289.37	8.92%
FTSE/Athex Personal Products	7,183.35	6,441.87	7,905.24	8.73%
FTSE/Athex Health Care	423.42	390.59	469.84	1.08%
FTSE/Athex Energy	4,925.00	4,780.16	5,856.79	-2.08%
FTSE/ATHEX Real Estate	3,829.76	3,783.96	4,461.05	-5.97%
FTSE/Athex Insurance	2,675.19	2,652.26	3,042.07	-8.85%
FTSE/Athex Telecommunications	3,702.05	3,511.53	4,391.80	-9.08%

Source: Daily official list of trading activity of the ATHEX 28/4/2023.

The observed fluctuations of the stock market were also reflected in the prices of the KEPE GRIV implied volatility index, the so-called “fear” index, during the first four months of 2023. The index reflects the uncertainty of the derivatives market participants about the expected short-term course of the Greek market and is calculated on the basis of the FTSE/ATHEX Large Cap options prices. The KEPE GRIV index decreased in April 2023, reaching 26.67% on 28/4/2023, from 29.10% on 31/3/2023. Moreover, the average daily value of the index decreased, reaching 27.40% in April

2023, from 29.92% in March 2023. The index remained below its historical average level (since January 2004) for the Greek market, which stands at 32.50%. The evolution of the index indicates a decrease in uncertainty for the expected short-term course of the Greek market compared to the end of the previous month. The highest levels of the index for the first four months of 2023 were recorded in March 2023, given the increased uncertainty related to the global financial system, and then deescalated and moved to lower levels than December 2022 (28.48% on 30/12/2022).

1.4.3. Greek Government T-bills, Greek Government bonds and corporate bonds

After a series of interest rate increases by Central Banks in 2022 and 2023, the effects on the bond market remain evident. At the beginning of May 2023, the seventh consecutive increase of ECB key interest rates since July 2022 was recorded, with the aim of a timely return of inflation to the ECB's medium-term target of 2%.¹ A direct consequence of these developments was the increase in the cost of borrowing for the Greek Government, with interest rates being recorded higher than at the end of 2022, while a relative stabilization of these is observed in the last months of the first four months of 2023.

Examining the issues of Greek Government T-bills of the first four months of 2023 (Table 1.4.2), it is observed that all yields are higher compared to the end of 2022 for all 13-, 26- and 52-week T-bills issued, with the largest increase recorded for the 13-week T-bills. The interest rates of the Greek Government benchmark bonds also moved upwards for the same period (Figure 1.4.1). According to Bank of Greece data, the average monthly yield of the Greek government bonds increased in April 2023 compared to December 2022 for almost all maturities, with the

five-year bond having the largest increase and the fifteen-year bond being the only one to record a marginal decrease compared to December 2022. Note that in March 2023, there was a slight de-escalation in almost all maturities (with the sole exception of the five-year bond, which recorded a marginal increase). Overall, there appears to be a relative stabilization of yields that has halted the sharp rise in the yields of 2022.

Also note the successful new issues of the ten-year Greek government bond in January 2023 (coupon 4.250%, re-offer yield 4.279%), as well as the five-year Greek government bond in March 2023 (coupon 3.875%, re-offer yield 3.919%). The bond reissues that followed in April 2023 were also successful, according to the Greek Government Bond Auction Calendar.²

Finally, the corporate bond indices of the ATHEX also moved upwards. According to ATHEX data, the Hellenic Corporate Bond Price Index³ recorded a return of 0.54%, and the Hellenic Corporate Bond Index⁴ a return of 1.72% during the first four months of 2023.⁵ In addition, the cash value of settled transactions of corporate bonds decreased, reaching €62.23 million in the first four months of 2023, from €88.14 million in the first four months of 2022.

TABLE 1.4.2 Greek Government T-bills yields (issues from the end of 2022 up to April 2023)

Auction date	13 weeks	Auction date	26 weeks	Auction date	52 weeks
5/4/2023	3.04%	26/4/2023	3.50%	8/3/2023	3.75%
1/2/2023	2.47%	29/3/2023	3.15%	7/12/2022	2.73%
4/1/2023	2.18%	22/2/2023	3.07%		
2/11/2022	1.79%	25/1/2023	2.40%		
		28/12/2022	2.50%		

Source: Ministry of Finance.

1. See ECB Press Release of the 4th of May 2023.

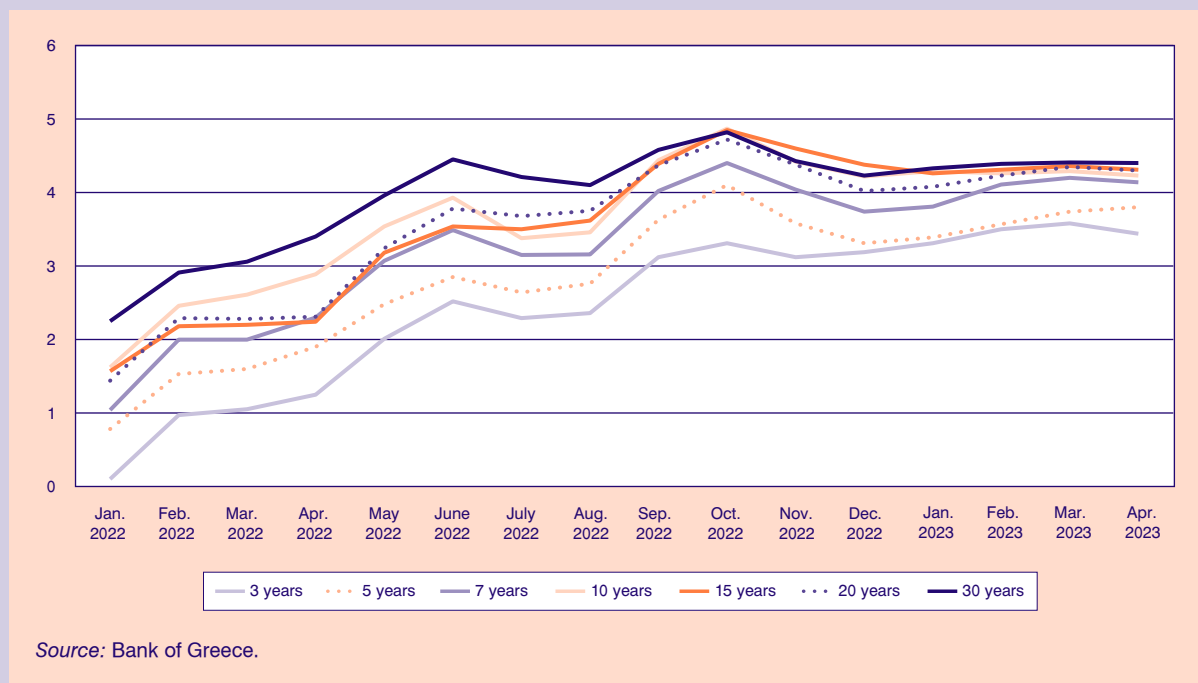
2. According to the announcement of PDMA of the 7th of April 2023, the Greek Government Bond Auction Calendar "is complementary to HR 2023 funding program, aiming at facilitating the GGBs' secondary market operation".

3. Based on the net price of each bond.

4. Based on the net price, accrued interest and the value of the payments of each bond.

5. Returns on 26/4/2023 according to the daily official list of trading activity of the ATHEX of 28/4/2023.

FIGURE 1.4.1
Monthly average yield (%) of Greek Government benchmark bonds (Jan. 2022 – Apr. 2023)
for maturities of 3, 5, 7, 10, 15, 20 and 30 years



1.4.4. Conclusions

The first four months of 2023 ended with a positive sign for the stock market. Despite the ongoing challenges for the market, the first four months of 2023 ended with positive returns for large, mid and small caps, as well as for the majority of sectoral indices. At the same time, the capitalization and transactions value increased for the same period. Moreover, although successive increases in key interest rates by Central Banks have affected the bond market, the rate of interest rate increases recorded in 2022 appears to be interrupted and a relative stabilization of bond yields is observed, according to the data under examination for the first four months of 2023.

At the same time, the prospect of returning to investment grade remains, while waiting for the national elections and the formation of a new government. Note that on April 21, 2023, the international rating agency Standard & Poor's upgraded Greece's outlook from stable to positive, maintaining the rating at BB+, just one notch below investment grade. According to Standard & Poor's, the positive outlook is based

on "its recent strong track record of implementing structural reforms" and on the fact that "the government has closed the fiscal deficit faster than it anticipated, through improvements they [the rating agency] view as broadly sustainable". At the same time, Standard & Poor's links the eventual upgrading of the country to the maintenance of fiscal discipline and to the maintenance of the pace of structural reforms by the next government, thereby boosting the competitiveness of the Greek economy.

The upgrade of Greece's credit rating to investment grade would have significant positive effects for businesses, the stock market and the government, as it would lead to the attraction of new investment funds, the expansion of the investment base for government bonds and a reduction of borrowing costs.

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1.5. Recent developments and prospects of global economic activity: Slowdown of global economic growth amid deteriorating financial conditions

Aristotelis Koutroulis

Despite the reopening of the Chinese economy and the easing of global supply chain constraints, the growth rate of global GDP is set to slow. The slowdown of economic activity in most regions of the world reflects the deteriorating financial conditions, the persistence of core inflation at high levels and the escalation of protectionism.

1.5.1. Recent developments and short-run prospects of the global economy

The international organizations' reports indicate that global economic activity will moderate for a second consecutive year. Specifically, the annual growth rate of global GDP is set to fall well below the average growth rate of the period 2000-2019, with projections for 2023 ranging from 2.1% (World Bank, 2023) to 2.8% (IMF, 2023; European Commission, 2023) (see Table 1.5.1). The slowdown of the global economy reflects the negative effects from the continuation of the war in Ukraine, high energy costs, large interest rate hikes to combat inflation, depositors' low confidence in the banking system due to the recent turmoil in the banking institutions of the US and Europe, global climate change, and the general trend of geopolitical and economic fragmentation (IMF, 2023; United Nations, 2023). At the same time, the robust consumption in the US and Europe, the reopening of the Chinese economy, the easing of supply bottlenecks, the gradual decline of energy prices and transport costs, and the resilient labour markets in advanced economies are all set to support the global economy (United Nations, 2023; European Commission, 2023).

According to the macroeconomic projections of international organizations, the picture for the global econ-

omy is expected to improve only marginally in 2024, with the rate of change of global GDP ranging between 2.4% (World Bank, 2023) and 3.1% (European Commission, 2023) (see Table 1.5.1). The poor prospects of the global economy are due to low investment rates in the real sector and the accumulation of high public debt in the majority of advanced and developing economies (United Nations, 2023).

1.5.2. Regional developments

More restrictive credit conditions due to tighter monetary policy and softening labour markets (e.g., a reduction in the rate of the creation of new jobs, a marginal increase in unemployment and a restraint in nominal wages) are expected to weigh on economic activity in major advanced economies in 2023 (World Bank, 2023). Specifically, GDP growth is projected to decline in the US due to slower household spending and due to the lagged effects of monetary policy on interest rate sensitive sectors (e.g., manufacturing and construction). In the euro area, growth is expected to weaken in 2023, mainly as a result of fiscal policy tightening, elevated uncertainty, high borrowing costs, and anemic investment activity. For Japan, amid a sluggish external demand, GDP growth is set to change only slightly. Finally, the UK economy is expected to contract marginally, reflecting stagnant investments and declining real household incomes due to high inflation.

The tight conditions that prevail in global financial markets, in combination with the poor performance of external demand, are expected to weigh on the growth prospects of most emerging and developing economies. Among the four major emerging economies, the Russian economy is expected to suffer the biggest losses with consumption remaining anemic and export earnings falling, mainly due to the European embargo on Russian oil. In India, the reduced growth rate reflects the negative effects of increased borrowing costs on consumption and manufacturing. Brazil is also expected to record a low growth performance due to high inflation, restrictive monetary policy and declining international prices of the commodities the country exports. On the contrary, after lifting the pandemic related restrictions, the GDP growth rate in China is expected to register a large increase on the back of robust household consumption (European Commission, 2023).

TABLE 1.5.1 Real Gross Domestic Product^{1,2}
(annual percentage changes)

	2022*					2023**					2024**				
	IMF	EC	OECD	WB	UN	IMF	EC	OECD	WB	UN	IMF	EC	OECD	WB	UN
World economy	3.4	3.3	3.3	3.1	3.1	2.8	2.8	2.7	2.1	2.3	3	3.1	2.9	2.4	2.5
Advanced economies	2.7	2.6	:	2.6	2.7	1.3	1.3	:	0.7	1	1.4	1.6	:	1.2	1.2
USA	2.1	2.1	2.1	2.1	2.1	1.6	1.4	1.6	1.1	1.1	1.1	1	1	0.8	1
Euro Area	3.5	3.5	3.5	3.5	3.5	0.8	1.1	0.9	0.4	0.9	1.4	1.6	1.5	1.3	1.4
Japan	1.1	1	1	1	1.1	1.3	1.1	1.3	0.8	1.2	1	1	1.1	0.7	1
United Kingdom	4	4.1	4.1	:	4	-0.3	-0.2	0.3	:	-0.1	1	1	1	:	1.1
Developing economies	4	3.9	:	3.7	3.9	3.9	4.1	:	4	4.1	4.2	4.2	:	3.9	4.2
Brazil	2.9	2.9	2	2.9	0.9	0.9	1	1.7	1.2	1	1.5	1.3	1.2	1.4	2.1
Russia	-2.1	-2.1	:	-2.1	-2.1	0.7	-0.9	:	-0.2	-0.6	1.3	1.3	:	1.2	1.4
India	6.8	6.7	7.2	7.2	6.8	5.9	5.6	6	6.3	5.8	6.3	6.6	7	6.4	6.7
China	3	3	3	3	3	5.2	5.4	5.4	5.6	5.3	4.5	4.7	5.1	4.6	4.5

Sources: IMF (2023); European Commission (2023); OECD (2023); United Nations (2023); World Bank (2023).

* Estimations, ** Projections.

Notes: 1. The observed differences between the available macroeconomic projections partly reflect the differences between the macro-econometric models and the data used by each international organization.

2. The sub-group of emerging economies is included in the group of developing economies.

1.5.3. Inflation

In 2022, the acceleration and stabilization of inflation at high levels in most regions of the world reflect the sharp and rapid increases in international prices of energy and other basic commodities, robust household spending, and global supply bottlenecks (IMF, 2023; European Commission, 2023). For 2023, it is expected that the ongoing normalization in energy and commodity markets, along with tightening monetary policy, will bring down inflation by 1.7 percentage points (see Table 1.5.2). Nevertheless, core inflation is set to remain elevated. In some advanced economies, the persistence of core inflation is explained by continuous large increases in the prices of services (e.g., housing, insurance, and transport) and rising nominal wages (United Nations, 2023). In developing and emerging economies, elevated core inflation is mainly attributed to local particularities (e.g., market imperfections).

1.5.4. Labour markets

The labor markets in Europe, Japan and North America are characterized by tight conditions, low unem-

ployment rates (see Table 1.5.3), and significant shortages of labor force in specific specialties. Furthermore, apart from the USA and the UK, employment rates have risen to levels that exceed those prevailing before the outbreak of the pandemic (United Nations, 2023).

According to World Bank analysts, tight labor market conditions in the advanced world are linked to a slowdown in labor supply due to declining labor force participation rates which, in turn, are attributed to an increase in early retirements (World Bank, 2023). As regards the observed mismatch between the demand and supply of specific skills and professions, this has added upward pressure on nominal wages, thereby creating problems in Central Banks' efforts to combat inflation.

Looking ahead, the large increase in interest rates and its negative impact on interest rate sensitive sectors (e.g., construction, manufacturing, and retail trade) are very likely to affect employment in the corresponding sectors (IMF, 2023). In addition, the projected moderation of global economic activity and the likelihood of a mild and short recession in some EU member-states may reverse the current trend of employment. Nev-

TABLE 1.5.2 Inflation¹
(annual percentage changes)

	2022*			2023**			2024**		
	IMF	EC	OECD	IMF	EC	OECD	IMF	EC	OECD
World economy	8.7	:	:	7	:	:	4.9	:	:
Advanced economies	7.3	:	:	4.7	:	:	2.6	:	:
USA	8	8	6.2	4.5	4.3	3.9	2.3	2.6	2.6
Euro Area	8.4	8.4	8.4	5.3	5.8	5.8	2.9	2.8	3.2
Japan	2.5	2.5	2.5	2.7	3.2	2.8	2.2	1.8	2
United Kingdom	9.1	7.9	9.1	6.8	6.7	6.9	3	2.4	2.8
Developing economies	9.8	:	:	8.6	:	:	6.5	:	:
Brazil	9.3	:	9.3	5	:	5.6	4.8	:	4.7
Russia	13.8	:	:	7	:	:	4.6	:	:
India	6.7	:	6.7	4.9	:	4.8	4.4	:	4.4
China	1.9	2	1.9	2	:	2.1	2.2	:	2

Sources: IMF (2023); European Commission (2023); OECD (2023).

* Estimations, ** Projections.

1. The sub-group of emerging economies is included in the group of developing economies.

TABLE 1.5.3 Annual unemployment rates

	2022*			2023**			2024**		
	IMF	EC	OECD	IMF	EC	OECD	IMF	EC	OECD
USA	3.6	3.5	3.6	3.8	4.1	3.7	4.9	4.8	4.4
Euro Area	6.8	6.8	6.7	6.8	6.8	6.7	6.8	6.7	6.6
Japan	2.6	2.6	2.6	2.3	2.5	2.5	2.3	2.4	2.4
United Kingdom	3.7	3.7	3.7	4.2	4.3	4.2	4.7	4.6	4.5
Brazil	7.9	:	:	8.2	:	:	8.1	:	:
Russia	3.9	3.9	:	3.6	3.7	:	4.3	4	:
China	4.2	:	:	4.1	:	:	3.9	:	:

Sources: IMF (2023); European Commission (2023); OECD (2023).

* Estimations, ** Projections.

ertheless, amid labor shortages, it is more likely that businesses will prefer to keep the workforce they employ. Therefore, changes in unemployment and employment figures in the near future are expected to be marginal (United Nations, 2023).

1.5.5. Financial conditions

The falling energy prices, in combination with the gradual deceleration of inflation during winter, had boosted portfolio investors' expectations of a faster transition of economies into a phase of stable, if not falling, interest rates. Indicative of these positive expectations was the increase in the willingness of markets to finance emerging economies and the record issuance of government bonds in the developing world last January (United Nations, 2023).

Contrary to market participants' initial expectations, policy interest rates registered further increases, adding pressures to financial stability and leading to banking turbulence in the US and Europe. Though the actions of monetary authorities managed to mitigate the risk of a systemic crisis, many problems remain unsolved. The increased cost of raising capital in the interbank market due to high interest rates, combined with the need to strengthen banks' capital buffers, has led to less favorable financing conditions for households and businesses in several OECD member states. This results in a slowdown in the rate of credit expansion to the private sector (OECD, 2023).

1.5.6. World trade and commodity prices

In line with the slowdown of global manufacturing activity, global trade in goods is expected to register a sharp slowdown in 2023. On the contrary, thanks to the increasing demand for travel services, trade in services will continue expanding at a high rate. Overall, global trade (goods and services) is set to grow approximately 3 percentage points (see Table 1.5.4).

TABLE 1.5.4 World trade volume
(annual percentage changes, goods and services)

	World trade volume (goods & services)			
	2021*	2022*	2023**	2024**
IMF	10.1	5.1	2.4	3.5
OECD	10.4	5	1.6	3.8
WB	11	6	1.7	2.8
UN	10.6	5	2.3	3.6

Sources: IMF (2023); OECD (2023); United Nations (2023); World Bank (2023).

* Estimations, ** Projections.

The decline in the expansion rate of international trade is primarily attributed to the shift of consumer demand from tradable goods (e.g., manufacturing products) to services, which, apart from international tourism, are produced and consumed domestically. Another factor that holds back global trade is related to rising protectionism.

Regarding commodity markets, international prices have been falling since mid-2022. Specifically, the downward trend in energy prices is set to continue in 2023 with oil prices hovering around 80 USD per barrel and European prices of natural gas falling by 23 percentage points compared to 2022 (European Commission, 2023; World Bank, 2023). Metal prices will remain below 2022 peaks as increased supply is expected to offset the upward pressures stemming from higher demand. As for agricultural commodity prices, cereals and vegetable oils have registered large reductions. On the contrary, the price reduc-

tions regarding meat and dairy products have been marginal. Overall, despite their downward trend, agricultural product prices are expected to be 30% higher than 2020 levels (European Commission, 2023).

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2. Fiscal developments

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State Budget, public debt and fiscal figures perspectives

Elisavet I. Nitsi

2.1. State Budget execution, January-April 2023

According to the most recent data retrieved from the General Accounting Office,¹ on a modified base, the execution of the State Budget in the period January-April 2023 shows a significant improvement compared to both the corresponding period of 2022 and the monthly estimates, as they were reflected in the executive summary of the State Budget for the fiscal year 2023. The deficit has been substantially reduced, while a primary surplus is observed against the forecast deficit, due to the significantly increased revenues.

According to the data shown in Table 2.1.1, the State Budget had a deficit in its balance amounting to 789 million euros in the period January-April 2023, against a deficit of 3.3 billion euros in the corresponding period of 2022, and a target for deficit of 3.8 billion euros. The State Budget Primary Balance, in surplus, stood at 2.7 billion euros in comparison to the primary deficit of 799 billion euros for the same period in 2022 and the primary deficit target of 869 million euros.

Net revenues of the State Budget increased compared to the corresponding period of the previous year, as they amounted to 21.1 billion euros, showing an increase of 3.4 billion euros or 19.5% compared to the revenues of the first four months of 2022 and by 2.5 billion euros or 13.5% against the targets set by the 2023 Budget. Public Investment Program (PIP) revenues reached 839 million euros, reduced compared to the corresponding period of 2022 (504 million euros or

37.5% less), while also falling short of the estimate of the 2023 Budget by 636 million euros or 43.1%. More specifically, the rise in revenue compared to the corresponding period of 2022 is owed to tax collection (1.8 billion euros, of which 0.9 billion euros is from VAT and 0.6 billion euros from personal income tax) and transfers (1.5 billion euros). The results in relation to the objectives set by the 2023 Budget are similar, although with a smaller deviation.

On the expenditure side, which amounted to 21.8 billion euros, the State Budget in the January-April 2023 period increased by 0.8 billion euros or 4% compared to the corresponding period of 2022, while in comparison with the target set at 22.4 billion euros, it lacks by 529 million euros or 2.4%. The main reasons for this expansion compared to the same period last year are the increase in transfers, by 881 million euros or 9.2%, and interest payments, by 708 million euros or 28%. In addition, it should be noted that, while it was foreseen that there would be a fund under allocation of appropriations, these were ultimately allocated to the remaining categories to meet current needs. Moreover, the PIP expenditures, amounting to 2.7 billion euros, increased by 112 million euros or 4.4% compared to the same period last year, while they increased by 340 million euros or 14.6% compared to the target set by the 2023 Budget. Finally, in the 2023 Budget, 1.7 billion euros have been budgeted from the Recovery and Resilience Fund that were absorbed in the period under review.

Overall, the execution of the Budget in the period January-April 2023 is shown to be significantly improved from the targets set by the Ministry of Finance with the 2023 Budget, as the consequences of the energy crisis have receded and, at the same time, VAT collections have increased significantly due to inflation, which, although it has decreased significantly, continues to be high in basic necessities, such as food.

1. Based on preliminary data published in the State Budget Execution Monthly Bulletin: April 2023, General Accounting Office, May 2023.

TABLE 2.1.1 State Budget execution, January-April 2023, in mil. € on a modified base

	Jan.-Apr. 2022	Jan.-Apr. 2023		2022	2023
	Outcome	Outcome	Budget estimates 2023 ¹	Outcome ²	Budget 2023 ³
State Budget					
Net Revenue	17,621	21,057	18,545	59,623	63,885
Taxes	16,040	17,803	16,236	55,217	57,421
VAT	6,615	7,542	7,093	21,422	22,217
Excise taxes	2,042	2,032	2,112	6,984	7,115
Property taxes	541	353	395	2,692	2,380
Income taxes	4,354	4,991	4,518	17,012	18,476
Social contributions	19	19	19	56	55
Transfers	2,443	3,959	3,147	6,357	7,953
Sales of goods & services	236	284	266	833	2,418
Other current revenue	631	1,120	614	3,301	2,124
Sales of fixed assets	1,681	2,128	1,739	6,153	6,110
Expenditures	21,007	21,846	22,375	71,279	71,871
Compensation of employees	4,464	4,602	4,495	13,640	13,796
Social benefits	110	137	119	391	397
Transfers	9,537	10,418	9,660	35,086	32,476
Purchases of goods & services	344	325	221	2,145	1,541
Subsidies	16	91	3	400	80
Interest payments (gross basis)	2,528	3,236	2,960	5,039	5,851
Other current expenditures	25	21	22	55	81
Non-allocated expenditure	0	0	847	0	3,156
Purchase of fixed assets	1,414	206	1,046	3,496	2,531
Public Investment Program (PIP)					
Revenue ⁴	1,343	839	1,475	4,569	4,000
Expenditures	2,558	2,670	2,330	8,182	8,300
Recovery and Resilience Fund					
Revenue ⁵	1,718	1,718	1,718	1,718	3,436
Expenditures ⁶	11	141	671	2,843	3,662

TABLE 2.1.1 (continued)

	Jan.-Apr. 2022	Jan.-Apr. 2023		2022	2023
	Outcome	Outcome	Budget estimates 2023 ¹	Outcome ²	Budget 2023 ³
State Budget Primary Balance⁸	-799	2,443	-869	-6,652	-2,134
State Budget Primary Balance^{7,8}	-3,316	-789	-3,829	-11,656	-7,985

Source: Budget Introductory Report 2023, Ministry of Finance. State Budget Execution, General Accounting Office, Ministry of Finance, May 2023.

Notes:

- 1 Budget estimates, as depicted in the 2023 Budget Introductory Report.
2. Data for the revenues and expenditures of the State Budget for the year 2022 are temporary and will be finalized with the ratification of the Revenue and Expenditure Report of the State for the fiscal year 2022.
3. Annual estimates as depicted in the executive summary of the 2023 Budget introductory report.
4. Public Investment Budget revenues are included in lines "Transfers" and "Other current revenues".
5. Revenues from the Recovery and Resilience Facility Fund are included in lines "Transfers".
6. The Recovery and Resilience Facility Fund expenditures are heterochronic and the estimated payments for the months of January-April are expected to be made in the following two months (May and June).
7. + Surplus, - Deficit.
8. Data is presented according to the new economic classification (Presidential Decree 54/2018).

2.2. The evolution of Greek public debt, first quarter 2023

According to the latest data available from the General Accounting Office,² in the first quarter of 2022, the Central Government's debt amounted to 401.5 billion euros, showing an increase of 1.3 billion (0.3%) compared to the previous quarter, i.e., end of 2022, and 7 billion (1.8%) compared to the corresponding quarter of 2022. In addition, cash deposits increased by 0.24 billion (1.3%) compared to the end of 2022 and 0.3 billion (1.6%) compared to the first quarter of 2022.

The composition of Central Government debt in the first quarter of 2023 is presented in Table 2.2.1. The debt of the Central Administration in the first quarter of 2023 is in its entirety at a fixed interest rate and in euros. Regarding the percentage ratio of Central Government debt based on the mode of negotiation, there is a small change in favor of non-negotiable debt over negotiable, which stood at 23.8% and 76.2%, respectively, during the period under examination against the previous quarter, but also against the corresponding quarter of 2022 (76.2% and 23.8%, respectively). In addition, as regards the guarantees

granted by the Greek State, these show a decrease of 291.8 million euros or 1% compared to the end of 2022 and by 1.2 billion or 3.8% compared to the first quarter of 2022.

The distribution of debt, based on the residual maturity in the first quarter of 2023, is reflected in Table 2.2.2. Short-term Greek government securities (with maturity less than one year) represent 17% of the total, compared to 11.8% from the medium-term notes (with maturities of one to five years), and 72.1% from long-term issues (maturity after five years) from 17.2%, 10.7% and 72.1%, respectively, which were the last quarter of 2022. Compared to the same quarter of 2022, a decrease in the share of short-term and long-term securities is observed, with an increase in medium-term securities.

The average residual maturity of the total Central Government debt stood at 17.46 years, decreased from that of 18.22 years in the corresponding quarter of 2022. Furthermore, regarding the new borrowing of the Greek government during the reporting period, the weighted average maturity rose to 4.63 years, with a significant decrease from the level of 5.53 years at which it had formed at the end of 2022. New borrow-

2. Public Debt Bulletin, March 2023, General Accounting Office, Ministry of Finance.

TABLE 2.2.1 Central Government debt¹³ (in million €)*

Period	2022Q1	2022Q4	2023Q1
Outstanding Central Government Debt	394,547.18	400,275.64	401,528.24
Debt by type of interest rate			
Fixed rate ²	390,996.26	400,275.64	401,528.24
Floating rate ^{2,3}	3,550.92	0.00	0.00
Debt by way of trading			
Tradable	95,480.42	96,866.70	95,563.72
Non-tradable	299,066.76	303,408.94	305,964.52
Debt by currency			
Euro	392,574.44	400,275.64	401,528.24
Non-Eurozone currencies	1,972.74	0.00	0.00
Cash Deposits of the H.R.⁴	18,856.30	18,796.70	19,098.80
Debt guaranteed by the Central Government	30,503.11	29,631.20	29,339.40

Source: Public Debt Bulletin, General Accounting Office, Ministry of Finance.

Notes:

1. Central Government Debt differs from General Government Debt (Maastricht definition) by the amount of intra-sectoral debt holdings and other ESA '95 adjustments.
 2. Fixed/floating ratio is calculated taking into account i) interest rate swap transactions, ii) the use of funding instruments by the ESM regarding the loans that have been granted to the Hellenic Republic and iii) the incorporation of the risk metrics of the EFSF's liability portfolio into the Greek debt portfolio.
 3. Index-linked bonds are classified as floating rate bonds.
 4. Included balance of dedicated cash buffer account, 15,697.3 million euros on 31/12/2022 & 31/3/2023.
- * Estimates.

TABLE 2.2.2 Budgetary Central Government debt by residual maturity (amounts in mil. €)*

Period	2022Q1	2022Q4	2023Q1
Total Amount	394,547.18	400,275.64	401,528.24
Short-term (up to 1 year)	66,872.07	68,876.94	68,241.03
Medium-term (1 to 5 years)	37,280.81	42,656.63	47,402.77
Long-term (more than 5 years)	290,394.30	288,742.07	285,884.44

Source: Public Debt Bulletin, General Accounting Office, Ministry of Finance.

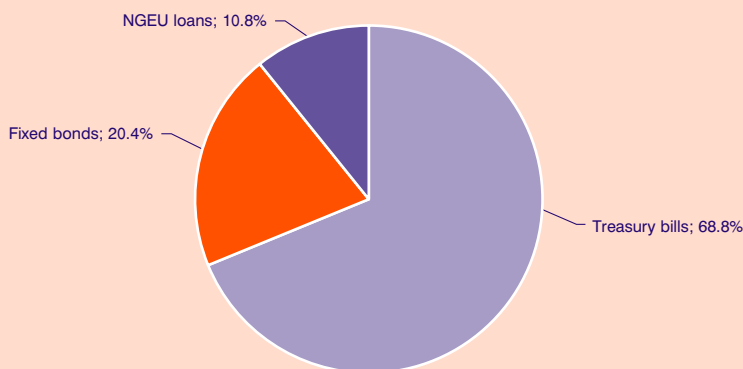
* It concerns the volume of bonds, interest-bearing bills and short-term securities and not the total Debt of the Central Administration.

ing for the first quarter of 2023 decomposes to 20.4% in fixed bonds and 68.8% in Treasury Bills and 10.8% from NGEU loans (Graph 2.2.1).

Graph 2.2.2 shows the redemption schedule of the Central Government debt based on the latest pub-

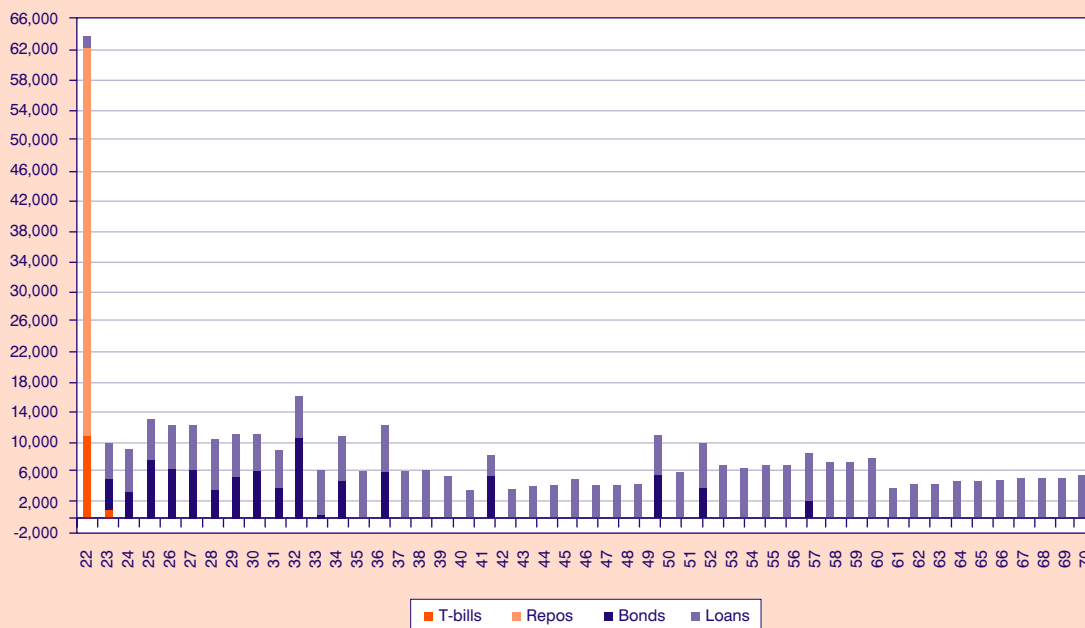
lished data. From the display of newer data, it seems that apart from the present year (2023), the dispersion of the burden of redemption of public debt has now leveled, with few exceptions, at less than 10 billion euros per year until 2070.

GRAPH 2.2.1
Composition of borrowing, first quarter 2023



Source: Public Debt Bulletin, General Accounting Office, Ministry of Finance.

GRAPH 2.2.2
Redemption schedule of Budgetary Central Government Debt on 31/3/2023 (amounts in million euro)



Source: Public Debt Bulletin, General Accounting Office, Ministry of Finance.

Notes: Buy-backs are scheduled for the smoothening of redemptions. Including extension of EFSF loans agreed on at the Eurogroup of 22-6-2018.

In conclusion, the debt stabilized in the first quarter of 2023, which demonstrates that the financial needs of the Greek economy during this period were met by the revenues of the State Budget and funding from the European Union funds to cover the emergency needs from not only the energy crisis, but also the financial crisis due to inflationary pressures.

2.3. Fiscal figures perspectives

Greece is facing significant challenges and prospects in the field of fiscal figures for the year 2023. The country is in a phase of economic recovery, reducing unemployment and restoring its economic viability. However, as the international environment shows a slowing growth, but also internally the inflationary pressures persist and the country within the Eurozone faces a tight monetary policy, the economic policy that will be followed by the newly elected government is particularly important.

In the field of public finances, the country has managed to implement reforms, improve the business environment, and control the deficit. However, the removal of the general escape clause from the fiscal targets in 2024 and the debated reform of the stability pact place limits on the scope for fiscal policy to support the recovery of the economy with expansionary measures, let alone to proceed with measures to support the society, increasing incomes and other measures that have been announced in the pre-election program of the new government.

Thus, the only path for the new government is economic development, which is important not only for improving the standard of living, but also for the sustainability of the debt, as well as for finding the necessary fiscal space for social policy. The maintenance of primary surpluses is necessary for the sustainability of the country in the markets, but at reasonable levels so that they do not create problems for development.

The recessionary pressures of the international environment are a hindrance on the development of the Greek economy. The financial instruments of the Recovery and Resilience Fund and the NSRF 2021-2027 could act as a counterweight. For this to happen, programs with a significant development footprint should be implemented immediately and as a priority.

The strengthening of private investment will also play an important role, as net investment remained negative in 2022. A necessary condition for the increase in investment is structural reforms so as to further improve the investment environment. Investments, foreign and domestic, should be oriented towards productive and technologically advanced activities, such as the tourism industry, agricultural production, the shipping industry and new technologies, which will contribute to job creation and state revenue increases. In addition, getting the investment grade as quickly as possible is imperative to contain borrowing costs and improve public debt.

In addition, a key tool in economic development and controlling the fiscal figures is controlling the current account deficits. This deficit is the most basic economic risk, as it is a structural problem of the Greek economy that demonstrates the country's problematic development pattern which, despite the reforms carried out in the last decade, is still based on consumption, mainly of imported products, and not on investments and exports. More problematic is the country's production model, which is based to a large extent on imported inputs.

In summary, maintaining fiscal discipline and improving the efficiency of public spending will become priorities for 2023. It is important to maintain the balance between the need for public investment and ensuring citizens' social protection. Maintaining fiscal discipline, the competitiveness of the economy and social protection remain the key parameters of economic policy.

3. Human resources and social policies

KEPE, *Greek Economic Outlook*, issue 51, 2023, pp. 37-43

3.1. Recent developments in key labour market variables

Ioannis Cholezas

3.1.1. Introduction

Typically, due to the seasonal volatility of economic activity, the number of unemployed persons goes up in the last quarter of the year, which usually means that the unemployment rate increases also, while the number of the employed goes down. The fourth quarter of 2022 was no exception. However, the situation seems very different when looking at annual changes. Most new jobs were occupied by men over the age of 25 with Greek citizenship. But, in relative terms, employed youth aged 15-24 and foreigners recorded the biggest increases. Moreover, the biggest percentage increase was reported for the employed with a higher secondary education degree, followed by Master's or PhD holders. On the contrary, the number of employed technical vocational education graduates went down. Certain industries that dominate the Greek economy have exhibited strong decreases in the number of the employed compared to 2021, like trade and tourism. On the other hand, the number of employed persons in education, which is closely linked to the public sector, exhibited the biggest increase. Paid employment set a record in the first three months of 2023, since 61.9 thousand net new jobs were reported in March, while overall in the first quarter of the year, the number of net new jobs outperformed all previous years. The consistent increase in full-time job contract conversions to work-in-shifts contracts without the consent of the employee is a negative finding, even though it is still far smaller than the number experienced in previous years.

All in all, in the first quarter of 2023, the labour market sent mixed messages. The number of employed people in March was smaller than a year before, but so was the number of the unemployed. In other respects, labour market prospects are closely linked to the prospects of the Greek economy. So far, the course of the

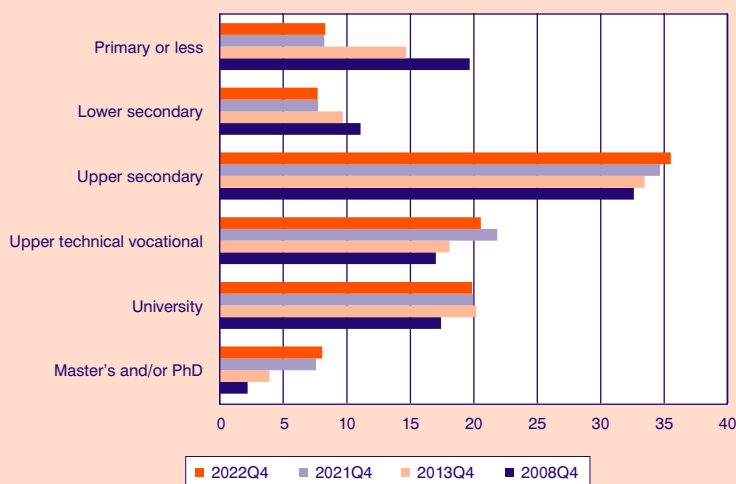
tourism industry allows great optimism, but it is overshadowed by vacancies in various industries, tourism included.

3.1.2. Employment

The number of employed persons aged 15-64 (15+) decreased in the last quarter of 2022 by 87.6 (80.8) thousand compared to the third quarter of the year, reaching 4,020 (4,135) thousand persons. Compared to the same quarter in 2021 (2021Q4), however, the number of employed persons increased by approximately 2%. Evidently, employment continued to expand despite seasonal variations. The biggest part of the annual increase came from men, even though the percentage change was similar for men and women and stood at approximately 1.8%. The number of employed youth aged 15-24 also increased considerably (13.5%) compared to employed persons over 25 (1.6%). However, most new jobs were occupied by persons over 25 years old. As a result, the employment rate for individuals 15-64 (15+) increased to 60.7% (45.7%), converging to the pre-crisis level. Women continued to be less likely to be employed than men, by approximately 17 percentage points (16.8 percentage points in 2021Q4), while the age differential (youth vs. 25+) decreased marginally (from 34.4 percentage points in 2021Q4 to 33.3 percentage points in 2022Q4).

Employment opportunities vary for different ethnic groups. The number of both Greeks and foreigners declined compared to 2022Q3, but increased compared to 2021Q4. The number of the former exhibited greater volatility (81 thousand fewer employed since the previous quarter and around 82 thousand fewer employed since last year), but foreigners reported the biggest relative change (5.6% increase on a yearly basis compared to 1.9% for Greeks). Meanwhile, the difference between men and women was less pronounced amongst foreigners, while the year-on-year relative increase in the number of foreign employed women (6.9%) surpassed not only that of foreign men (4.6%), but also of Greek men (1.8%) and women (2%). Consequently, foreigners overall continued to have a bigger employment rate than Greeks (52.4% vs. 45.5%); the employment gap is especially wide

GRAPH 3.1.1
Shares of the total employed by education group (%)



Source: ELSTAT, Labour Force Survey.

among men of a different nationality, since more than seven out of ten foreigners (72.8%) were employed compared to slightly more than half of Greeks (54%).

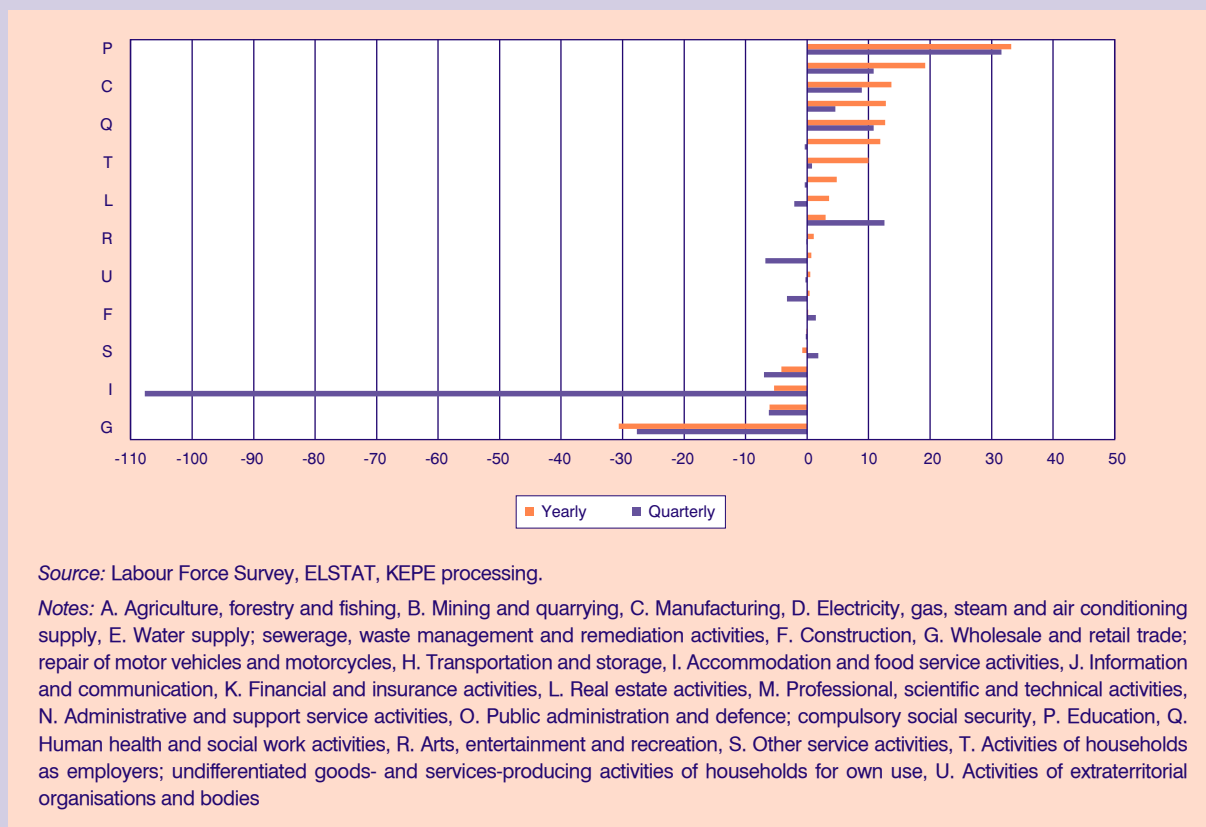
The reduction in the number of employed persons on a quarterly basis was fueled by upper technical vocational education graduates (down by 28 thousand) and secondary education graduates (36.6 thousand fewer upper secondary education graduates and 23.3 thousand fewer secondary education graduates). On the contrary, the number of employed university graduates increased compared to 2022Q3 by 9 thousand. On the other hand, the year-on-year increase was caused primarily by increases in the number of upper secondary education graduates (63.8 thousand) followed by increases in the number of employed persons with a Master's and/or a PhD (26.2 thousand). On the other hand, the number of employed upper technical vocational graduates went down by 35.3 thousand year-on-year the only education group that exhibited a decline. Those shifts changed groups' shares in total employment (Graph 3.1.1); employed persons with more years of education increased their share while employed persons with fewer years of education decreased theirs.

Changes in employment by industry were heterogeneous and, in some cases, they differed considerably in size and direction. Graph 3.1.2 presents year-on-year and quarterly changes. Industries are ranked from the biggest to the smallest annual change. It is interesting that in specific industries, the direction of movements in employment was opposite on a yearly and quarterly

basis. *Information and Communication* is such an example, since it exhibited a decline in the number of the employed by 6.8 thousand compared to 2022Q3, but an increase of 700 new jobs over the past year. It is also evident from the graph that some industries are much more sensitive to seasonality than others. For example, 107.7 thousand jobs were lost in 2022Q4 in *Accommodation and food service activities* while another 27.7 thousand jobs were lost in *Wholesale and retail trade, repair of motor vehicles and motorcycles*. Both these industries have also suffered losses on an annual basis, especially trade, where 30.6 thousand jobs were lost over the past year, the biggest losses recorded among industries. On the other hand, there are industries that increased the number of persons employed over the past year like *Education*, with 32.2 thousand more employed individuals, *Agriculture, forestry, and fishing* with 19.2 thousand more and *Manufacturing*, with 13.7 thousand more employed persons.

At the time of writing, the latest available seasonally adjusted monthly data referred to the first three months of 2023, and showed a decline in the number of employed persons in January 2023 compared to December 2022 by 28.3 thousand, a further reduction by 28.2 thousand in February and a strong increase in March by 59.4 thousand; the latter compensated for the losses of the two previous months. Over the past year, there were 119.1 thousand more employed persons in January 2023 compared to January 2022, but during the subsequent two months, this number fell short by 55.9 thousand in February and 2.7 thousand in March.

GRAPH 3.1.2
Changes in the number of employed persons by industry (in thousand)



Source: Labour Force Survey, ELSTAT, KEPE processing.

Notes: A. Agriculture, forestry and fishing, B. Mining and quarrying, C. Manufacturing, D. Electricity, gas, steam and air conditioning supply, E. Water supply; sewerage, waste management and remediation activities, F. Construction, G. Wholesale and retail trade; repair of motor vehicles and motorcycles, H. Transportation and storage, I. Accommodation and food service activities, J. Information and communication, K. Financial and insurance activities, L. Real estate activities, M. Professional, scientific and technical activities, N. Administrative and support service activities, O. Public administration and defence; compulsory social security, P. Education, Q. Human health and social work activities, R. Arts, entertainment and recreation, S. Other service activities, T. Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use, U. Activities of extraterritorial organisations and bodies

Considering the first three months of each year, it turns out that 98.6 thousand new jobs were created in 2022 compared to just 2.9 thousand new jobs in 2023. This finding should cause concern over the prospects of employment in the following months since it is a sign that employment growth is slowing down.

3.1.3. Paid employment

In the previous issue of the *Greek Economic Outlook*, it was stressed that the share of paid employment in total employment had reached a new high, even though Greece still lags most other European countries. Table 3.1.1 presents the annual data from Eurostat’s Labour Force Survey across selected countries, which verify that Greece exhibits the smallest share of paid employment amongst the EU27 (European Union) and the EZ20 (Eurozone). Even though the share in Greece has increased since 2013 by seven percentage points and has converged to the European average, the latter

remains approximately ten percentage points bigger. Another interesting finding is that women are more likely to be paid employees than men. This gender gap is present in all countries, and it has the same sign, which means that there are some factors at play that drive men towards other types of employment more often than women or push women to paid employment. However, this paid employment gender gap widened in Greece in the period 2013-2022, contrary to what was observed in the EU27 and the EZ20. Indeed, the second widest gender gap was found in Greece in 2022 (10.2 percentage points),¹ while in Luxembourg, the gap switched sign.

The balance of paid employment flows was negative in January 2023 (see Graph 3.1.3), which is expected due to the seasonal nature of economic activity. Approximately 27.6 thousand jobs were lost in January, i.e., 1.8 thousand more compared to the same month in 2022. The balance was positive in the next two months, while in March 2023, it outperformed every other March with 61.9 thousand net new paid jobs.

1. The widest gap was recorded in Slovakia.

TABLE 3.1.1 Shares of paid employees in total employed (%), 2013-2022

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Denmark	91.7	91.9	91.8	91.9	92.3	92.5	92.4	92.2	92.0	92.2
Men	88.8	89.1	89.1	89.4	89.8	90.1	90.0	89.8	89.5	89.7
Women	94.8	94.9	94.8	94.6	95.1	95.3	95.0	94.8	94.8	94.9
Germany	89.6	89.9	90.1	90.4	90.7	91.0	91.3	91.8	92.0	92.2
Men	87.2	87.5	87.7	88.3	88.6	89.0	89.3	90.1	90.1	90.5
Women	92.4	92.5	92.7	92.9	93.0	93.3	93.5	93.7	94.1	94.1
Sweden	90.5	90.8	91.0	91.2	91.3	91.3	91.2	91.3	91.3	91.2
Men	87.0	87.4	87.7	88.1	88.1	88.0	87.7	88.0	88.0	88.2
Women	94.4	94.5	94.4	94.6	94.7	94.9	94.9	94.9	95.0	94.6
EZ20	84.9	85.1	85.3	85.5	85.9	86.2	86.2	86.3	86.6	86.6
Men	81.4	81.7	82.0	82.3	82.8	83.1	83.2	83.3	83.5	83.7
Women	89.0	89.1	89.2	89.3	89.5	89.8	89.8	89.7	90.0	89.9
EU27	84.0	84.2	84.6	84.9	85.3	85.6	85.7	85.7	86.2	86.3
Men	80.7	81.0	81.3	81.8	82.2	82.5	82.6	82.7	83.1	83.3
Women	88.0	88.1	88.4	88.6	88.9	89.2	89.3	89.2	89.9	89.8
Poland	78.7	79.2	79.2	79.7	80.1	80.3	80.5	79.9	80.8	80.6
Men	76.0	76.3	76.3	76.6	76.6	76.9	77.1	76.2	76.7	76.5
Women	82.1	82.7	82.8	83.6	84.3	84.4	84.7	84.6	85.7	85.5
Italy	76.2	76.5	76.8	77.3	78.0	78.3	78.4	78.7	79.5	79.6
Men	71.8	72.3	72.8	73.4	73.9	74.3	74.7	74.9	75.8	76.1
Women	82.3	82.2	82.3	82.6	83.5	83.6	83.5	83.9	84.5	84.5
Greece	63.7	64.8	65.9	66.7	66.8	67.4	69.1	69.2	69.2	70.7
Men	60.2	60.8	61.9	63.3	63.3	63.8	65.2	65.3	64.7	66.3
Women	68.5	70.2	71.3	71.4	71.8	72.5	74.3	74.4	75.3	76.7

Source: Eurostat, Labour Force Surveys.

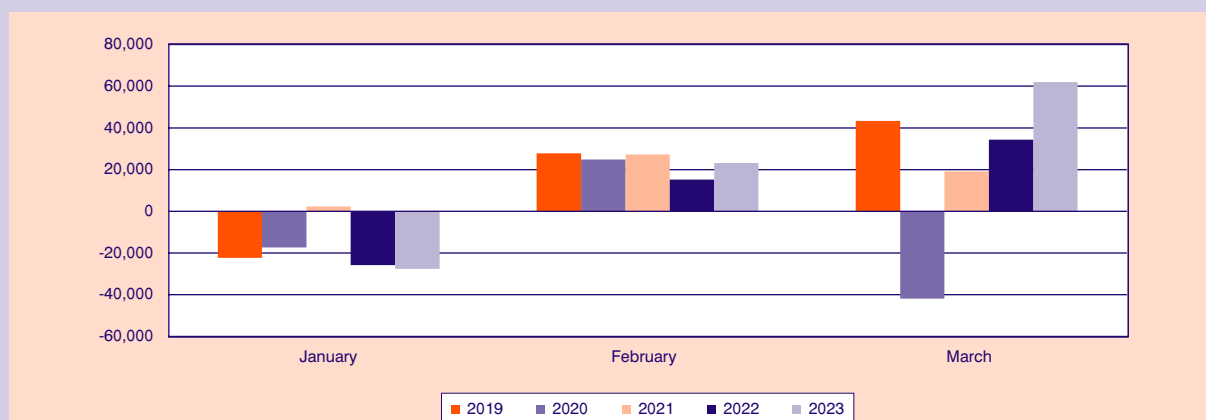
Note: Countries are ranked from biggest to smallest share in 2022.

Overall, in the first quarter of 2023, some 57.5 thousand net new jobs were created. This is the biggest number of net new jobs recorded since 2001. A similar performance was recorded only in 2018 when 55.6 thousand net paid jobs were created. Even though this is by itself an achievement, one must explore which of these new jobs are due to state subsidies and public sector hires. There is no other way to have a clear view of the situation in the labour market.

Another interesting finding is the composition of hires. Most hires in January and March involved full-time

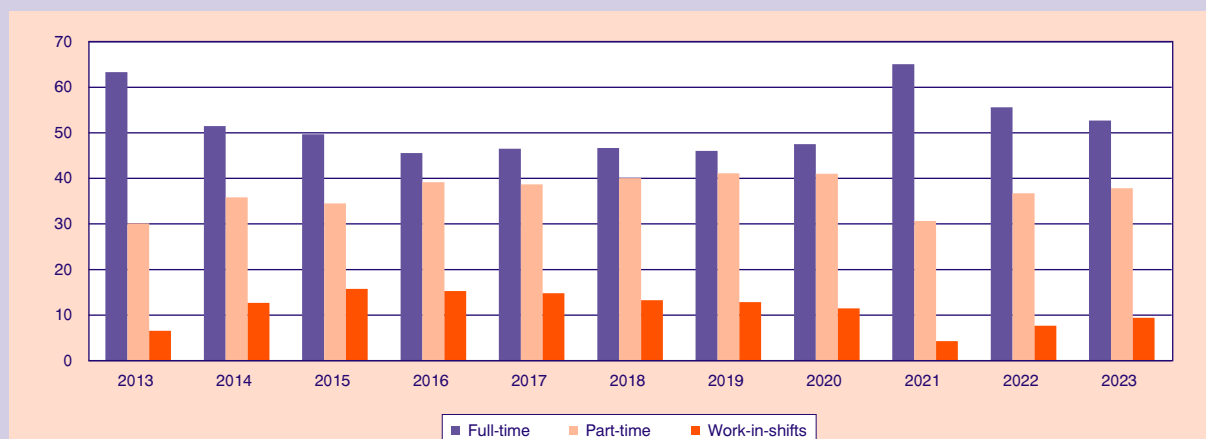
jobs, while in February, the respective share was a bit lower, at 48.6% (see Graph 3.1.4). Overall, 52.7% of hires in the first quarter of 2023 involved full-time jobs, 37.9% involved part-time jobs and 9.4% involved work-in-shifts jobs. However, compared to the first quarter of 2022, the share of full-time jobs hires declined while the shares of flexible job contracts increased, especially hires that involved work-in-shifts jobs. All in all, it is clear in Graph 3.1.4 that flexible employment types have been increasing over the past two years, following the sharp increase in hires that involved full-time jobs in 2021.

GRAPH 3.1.3
Net new paid employment jobs



Source: ERGANI, Ministry of Labour and Social Affairs, KEPE processing.

GRAPH 3.1.4
Share of hires by type (%), 2023Q1



Source: ERGANI, Ministry of Labour and Social Affairs, KEPE processing.

Finally, the number of conversions of full-time job contracts to flexible types of job contracts declined by 20% compared to the first quarter of 2022. The number of conversions to part-time contracts declined sharply (25.8%), while the decline in the number of conversions with the consent of the employees involved was noteworthy (10.5%). On the contrary, the number of conversions to work-in-shifts job contracts without the consent of the employees involved went up by 7%, and it is a finding worth exploring more. As a share of overall conversions, those without consent reached 12.7% in 2023Q1. However, despite the increase reported over the past two years, the number of conversions of this type have not reached levels seen in the past,

either in absolute number or as a share of total conversions. For the sake of argument, it suffices to note that the number of conversions without the consent of the employees involved decreased from around 29% in 2014 to 16% in 2019, but then went up to 21.5% of total in 2020 during the coronavirus era, only to decline again to 5% in 2021. Since then, they have continued to increase. The upward trend should cause concern.

3.1.4. Unemployment

The unemployment rate dropped to 12.1% for individuals aged 15-64 in the last quarter of 2022. Despite the

temporary increase in the number of the unemployed due to seasonality, the comparison to the last quarter of 2021 is favourable, since there were 58.2 thousand fewer unemployed individuals in 2022Q4. Therefore, the total number of unemployed aged 15-64 in 2022Q4 was 550.9 thousand, while the respective number of persons over the age of 15 reached 558.4 thousand. The number of unemployed persons in the last quarter of 2022 was bigger than in 2008Q4 by approximately 150 thousand. Hence, despite the de-escalation, there is still room for improvement.

Typically, women in Greece find it considerably harder to get a job than men. This has not changed. Therefore, in 2022Q4 the unemployment rate for women aged 15-64 stood at 15.7%, almost double that for men (8.8%). Similarly, youth aged 15-24 were faced with an unemployment rate of 29.5%, almost three times that for older persons aged 25-64 (11.1%). The relatively much worse employment prospects of women and youth are issues that must be addressed if the country's human resources are to be managed in a rational and efficient way. In the same manner, the higher unemployment rate facing foreigners should also be addressed, not least because of reasons of social peace. In the last quarter of 2022, the ethnic unemployment gap reached 8.3 percentage points (19.9% vs. 11.6%), which was lower than the previous year, but still unacceptably wide. Given that the ethnic unemployment gap appeared during the economic crisis and has persisted ever since, one may be tempted to assume that it has become an integral part of the Greek labour market.

The good news is that the unemployment rate for Master's and/or PhD holders dropped to 5.1% in 2022Q4, which was 2.1 percentage points lower compared to 2022Q3 and 1.4 percentage points lower compared to 2021Q4. Indeed, during the final quarter of 2022, the number of the unemployed decreased by 8 thousand. A more careful look, however, reveals that this equals the decrease in the number of labour force participants with the same qualifications over the same period (8.3 thousand). Whether this is the result of emigration is a question that must be explored. On the contrary, on an annual basis, the two variables moved in opposite directions: the labour force increased by 22.7 thousand while the unemployed decreased by 3.6 thousand. The unemployment rate compared to 2021Q4 went down for all education groups, but more so for higher education graduates (-2.3 percentage points) and those who have completed primary education or fewer years of school (-2.5 percentage points). By the

end of 2022, secondary education graduates were facing the highest unemployment rate: 14.5% for lower secondary graduates and 14.6% for upper secondary education graduates.

The most recent monthly data on unemployment shows a further decline of the unemployment rate in the first three months of 2023, always compared to the same period in 2022. The usual seasonal fluctuation has been evident this year also. All in all, the unadjusted unemployment rate for people over 15 years of age in the first quarter of 2023 stood at 11.5%, while the adjusted rate stood a bit lower, at 10.8%. Moreover, seasonally adjusted estimates show a decline in the number of the unemployed between December 2022 and January 2023 by approximately 85 thousand persons, an increase in February by about 50 thousand, and a further decrease in March by approximately 14 thousand individuals. Compared to the number of the unemployed in the respective months in 2022, there is a sizable decline in 2023, which was especially strong in January (158.2 thousand). This data contradicts those for the number of the employed since they suggest that the number of the unemployed dropped during the first three months of 2023; at the same time, the number of the employed also dropped. However, one should bear in mind that exit from unemployment does not necessarily mean entry to employment. One look at the reduction of the labour force in the first quarter verifies this supposition. The systematic increase of the labour force participation rate that was pointed out in previous issues of the *Greek Economic Outlook* halted in the last quarter of 2022 and was followed by a small drop 1.2 (0.8) percentage points to 69% (51.9%) for people aged 15-64 (15+).

3.1.5. Labour market challenges

It has been stressed in past issues of the *Greek Economic Outlook* that the labour market does not operate in a vacuum since labour demand is derived. This means that it depends on and is affected by the course of the economy. Recent estimates by the European Commission² forecast a growth rate equal to 2.4% in 2023, a big drop in prices and an inflation rate of 4.2%. A marginal drop in the unemployment rate (12.2%) is also expected, facilitated by the negative growth rate of real wages (despite nominal increases that took place). Therefore, no major changes are expected to happen in the following months regarding the economic variables, including the labour market.

2. <https://economy-finance.ec.europa.eu/economic-surveillance-eu-economies/greece/economic-forecast-greece_en>

There are still parameters, though, that increase uncertainty. The relationship between Greece and Turkey is one of them, even though there seems to be some improvement in the past months, especially considering the political situation in both countries. The war in Ukraine could also constitute a source of instability, since a sudden increase in tension could lead to higher energy, oil and food prices possibly renewing inflationary pressures and forcing the ECB to further interest rate increases that would slow down the economy in Greece and other European countries.

On the positive side, one should include developments in the tourism industry. Both the administrative data and the survey at the borders presented in the Statis-

tical Bulletin of INSETE in April³ reported an impressive increase in arrivals (over 85%) and revenues (over 75%) in the first months of 2023 compared to the respective period of 2022. The diffusion of benefits from tourism to the entire economy is expected to contribute positively to developments in the labour market. Job vacancies in tourism and hotels and restaurants,⁴ as well as in leading industries, like information and communication technology,⁵ constitute the only black mark. The incidence of job vacancies, despite efforts to address them, shows that there is still room to improve the matching process between demand for and supply of labour (and skills) to fill vacancies and create new complementary jobs.

3. <https://insete.gr/wp-content/uploads/2023/04/Bulletin_2304.pdf>

4. <https://insete.gr/wp-content/uploads/2022/03/22-03_Apasxolhsh_Eleipseis_ED.pdf>

5. <<http://www.sepe.gr/gr/research-studies/article/21914975/1-stis-2-etaireies-thelei-na-proslavei-ergazomenous-ston-horo-tis-tehnologias/>>

3.2. Poverty and social exclusion

Vlassis Missos

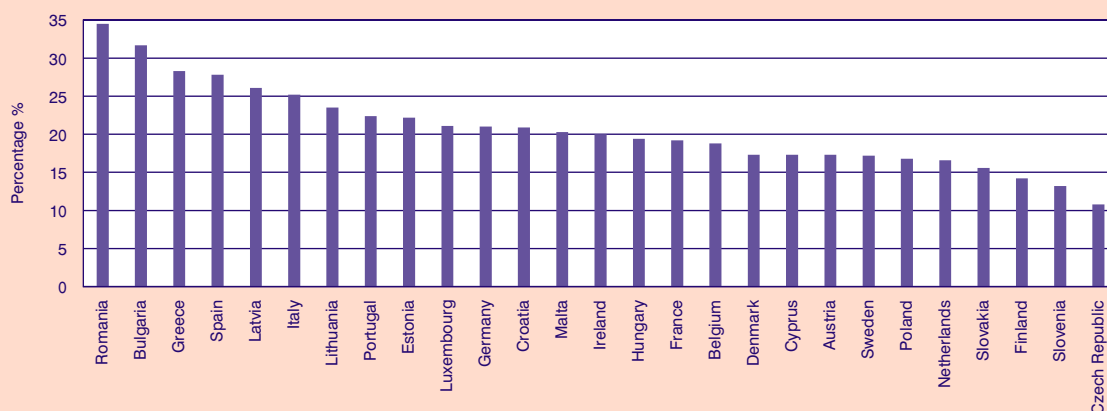
A complex process of measurement is followed to compose the *poverty and social exclusion* index. According to Eurostat,¹ the indicator is defined as the number of people being either at risk of poverty or under severe material and social deprivation, while living in low work-intensity households. To monitor and evaluate the objectives of the *Europe 2030 strategy*,² the European Commission has created an indicator based on the proportion of people experiencing severe material and social deprivation. One of the central objectives of the strategy is to reduce the population in poverty or social exclusion in the EU by 15 million people, five of which being children under 16 years of age.

More specifically, risk of poverty is defined as the percentage of the population whose total individual equivalent income is below 60% of the country's median

income. On the other hand, the percentage of the population living in severe material deprivation is calculated through a list of 13 goods and services, either for households or individuals. Those lacking at least 7 of the 13 proposed goods or services are considered as living in conditions of severe material deprivation.

At a household level, the list of items against which the population faces difficulties to respond are 1) the capacity to pay arrears (mortgage, housing rent, utility bills, loan payments, etc.), 2) the capacity to afford the expenses for a one-week holiday per year, away from home, 3) the capacity to eat fish, meat, chicken or vegetables of equivalent nutritional value, every second day, 4) the capacity to face unanticipated expenses, 5) the capacity to own a car, 6) the ability to keep the home adequately warm or cool. At an individual level, the dimensions of material deprivation concern 7) having an internet connection, 8) the ability to replace worn-out clothing, 9) having two pairs of properly fitting shoes, 10) spending a small amount of money each week for own pleasure, 11) getting together with friends for a drink/meal at least once a month and 12) having regular leisure activities.

FIGURE 3.2.1
Rate of poverty and social exclusion, EU27, EUSILC 2021 (incomes of 2020)



Source: Eurostat.

1. At risk of poverty and social exclusion (AROPE): <[https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At_risk_of_poverty_or_social_exclusion_\(AROPE\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At_risk_of_poverty_or_social_exclusion_(AROPE))>.

2. The European pillar of social rights action plan (EU 2030 targets): <[https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:The_European_Pillar_of_Social_Rights_Action_Plan_\(EU_2030_targets\)&stable=0&redirect=no](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:The_European_Pillar_of_Social_Rights_Action_Plan_(EU_2030_targets)&stable=0&redirect=no)>.

TABLE 3.2.1 Rate of poverty and social exclusion by employment status, EU27, Survey 2021 (incomes of 2020)

	Employed persons		Non-employed persons		
	Salaried	Non-salaried	Unemployment	Pension	Other
Belgium	4.8	11.5	64.2	15.4	46.3
Bulgaria	15.7	17.5	63.6	45.1	49.5
Czech Republic	3.3	7.2	63.9	10.8	25.1
Denmark	6.4	18.9	64.0	12.9	53.6
Germany	9.6	17.5	78.6	20.7	46.4
Estonia	8.0	32.2	49.6	48.7	40.5
Ireland	5.3	9.6	54.1	21.1	40.6
Greece	12.2	26.9	64.2	15.2	42.6
Spain	13.4	30.1	64.3	16.0	41.0
France	7.3	20.5	61.9	12.8	45.4
Croatia	4.4	13.2	54.0	30.8	34.7
Italy	12.2	18.9	63.7	14.9	41.6
Cyprus	8.3	9.5	51.6	20.5	29.6
Latvia	9.7	26.8	53.3	52.2	45.6
Lithuania	8.5	15.2	60.5	41.8	43.9
Luxembourg	13.7	21.9	60.4	9.8	35.3
Hungary	11.8	7.7	61.5	19.0	34.9
Malta	7.5	20.4	56.7	25.4	40.9
Netherlands	4.6	14.0	73.7	17.5	38.3
Austria	7.5	13.5	61.9	15.3	35.4
Poland	5.4	27.8	51.0	19.1	37.1
Portugal	11.0	32.4	60.4	22.3	39.9
Romania	13.2	70.7	64.9	36.6	51.7
Slovenia	3.4	22.2	48.7	18.7	23.5
Slovakia	7.9	12.1	60.2	13.4	27.3
Finland	1.8	12.2	62.1	13.1	36.5
Sweden	5.9	15.3	63.2	13.6	49.5

Source: Eurostat.

Moreover, the population living in low work-intensity households refers to people aged between 0-64 who report working less than 20% of the time that is potentially expected. This percentage is determined as the ratio between the number of months during which household members worked in the previous year and the corresponding number of months they could potentially have worked during the same period.

Figure 3.2.1 is based on data retrieved from the European Survey of Income and Living Conditions, for countries of the EU27. The 2021 survey (referring to 2020 incomes) is the latest available, while the 2022 survey has yet to be completed for all countries of the EU27. As shown in Figure 3.2.1, Greece (28.3%) is ranked third, after Romania (34.5%) and Bulgaria (31.7%), among countries having the highest rate of poverty and social

exclusion. Four countries, Greece, Spain, Latvia and Italy, are quite close, above 25%, while Finland, Slovenia and Czech Republic are found below 15%. Regarding the targets of the *Europe 2030* agenda, it is noted that during the period between 2015-2018, the total population at risk of poverty or social exclusion in the EU27 has reduced by 11.35 million people, while in the next two years (2019-2020), the relevant surveys have estimated an increase of 3.36 million people. According to the European Commission, the increase was due to the pandemic period and the sharp decrease in economic activity.

Of particular interest is the corresponding indicator of risk of poverty and social exclusion by employment status. Table 3.2.1 presents the results of the 2021 survey (referring to 2020 incomes), separating the population according to whether they are employed or not. Moreover, each of the two cases is further divided among subcategories. Table 3.2.1 refers to people living at risk of poverty and social exclusion over the population of the subcategory to which they refer, and all comparisons should be made vertically, i.e., among countries.

As it is evident, there is considerable heterogeneity across the countries of the EU27. Eight countries appear to have more than 10% in wage employment, whereas in Greece, 12.2% of wage earners are considered to be at risk of poverty and social exclusion, ranked 5th together with Italy. The corresponding issue is much more pronounced in the case of non-salaried

workers (26.9%), where the country is ranked 6th, very close to Latvia (26.8%). As in previous surveys, in this category, Romania is posited extremely high (70.7%), twice as high in comparison to any country, occupying the 2nd place.

The non-employed population is divided among the unemployed, retired and other (economically inactive). Regarding the unemployed population, the majority of EU27 countries have rates above 60%. Greece is very close to the corresponding rate of Belgium and Spain, while Denmark, too, shows an unusually high rate (64%). Compared to the other sub-groups, the unemployed population in all countries (except Romania) is assessed as more vulnerable and as having the highest risk of poverty and social exclusion.

Lastly, as far as pensioners are concerned, Greece ranks quite low (19th). As several studies³ on the impact of the social protection system on disposable income have indicated, pensions play a very important role in reducing poverty and inequality. Similarly, the proportion of pensioners at risk of poverty or social exclusion is estimated at 15.2%. Finally, the proportion of other economically inactive people is estimated at 42.6%. These figures may suffice highlighting the need for immediate initiatives in specific categories whose rates appear to be increasing. In this context, the analysis is an important policy tool for strengthening income and reducing inequality between population groups.

3. See: Papatheodorou Ch. and Missos V. (2013), *Structure and trends of poverty in Greece* [in Greek: *Δομή και Τάσεις της Φτώχειας στην Ελλάδα*], Report 9, Observatory Institute of Labour GSEE, and Missos V. (2021), *The effects of the system of social protection on poverty and inequality in Greece and the EU* [in Greek: *Η επίδραση του συστήματος κοινωνικής προστασίας στην ανισότητα και φτώχεια στην Ελλάδα και στην ΕΕ*, Report 82, Athens: KEPE.

4. Reforms-Economic development

KEPE, *Greek Economic Outlook*, issue 51, 2023, pp. 47-54

4.1. Developments and use of digital public services in Greece

Ersi Athanassiou, Agapi Kotsi

4.1.1. Introduction

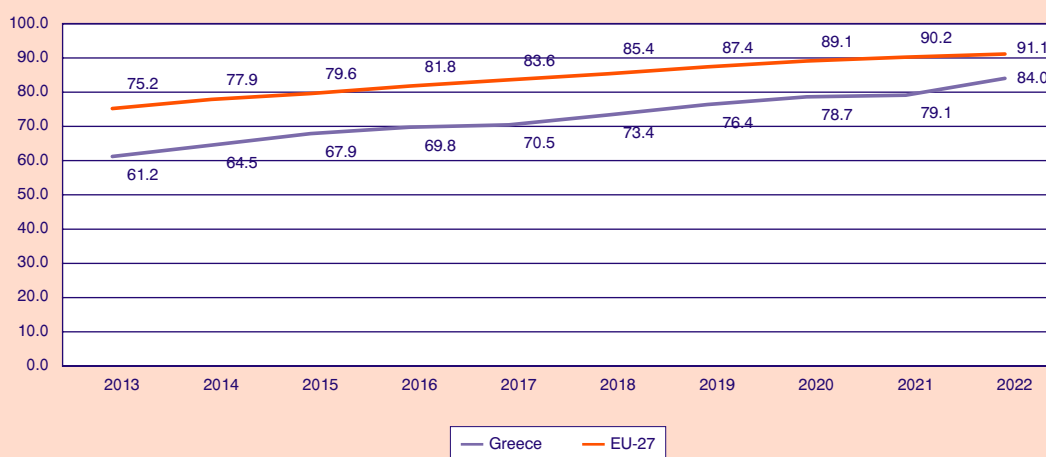
The availability of digital public services to citizens and businesses, and the actual use of these services by the general public, are areas in which Greece has recorded great progress in recent years. Efficient interaction with public administration through digital means requires, on the one hand, an adequate level of digital skills and a sufficient degree of penetration of internet usage among individuals and, on the other hand, the extensive digitisation of public services and the operation of easy-to-use digital platforms for carrying out this interaction. The purpose of the present article is to capture the main developments in these areas in Greece, starting from an overview of the recent picture regarding the digital skills of individuals and the pene-

tration of internet usage in daily life, and proceeding to a presentation of data regarding developments in the use of digital public administration services.

4.1.2. Digital skills and internet use by the general public

According to the annual EU survey on the use of Information and Communication Technologies (ICT), which provides harmonized and comparable information on the use of ICT in households and by individuals across European Union (EU) countries, the penetration of the internet is rising continuously year by year. Based on the most recent results of the survey, in the year 2022, the percentage of individuals using the internet recorded a significant increase in Greece (to 84.0% from 79.1% in 2021), thus bringing the country closer to the corresponding EU-27 average (Figure 4.1.1). Regarding the main categories of uses of the internet by the general public (Figure 4.1.2), it appears that the percentage of individuals making use of the internet in Greece, as compared to the EU-27 average, is higher for the categories of finding information about goods and services, telephoning or video calls, participation

FIGURE 4.1.1
Internet use, 2013-2022, % of individuals



Source: Eurostat, 2023.

FIGURE 4.1.2
Main Internet uses, Greece–EU-27, 2022, % of individuals

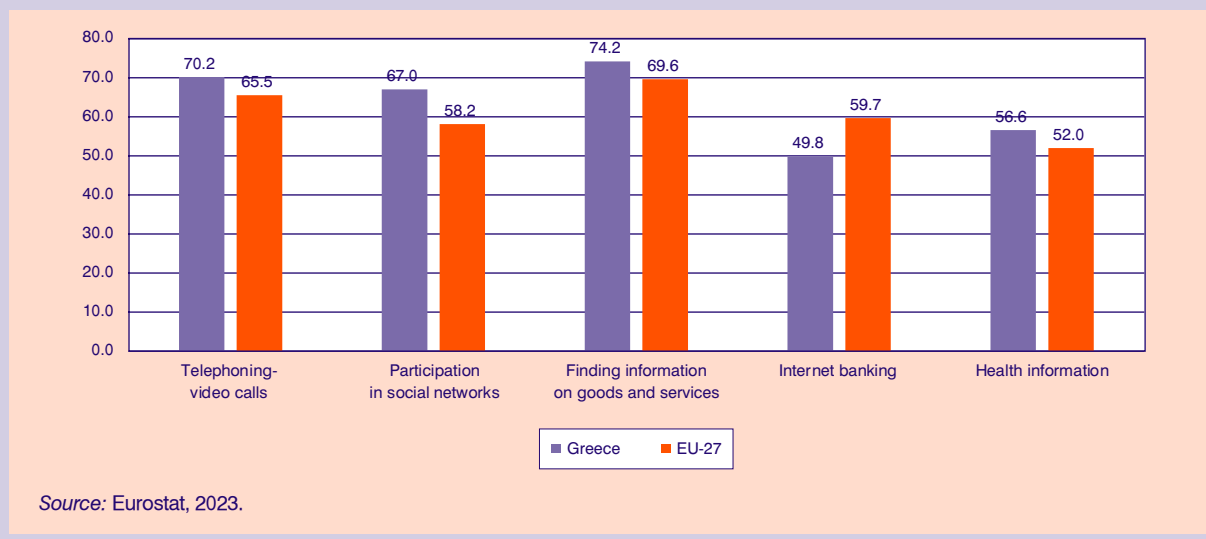
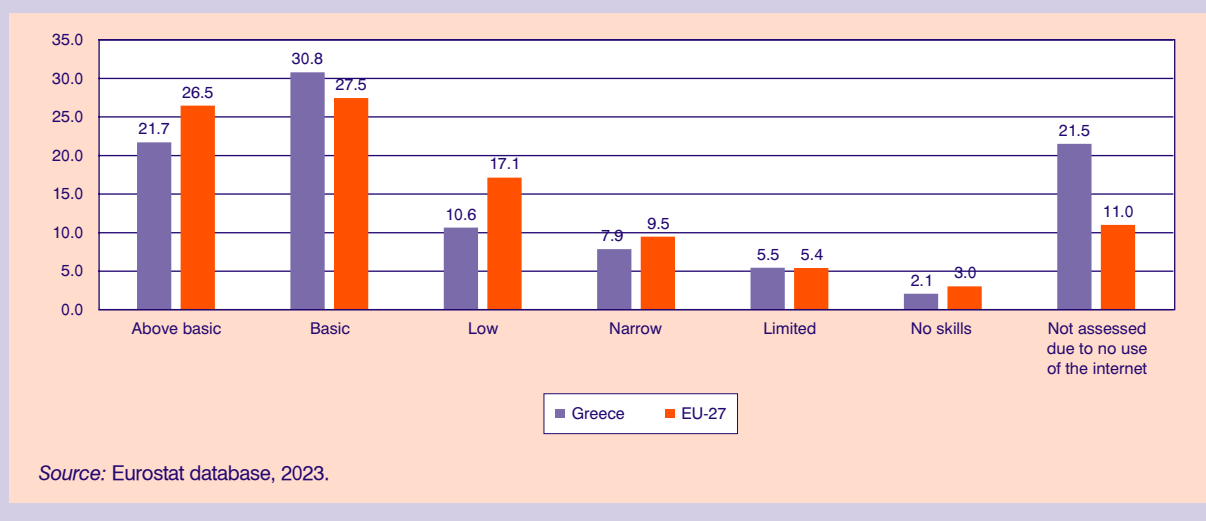


FIGURE 4.1.3
Level of digital skills, 2021, Greece, EU-27, % of individuals



in social networks and seeking health information, and lower for the category of internet banking. Based on the above information, it seems that, although there is room for improvement, the degree of penetration of internet usage among individuals in Greece does not pose an obstacle to the successful utilisation of digital public administration services.

In relation to the digital skills of citizens, the European Digital Competence Framework (DigComp 2.2) defines digital competence as a combination of skills in five main areas: 1) information and data literacy, 2) communication and collaboration, 3) digital content creation, 4) safety and 5) problem solving. According

to the European digital transformation strategy (Digital Compass 2030), the EU has set a target of reaching a minimum of 80% of the population with basic digital skills in all five categories by 2030.

Figure 4.1.3 presents an assessment of digital skills of individuals in Greece and the EU-27, in year 2021, based on the ranking of digital skills provided by the European Commission’s Digital Skill Indicator 2.0. It is noted that according to this indicator, the overall digital skills of individuals are defined as ‘above basic’ if their skills are above basic in all 5 of the above mentioned categories, ‘basic’ if their skills in all 5 areas are at least at basic level, ‘low’ if individuals have basic or

above basic skills in 4 areas and no skills in 1 area, 'narrow' if they have at least basic skills in 3 areas and no skills in 2 areas and 'limited' if they have at least basic skills in 2 areas and no skills in 3 areas. Individuals with no skills in 4 or 5 areas are considered as having 'no skills'.

According to Figure 4.1.3, in Greece, the overall proportion of individuals with basic or above basic digital skills was, in the year 2021, much lower than the EU target for 2030, although it stood close to the corresponding EU-27 average, and more particularly at 52.5%. In relation to below-basic skill levels, the proportion of individuals in Greece was close to or below the European average in all relevant categories, although actual shares in these categories are difficult to measure in the case of Greece, as a large percentage of individuals (21.5%) had not used the internet recently and therefore their skill level could not be assessed. With respect to the significance of the above information for the use of digital public administration services, if the ability to use such services is considered to be guaranteed by the possession of at least basic digital skills, then it becomes clear that, both in Greece and in the EU-27 as a whole, there is a significant margin for the further utilization of digital public services through the improvement of citizens' digital skills.

4.1.3. Use of digital public services

In Greece, the provision of high-quality digital public services to citizens and businesses is one of the most important priorities of the country's digital transformation strategy. In the context of this strategy, and more particularly in the framework of projects for the digitization of public administration implemented on the basis of Greece's Digital Transformation Bible, the Single Digital Portal gov.gr is the main channel for the interaction of the general public with the digital public administration services provided. The gov.gr portal started its operation in March 2020 with the integration of 501 pre-existing digital services, and since then it has been continuously expanding, hosting a total of 1,530 services three years later. Along with the gov.gr portal, continuous progress has been recorded in a series of other interventions to improve digital public services (Athanassiou, Kotsi & Cholezas, 2023). In this context, the interconnection and interoperability between the main electronic registers of public adminis-

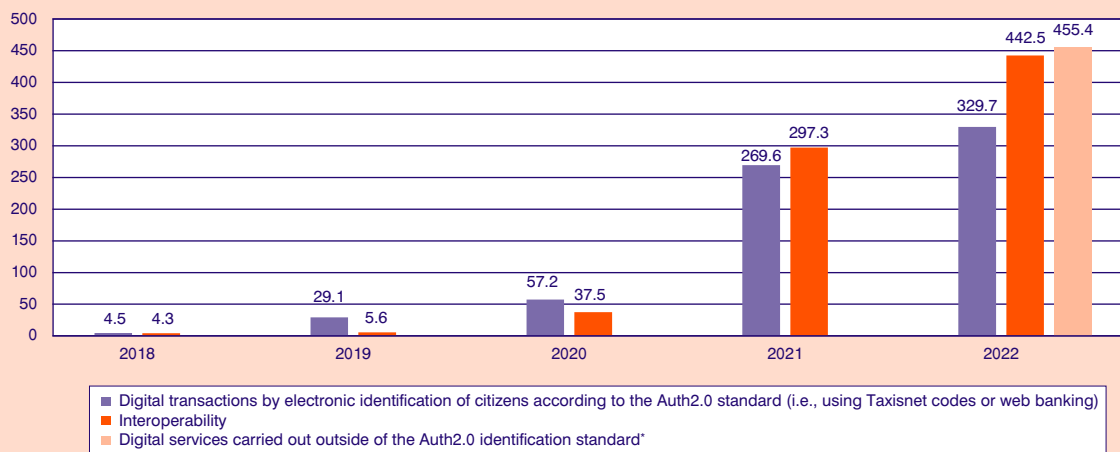
tration (e.g., the Tax Register, the General Commercial Registry [GEMI], the Citizen Register, the Social Security Register, etc.) are key components for the expansion of the services provided through gov.gr and more generally for the fulfillment of the "once-only" principle. According to this principle, which underpins the institutional framework for the development of the digital state, citizens and businesses interacting with public administration should be required to submit information only once.

In anticipation of the publication of the Digital Economy and Society Index (DESI) for 2023, which in the case of Greece is expected to record a significant improvement in the section concerning digital public services,¹ an indicative picture of the progress in the use of these services is provided by recent relevant data from the Hellenic Ministry of Digital Governance. According to these data, the number of digital transactions by electronic identification of citizens according to the Auth2.0 standard (i.e., using Taxisnet codes or web banking) or via interoperability (i.e., the exchange of information between services and public registers without any other action on the part of the interested party other than giving their consent), reached a total of 772 million in the year 2022, compared to 567 million in the year 2021 and 95 million in the year 2020 (Figure 4.1.4). Also counting the digital services of the financial sector (tax, customs, etc.) that are carried out outside of the Auth2.0 identification standard, the total number of digital public services transactions exceeded 1.2 billion in the year 2022.

A more comprehensive and long-term picture of the evolution of citizens' interactions with public services in Greece is provided by the annual EU survey on the use of ICT, which provides harmonized information on the use of e-government services by individuals across all countries of the EU. Table 4.1.1 reports the survey results for Greece and the EU-27 in terms of the overall percentage of individuals who appear to have interacted with public services online as well as in terms of the respective percentages of individuals who reported interaction in three relevant sub-categories, which concern the use of the internet for obtaining information from public authorities' websites, downloading official forms and submitting completed forms. For the categories of obtaining information and downloading forms, the survey results are available for the period 2011-2022, while for the category of submitting com-

1. Already in the 2022 edition of the DESI indicators, where the digital public services index was determined at 39.4 for Greece against 67.3 for the EU, it was mentioned that in this specific dimension of digitalisation, Greece had embarked on a comprehensive range of improvements that were not yet entirely reflected in the value of the relevant index.

FIGURE 4.1.4
Digital public services transactions (million), Greece, 2018-2022



Source: General Secretariat of Information Systems for Public Administration, Hellenic Ministry of Digital Governance (2023).

* The exact calculation of the number of transactions in this category became technically feasible for the first time in 2022.

TABLE 4.1.1 E-government activities of individuals via websites, Greece, EU-27, 2010-2021, % of individuals

	Overall interaction		Obtaining information		Downloading official forms		Submitting completed forms	
	EU-27	Greece	EU-27	Greece	EU-27	Greece	EU-27	Greece
2010	39.7	15.8						
2011	40.9	26.8	36.1	22.5	25.0	15.2	20.0	12.7
2012	44.0	34.3	39.9	28.6	26.5	17.2	21.5	18.1
2013	41.6	35.6	37.4	32.0	25.6	19.0	20.8	19.7
2014	46.0	45.1	40.8	38.2	29.2	21.2	25.0	24.2
2015	45.8	46.4	40.0	42.2	28.1	24.5	25.3	25.2
2016	47.6	48.9	41.7	44.4	29.0	26.8	27.1	26.2
2017	48.8	47.4	41.6	45.3	30.4	28.0	29.5	24.3
2018	51.3	49.8	43.3	47.3	30.8	29.2	32.7	24.4
2019	53.4	52.1	44.3	49.4	32.2	30.5	35.7	27.9
2020	57.2	52.9	47.7	52.1	35.1	31.7	38.5	26.9
2021	58.5	55.0	47.4	52.3	38.4	43.9	44.2	36.6
2022			38.7	50.4	44.0	59.0		

Source: Eurostat, 2023.

pleted forms and thus for the overall interaction of individuals with digital public services, data are available up to the year 2021.

As observed from Table 4.1.1, at the beginning of the period under consideration, Greece was lagging significantly behind the EU-27 average, both in terms of the total percentage of individuals using digital public services (15.8% in Greece compared to 39.7% in the EU-27 in the year 2010) as well as with respect to the three sub-categories of use of digital public services. During the period 2011-2014, Greece made great progress, converging rapidly to the overall European average, while in the subsequent years both Greece and the EU-27 recorded a progressive increase in the interaction of individuals with digital public services, with the total percentage of people who interacted online reaching 55.0% in Greece, compared to an average of 58.5% in the EU-27. As can be seen from the results of the survey for the year 2022, for both sub-categories of obtaining information and downloading official forms, the interaction of individuals in Greece has come to significantly exceed the corresponding EU average.

A more detailed picture of Greece's position among EU countries in the latter two sub-categories of interaction is provided in Figures 4.1.5 and 4.1.6, which depict the relevant survey results for the year 2022 by EU member state. As shown in Figure 4.1.5, Greece ranks 8th in the EU in terms of the percentage of individuals who use the internet to obtain information from public organization websites. The leaders in this category are the Scandinavian countries and the Netherlands, fea-

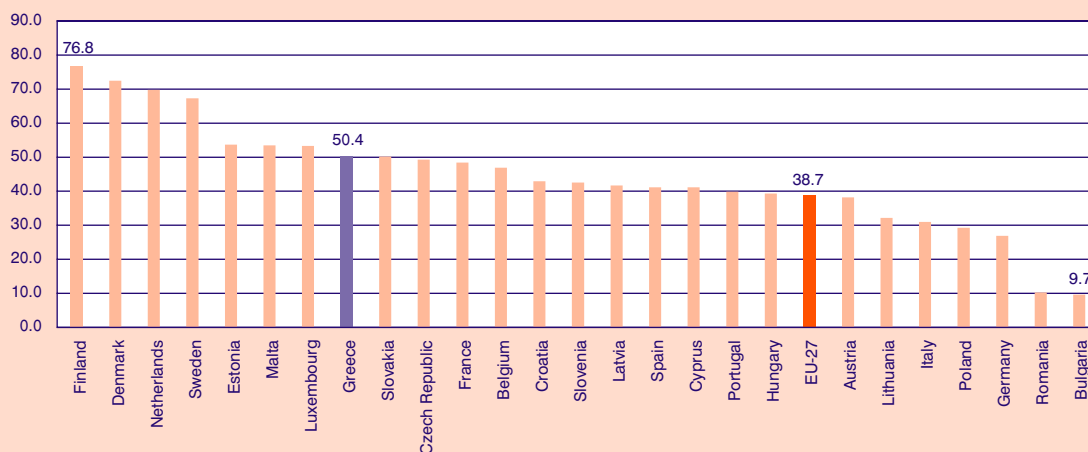
turing percentages that approach or exceed 70% of individuals, and demonstrate that in Greece too, the room for improvement in the relevant use of e-government services is significant. Regarding the use of the internet for downloading official forms, as can be seen in Figure 4.1.6, Greece ranks 9th among the EU countries, featuring a smaller difference from the countries that lead in this category. This result is indicative of the very good performance Greece has achieved with respect to public access to official documents via the internet.

An additional form of interaction of citizens with digital public services, which was assessed for the first time in the 2022 EU survey on the use of ICT, refers to the access of individuals to public databases or registers via the internet. As illustrated in Figure 4.1.7, Greece ranks 4th among EU countries in this important dimension of e-government use, with the percentage of people reporting access to services of this type amounting to 39.3% in the country, compared to 16.5% on average in the EU-27.

In addition to the above data on the utilisation of digital government services, the latest EU survey on the use of ICT also includes information in relation to the reasons for not submitting completed forms to public authorities' websites, and the problems experienced when using e-government websites.

As observed from Figure 4.1.8, in the case of Greece, the most common reason for not submitting forms is the lack of need to do so (28.5% of individuals). Fur-

FIGURE 4.1.5
Internet use for obtaining information from public authorities' websites, EU-27 countries, 2022, % of individuals



Source: Eurostat, 2023.

FIGURE 4.1.6
Internet use for downloading official forms, EU-27 countries, 2022, % of individuals

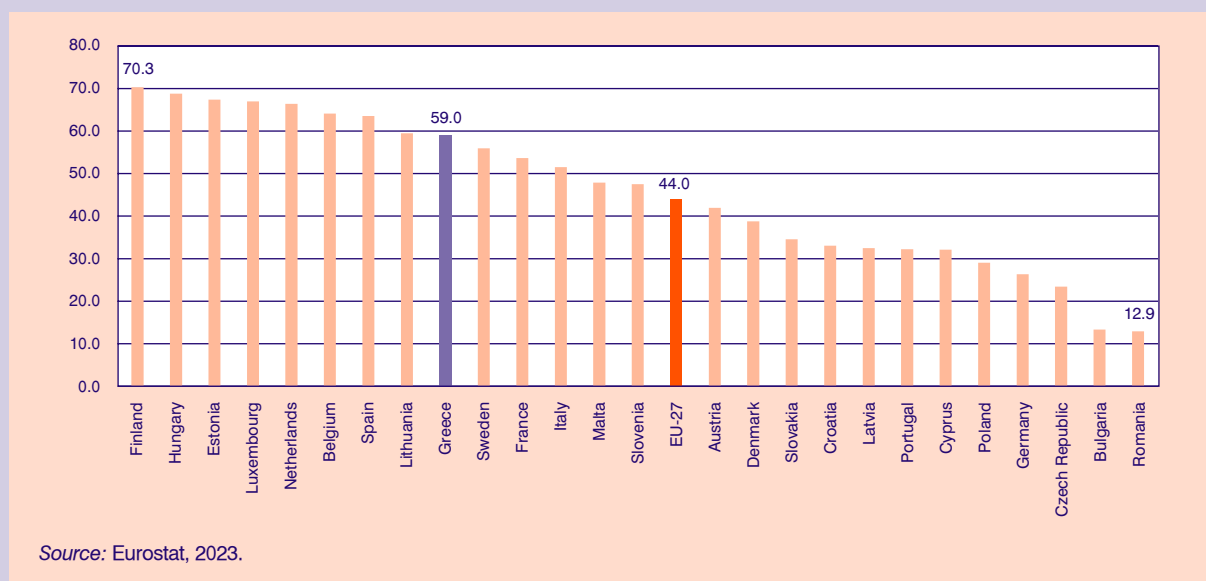
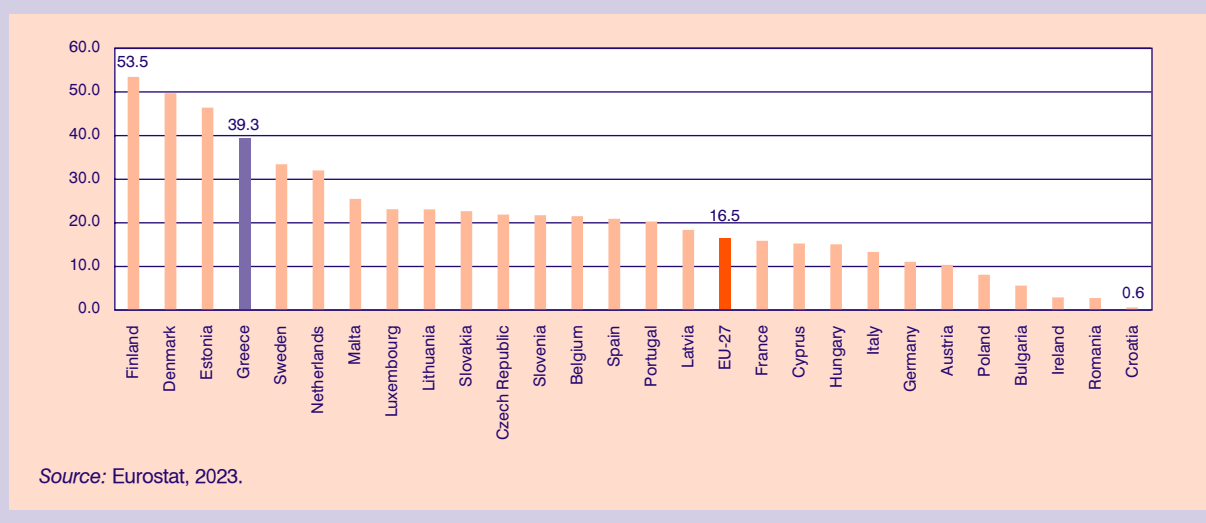


FIGURE 4.1.7
Internet use for accessing public databases or registers, EU-27 countries, 2022, % of individuals



thermore, in Greece, a significant percentage of individuals do not request the submission of forms even when it is necessary to do so (20.4% versus 13.5% in the EU), and submission through the mediation of another person is also a fairly common practice (14.6% versus 4.2% in the EU). It is notable that for the latter two reasons, the share of individuals in Greece is significantly higher than the corresponding European average, an observation possibly indicating that, in Greece, the share of the public who find it difficult to use e-government services for the submission of forms is comparatively higher. Another indication in this di-

rection is the finding that a lack of skills or knowledge as a reason for not submitting forms is mentioned by a higher percentage of people in Greece (4.7%), compared to the corresponding EU average (2.7%).

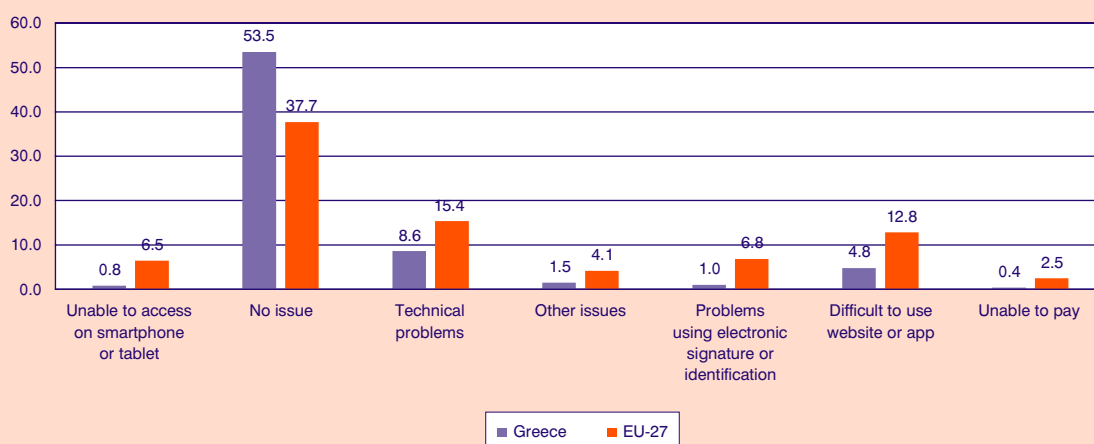
In relation to the problems faced by individuals when using e-government websites, as shown in Figure 4.1.9, in Greece, the percentage of people reporting no issues is significantly higher than the corresponding European average (53.5% against 37.7% in the EU-27). Furthermore, the frequency of reporting problems with use is lower in Greece in all individual problem

FIGURE 4.1.8
Reasons for not submitting completed forms to public authorities' websites, Greece, EU-27, 2022, % of individuals



Source: Eurostat, 2023.

FIGURE 4.1.9
Problems experienced when using e-government websites, Greece, EU-27, 2022, % of individuals



Source: Eurostat, 2023.

categories of the survey. The reference to problems is notable for Greece only in the categories of technical problems (8.6%) and difficulties using an e-government website or application (4.7%), with Greece, however, demonstrating a significantly lower percentage of people reporting such problems compared to the European average (15.4% and 12.8% respectively). Based on these results, it seems that e-government websites in Greece are quite user-friendly, and the problems encountered in their use are comparatively limited.

4.1.4. Conclusions

In recent years, Greece has recorded great progress in the provision of digital public services and the use of these services by the general public. The increasing penetration of the internet in Greece, combined with the operation and continuous expansion of the gov. gr portal, has led to a large increase in digital public services transactions. In parallel, the multiple interventions for the improvement of the services provided are constantly enhancing the interaction of people with

e-government services. Thus, Greece has approached the EU average with respect to the overall interaction of individuals with digital public services and has also exceeded the European average with regard to the share of individuals obtaining information and downloading official forms from e-government websites. Public administration websites in Greece seem to be quite user-friendly, with the problems encountered in their use being relatively limited compared to the EU average. However, there are indications that the share of the public who find it difficult to use e-government services for the submission of forms is comparatively higher in Greece compared to the EU average. The enhancement of the digital skills of citizens may help

significantly in overcoming these difficulties, contributing to a better utilization of digital public services.

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4.2. External trade of agri-food products

Athanasios Chymis

4.2.1. Greece's overall external trade

The year 2022 was quite good for the Greek economy in terms of growth. This was followed by a significant increase in imports of 44.9%, which resulted in a dramatic widening of the trade deficit by 58%. The increase in total exports of 36.9% was not enough to mitigate the rapid increase in the trade balance.

Table 4.2.1 shows that foreign trade in 2022 set several new records. Both total imports and total exports exceeded €93 billion and €54.6 billion, respectively. Trade in fossil fuels and fertilizers (petroleum products) almost doubled (91.5% increase in imports and 78.5% in exports) due to the significant increase in prices due to the war in Ukraine, without any considerable change in traded quantities, adding €12.4 billion to the trade deficit compared to €5.7 billion in 2021.

If we take out the trade in petroleum products, which constitutes about 35% of the total trade, a clearer look at the rest of the trade goods is possible. Thus, non-petroleum imports reached a new high of €60.6 billion (up 28.1%). Similarly, exports reached a new high of €34.6 billion (up 20.5%) with the deficit increasing by around 40%, to €26 billion. While exports demonstrate

TABLE 4.2.1 Total goods trade and agri-food products trade (in billion €)

	2008	2015	2018	2020	2021	2022	% change 2020-2021
Imports							
Total imports	60.72	42.60	55.19	48.69	64.24	93.05	44.9
Petroleum prod. imports	12.12	11.36	15.99	9.71	16.96	32.47	91.5
Total except petroleum prod.	48.60	31.24	39.20	38.99	47.28	60.58	28.1
Agri-food products	7.05	6.31	7.05	6.65	7.86	10.20	29.9
Agri-food %	14.5	20.2	18.0	17.1	16.6	16.8	
Exports							
Total exports	17.36	25.50	33.46	30.74	39.95	54.68	36.9
Petroleum prod. exports	1.90	7.60	11.48	6.73	11.27	20.11	78.5
Total except petroleum prod.	15.46	17.90	21.97	24.01	28.69	34.57	20.5
Agri-food products	4.01	5.72	6.49	7.18	8.35	9.91	18.7
Agri-food %	25.9	31.9	29.6	29.9	29.1	28.7	
Trade balance							
Total balance	-43.36	-17.10	-21.73	-17.96	-24.29	38.37	58.0
Excluding petroleum prod.	-33.14	-13.34	-17.23	-14.98	-18.59	-26.01	39.9
Agri-food	-3.04	-0.60	-0.55	0.52	0.49	-0.30	*

Source: Hellenic Statistical Authority (ELSTAT), own calculations.

* Due to changes in the sign, calculation of the rate of change is not possible.

a good momentum, the galloping increase in imports leaves no room to contain the widening rate of the trade deficit.

4.2.2. Agri-food products trade

Regarding the trade in agri-food products, several records were also set. The rate of growth in tourism, as in 2021, combined with economic growth and, most importantly, the increase in prices were the major reasons for the unprecedented increase in imports by 30%, to €10.2 billion. Agri-food exports rose by 18.7%, to €9.9 billion. Due to the much faster growth rate of imports, the trade surplus of the last two years (2020 and 2021) became a deficit of €295 million (or €0.3 billion).

The high inflation in 2022 boosted the increase of the trade value of imports and exports. Specifically, while the change in imported quantities ranged from -2.8% (coffee, tea, etc.) to 22.8% (beverages), the increases in the value of imported products ranged at much higher levels, between 16.8% (tobacco) and 40.9% (wood). The only product category where the unit price fell is tobacco. It is worth noting the significant increase in skin imports (51.4% by quantity and 63.6% by value) which, however, constitute a minimal percentage of all imported agri-food products.

Table 4.2.2 shows the structure of imports by main product categories. For the first time, the imported value of dairy products, cereals, and fruit and vegetables exceeded €1 billion. The significant rise in the price of cereals has pushed them ahead of fruit and vegetables in terms of import value.

Exports of agri-food products increased by 18.7%, keeping the dynamic they had in 2021 when they increased by 16.3%. However, this was not enough to outweigh the 30% increase in imports; thus, the trade balance has a deficit after two years of surplus. It should be noted that here too inflation has played a catalytic role and most of the increase in exported value is purely due to price increases. Specifically, there are several categories of products whose exported quantities decreased, such as cotton -28.3%; coffee, tea, etc. -19.8%; cereals -11.4%; raw materials -9.1%; fruits and vegetables -2.1%; and dairy -0.2%.

Table 4.2.3 shows that almost all categories saw an increase in exported value. The exception is hides and skins, which despite the increase in exported quantities (9.5%), their value decreased by 3.4% due to their reduced price. Similarly for wood, while there was a significant increase in the exported quantity (22.9%),

the value only increased by 10.9%, which shows a decrease in per unit export price.

This is something that the Greek agri-food sector should seriously consider: the fact that the prices of imported products are increasing faster than those of exported products. Moreover, the Greek agri-food sector should take notice of the quantity decrease in several exported goods, which significantly outnumber the imported goods whose quantities declined.

4.2.3. Concluding remarks

Agri-food products exports have had very good dynamics since the beginning of the economic crisis (2009). They have also coped very well with the COVID-19 crisis as well as the war in Ukraine. This strong dynamic since the economic crisis resulted in turning the trade deficit into a surplus. However, the surplus that was first observed in 2020 and continued in 2021 proved to be temporary due to the unprecedented growth rate of agri-food imports in 2022. This column has repeatedly emphasized that no matter how well cotton and oil perform export-wise, they are not enough to maintain a trade surplus.

Cotton export value, in 2022, decreased by 6.9%, and the increase in price partly offset the large drop of 28.3% in the exported quantity; olive oil, thanks to the increase in its price, increased the exported value by 40.6%, while the exported quantity increased by only 4.3%. The current price increase is mainly due to international conditions and inflation and not due to any domestic manufacturing strategy to increase the added value of the product.

The above means that the eventual surplus that may occur in some years is mainly due to exogenous factors. This is what happened in 2020 and 2021, where the international crisis of the pandemic reduced the need for imports due to the limitation of tourist flows. To achieve a sustainable surplus in the agri-food trade, specific actions are required from the Greek agri-food sector. Specifically, livestock production needs to be strengthened either for domestic consumption and, therefore, a reduction in imports, or for the export of meat with high-quality, high nutritional value and, consequently, high monetary value.

Regarding cotton, a series of actions is required. The focus should be on maintaining quality after harvest. In order to do this, organization and cooperation along the entire production chain is needed, i.e., producers, ginners and traders with simultaneous cooperation with the quality control center for standardization and classification of cotton.

TABLE 4.2.2 Imports of agri-food products categories in million € (M €)

	2008		2015		2018		2019		2020		2021		2022	
	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%
<i>Meat products^a</i>	1,211	17.2	1,117	17.7	1,242	17.6	1,322	18.1	1,132	17.0	1,218	15.5	1,582	15.5
<i>Dairy</i>	808	11.5	752	11.9	829	11.8	857	11.7	819	12.3	934	11.9	1,297	12.7
<i>Cereals</i>	681	9.7	554	8.8	682	9.7	707	9.7	664	10.0	831	10.6	1,081	10.6
<i>Fruits-Vegetable</i>	786	11.1	731	11.6	827	11.7	900	12.3	817	12.3	898	11.4	1,061	10.4
<i>Feeding stuff</i>	406	5.8	401	6.4	462	6.6	487	6.7	548	8.2	659	8.4	811	7.9
<i>Fish</i>	428	6.1	375	5.9	521	7.4	540	7.4	423	6.4	544	6.9	706	6.9
<i>Coffee, tea, etc.</i>	365	5.2	472	7.5	453	6.4	470	6.4	436	6.6	502	6.4	617	6.0
<i>Oils and fats</i>	290	4.1	264	4.2	256	3.6	226	3.1	224	3.4	367	4.7	568	5.6
<i>Various foodstuff</i>	344	4.9	352	5.6	358	5.1	374	5.1	376	5.7	423	5.4	503	4.9
<i>Beverages</i>	436	6.2	255	4.0	309	4.4	328	4.5	235	3.5	324	4.1	445	4.4
<i>Tobacco</i>	335	4.7	301	4.8	347	4.9	327	4.5	286	4.3	340	4.3	398	3.9
<i>Sugars</i>	225	3.2	207	3.3	196	2.8	203	2.8	209	3.1	225	2.9	360	3.5
<i>Oil seeds</i>	224	3.2	211	3.3	202	2.9	204	2.8	186	2.8	220	2.8	302	3.0
<i>Wood</i>	262	3.7	124	2.0	140	2.0	147	2.0	132	2.0	157	2.0	221	2.2
<i>Raw materials</i>	130	1.8	123	1.9	140	2.0	140	1.9	134	2.0	167	2.1	182	1.8
<i>Hides-skins</i>	93	1.3	56	0.9	62	0.9	56	0.8	14	0.2	18	0.2	30	0.3
Total	7,054^b		6,313		7,047		7,313		6,653		7,855		10,204	

Source: Hellenic Statistical Authority (ELSTAT), own calculations.

a. Includes live animals and meat products.

b. The sum of values for each product may not equal to 'Total' because some categories with insignificant values such as cotton, natural rubber, other natural textile fibers, wool and jute are not included.

TABLE 4.2.3 Exports of agri-food products categories in million € (M €)

	2008		2015		2018		2019		2020		2021		2022	
	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%
<i>Fruits-Vegetables</i>	1,346	33.6	1,846	32.3	2,086	32.1	2,175	32.9	2,425	33.8	2,514	30.1	2,868	28.9
<i>Dairy</i>	275	6.9	561	9.8	672	10.3	705	10.7	805	11.2	920	11.0	1,117	11.3
<i>Oils and fats</i>	333	8.3	714	12.5	704	10.8	421	6.4	570	7.9	745	8.9	1,047	10.6
<i>Fish</i>	449	11.2	590	10.3	689	10.6	684	10.3	728	10.1	807	9.7	940	9.5
<i>Tobacco</i>	416	10.4	450	7.9	489	7.5	508	7.7	550	7.7	629	7.5	798	8.1
<i>Cereals</i>	315	7.9	303	5.3	402	6.2	422	6.4	467	6.5	611	7.3	777	7.8
<i>Cotton</i>	236	5.9	299	5.2	342	5.3	530	8.0	397	5.5	685	8.2	638	6.4
<i>Various foodstuff</i>	124	3.1	236	4.1	307	4.7	338	5.1	376	5.2	400	4.8	470	4.7
<i>Beverages</i>	163	4.1	209	3.7	223	3.4	229	3.5	235	3.3	281	3.4	337	3.4
<i>Meat products^a</i>	76	1.9	84	1.5	125	1.9	145	2.2	138	1.9	189	2.3	241	2.4
<i>Feeding stuff</i>	51	1.3	54	0.9	80	1.2	88	1.3	120	1.7	135	1.6	185	1.9
<i>Oil seeds</i>	76	1.9	96	1.7	76	1.2	76	1.1	101	1.4	97	1.2	137	1.4
<i>Sugars</i>	54	1.3	77	1.3	91	1.4	76	1.1	75	1.0	90	1.1	107	1.1
<i>Coffee, tea, etc.</i>	30	0.7	78	1.4	80	1.2	86	1.3	86	1.2	100	1.2	102	1.0
<i>Raw materials</i>	18	0.4	37	0.6	51	0.8	54	0.8	58	0.8	70	0.8	72	0.7
<i>Hides-skins</i>	38	0.9	73	1.3	63	1.0	56	0.8	30	0.4	57	0.7	55	0.6
<i>Wood</i>	9	0.2	8	0.1	11	0.2	13	0.2	12	0.2	14	0.2	15	0.2
Total	4,011^b		5,717		6,493		6,609		7,177		8,347		9,909	

Source: Hellenic Statistical Authority (ELSTAT), own calculations.

a Includes live animals and meat products.

b The sum of values for each product may not equal to 'Total' because some categories with insignificant values such as wool, natural rubber, other natural textile fibers and jute are not included.

Generally, there is a strong need for better organization in the processing of most agri-food products, especially exportable ones, so that standardization, certification, and packaging promote the achievement of higher product quality, thus creating the right condi-

tions for increasing the price of exportable quantities. Finally, the organization of the marketing channels is also an essential measure to ensure not only an increase in the per unit export price, but also to guarantee an increase in exported quantities.

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Greece's recent economic performance and post-pandemic prospects

Pródromos Prodromídís*,**

Abstract

The article describes Greece's recent performance in terms of COVID-19 mortality, real output per capita, unemployment, public investment spending, the trade deficit, and price inflation. Greece emerges as a country that (a) achieved a mid-range mortality rate in the EU despite the relatively high population share of elderly people, and also (b) exhibited one of the lowest price inflation rates in the EU, both before and during the war in Ukraine. Even though the external trade deficit spiked in 2022, as Greece switched to expensive substitutes for Russian energy imports, the country turned a corner as real per capita output started (feebly in 2020-21, more prominently in 2022) to converge to the EU-27 average for the first time since 2009, and the unemployment rate continued to fall. The extensive public investment spending plan agreed with the EU is a source of optimism regarding future output.

Keywords: real GDP per capita, inflation, unemployment, COVID-19 mortality, trade deficit, public investment spending

JEL Classification: E20, E30, F10, H50, I12

1. Introduction

In a year when international uncertainties are running high, Greece, the EU's most over-indebted country,

stands at a socioeconomic, electoral, and geopolitical crossroads.

The OECD (2023) and the Bank of Greece (2023) are optimistic of the country's prospects as long as credible economic policies are implemented, the reform momentum and consensus among stakeholders are maintained, the infrastructure is upgraded, modest primary budget surpluses are achieved, the public sector is modernized, the institutions are strengthened, and vulnerable households are supported.

In line with the good practice of cross-checking assessments on matters of importance, the article looks into Greece's recent performance in terms of a number of crucial variables, namely, real output per capita, COVID-19 mortality, public investment spending, unemployment, the trade deficit, and price inflation –each in a separate section (the six sections that follow)– in order to evaluate the situation and make inferences or draw conclusions about the prospects. The inferences and conclusions are supplied in the last (the eighth) section.

2. Real per capita output

Over the course of Greece's membership in the Eurozone,¹ the country's real per capita Gross Domestic Product (GDP) initially expanded (until 2007),² then contracted (up to 2013), stabilized and recovered. The mild recovery was interrupted initially by the COVID-19 pandemic (in 2020), and subsequently (though less visibly) by the sanctions and countersanctions and the energy crisis that followed the Russian invasion of Ukraine (in 2022). See Figure 1.

The largest reduction occurred in 2011, the second largest occurred in 2020 (first year of the pandemic), and additional large reductions (in descending order)

* Senior Research Fellow, Centre of Planning and Economic Research (KEPE). E-mail: pjprodr@kepe.gr

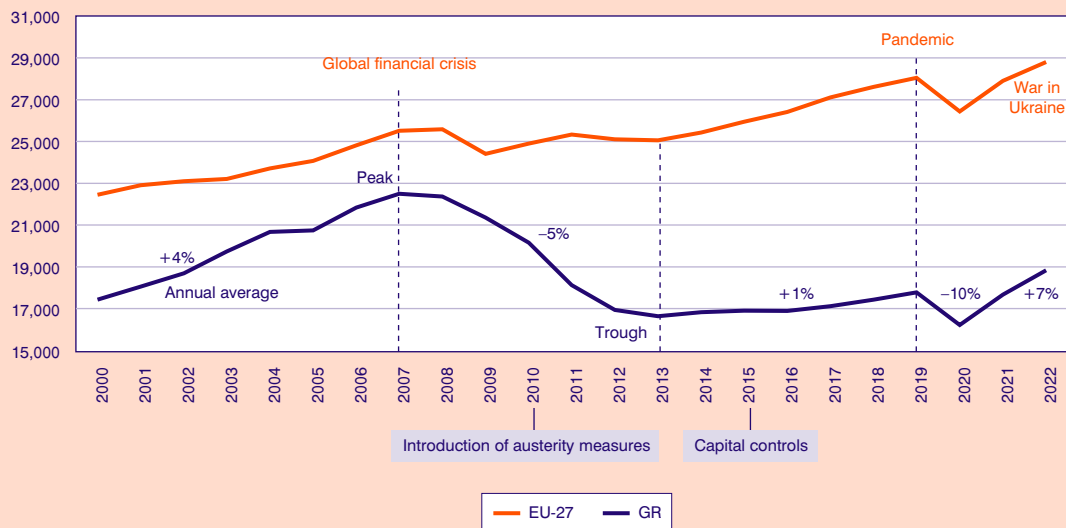
** The article has benefited from helpful comments offered by an anonymous referee. The editorial suggestions made by Nicky Spanoudis are greatly appreciated.

– Opinions or value judgments expressed in this article are the author's own and do not necessarily reflect those of the Centre of Planning and Economic Research.

1. Greece met the Maastricht criteria in mid-2000 and joined the Eurozone in early 2001.

2. Year 2007 included, as the global financial crisis spread.

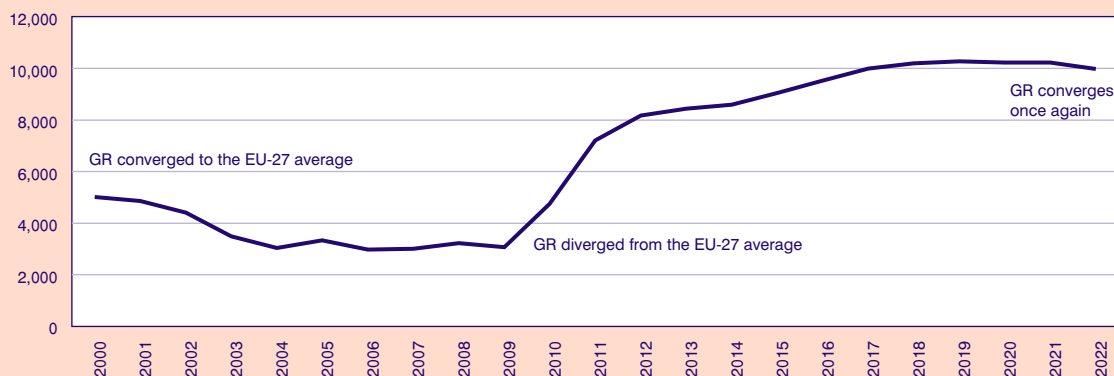
FIGURE 1
The evolution of real GDP per capita in Greece and the EU-27 during 2000-22, in €



Note: A break occurs in the time series in 2010 (i.e., from 2010 onwards).

Source: Eurostat, own calculations.

FIGURE 2
The real per capita GDP difference between the EU-27 and Greece, 2000-22, in €



Note: A break occurs in the time series in 2010 (i.e., from 2010 onwards).

Source: Eurostat, own calculations.

occurred in 2010,³ 2012 and 2009, all in the wake of an external shock: the global financial crisis. By contrast, the largest surge occurred in 2021 and the second largest surge occurred in 2022 (in the second and third year of the pandemic, respectively).

As the EU-27 average generally increased over time, Greece's initial convergence to the EU-27 average came to a standstill in 2004-09. It was followed by considerable divergence up to 2019, and convergence in 2020-22. See Figure 2.

3. This was the year that the first austerity measures were introduced in Greece, and the first bailout Memorandum of Understanding (MOU) was agreed with the European Commission, the European Central Bank and the International Monetary Fund. It is also the year for which a break in the GDP time series is reported by Eurostat.

TABLE 1 The average rate of overall life satisfaction (0-10) among people aged 16 or older in 2013, 2018, 2021

	2013	2018	2021
EU-27	7.0	7.3	7.2
GR	6.2	6.4	6.8

Source: Eurostat.

An infrequently estimated measure of well-being also suggests that people’s overall life satisfaction generally increased faster in post-recession Greece compared to the rest of the EU. See Table 1.

All in all, Greece appears to be turning a corner in its conversion to the EU-27 real GDP per capita average, after years of economic pain.

The latest (2022) real GDP per capita figure stands at 84% of the figure observed in 2010 (when the first austerity measures were introduced); while the latest distance (gap) from the EU-27 average is about 2.1 times larger than the distance from the respective 2010 EU-27 average.

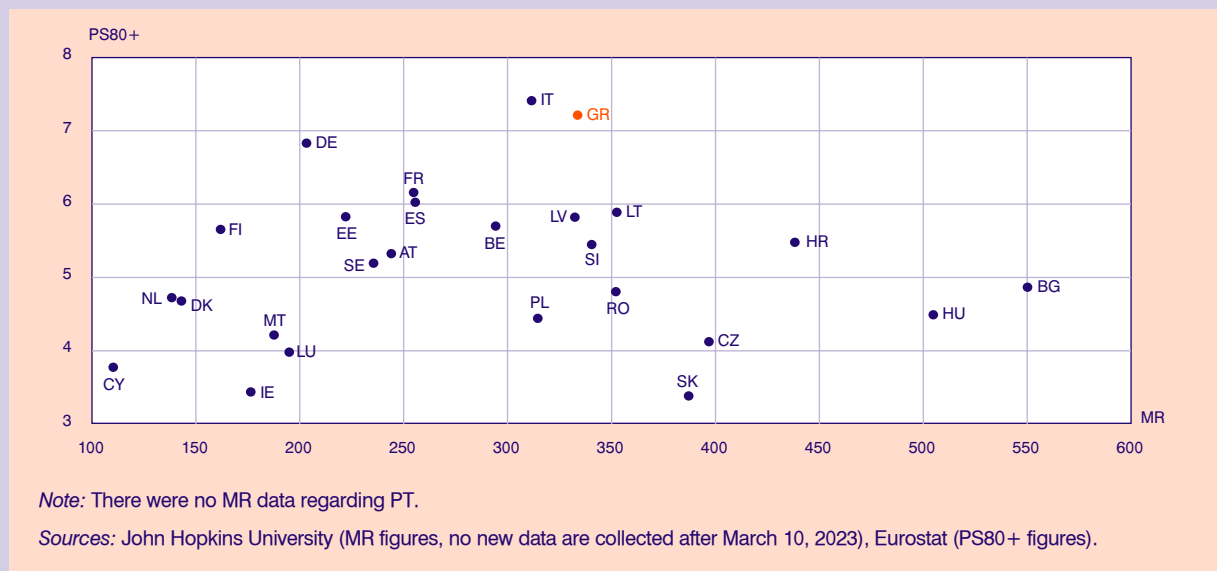
3. COVID-19 mortality

The pandemic affected a dilemma amongst policy-makers across the world to either: (a) maintain economic activity and interaction at the risk of suffering a rapid spread of the coronavirus in the population and considerable losses in terms of human lives, or (b) reduce economic activity and social interactions so as to delay the spread of the coronavirus in the population (and prevent considerable loss of human lives) until vaccines are developed and supplied to a large portion of the public (Prodromidis, 2021).

Figure 3 provides (a) the COVID-19 mortality rates (MR) observed in the EU member states up to the time the article was written (in spring of 2023), and (b) the population shares of the late elderly (aged 80 years or older) in each member state (PS80+), at the time the virus reached Europe.

It seems that Greece achieved the EU’s mid-range mortality rate even with (a) a relatively large population share of late elderly people (the age group that turned out to be the most vulnerable) and (b) the weakened state of the country’s health service (and of other services) due to cutbacks and the long recession, while rushing to make up lost ground and raise output in 2022.⁴

FIGURE 3
The population shares of people aged 80 or over (PS80+) in the EU on January 1, 2020 and the number of deaths per 100,000 population (MR) across the EU up to March 10, 2023



4. By March 2022, over 76% of the population had received at least one dose of the vaccine, and booster doses were available for all who wished; so the smooth operation of economic life was restored.

4. Public investment spending

Shifting attention to the country's post-pandemic prospects in terms of output, we look at its best-known measure, the GDP, Y . One of the standard ways of calculating the GDP is by adding up the values of all goods and services consumed in a year. These goods and services are usually organized in terms of five components:

$$Y = C + I + G + (X - M). \quad (1)$$

Consumption, C , consists of private (household) and nonprofit organization expenditures for durable goods, non-durable goods, and services in the country. It generally increases with output. That is, consumption goes up in the recovery and expansion phases, and down in the contraction phases (recession, depression).

Private investment, I , refers to (a) household spending on new houses in the country, and (b) purchases of buildings, machinery, equipment, software, and other intellectual property that businesses make in the country in order to produce goods and services, minus the disposal of such assets, plus certain additions to the value of non-produced assets realized by the productive activity (such as improvements to land).⁵ The received wisdom is that in the course of the recession, especially from 2009 on, private investment in Greece declined, even collapsed.

Government spending, G , is the sum of government expenditures on final goods and services. It includes salaries of public servants, purchases of weapons for the military, and any investment expenditure by the government on equipment, buildings, and other structures such as roads, bridges, etc.⁶ Much like consumption and private investment, government spending in Greece followed a cyclical path and declined during the recession.

Exports, X , capture the overall value of goods and services that the country produces for other nations' consumption.

Imports, M , capture the overall value of goods and services supplied from other nations and purchased by domestic consumers.

It turns out that the lower bound of certain future values of one of these items, namely, of public investment spending (a part of G), G_1 , is to a considerable extent already known to economic development pol-

icy planners. Indeed, the annual amounts of G_1 for a number of years to come have already been pledged, checked and agreed upon (mostly between the EU and national authorities). As G_1 by and large originates from overseas, it may not crowd out domestic private investment. To the extent its lower bound is expected to massively surpass what was ever available in Greece in the recent past, *ceteris paribus*, the GDP is likely to move in the same direction: up. See Figure 4.

In particular, this G_1 is expected to first shift the economy's aggregate demand (AgD) to the right, and at a later stage – through the manmade or human capital produced (i.e., via the projects funded by this G_1) – to enter the production process and, in all likelihood, shift the economy's aggregate supply (AgS) to the right. If the shift of the AgD dominates the shift of the AgS, then both real output and prices go up, and if the shift of the AgS dominates the shift of the AgD, then real output goes up and prices go down (see Prodromidis, 2022). Consequently, some degree of optimism about Greece's output prospects may be warranted.

At any rate, *ceteris paribus*, the rightward shift in the AgD will have a positive effect on labor demand and, by extension, on employment, bringing about a reduction in both the number of the unemployed and the unemployment rate. Consequently, the unemployment rate will continue to converge towards the EU average. See Figures 5 and 6. However, the impact of G_1 may be tempered by leakages. We discuss these leakages in Section 6.

5. Unemployment

The number of unemployed people peaked in the 1st quarter of 2014 and, as Figure 5 suggests, declined subsequently. In addition, the long-term component (people in unemployment for over 11 months) came down at a faster pace compared to the total number of unemployed. So, in 2022, on average, the former stood at 39% of its 2014 level, and the latter at 46% of its 2014 level.

The availability of a good number of monthly observations before and after the peak (a) helps the reader look at developments in a more detailed manner than

5. NB: In this context, the term *investment* should not be confused with the purchases of financial products. Indeed, buying financial products is considered as *saving*, not as investing.

6. Transfer payments made by the government are not counted because these payments do not reflect a purchase by the government, but rather a movement of income. They are captured in consumption when the payments are spent.

FIGURE 4

The recent evolution of real GDP per capita and public investment spending in Greece (2013-22), and the spending plans of the public investment secured, 2013=100

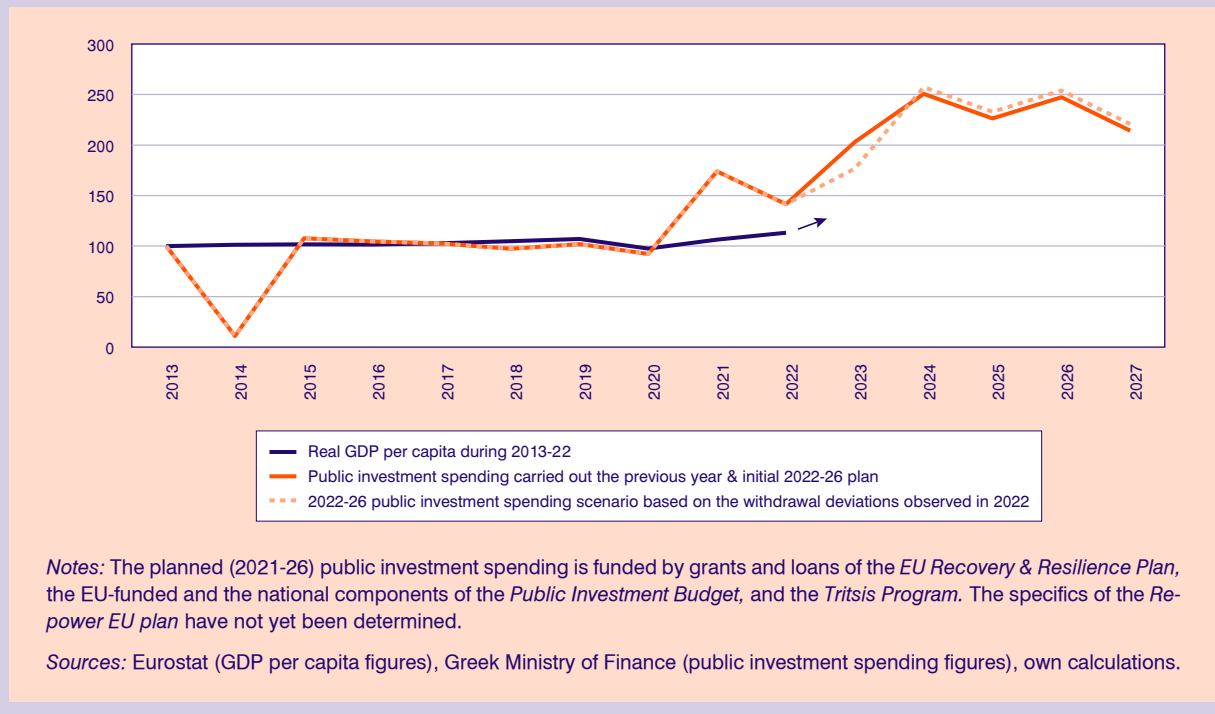


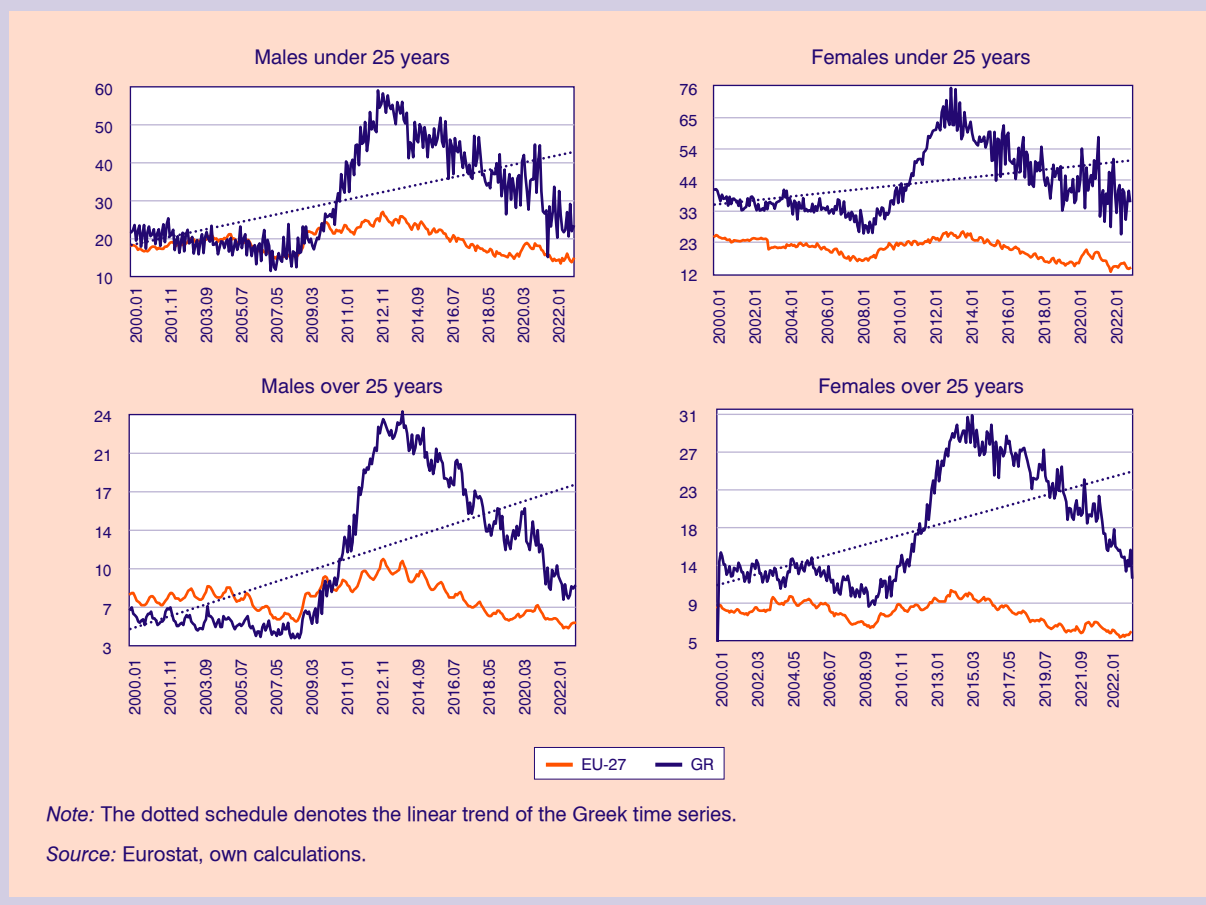
FIGURE 5

The evolution of the LFS number of the unemployed aged 15-74 (in thousand people) and of the declared job vacancies from the 3rd quarter of 2013 to the last quarter of 2022



FIGURE 6

The evolution of the unemployment rate in Greece and the EU from Jan. 2000 to Jan. 2023



output data,⁷ and (b) permits an econometric description of the evolution of the total number of unemployed people, in terms of seasonal and cyclical fluctuations and components.⁸ See Table 2. The findings reveal that, from a cyclical perspective, the number of the unemployed

- increased from April 2004⁹ (as the preparations for the Athens Summer Olympics came to a close) to June 2008,
- dropped in July-November 2008,¹⁰
- increased in December 2008-July 2011, increased further during August 2011-January 2012, even more during February-July 2012, and again in August 2012-February 2014,
- dropped somewhat in March 2014, dropped further in July 2014, and again in April 2015,
- increased again in May 2015-November 2016, at a slower pace, spiked briefly in June-July 2015, at the time of imposition of capital controls in Greece, and
- decreased from December 2016 on.

7. Indeed, output is available in more aggregated (i.e., quarterly or annual) form. As a result, the number of available observations may be insufficient for regression analysis. The association between unemployment and output is made with Okun's Law in mind. Okun's Law is an empirically observed relationship between changes in the unemployment rate and changes in the real GDP: An increase in the one is associated with a decrease in the other, and vice versa.

8. The rest is, to a considerable extent, frictional and structural. In Figure 5, the declared job vacancies schedule provides a lower bound for the structural component. The Manpower Group (2023) reports that eight in ten employers in Greece find it difficult to fill open roles, and according to SEVE (2023), nine in ten exporting businesses in Greece cannot find specialized and unspecialized staff.

9. In accordance with the extremes of the expression estimated in Table 2 with respect to time (see bottom line of Table 2).

10. The development was short-lived as in November 2008, the Eurozone entered into recession; in Greece, December was marred by extreme social unrest and considerable deterioration in the cost of financing the government.

TABLE 2 The evolution of the total number of unemployed people aged 15 or over in Greece, from Jan. 2000 to Jan. 2023 in thousand people

Regressors	Coefficients
Autonomous component (initial level)	677.1895
Seasonal component (November-May: reference)	
• June-October	-41.4256
• May of 2008 and 2009	-216.483
Cyclical components	
• Time *	-11.0587
• Time square *	0.1348
• Time cube *	-0.0004
Other notable fluctuations	
Jul.-Nov. 2008	-189.1844
Aug. 2011-Jan. 2012, and Jun.-Jul. 2015	207.1473
Feb.-Jul. 2012, and Mar.-Jun. 2014	331.7629
Aug. 2012-Feb. 2014	431.3235
Jul. 2014-Mar. 2015	277.1893

Observations: 277. Model fitness (R^2): 93.68%

Notes: The regression is estimated with robust standard errors so as to address issues of heterogeneity and lack of normality. All p-values are equal to 0. They are not reported as they are useful only in analyses carried out in samples. (When p-values are very close or equal to zero, one may deduce that the positive or negative effects observed in the sample also exist in the larger population.) Here the analysis is carried out in the population.

* The three coefficients suggest that the slope was initially negative, turned positive in Apr. 2004, and again negative in Dec. 2016.

Source: Eurostat, own calculations.

The latest (most recent, January 2023) unemployment rates of males and females, both under and over 25 years old, are at about the respective January 2010 rates (i.e., the rates observed prior to the passing of austerity measures and the first bailout MOU). See Figure 6 above. In particular, the latest unemployment rate is

- slightly above the EU-27 rate (by 3 percentage points), in the case of males over the age of 25;
- moderately above the EU-27 rate (by 6 percentage points), in the case of females over the age of 25;
- considerably above the EU-27 rate (by 9 percentage points), in the case of males under the age of 25;
- very much above the EU-27 rate (by 23 percentage points), in the case of females under the age of 25.

To deal with the situation, the Greek Government (2021) set out to upskill and reskill the workforce by financing,

with considerable *Recovery and Resilience Fund* resources, the training and lifelong education of the workforce. In addition, in 2022, the public body for the promotion of employment was revamped in terms of both operations and interventions. The expectation is that in the future (a) the workforce will fill more job vacancies more quickly (see Figure 7; most vacancies are in accommodation, food services, and construction), and pursue additional employment opportunities and higher wages; (b) the domestic labor market may become more efficient; and (c) with more people employed, earning incomes, and being taxed, future state revenues may go up.

In addition, from 2019 on, the government

- Succeeded in attracting some private foreign investment –considerable by Greek standards as, historically, the country has not been able to systematically do so (see Enterprise Greece, 2022; Zisisimou, 2023). *Ceteris paribus*, with more private in-

FIGURE 7
Job vacancies across sectors in Greece, 2017.Q1 – 2022.Q4

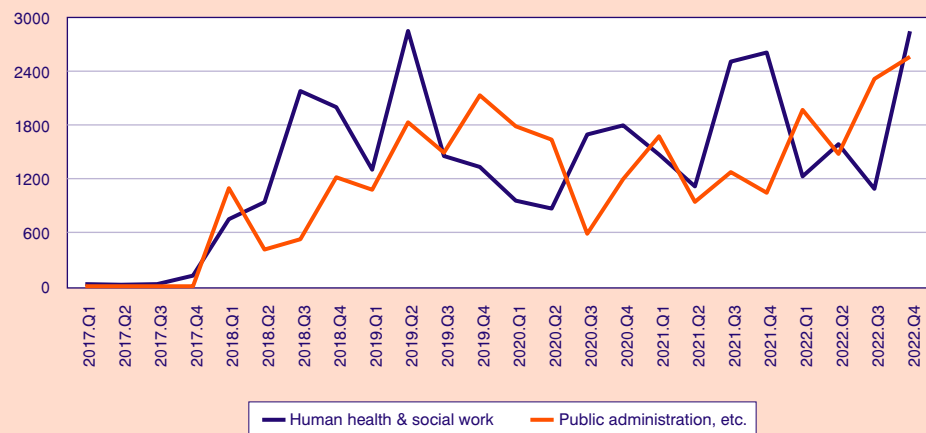
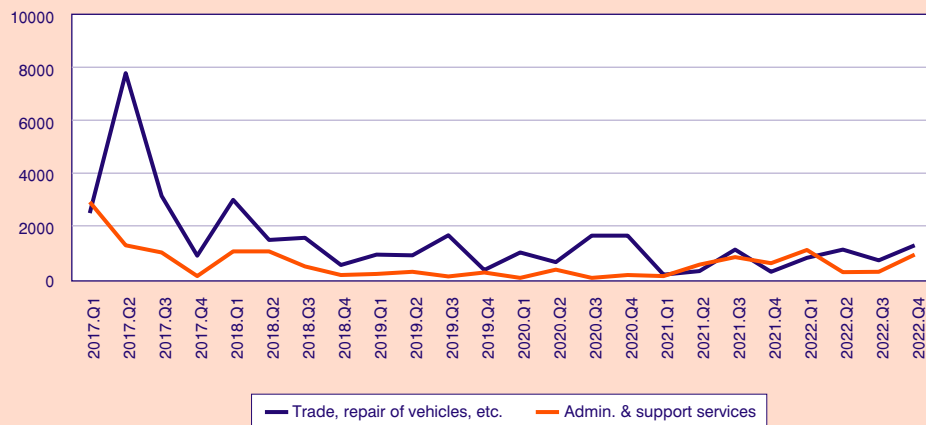
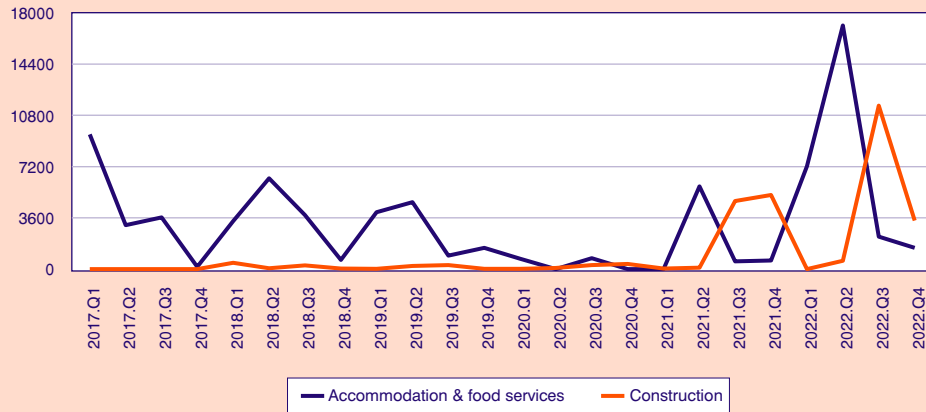


FIGURE 7 (continued)

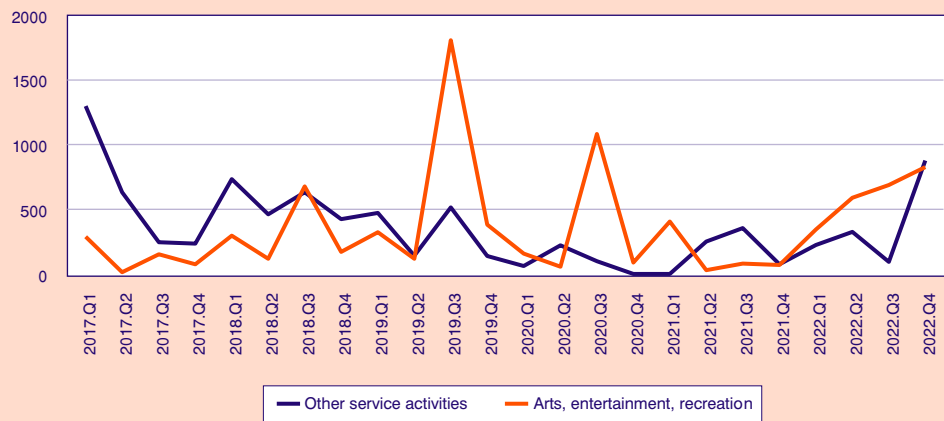
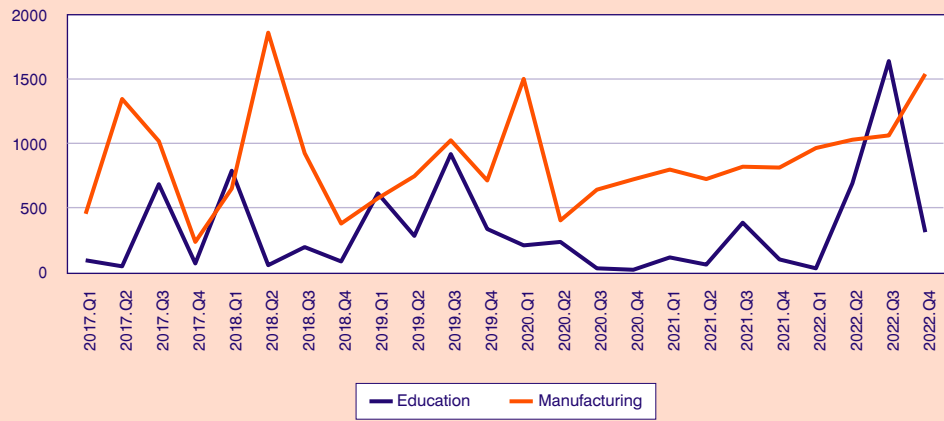
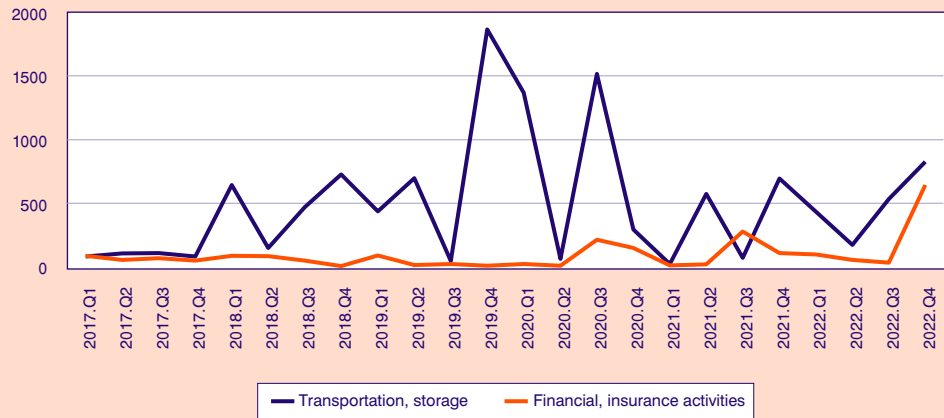
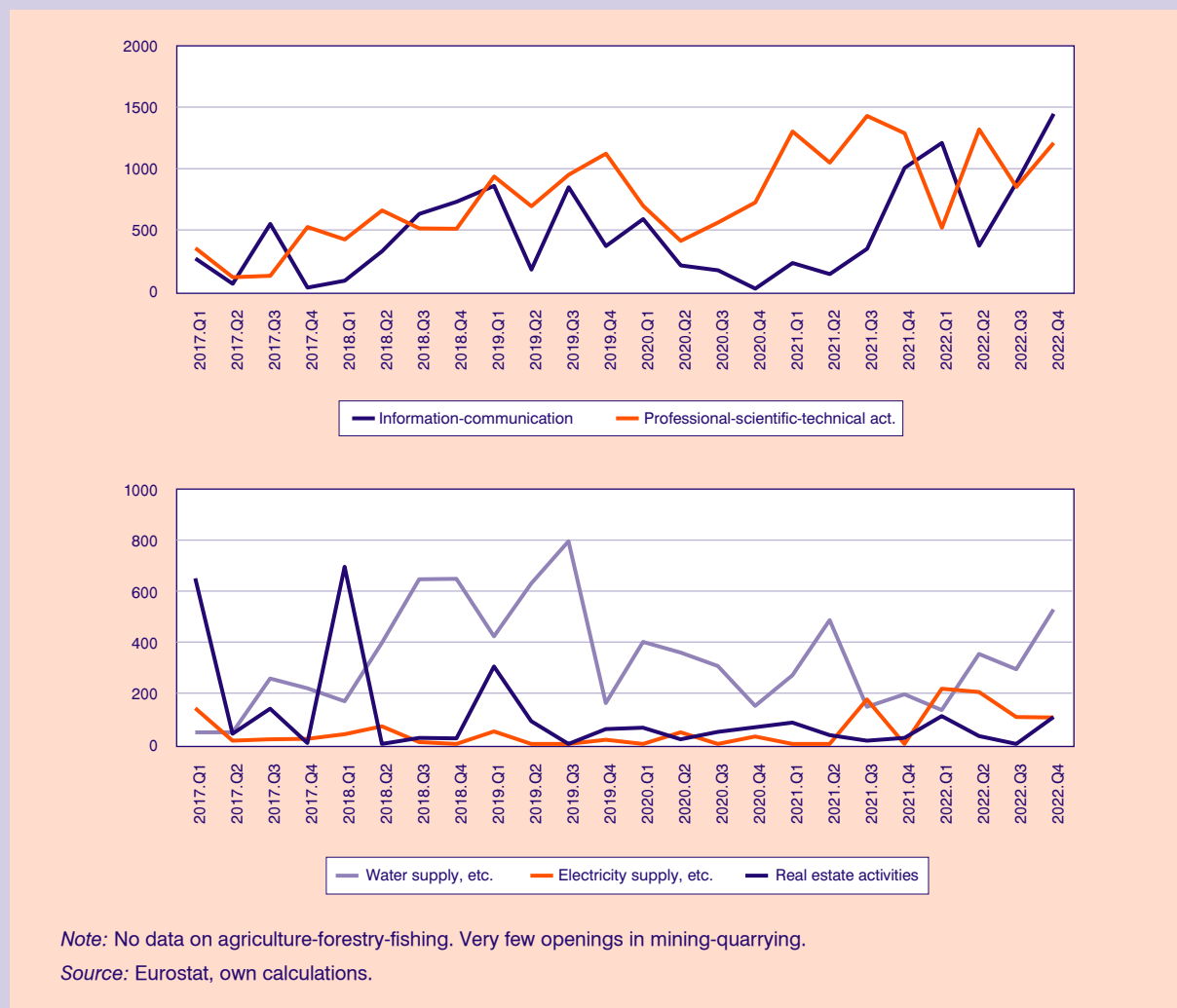


FIGURE 7 (continued)



Note: No data on agriculture-forestry-fishing. Very few openings in mining-quarrying.
Source: Eurostat, own calculations.

vestment, and therefore more private capital in the production process, output ought to increase.¹¹

- Took steps to fill some vacancies (jobs that natives did not want to do) via other arrangements so that both production and the domestic value chain are maintained. A case in point is the plan to bring 5,000 temporary seasonal agricultural workers from Egypt (Koutantou, 2022; Greek Government, 2023).

6. External trade deficit

Understandably, the impact of government spending is stronger when the amount spent does not flow (leak) overseas or when existing leakages are re-

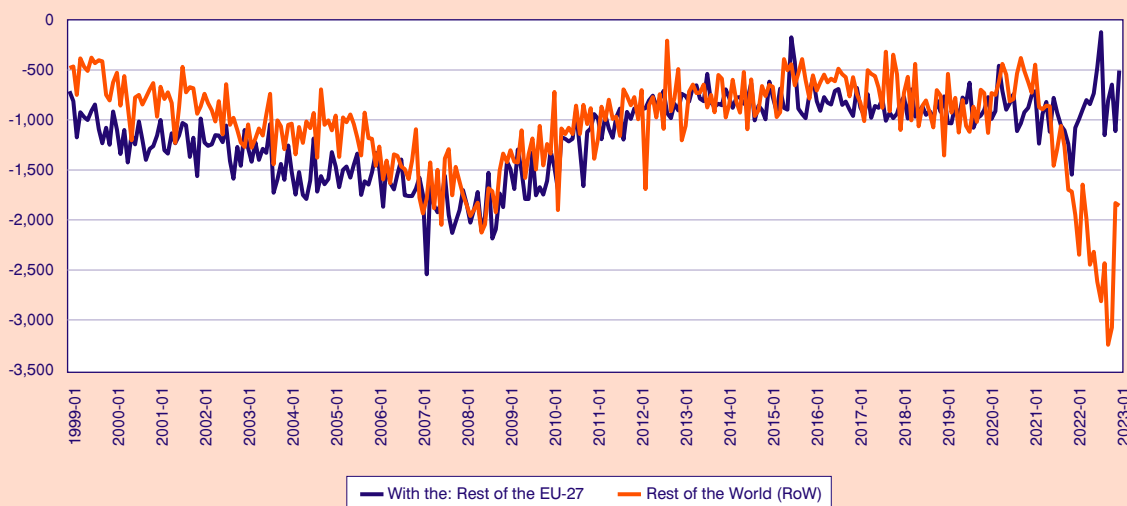
duced, and the economy becomes less dependent on imports.

As Figure 8 suggests, Greece’s external deficit was modest during 2011-21 compared to 2003-10, but spiked in 2022. The spike is by and large attributed to imports that were not cheap or easy to substitute, like crude petroleum and natural gas, i.e., intermediate inputs purchased at high prices (inordinately high prices as a result of the international sanctions on Russia) primarily from the USA, and, to a lesser extent, from Italy and Bulgaria. At the time, both Greece and the rest of the EU responded to the violation of international peace and security in Ukraine by turning away from cheap Russian supplies, and scrambled to internation-

11. It is a reasonable assumption, unless the investment was directed to projects in which the marginal product of capital was (or was close to turning) negative.

FIGURE 8

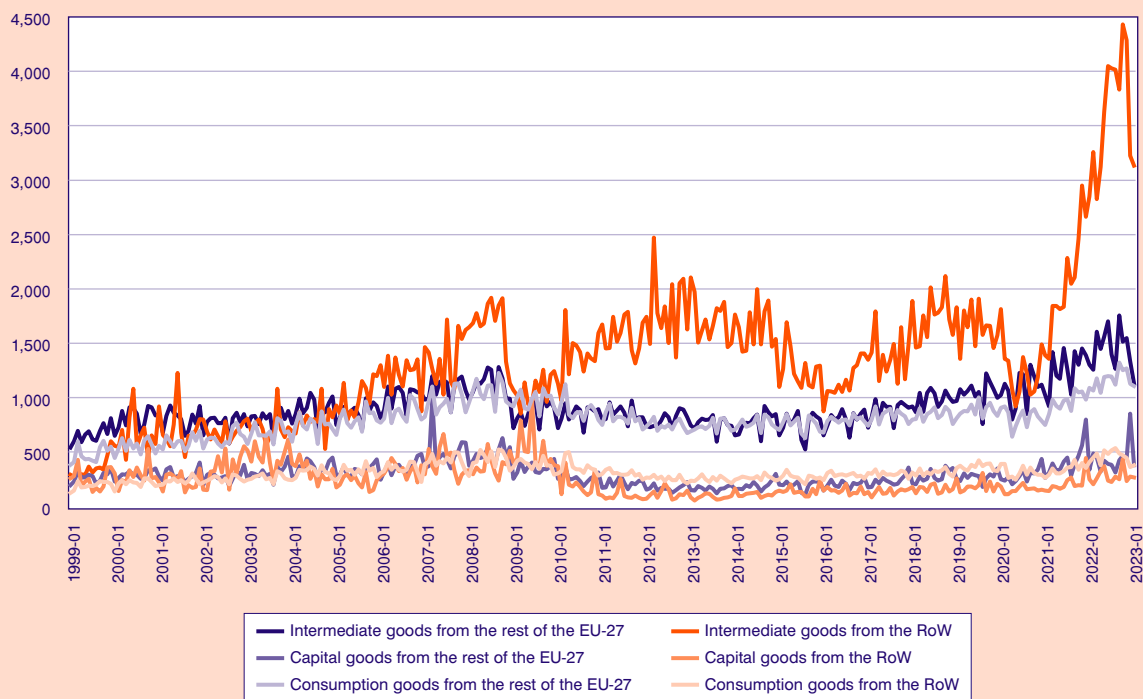
The evolution of Greece's external trade (deficit), Jan. 1999-Jan. 2023 in million €, €



Source: Eurostat, own calculations.

FIGURE 9

The evolution of Greece's imports, Jan. 1999-Jan. 2023 in million €, €



Source: Eurostat, own calculations.

al markets so as to prepare their storage for the winter of 2022-23. See Figure 9 above.

These were exceptional circumstances. However, other long-term EU policies –based on moral grounds and undertaken with good intentions– may have comparable effects.

Indeed, additional leakages in the form of increased imports will almost certainly be affected by the EU-wide effort to phase out coal in the energy sector and achieve climate neutrality, as a considerable number

of electric cars, solar panels, wind turbines and blades, relevant components, energy efficient and eco-friendly appliances, etc. will be needed, and will be imported to Greece from overseas.

Obviously, if a comparative advantage were developed in Greece so as to domestically produce –even export– some of the above, then the transition might be facilitated. Generally speaking, the satisfaction of a greater proportion of the country’s total demand of goods and services by domestically produced goods and services will keep the external deficit in check.

FIGURE 10
The harmonized consumer prices indices (2015 = 100) across the EU from the 5th day of the war in Ukraine, Mar. 2022 - Mar. 2023



Another cause of concern arises from the EU Commission's attempt to protect/raise its budget by (a) calculating losses from customs duties based on a method which was originally developed for risk profiling,¹² and (b) pressuring customs services to raise the values of many imports to the level estimated by the said method or pay the difference.

However, if the Commission's method is flawed, and the customs service raises the value of many imports so as to avoid clashing with the Commission, then the GDP measure may be artificially, and wrongly, reduced. This will adversely affect a whole range of things in Greece, running from maintaining a low government debt-to-GDP ratio to improving social welfare. From a broader perspective, with the EU-27 as a whole narrowly avoiding a recession in 2022 and possibly in 2023 (Davies, 2023; Rankin, 2023), any artificial rise in the level of imports –i.e., any move that will bring about an equal reduction in the EU's GDP– may be untimely and counter-intuitive.

7. Price inflation

The war in Ukraine added heavily to the inflationary pressures that were building up across the EU during the pandemic, and pushed up consumer prices, especially for energy and food (Caldara et al., 2022; Maurya et al., 2023).

As the above Figure 10 suggests, from year 2015 and up to the time of the Russian invasion in Ukraine, generally, prices rose (a) considerably in the eastern member states that joined the EU last, (b) less in a cluster west of the aforesaid belt of eastern member-states, (c) much less in two Scandinavian and a number of central and western Mediterranean states,¹³ and (d) the least in the southeastern- and the western-most edges of the EU,¹⁴ Greece included.

In addition, Greece featured one of the lowest price inflation rates in the months that followed, i.e., from the Russian invasion onwards. Indeed, Greece exhibited the fifth lowest average monthly increase from March 2022 to March 2023 (5.4%), behind the Benelux countries and Spain, and ahead of Cyprus, Finland, the other EU-member states, and the EU-27 average (8.3%).

If any of the policies tried out by the other states turns out to be successful, it may be sensible to consider and potentially employ these successful policies in Greece as well.

8. Inferences and conclusions

Greece handled the pandemic crisis competently. The initial fall in real per capita GDP was followed by a recovery, unemployment fell, and the country achieved a mid-range mortality rate in the EU despite the relatively high population share of late elderly people. In addition, Greece had one of the lowest price inflation rates in the EU despite the inflationary pressures in the EU both before and during the war in Ukraine and is turning a corner as real per capita output starts to converge to the EU-27 average.

The overhaul of the employment promotion agency, the amount of resources directed to upskilling and re-skilling the workforce, the amount of public investment spending and foreign private investment carried out in Greece (both of which are considerably higher compared to what was available in the recent past), along with initiatives taken to fill job vacancies via other arrangements, are all likely to raise output and provide a source of optimism regarding future output.

Though in better shape compared to 2011, and moving in the right direction in several respects, Greece continues to face a number of challenges. The analysis draws attention to (a) the unemployment rate of young people (especially women), which remains much higher than the EU average, and (b) the rising value of imports, which may adversely affect output.

We recognize that there are many more challenges, including national, energy, environmental and cyber security; domestic inequality, marginalization, and exclusion; and meeting the country's debt repayment obligations. The level of economic growth that will be achieved depends on many aspects and events, such as the priorities of the government that will form after the coming elections, the new fiscal rules of the EU, as well as the quality of development planning and of its implementation.

12. I.e., intended to identify shipments of imported goods that may present a significant risk of undervaluation across the EU, so that the particular shipments may be inspected while entering the EU. Oddly, the method treats time-series data as cross-sectional and at times relies on regressions of very few observations (say, 4-36) (Arsenis et al., 2015; EU Court of Justice, 2022).

13. Namely, Croatia, Slovenia, Italy, France, Spain, Denmark, and Finland.

14. Namely, Cyprus, Greece, Malta, Portugal, and the Rep. of Ireland.

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The Greek energy sector and the impact of natural gas prices on domestic electricity prices

Vassilis Lychnaras*,
Costas Passas**

Abstract

The sudden and strong rise of energy prices over the past two years had a high impact on the economies of European countries. In Greece, the energy crisis had a strong effect on the domestic economy. At the same time, it highlighted the fact that the structure and operation of our country's energy sector was unable to face the effects of the increased prices of energy products. The sharp rise in the price of natural gas, combined with the country's high dependence on fuels imports and its large share in the electricity generation mix, led to even stronger pressures on electricity prices. This article examines the above issues and analyzes the correlation between the European gas price index and the domestic electricity price.

Keywords: Energy cost, natural gas, electricity

JEL Classification: C22, C53, Q41, Q47, Q48, L94

1. Introduction

During the past two years, all European countries faced the serious consequences of the sharp rise of energy prices. More specifically, during the second half of 2021 and until the end of 2022, international prices of energy products and especially the price of natural gas increased steeply, resulting in sharp upward pressure on electricity prices and, therefore, the cost of most consumer goods. Indicatively, the average price of natural gas in Europe, during the first months of 2021, was below €20/MWh, while by August 2022, it reached €236/MWh, i.e., the highest

price recorded during the last years. As a result, the increase of natural gas prices negatively affected the cost of generating electricity.

As far as the Greek economy is concerned, there were significant effects caused by the steep rise in energy products prices, burdening both household and non-household consumers. More specifically, electricity prices recorded a strong increase as of mid-2021, following an upward trend until the first half of 2022. Thus, while in the beginning of 2021 the monthly average price of the wholesale market stood right above €50/MWh, in August 2022, the price reached €437/MWh, the highest monthly price recorded. The burden was particularly great for households, both due to the increase of energy costs and consumer goods prices. Therefore, the rise in energy prices led to a direct impact on the Consumer Price Index (CPI) and the evolution of inflation (Marsellou and Lychnaras, 2022; Marsellou and Lychnaras, 2023). However, by the end of 2022, the price of energy products followed a significant downward trend, leading to the deceleration of inflation too.

The recent energy crisis highlighted the fact that specific structural characteristics of the country's energy sector seem to have affected the efforts of mitigating the consequences of the rising energy product prices. More specifically, certain factors indicating the country as highly dependent on international markets and exposed to fluctuations in international energy prices became more evident. In this context, the paper focuses on the investigation of the above factors, aiming at reaching sound conclusions and formulating policy proposals that may contribute to the national strategic energy plan. Moreover, the main purpose of the work is analyzing the correlation between the European natural gas price index and the domestic price of electricity in an effort to estimate the influence of gas prices in the domestic energy market.

The article has the following structure. In section 2 below, key structural characteristics of the Greek energy sector are presented and analyzed. Section 3 analyzes the evolution of the European natural gas price index over time and section 4 the evolution and role of the price of carbon emission allowances. Then, section 5

* Senior Research Fellow, Centre of Planning and Economic Research (KEPE). Email: vlychn@kepe.gr

** Senior Research Fellow, Centre of Planning and Economic Research (KEPE). Email: kpassas@kepe.gr

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deals with the evolution of electricity prices in Greece over time and presents its connection with the price of natural gas, while section 6 examines econometrically the relationship between the domestic price of electricity and the price of natural gas. Finally, section 7 summarises the main conclusions that emerge from the work and lists relevant proposals for the energy sector.

2. Key structural characteristics of the energy sector in Greece

The severe consequences of the energy crisis on the Greek economy revealed, among other things, the negative impact of some specific structural characteristics of the energy sector on the evolution of domestic energy prices. Indicatively, parameters such as the composition of the country's energy mix, and especially the composition of the electricity generation mix, the dependence on energy product imports, as well as the structure and operation of the electricity market affect the ability to manage the impact of the global energy crisis on the domestic market.

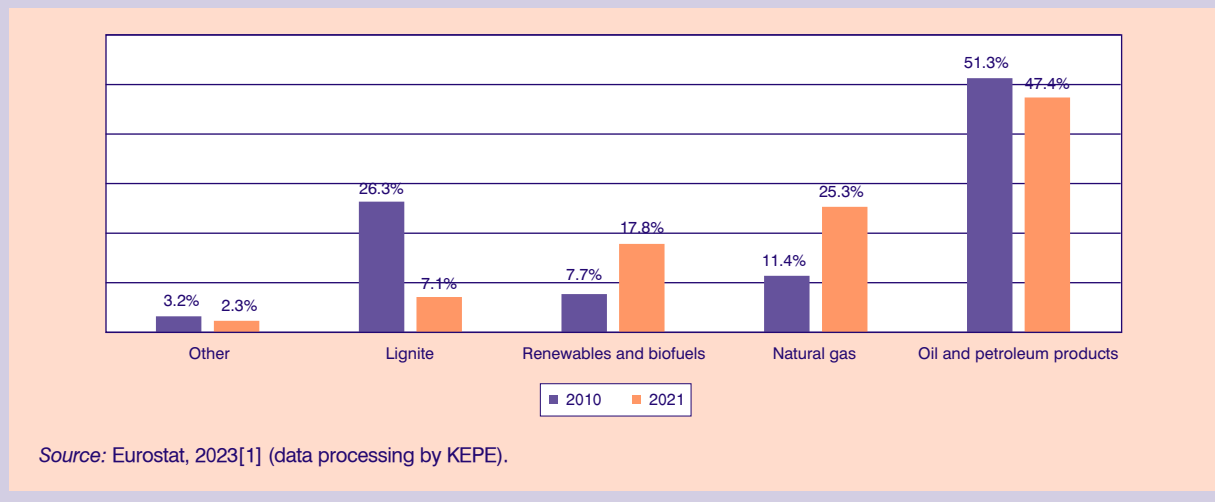
Regarding the energy mix of the country, there has been a significant change in its percentage composition during the last years. Figure 1 shows the change in the shares of various types of fuel in the gross inland energy consumption¹ in 2010 and 2021. It is mainly ob-

served that the share of lignite decreased from 26.3% in 2010 to 7.1% in 2021, while Renewable Energy Sources (RES) and natural gas significantly increased in the total share of the country's energy mix. Thus, in 2021, the share of RES and natural gas rose to 17.8% and 25.3%, respectively. Moreover, petroleum products remain the main type of fuel in the country's gross consumption with a share of about 50%.

Accordingly, a significant change was also recorded in the mix of electricity generation. Figure 2 shows the change in the mix of electricity production by fuel type in our country, compared to the EU average, for 2010 and 2021. We notice that the share of solid fuels in Greece, i.e., lignite, decreased from 51% to 9.7%, while the share of natural gas almost doubled, from 21.9% to 41.1%. At the same time, the share of RES increased significantly from 17% in 2010 to 40.6% in 2021. Consequently, a change in the energy mix through using clean energy sources and reducing the carbon footprint is recorded. In any case, we should underline that Greece is much more dependent on natural gas for electricity production compared to the EU27 average.

As known, a key parameter for a country's energy security, as well as a factor determining the cost of energy, is dependence on imports of energy products. Greece is characterized by a particularly high import dependency rate for energy needs. The total energy dependency rate on imports² reached 73.1% in

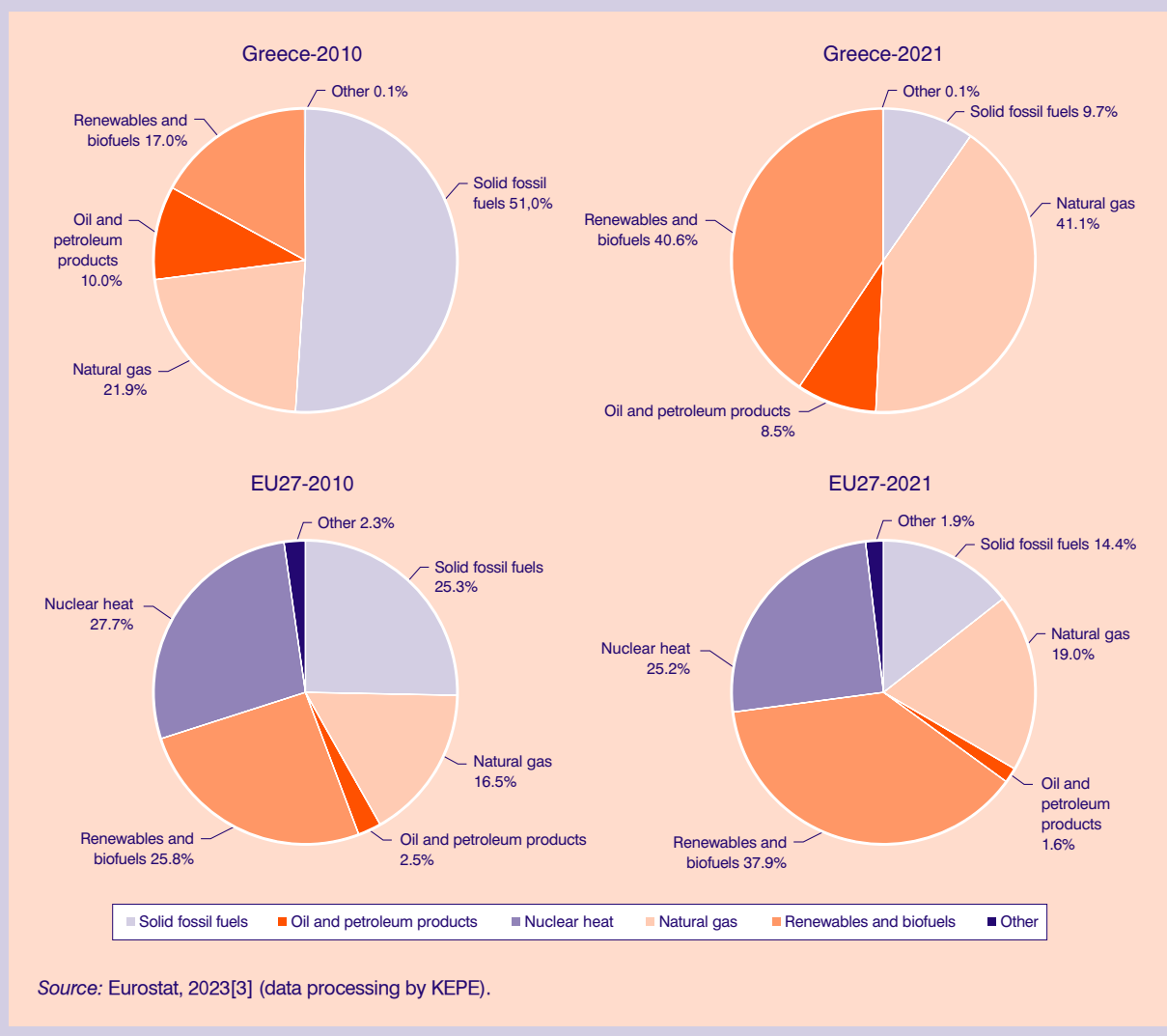
FIGURE 1
Change in gross inland energy consumption by fuel type, 2010 vs 2021



1. Gross inland energy consumption, sometimes abbreviated as gross inland consumption, means the overall supply of energy for all activities on the territory of the country, but excluding international maritime bunkers.

2. The indicator shows the share of the total energy needs of a country met by imports from other countries. It is calculated as net imports divided by the gross available energy. Energy dependence = (imports – exports) / gross available energy.

FIGURE 2
Electricity generation by fuel type, percentage share change between 2010 and 2021



2021 (Figure 3). In fact, in 2020, this rate rose to 81.4%. Moreover, its continuous increase during the last years places Greece among the countries with a rate much higher than the EU27 average, which ranges between 55% and 60%. The change in the energy consumption and especially the increase of natural gas use, entirely based on imports, has contributed to the increase in the country's energy dependence.

More specifically, the fact that Greece is totally dependent on natural gas imports is crucial. Imports counted for 99.4% of the country's total gross natural gas energy in 2021 (Figure 4).³ In fact, it is observed that the rate remains consistently higher than the EU average, despite the upward trend in Europe due to the generalized increased use of gas. Greece is also charac-

terized by a significantly high energy dependence on oil product imports, at a rate of 93.1% for 2021. On the other hand, we should note that the country has a high export rate of liquid transport fuels, due to the intense economic activity in the refining sector. Finally, Greece's dependence on fossil fuel imports does not exceed 40%.

Therefore, we conclude that Greece has always experienced a very high proportion of petroleum products in the mix of gross energy consumption. In recent years, the use of natural gas has significantly increased both in the domestic sector and in the production of electricity, which has also led to an increase in the share of fuel in gross energy consumption. At the same time, the country has a particularly high energy dependence

3. A share of more than 100% arises due to exports.

FIGURE 3
Total energy dependency of Greece, 2010-2021

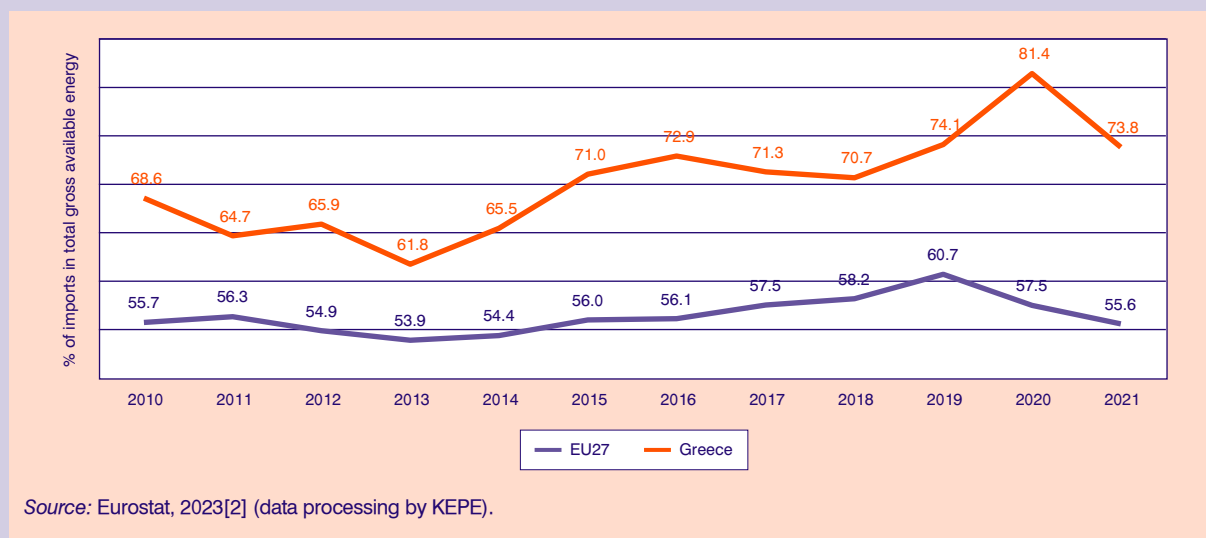
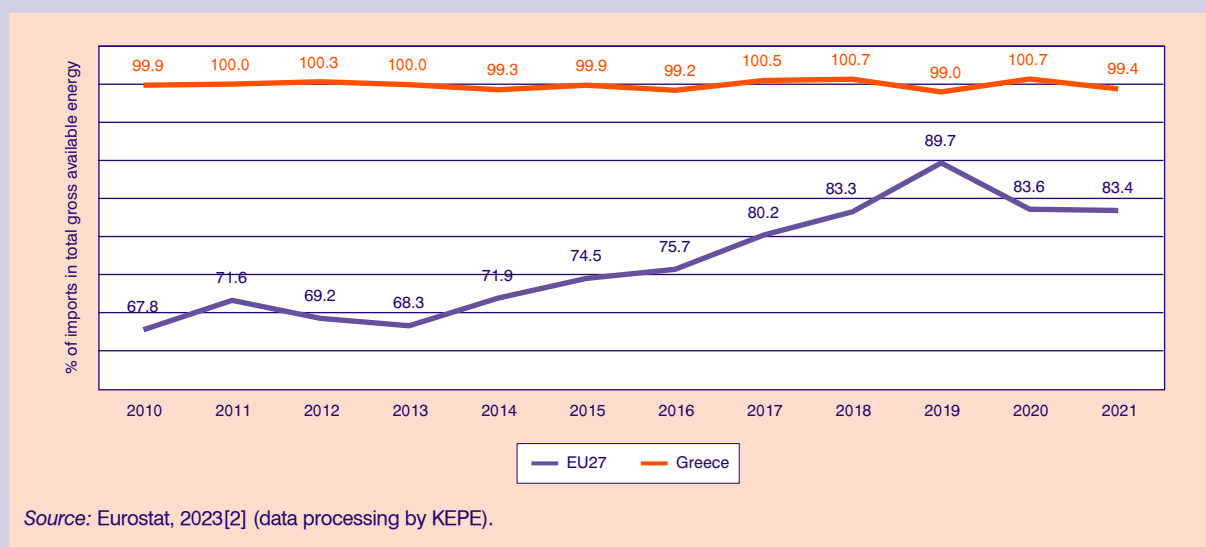


FIGURE 4
Natural gas import dependency, 2010-2021



rate, since a large proportion of its gross available energy is covered by imports. Regarding oil and natural gas sources, the dependence is almost complete. All these factors make Greece particularly vulnerable to developments in international markets and fluctuations in prices.

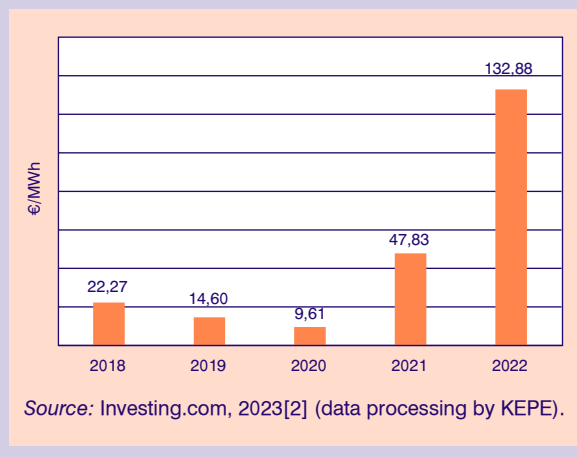
As underlined in the analysis of Uribe et al. (2022), the composition of the energy mix of EU countries seems to influence the degree to which the price of natural gas affects domestic electricity prices. In previous works of KEPE, it was also noted that, before the energy crisis, the increasing use of natural gas led to an increase in the country’s energy dependence rate. Thus, it is ex-

pected that a rise in prices would have strong negative impact on important economic activities, such as manufacturing, trade, tourism, etc., and would also affect the economic development of the country; at the same time, this would burden households and intensify energy poverty (Lychnaras, 2020).

3. The evolution of the European gas price index

Regarding natural gas, this analysis takes into account Dutch Title Transfer Facility (TTF) Natural Gas Futures. It should be noted here that due to the large volume of

FIGURE 5
Evolution of the annual average price of natural gas, 2018-2022

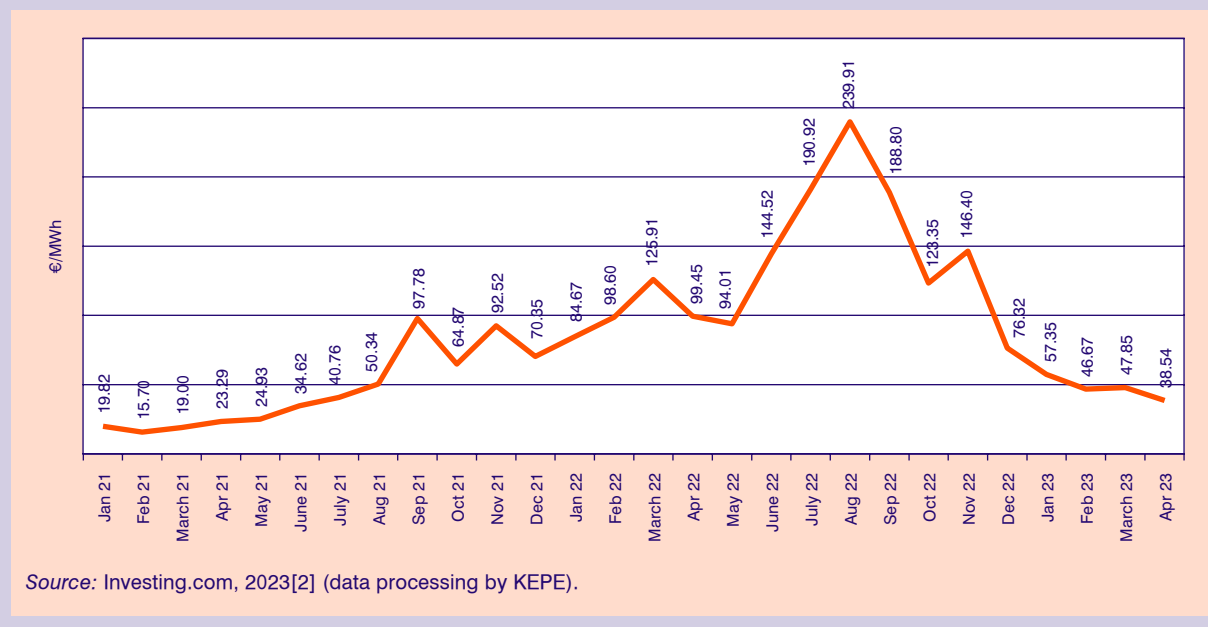


transactions in the Dutch TTF, the price formed there was adopted as a benchmark index for the price of natural gas in the EU. However, today, due to the increase in imports of Liquefied Natural Gas (LNG), TTF is no longer considered as the most representative indicator of the average price of contracts. In this context, the European Commission has focused on the composition of a new benchmark that will combine the TTF with other indices. However, in this analysis, the daily closing prices of the stock exchange have been used. The weekly, monthly, and annual average prices presented in the charts below have been processed from these prices.

Figure 5 presents the evolution of the annual average price of natural gas during the period of analysis, i.e., 2018-2022. We observe that until mid-2021, the monthly average TTF natural gas price was at very low levels. Indicatively, the annual average price in 2018 was €22.27/MWh and decreased to €14.60/MWh in 2019 and even more, to €9.61/MWh, in 2020. The low cost of fuel combined with its lower environmental footprint, especially compared to lignite, are some of the main reasons that led to the gradual increase of its use for electricity production and to the installation of new natural gas power plants that gradually replaced the older lignite plants. We should note that the electricity generation cost from lignite was constantly increasing, both due to the operating costs of lignite plants and due to the rising cost of purchasing emission allowances.

Nevertheless, during 2021-2022, there was a sharp and particularly strong increase in the price of gas. More specifically, in 2020, the annual average price amounted to €47.83/MWh, while in 2021 the average price reached €132.88/MWh. Focusing on this period (Figure 6), we observe that at the beginning of 2021, the price was at particularly low levels. But then, and especially from the second half of 2021 onwards, due to the restart of the economy after the pandemic that led to a sharp rise of global demand for natural gas, the price of fuel followed a strongly increasing trend. Indicatively, in December 2021, the price amounted to €115/MWh, with a 600% annual percentage increase compared to December 2020. Russia's invasion of Ukraine in early 2022 also had a particularly negative

FIGURE 6
Evolution of the monthly average price of natural gas, January 2021-April 2023

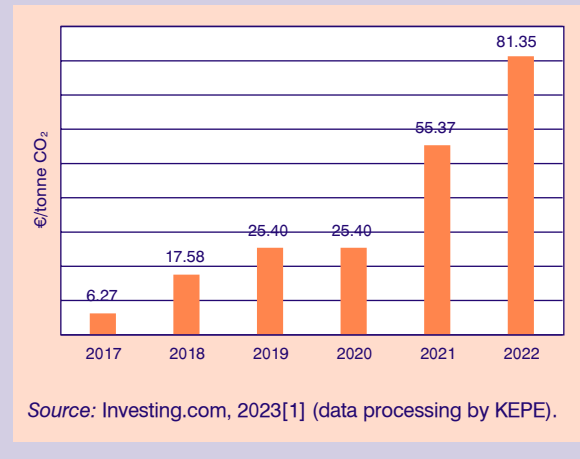


impact on price developments. The shortage of natural gas in the international market and the conditions of energy insecurity led to a new sharp rise in prices. In August 2022, the average price reached €236/MWh, the highest price in recent years, and recorded an annual percentage increase of 428% compared to the already increased prices of August 2021. Nevertheless, from autumn 2022, the price of natural gas followed a sharp downward trend that continued until the first months of 2023. This fact contributed to the end of the energy crisis for the European economy.

4. The role and the evolution of the carbon emission allowances price

Electricity generation from the country's conventional lignite power plants not only has a negative environmental impact, but is also characterized by increased production costs due to carbon emission allowances. As mentioned above, the increase in production costs from lignite was also one of the causes that contributed to the shift to electricity generation from natural gas. Therefore, the evolution of the price of CO₂ emission allowances is an important parameter that not only directly affects the competitiveness of manufacturing, but is also a key parameter for the domestic energy sector. Additionally, in our country, the cost of carbon emissions plays a particularly important role in periods of increased natural

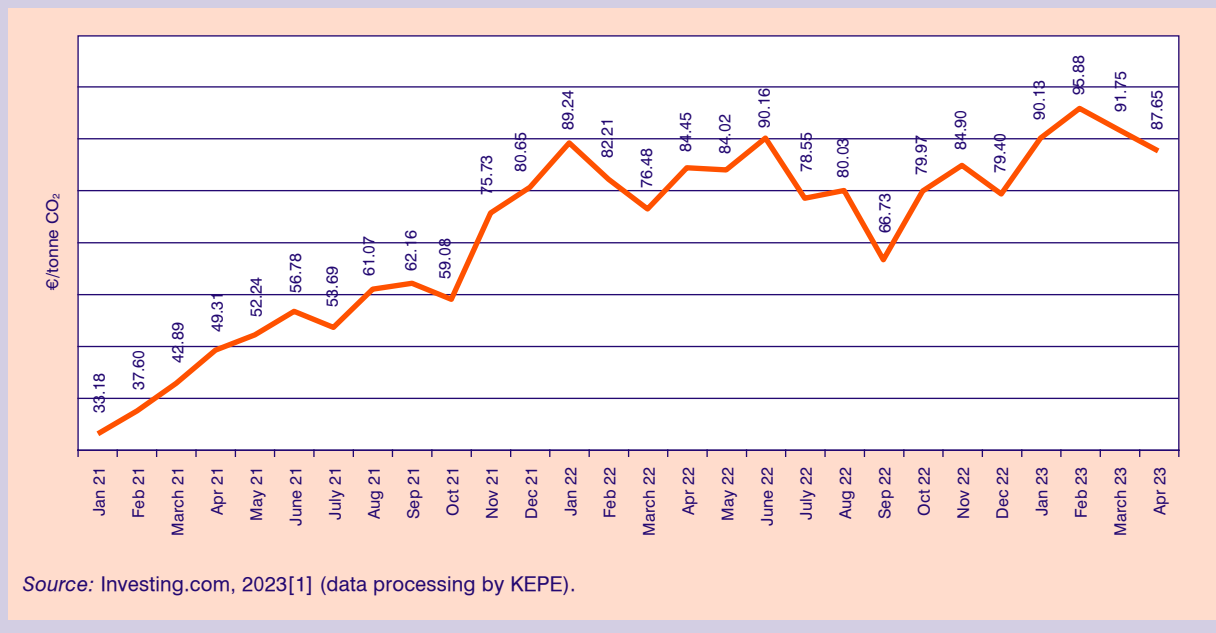
FIGURE 7
Evolution of the annual average price of emission allowances, 2017-2022



gas prices, when lignite production is needed to contribute to the country's energy security.

The price of carbon allowances has increased significantly in recent years. Figure 7 shows the evolution of the annual average price for the period 2017-2022. The average price in 2017 was at particularly low levels, namely €6.27/tonne CO₂. The low cost of emission allowances contributed to criticism of the effectiveness of the EU ETS.⁴ Nevertheless, the cost of emission rights

FIGURE 8
Evolution of the monthly average price of emission allowances, January 2021-April 2023



4. EU Emissions Trading System (EU ETS): <https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en>.

has been constantly increasing since 2017. Especially during the last two years, the rise has been steep, leading to an annual average price of carbon allowances of €55.37/tonne CO₂ in 2021, and €81.35/tonne CO₂ in 2022. Focusing on the period since January 2021, the monthly average price of carbon allowances showed a strong upward trend (Figure 8 above). Indicatively, the average price in January 2021 was €33.18/tonne CO₂ and rose to €89.24/tonne CO₂ in January 2022. Since the beginning of 2022, the price has been fluctuating, but seems to have stabilised at higher levels. Today, it ranges at around €90/tonne CO₂. These high prices negatively affect the cost of electricity production from lignite.

5. The evolution of electricity prices in Greece and its correlation with the price of natural gas

As it is understood, both the price of natural gas and the price of carbon emission allowances are two key parameters that determine the cost of electricity production in our country. As discussed above, in Greece, the natural gas market is directly dependent on the international prices of this fuel. In this context, this article focuses on studying the impact of the European natural gas price index on the formation of the domestic electricity price of the wholesale market. Especially during the period of high natural gas prices, the large share of fuel (about 40%) in the electricity generation mix in our country, combined with the structure and the operation characteristics of the electricity market, seem to affect the formation of the electricity prices with a time lag. More specifically, the international gas price of each

month seems to form the price of the next month in the domestic wholesale electricity market.

Regarding the analysis of electricity prices in Greece, in this article, we take into account the Day-Ahead Market clearing price on the Hellenic Energy Exchange S.A. (HEEx S.A.). Figure 9 shows the evolution of the annual average price from 2018 to 2022. As shown, the price was low during the period 2018-2020. Especially in 2020, the average price fell to €45/MWh, which is probably related to the effects of the pandemic and the decrease of the price of natural gas. On the contrary, in 2021 and even more in 2022, the annual average price recorded a significant increase. Thus, in 2021, the annual average wholesale electricity price in our country was €116/MWh, while in 2022, the average price increased to €279/MWh.

More specifically, regarding the evolution of the monthly average price of electricity, over the last two years (Figure 10), domestic prices increased starting in the middle of 2021, due to the restart of the economy after the pandemic that led to the increase of demand for energy. Additionally, at the beginning of 2022, the increasing trend of the cost of electricity became stronger because of the impact of the Russian invasion of Ukraine. Consequently, the average price reached its peak of €437/MWh in August 2022, recording an annual percentage increase of about 260% compared to the price of August 2021. However, since October 2022, a strong downward trend of the prices of electricity has been recorded in our country. We can conclude that the recent decrease in the price of natural gas, combined with the stabilization in emission allowance prices, had a positive impact on the evolution of electricity prices.

Based on the data, it seems that there is a correlation between the price of natural gas and the domestic wholesale price of electricity in Greece over time. More specifically, it is observed that the former has a direct effect on the latter, with a time lag, as mentioned above. Additionally, the recent effect of the crisis on energy costs showed that the impact of natural gas prices on the electricity market seems to be more intense during periods of high price levels. In this context, we investigate the correlation between these prices for the period January 2018-December 2022. Figure 11 presents comparatively the monthly average price of natural gas and the monthly average domestic wholesale electricity price. As noted, from June 2021 until August 2022, when there was a sharp increasing trend in the price of natural gas, the price of electricity also showed a stronger increase in Greece. Subsequently, the fall in the price of natural gas contributed to the de-escalation of the domestic price of electricity.

FIGURE 9
Evolution of the annual average electricity price, 2018-2022

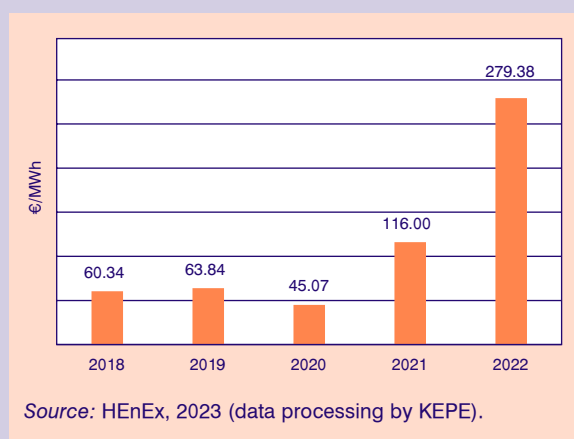


FIGURE 10
Evolution of the monthly average electricity price, January 2021-April 2023

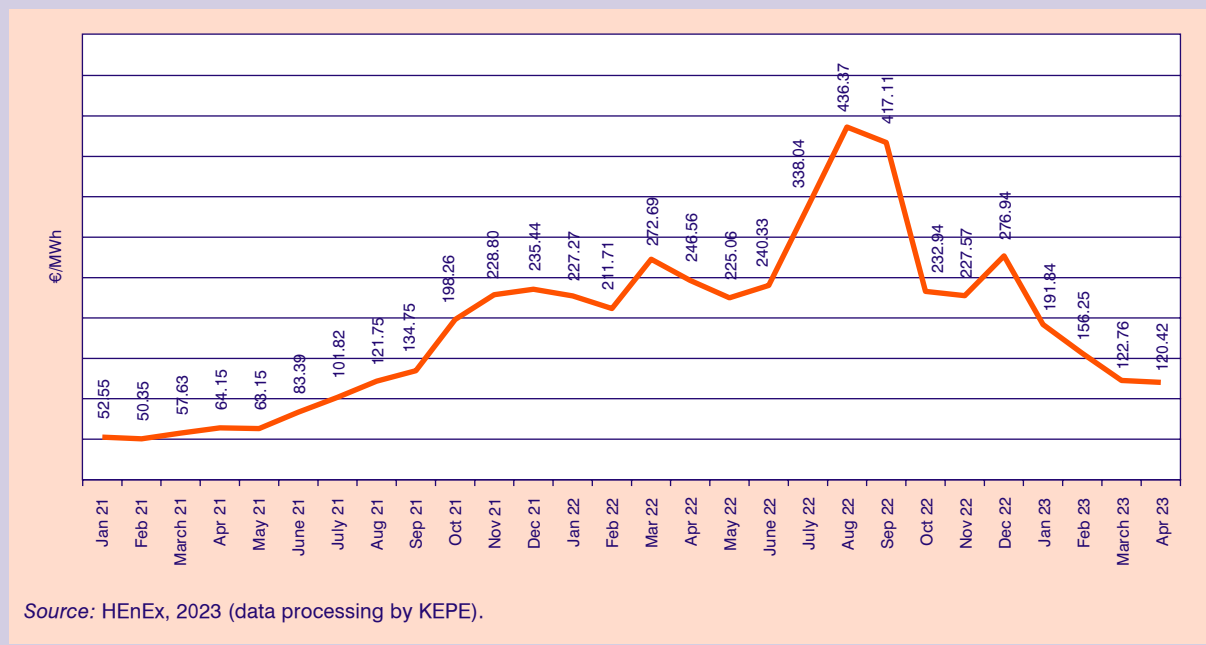
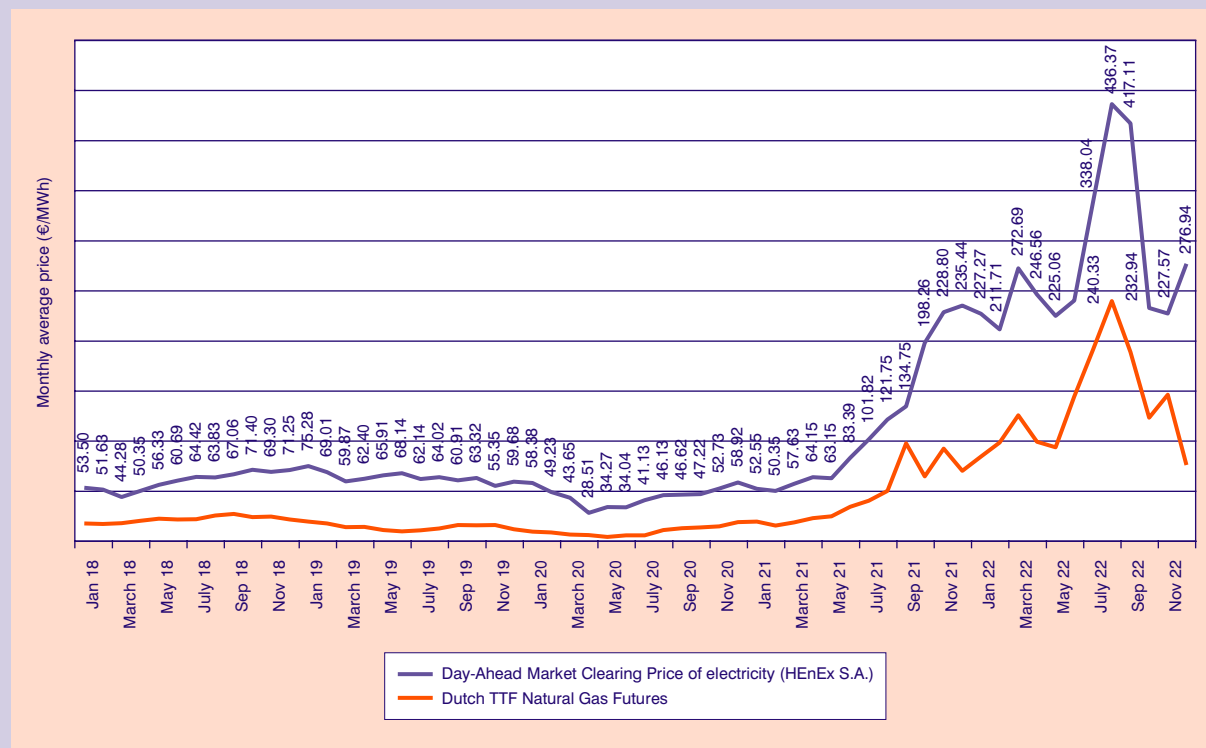


FIGURE 11
Effect of the monthly average price of natural gas on the monthly average domestic wholesale electricity price, January 2018-December 2022



6. Estimating the effect of international gas prices on the domestic price of electricity

In order to account for the effect of international gas prices on the domestic wholesale price of electricity, we proceed with the estimation of a simple econometric model that considers a linear relationship between the two variables. In particular, we estimate the following relationship:

$$pe = \alpha + \beta pg + \varepsilon \quad (1)$$

with pe the natural logarithm of electric prices, pg the natural logarithm of gas prices, and ε the disturbance term. Our initial values come from daily prices of the two variables for the period between January 2018 and December 2022. However, since the time series for electricity prices and gas prices are in different frequencies, with electricity prices following a 7-day week pattern and gas prices following a 5-day week pattern, resulting in 1826 and 1263 observations respectively, we proceed with a frequency conversion into weekly averages obtaining 261 unique observations for each series.

The first step in the estimation process is to test both series for stationarity using the Augmented Dickey-Fuller test. Results, presented in Table 1, indicate that both series are non-stationary in levels and stationary in first differences irrespectively of the inclusion of a time trend. We note that a variable is considered stationary if in the long run its values revert to its mean, while it is non-stationary if it systematically deviates from the mean.

As we have already mentioned, the international price of natural gas follows an explosive behaviour after mid-2021, and as a result, it is highly probable that the estimation of the relation between the two variables would proceed for two discrete sub-periods. Therefore, we opt to test for the presence of a structural break using a Bai-Perron test. The results of this test, and in particular the scaled F-Statistic method, indicate the presence of a single structural break in the relationship in mid-June 2021 (Table 2). The alternative method of a weighted F-Statistic indicates the presence of 3 separate structural breaks: October 2018, February 2020 and July 2021. Thus, the results of the weighted F-Statistic verify the existence of a structural break in June-July 2021, whereas the other two structural breaks have no direct economic significance.

Having verified the order of integration, both variables being $I(1)$, and that the relationship between them has a structural break, we proceed to test for cointegration in each sub-period using the Engle-Granger method. The results indicate the presence of a cointegrating relationship both for each sub-period and for the period as a whole (Table 3).

Finally, having verified the existence of a cointegrating relationship, we proceed to the actual estimation of the relationship between the variables using the Dynamic OLS method. This method, proposed by Saikkonen (1992) and Stock and Watson (1993), utilises forward and backward lags in the cointegrating relationship to obtain orthogonal errors and asymptotically efficient estimators. Results, presented in Ta-

TABLE 1 ADF test

	Total period under consideration		Period after June 2021	
	PE	PG	PE	PG
Constant term, no trend, levels	-0.16 (0.94)	-0.64 (0.85)	-2.71 (0.09)	-2.32 (0.18)
Constant term, trend, levels	-1.30 (0.88)	-1.58 (0.79)	-2.64 (0.27)	-1.59 (0.76)
Constant term, no trend, first differences	-6.08 (0.00)	-5.31 (0.00)	-3.24 (0.03)	-3.61 (0.02)
Constant term, trend, first differences	-6.12 (0.00)	-5.36 (0.00)	-4.65 (0.01)	-4.02 (0.03)

Note: t-statistics, p-values in parentheses, weekly frequency.

TABLE 2 Bai-Perron tests of 1 to M globally determined breaks

Breaks	F-statistic	Scaled F-statistic	Weighted F-statistic	Critical Value
1 *	97.44802	194.8960	194.8960	11.47
2 *	80.86943	161.7389	190.2713	9.75
3 *	79.63953	159.2791	218.5324	8.36
4 *	62.67126	125.3425	199.9553	7.19
5 *	51.41377	102.8275	201.6123	5.85
<hr/>				
UDMax statistic*		194.8960	UDMax critical value**	11.70
WDMax statistic*		218.5324	WDMax critical value**	12.81

Note: weekly frequency,

* Statistically significant at 0.05.

** Bai-Perron (1998) critical values.

Estimated break dates: 6/14/2021.

TABLE 3 Engle-Granger Cointegration Test

	Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
Period 1/1/2018 to 26/12/2022	LPE	-4.7919	0.0005	-42.6434	0.0003
Period 1/1/2018 to 14/6/2021	LPE	-4.64363	0.0010	-38.6599	0.0006
Period 14/6/2021 to 26/12/2022	LPE	-4.28303	0.0049	-31.2664	0.0022

Note: Weekly frequency. Automatic lags specification based on Schwarz criterion, MacKinnon (1999) p-values.

ble 4, indicate that the relationship between the variables is positive and highly significant. In particular, we observe that an increase in the price of natural gas by 10% results in an increase in electricity prices by 7% over the whole period under consideration. Focusing on the effect by sub-period, we observe that this is significantly higher during the second sub-period, after June 2021, with an increase in gas prices by 10% resulting in an increase in electricity prices by 7.5%, whereas in the first sub-period, before June 2021, the effect is significantly lower with an increase in gas prices resulting in an increase in electricity prices by 3.8%. In Figure 12 that follows, we present the actual and fitted values, as well as the regressions error, for the price of electricity.

7. Summary, conclusions and recommendations

Greece, as other European countries, faced an unexpected energy crisis that affected the energy market, as well as all economic activities, during the last two years. The rise in international energy prices, especially during the period June 2021–August 2022, led to a significant impact on the countries' domestic economies, enterprises and consumers. Apart from the increase in the price of crude oil and the cost of carbon emission allowances, the sudden and sharp increase in the price of natural gas also had a strong negative effect. Additionally, the fact that the energy crisis coincided with the green energy transition strategies aiming at limiting the use of fossil fuels and further increas-

TABLE 4 Dynamic OLS

Period 1/1/2018 to 26/12/2022

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(PG)	0.704681	0.027335	25.77919	0.0000
C	2.167745	0.088781	24.41690	0.0000

Period 1/1/2018 to 14/6/2021

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(PG)	0.383697	0.056470	6.794713	0.0000
C	2.991899	0.153963	19.43258	0.0000

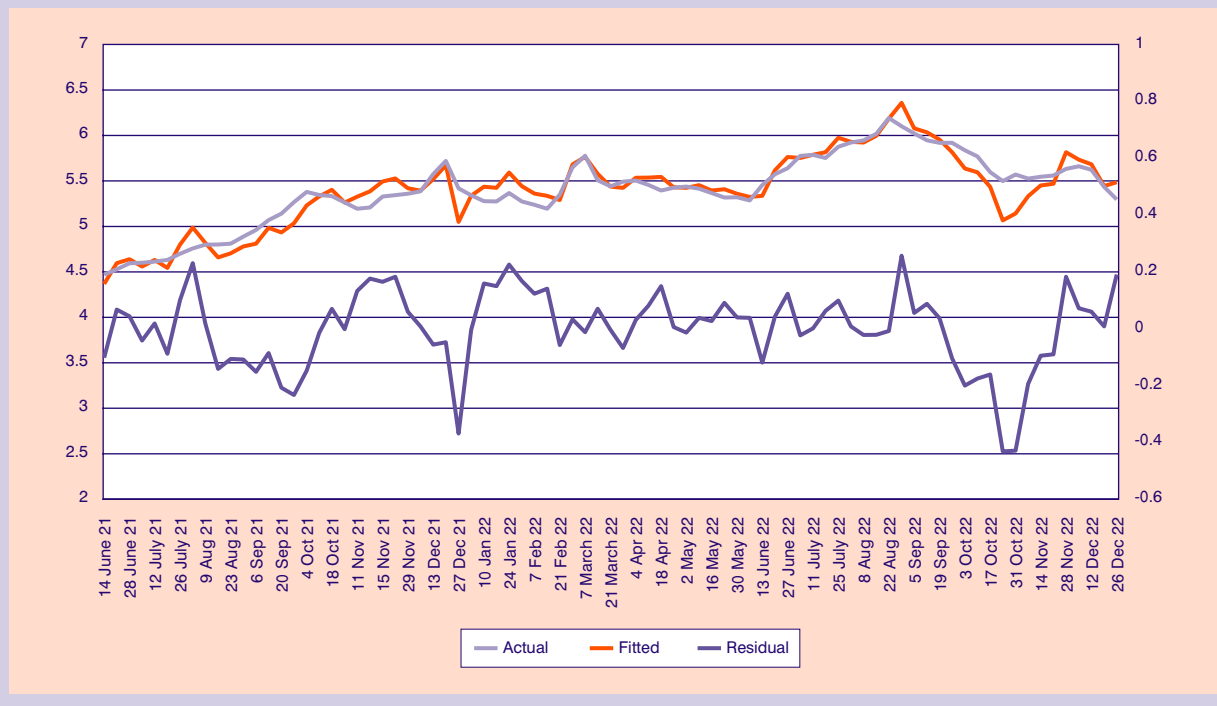
Period 14/6/2021 to 26/12/2022

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(PG)	0.751722	0.047241	15.91237	0.0000
C	1.959590	0.217418	9.013002	0.0000

Note: Weekly frequency, Automatic lags specification based on Akaike criterion.

FIGURE 12

Actual and fitted values for the natural log of wholesale domestic electricity prices



ing renewables, created additional constraints in the EU energy sector.

In recent years, the energy mix of gross inland energy consumption in Greece has changed. Especially concerning the mix of electricity production, there was a clear shift towards increasing the use of natural gas. At the same time, Greece is highly dependent on imports of energy products. Energy dependency has also been raised due to the increase in the use of natural gas. These two factors have made the domestic market particularly vulnerable to exogenous parameters, such as fluctuations in international energy prices.

During the period of the sharp rise in natural gas prices, because of the large share of this fuel in the electricity generation mix in our country (about 40%), combined with the structure and the operation system of the market, the cost of natural gas had a direct and strong effect on wholesale prices of electricity. High energy costs burden households, both directly due to the high levels of energy prices and indirectly due to the increased prices in most consumer goods.

In this context, this article focuses on investigating the factors that negatively affected efforts to mitigate the effects of the energy crisis in Greece. Moreover, the main objective of the article is to analyze the correlation between the price of natural gas and the domestic price of electricity. Based on these, it is possible to draw basic conclusions and formulate proposals that will contribute to reducing the country's energy dependence on international changes and, at the same time, support the green energy transition of the economy.

Econometrically estimating the relationship between the domestic price of electricity and the international price of natural gas, we identified the existence of a cointegrating relationship between the two variables, both for the period from mid-June 2021 and at least up to December 2022, and for the previous period from January 2018 to mid-June 2021. Estimating the relationship between the two variables and comparing by period using Dynamic OLS, we found that an increase in the price of natural gas by 10% results in an increase in the price of electricity by 7% for the entire period under consideration, with 3.8% in the first period and 7.5% in the second period, respectively. As a result, the effect of natural gas prices on the price of electricity becomes a dominant factor in the second period (after mid-June 2021). Therefore, the analysis verifies the fact that the domestic electricity market in Greece is highly dependent on international natural gas prices, especially during the period of an energy price crisis.

Today, our country is at a critical point towards a low-carbon economy transition that emphasizes RES and energy saving. Apart from the constraints that occur as a result of this green energy transition, it should be considered as an essential opportunity for the economic growth of Greece. In this context, the country's mid- and long-term energy strategy should be focused on reducing energy dependence and enhancing the use of low-cost renewable energy from domestic sources. Additionally, emphasis should also be placed on the energy upgrade of the economy, with the aim of reducing energy consumption and CO₂ emissions. Taking into account the experience of the negative effects of the recent energy crisis and considering the current conjuncture, Greece should focus on a rational economic and energy strategy plan, emphasizing production processes that increase domestic added value and create new jobs.

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International developments on inflation and banks – Market concentration and interest rate policy of the Greek banking system

Georgios Bertatos*

Abstract

What is the relationship between the interest rate policy of banks and the market concentration of the banking system, and what is the interconnection with international developments and interest rate hikes by central banks? We answer this question by focusing on the Greek banking industry. Following the key interest rate hikes by the European Central Bank, an asymmetric response takes place in Greece and the Eurozone with respect to the pricing of loan and deposit interest rates. In Greece, the interest rate spread between loans and deposits is one of the highest in the Eurozone and hits new record highs. This is because, on the one hand, loan interest rates increased immediately and, on the other hand, banks slightly passed on interest rate rises to deposits. Such an asymmetric behavior could be explained by the –highly concentrated– Greek banking sector in recent years, highlighting the importance of substantially improving competition in the domestic sector under consideration.

Keywords: Banks; Inflation; Interest rates; Market concentration;

JEL Classification: E31; E40; E43; E58; G20; G21.

Introduction

Rising inflation plagues most economies worldwide and central banks try to combat it, as if it were demand-pull inflation, by repeatedly putting their key interest rates up.

The aftermath of quantitative tightening (QT) and interest rate hikes by the Federal Reserve (Fed) in the US is the collapse of several small- and medium-sized banks, as well as the plunge in the share prices of several other banks. This situation highlights problems in the US banking industry, raising questions about capital requirements for interest rate risk.

The European Central Bank (ECB) has been raising its key interest rates and European banks respond asymmetrically to the pricing of their interest rates on loans and deposits. To be more specific, banks immediately raised interest rates on loans whilst keeping deposit interest rates low, leading to an increase in the interest rate spread between them. Moreover, the interest rate spread in Greece is one of the highest in the Eurozone. We document an ever-widening interest rate spread between loans and deposits in the Greek banking system that could be explained by the high concentration and low competition in the domestic banking sector: from 2019 onwards, the concentration ratio of the 4 systemic banks exceeds 96% and the Herfindahl-Hirschman Index (HHI) is more than 2300 points.

The rest of the article is as follows: In Part 1, we present international and domestic developments on the inflation whirlwind, as well as developments in the banking system with the successive bankruptcies in the US. Next, the role of central banks, with their highly aggressive interest rate hikes, is highlighted. Having documented the nature of current inflation and discussed how central banks are dealing with it, Part 2 focuses on the Greek banking sector and its market structure in recent years. Part 3 analyzes the Greek banking industry's policies for pricing interest rates on loans and deposits, and highlights the all-time highs of interest rate spreads between loans and deposits. Finally, concluding remarks are provided.

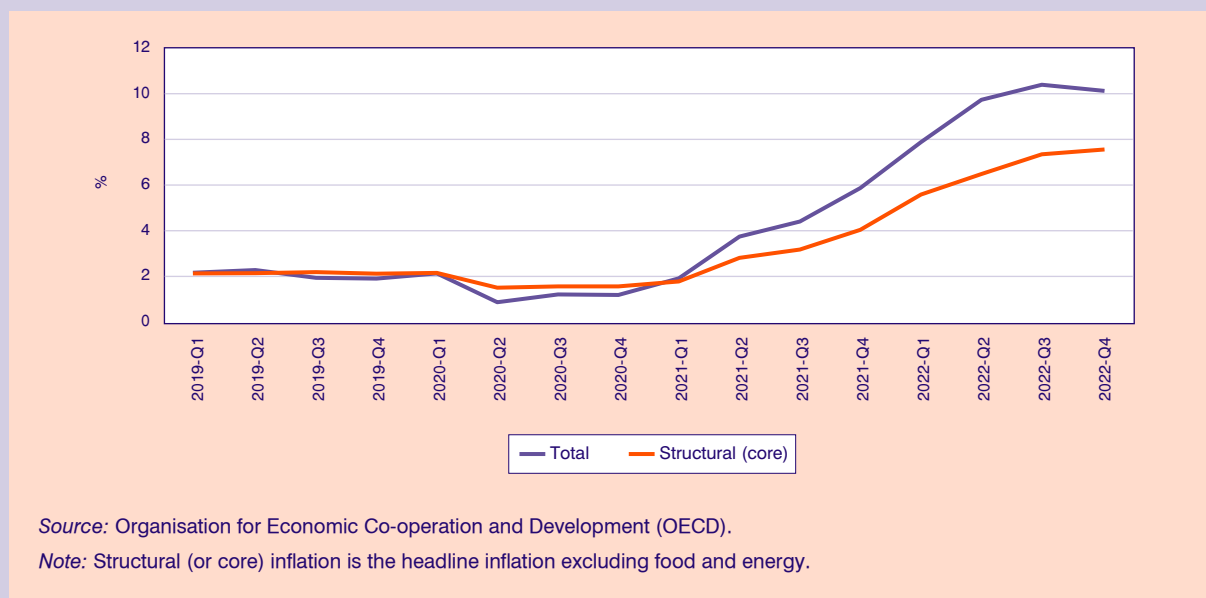
Part 1 – International developments

There has been a lot of talk lately about the interest rate policies that central banks are pursuing to curb inflation, which from the second half of 2021 to 2022

* Research Fellow, Centre of Planning and Economic Research (KEPE). Gulf One Lab for Computational & Economic Research, Lancaster University, UK. E-mail: gbertatos@kepe.gr

– Opinions or value judgments expressed in this article are the author's own and do not necessarily reflect those of the Centre of Planning and Economic Research.

FIGURE 1
Total and structural inflation in OECD countries



has been hitting one record high after another in many countries. According to data from the Organisation for Economic Co-operation and Development (OECD, 2023a), in the third quarter of 2022, inflation in OECD countries reached 10.4% (see Figure 1), hitting a near 35-year record high and significantly squeezing household purchasing power. Structural (or core) inflation at the end of 2022 peaked at 7.6%, hitting an almost 34-year record high.

After almost 11 years of zero or negative interest rates, the European Central Bank (ECB) increased its key interest rates. Specifically, on 27 July 2022, the ECB increased its interest rates by 50 basis points. Next, a double increase of 75 basis points on 14 September and 2 November followed, and 2022 ended with a fourth hike of 50 basis points on 21 December. This was followed by two further 50 basis point rate hikes on 8 February and 22 March 2023. After about a month and a half, on 4 May 2023, the die was cast for the seventh ECB hike of 25 basis points (effective from 10 May 2023), whilst the ECB signaled for more interest rate increases to come. Regarding the period 18/9/2019 – 10/5/2023 and given the successive increases in the ECB’s key interest rates,

- the interest rate on the deposit facility, namely the overnight rate received by banks for depositing

money with the Eurosystem, increased from -0.50% to 3.25%;

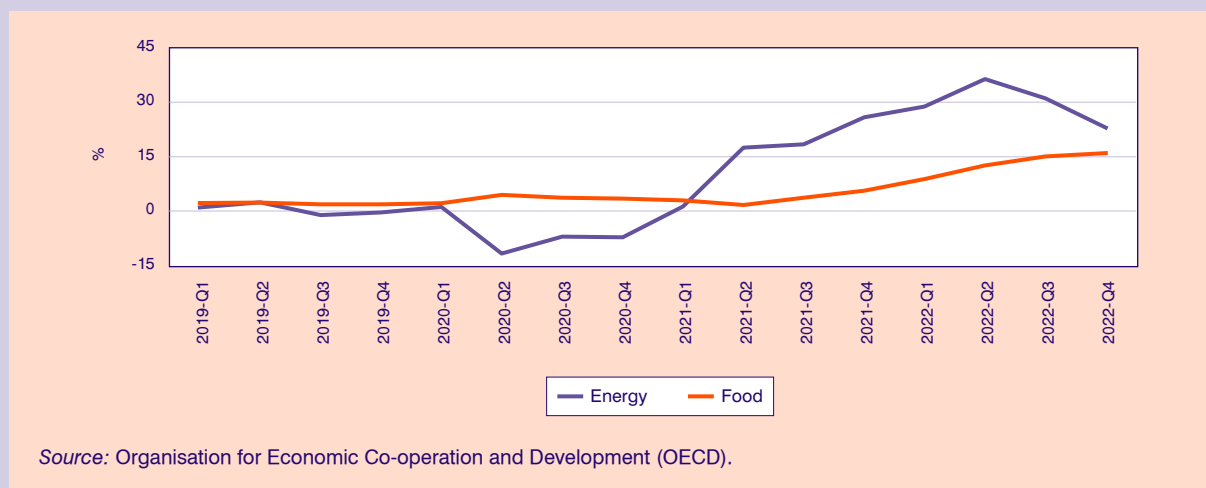
- the interest rate on the main refinancing operations, namely the interest rate that provides the bulk of liquidity to the banking system and at which banks can borrow from the Eurosystem for one week, increased from 0.00% to 3.75%; and
- the interest rate on the marginal lending facility, namely the overnight rate that banks pay when they borrow from the Eurosystem, increased from 0.25% to 4.00%.

On the other side, the US Federal Reserve (Fed) started the fight to tame inflation earlier than the ECB by raising interest rates in March 2022. As a result of 10 consecutive increases by the Fed (the last one was on 3 May 2023 by 25 basis points, and further increases in the future are not excluded), current US interest rates were set at 5.00% to 5.25%, recording a 16-year record high as interest rates were at 5.25% from 29 June 2006 to 17 September 2007.¹

But before applying a remedy (raising interest rates) to a problem (high inflation), one must first investigate the root of the problem. More specifically, we have to do with an inflation that is not demand driven. It is inflation stemming from the supply side, which was initially

1. Regarding inflation in the US, Nobel laureate Paul Krugman in an op-ed for the *New York Times* in June 2023 criticizes the Fed’s inflation target of 2% and argues that it should be revised upwards.

FIGURE 2
Energy and food inflation in OECD countries



caused by the disruption of the supply chains by the COVID lockdowns,² and was later reinforced by the energy crisis³ in the spring of 2021, which subsequently triggered the food crisis and is still fueling soaring food prices.⁴ Thereafter, the growth rate of prices continued their galloping trend (see Figure 2) as the two aforementioned crises were intensified by the military conflicts in Ukraine (starting in February 2022), where an informal global war has been unfolding with economic sanctions and counter-sanctions succeeding one after another.⁵

Raising interest rates is generally a mechanism to reduce inflation by bringing down demand and is especially effective when inflation is demand-pull. But when inflation comes from the supply side and is cost-push inflation, then interest rate increases will lead, in the long run, to a reduction in investment and economic activity, fueling recession fears. Moreover, serious concerns of heightened non-perform-

ing loans (NPLs) and loan defaults emerge –the so-called “mortgage bomb”– as well as worrying signs of a debt crisis. In such a case, social explosions and widening social inequalities would be inevitable. Additionally, a tightening of lending standards and a reduction in new bank lending (which may fuel the rise of “shadow banks”), an increase in corporate bankruptcies, and a reduction in the growth rate of the economy⁶ are anticipated due to increased interest rates by central banks.

On the contrary, a policy aiming at increasing supply (e.g., by reducing production costs or tackling any oligopolistic practices or introducing financial incentives for new businesses) would be effective in reining in cost inflation. Similarly, a policy mix of raising interest rates and stimulating the supply of goods and services would also be effective.

In the aftermath of the abovementioned developments, the financial sector was shaken, culminating in the

2. Initially, there was an abrupt reduction in the demand and supply of goods and services (see also Lebastard and Serafini, 2023), with the demand falling at a larger degree. As a result, the growth rate of price levels slowed down, and headline inflation fell. But when the market gradually opened, demand quickly returned to its previous levels, while supply was unable to keep up with the frenetic pace of demand. Therefore, the asymmetric response of supply and demand forces created an imbalance, and the growth rate of prices accelerated from 2021:Q2 (3.7%) onwards, outpacing the average inflation rate of just under 2% that was in place before 2020:Q1.

3. In 2021:Q2 energy prices rose by 17.5%, while in 2022:Q2 energy inflation hit an all-time high, soaring to 36.4%.

4. There has been a rally in food prices from 2021:Q3 with the inflation being equal to 3.7%, while its value in 2022:Q4 peaked at 16.0% (approaching the historic high of 18.8% in 1974:Q1).

5. In *A Year Later: War in Ukraine and Western Balkan (Geo)Politics* of Dzankic et al. (2023), Panagiotou argues that from the beginning it was clear that it would not be a local conflict between two states (Russia and Ukraine), but would involve many international players.

6. According to the OECD (2023b), the growth rate of real GDP in OECD countries is predicted at 0.8% in 2023, i.e., relatively close to the sluggish 0.4% growth rate in 2008. Additionally for 2024, the OECD forecasts an improvement of the real GDP growth rate at 1.4%, similar to that in 2012 (1.4%), 2013 (1.6%) and 2019 (1.7%).

banking crisis of March 2023: three small- and medium-sized banks (Silvergate Bank, Silicon Valley Bank and Signature Bank) collapsed and other US domestic banks suffered stock market losses. The collapse of “Swiss giant” Credit Suisse followed in the same month, which had been, since 2011, one of nearly 30 global systemically important banks (G-SIBs), according to the Basel Committee on Banking Supervision (BCBS) when the G-SIBs categorization initiated. Moreover, in early May 2023, another small- and medium-sized bank in the US, the First Republic Bank⁷, crossed the Rubicon, triggering a new round of hammering on bank shares (especially of small- and medium-sized ones) with a simultaneous outflow of deposits. Each of these banks had their own reasons for failure. Indicatively: interest rate risks in long-term bonds, deposit outflows, liquidity risks, recording losses, exposure to the cryptocurrency market, asset evaporation, high concentration of the client base, lack of diversification, various scandals, ineffective internal control, and material weakness.⁸

The case of Credit Suisse has caused turmoil in the market of additional tier 1 bonds (AT1 bonds, i.e., a class of equity convertible bonds) because the hierarchy of shareholder/bondholder participation in the bank’s liquidation was violated. Also, the consequences of interest rate risks were catalytic in the case of Silicon Valley Bank and First Republic Bank.

Higher interest rates could be a serious threat for several small- and medium-sized banks in the US; a rise in interest rates negatively impacts the fundamental valuation of stock prices. Nevertheless, the probability of future interest rate hikes by the Fed is not zero yet.

Right after the collapse of Lehman Brothers on 15 September 2008, it was not common to let the big banks fail, and the US authorities released the TARP bailout

program. The “too big to fail” phenomenon prevailed in the markets, i.e., a megabank cannot be allowed to fail because of its externalities and its interconnectivity with the overall financial system.⁹ However, it seems that the “too many to fail” phenomenon could also be a serious issue lately, i.e., many bank failures lead to many systemic banking crises (Acharya and Yorulmazer, 2007).¹⁰

Transmission of instability from the banking industry to financial markets, along with the triggering of the so-called “domino effect” combined with “too many to fail”, should be a serious issue for the policymakers. The practice of megabanks bailing out small and medium-sized banks turns out to be an ominous sign for competition and concentration. In fact, observing the evolution of the number of US banks –with data from the US Federal Deposit Insurance Corporation (FDIC)– one can notice that the number of banks has decreased from 18,000 in early 1986 to about 4,700 in 2022.

Finally, according to Acharya and Yorulmazer (2007) on the “too many to fail” problem, bailing out a few small banks by large banks is considered an optimal policy, but in the case of the failure of many banks, it is optimal for the regulator to bail them out *ex post*. Therefore, small- and medium-sized banks have an incentive to herd *ex ante*, which is also reported by Kress and Turk (2020).

Focusing on Greece

Greece, like most countries, has been affected by the maelstrom of global crises and is still reeling from the inflation whirlwind (see Figure 3).

According to OECD (2023a) data on inflation in Greece, total inflation stands at 8.3% in the fourth quarter of

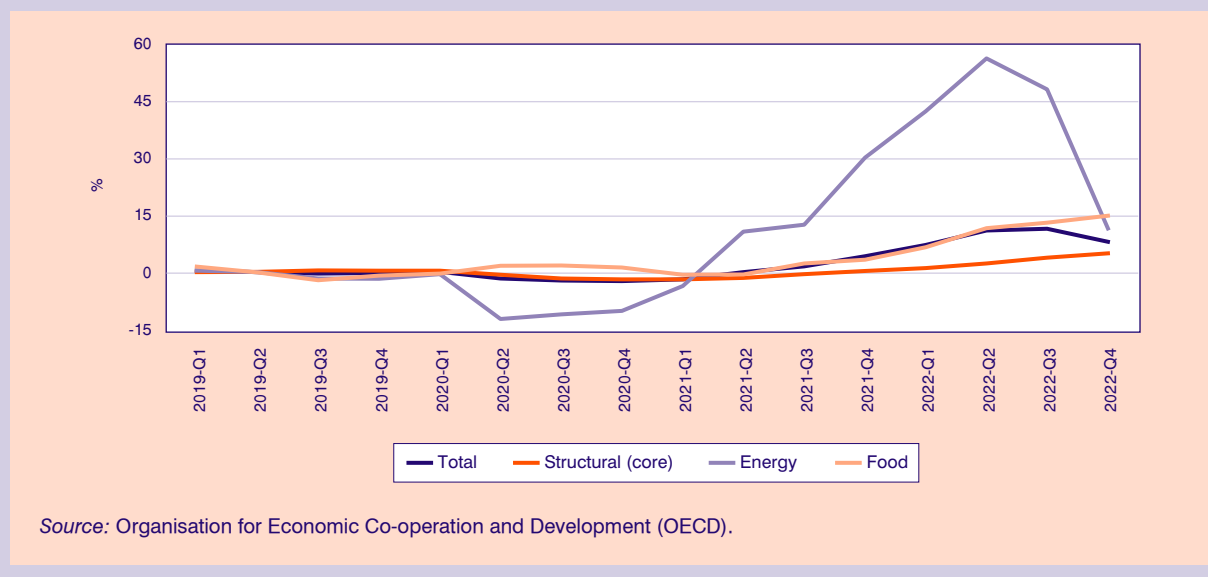
7. As of 31/12/2022, Silicon Valley Bank had assets of nearly US\$212 billion, Signature Bank and Silvergate Bank had assets of almost US\$110 billion and US\$11 billion, respectively, and First Republic Bank had assets of about US\$213 billion. Namely, at current prices, the assets of these four banks are equivalent to 80% of Lehman Brothers’ assets in 2008. Alternatively, according to the average daily nominal exchange rate of 1.0538 US dollars per euro in 2022, the assets of the four recently collapsed US banks correspond to approximately 61.9%, 32.1%, 3.2% and 62.2% of the aggregate assets of the Greek banking system (and cumulatively 159.4%) as of 31/12/2022, which amounted to close to €325 billion based on the Bank of Greece’s May 2023 Financial Stability Report (Publications and Research).

8. At this point it is worth noting the potential risk for the pension funds that have invested in long-term bonds in case they need immediate liquidity. If they liquidate these bonds, a significant discount will be applied due to the new market conditions with increased interest rates, leading possibly to large losses.

9. However, there are papers offering another view, that of the “too big to save” phenomenon for banks. For example, Demircuc-Kunt and Huizinga (2013) examine the market-to-book ratios and CDS spreads in an international sample of banks, providing ample evidence in favor of the “too big to save”. Moreover, according to their findings, systemically important banks could increase their valuation by downsizing or splitting up, especially if the country of origin of such a bank is facing fiscal problems.

10. According to Kress and Turk (2020), the “too many to fail” problem is understated and emerges when numerous small banks collapse. Also, they argue that it has been the dominant source of systemic risk throughout the history of the US banking sector.

FIGURE 3
Inflation in Greece



2022, having peaked earlier at 11.7% just a quarter ago, with the next highest value being 12.2% at the end of 1993. Structural inflation continued its galloping trend, recording a 25-year record high at 5.3% at the end of 2022, with the previous highest value being 6.4% in late 1998. In addition, in 2022:Q4 energy inflation eased to 11.8%, having peaked two quarters earlier at above 56%, with the previous high record being equal to 61% in late 1990. Ultimately, food inflation rose further to 15.1% at the end of 2022, hitting a record high after 15.4% in 1994:Q3.

Headline inflation in Greece hovered at 1.8% in 2021:Q3 and 4.5% in the following quarter, and since then, the rally in the growth rate of prices has begun. Headline inflation rose to around 12% in mid-2022 and reached 8.3% at the end of 2022. Regarding structural inflation, it returned to positive levels in 2021:Q4 at 0.6% and has been rising progressively thereafter, ending up at 5.3% a year later. Energy inflation started jumping skyward from 2021:Q2 to 10.9% and peaked a year later at 56.3%. In addition, food inflation recorded a strong upward trend from 2021:Q3 with a value of 2.6%, ending at 15.1% at the end of 2022.

Finally, interest rate hikes by the ECB are likely to increase the redefault rates of settled “red loans” in Greece, as well as trigger a new wave of NPLs¹¹ (both from consumer and business lending). In such a case, employment and economic growth could be negatively affected.

Part 2 – Market concentration of the Greek banking sector

Before we focus on the interest rate policy of the Greek banking industry, it is important first to investigate its market structure.¹²

Table 1 shows that the market share of each of the four systemic banks, in terms of total assets of the Greek banking industry, ranges between almost 23% and 26% in recent years, with the National Bank of Greece and Eurobank mainly occupying the first place. The four systemic banks together hold more than 96% of the total assets of the Greek banking system, which reveals the oligopolistic structure (i.e., a form of imperfect competition) of the Greek banking sector and

11. NPLs remain a social problem for the Greek economy as they continue to exist in its financial system (from €99.7 billion in December 2018 to €83.9 billion in December 2022). This is because they have simply changed management: they decreased in bank balance sheets from €81.8 billion in December 2018 to €13.2 billion in December 2022, but increased in Credit Servicing Firms (CSFs), or servicers, from €17.9 billion in December 2018 to €70.7 billion in December 2022. However, it is worth mentioning that as of 2022:Q4, the calculation method has changed: the nominal value of loans does not include the off-balance sheet interest and the amounts of write-offs and write downs of loans made by the credit institution that transferred the loan portfolio.

12. Freixas and Rochet (2023) extensively discuss the industrial organization and modelling of the banking sector.

TABLE 1 Book value of assets and concentration ratios

Date	Banks				
	National Bank of Greece	Piraeus Bank	Alpha Bank	Eurobank	Banking Sector
31/12/2019	64.248 [24.6%]	61.231 [23.4%]	63.458 [24.3%]	64.761 [24.8%]	261.388
31/12/2020	77.485 [26.2%]	71.576 [24.2%]	70.057 [23.7%]	67.728 [22.9%]	296.094
31/12/2021	83.598 [25.6%]	79.789 [24.5%]	73.356 [22.5%]	77.852 [23.9%]	326.095
31/12/2022	78.113 [24.0%]	75.661 [23.3%]	78.019 [24.0%]	81.460 [25.0%]	325.354

Notes: The book value of assets is in billions of euros. The source for the aggregate assets of the banking sector is the Bank of Greece's Financial Stability Reports, while that for each of the 4 systemic banks is Yahoo Finance.

its high concentration. More specifically, the 4-bank concentration ratio (CR4), based on market shares on total assets, is equal to 97.1% in 2019, 96.9% in 2020, 96.5% in 2021 and 96.3% in 2022. Therefore, a slight downward trend in the concentration ratio is reflected in the period 2019 to 2022, and this could be explained by the dynamic entrance of smaller banks in the Greek territory lately, such as Optima Bank and Pancretia Bank. Finally, Cavalleri et al. (2019) argue that the concentration ratio, based on market shares, reveals the capacity for collusion as the more the number of firms in the industry under consideration decreases, the more collusion is expected to increase.

Next (see Table 2 and Figure 4 below), the degree of concentration of the Greek banking system according to the Herfindahl-Hirschman Index (HHI)¹³, which varies between 0 and 10000, is calculated as follows:

$$HHI = \sum_{i=1}^N S_i^2$$

where S_i is the market share in percentage points with respect to total book assets, i.e., the share of each bank i in the total assets of the Greek banking industry.

The interpretation of the HHI index depends on the thresholds used by the competent authorities. The US Department of Justice revised the guidelines for horizontal mergers in 2010 and defined three regions for the HHI index: the first region below 1500 points, the second region between 1500 and 2500 points, and the third region between 2500 and 10000 points.¹⁴ When the index takes values below 1500, it signals an industry of low concentration and high competition. Values between 1500 and 2500 indicate a moderately concentrated industry, while values above 2500 mean that the sector under consideration is highly concentrated. Or said differently, when the HHI index approaches zero (case of an atomistic market), the greater the evidence of a competitive industry, whilst the closer the HHI is to 10000 points (case of pure monopoly), the greater the monopoly power of the examined sector.¹⁵

Cavalleri et al. (2019) examine competition and market concentration in France, Germany, Italy and Spain. They calculate the HHI index and employ thresholds of 1000 and 1800 points. Namely, the first cutoff for the HHI index is 1000 points, and the second cutoff is 1800 points.¹⁶ As a result, concentration is low in the

13. See Herfindahl (1950) and Hirschman (1945, 1964).

14. See <<https://www.justice.gov/atr/herfindahl-hirschman-index>>, and Nocke and Whinston (2022).

15. See the US Department of Justice and the Federal Trade Committee (2010) on horizontal mergers guidelines, as well as Cavalleri et al. (2019).

16. In previous horizontal mergers guidelines, the US Department of Justice reported a threshold for the first region equal to 1000 points and for the second region 1800 points.

TABLE 2 Herfindahl-Hirschman Index of the Greek banking sector

Date	HHI
31/12/2019	2360.5 (2356.1 , 2364.8)
31/12/2020	2357.1 (2352.2 , 2362.0)
31/12/2021	2338.1 (2331.9 , 2344.3)
31/12/2022	2326.0 (2319.1 , 2332.9)

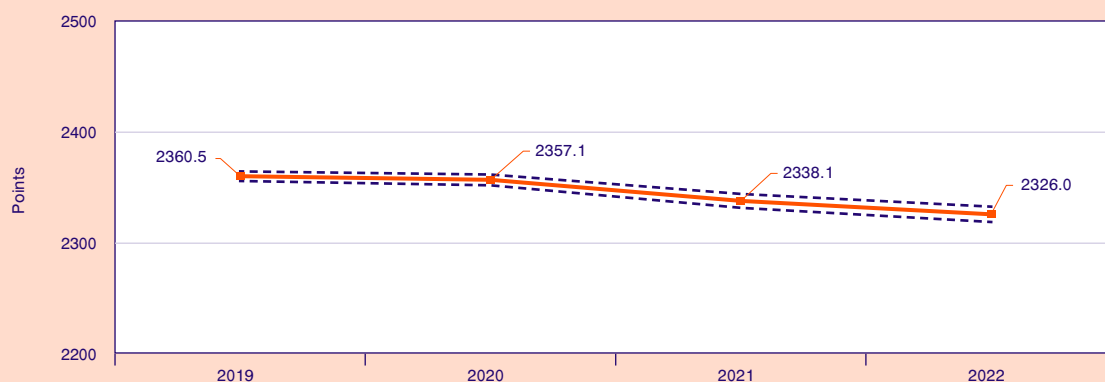
Notes: The first value is the average of the lower and upper bounds of the Herfindahl and Hirschman concentration index (HHI) in each time period. The lower and upper bounds of the actual HHI index of the Greek banking sector are in the second row in brackets. The lower bound is calculated as the HHI index taking into account the 4 systemic banks, and hence, it is a conservative estimate of the actual HHI index. The upper bound is calculated as the HHI index assuming that the remaining banks, apart from the 4 systemic banks, form a single banking group. As a result, the actual HHI index of the Greek banking industry lies between the two bounds.

region between 0 to 1000 points and moderate in the region between 1000 to 1800 points, whilst the region between 1800 and 10000 points indicates a highly concentrated sector.

According to Table 2 and Figure 4, we see that there is a slight decrease in the degree of concentration. To be more specific, the associated decrease between 2019 and 2022 amounts to 1.5% or 34.5 points.¹⁷

But such a decrease in the HHI index does not necessarily lead to an improvement in banking competition with a positive impact on the economy. This is because the values of the HHI index remain close to 2500 points and are substantially far from the 1500-point cutoff. This signals a medium to high degree of concentration in the banking industry according to the “loose” HHI cutoffs for horizontal mergers in the US. However, should we adopt more “stringent” thresholds, such as those employed by Cavalleri et al. (2019) in the ECB working paper, the HHI values of the Greek banking system (historical average scores more than 2350 points) are remarkably above 1800 points, suggesting an industry with a high degree of concentration and low competition. In fact, as will be illustrated in Part 3, the interest rate policy of banking institutions in Greece provides ample evidence of an oligopolistic form of the domestic sector.

FIGURE 4 Average HHI index of the Greek banking sector



Notes: The solid line shows the average of the lower and upper bounds (dashed lines) of the Herfindahl and Hirschman concentration index in each time period.

17. It is worth mentioning that the HHI index has some drawbacks, such as failing to control for geographic coverage, and therefore, it would be prudent to combine it with other concentration indicators, along with other factors, to draw conclusions on the intensity of competition in the examined industry.

Part 3 – Interest rate policy of the Greek banking sector

Focusing on the lending and deposit interest rates of the Greek banking system, following the aggressive and successive interest rate hikes by the ECB, a fruitful discussion can take place.

The formation of the lending rates involves the addition, *mark-up*, of a margin, *spread* or *écart*, to the cost of money. The spread includes the risk premium, the operating costs and the profit margin of each bank,

as well as taxation. The risk premium depends on the credit rating of each customer. In other words, the pricing of the lending rate is subject to customer-oriented management. Finally, the cost of money is derived either from each bank’s calculations or from the reference rates (see e.g., Euribor, Eonia, Libor, and the ECB’s key reference rates).

First, Figures 5 and 6 visualize the evolution over time of the weighted average interest rates on outstanding amounts of loans and deposits, as well as the resulting interest rate spread between them.

FIGURE 5
Interest rates on outstanding amounts of loans and deposits

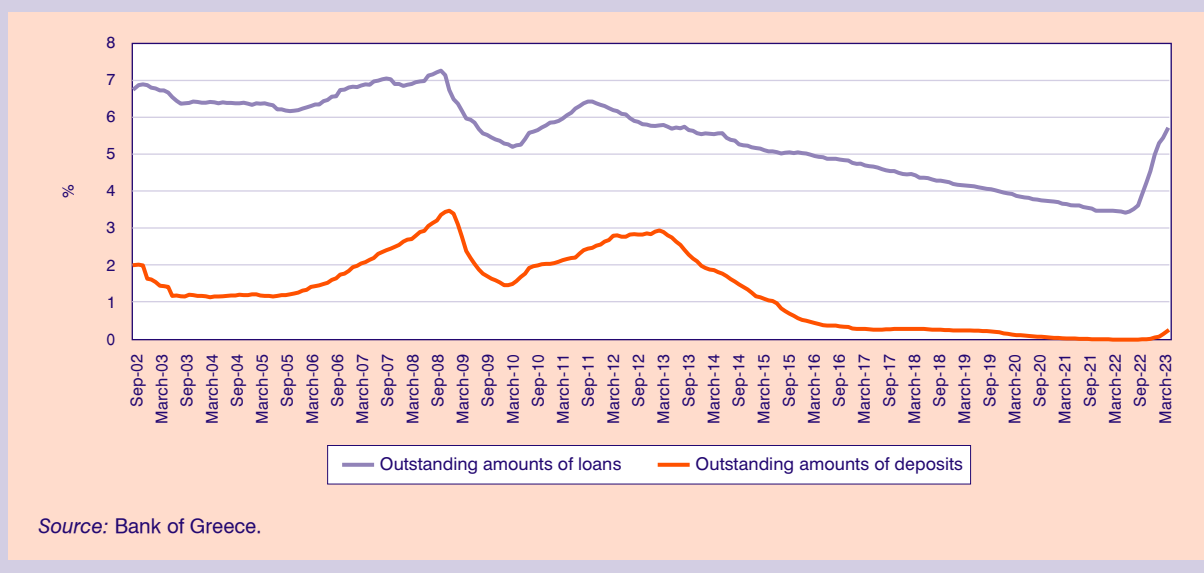
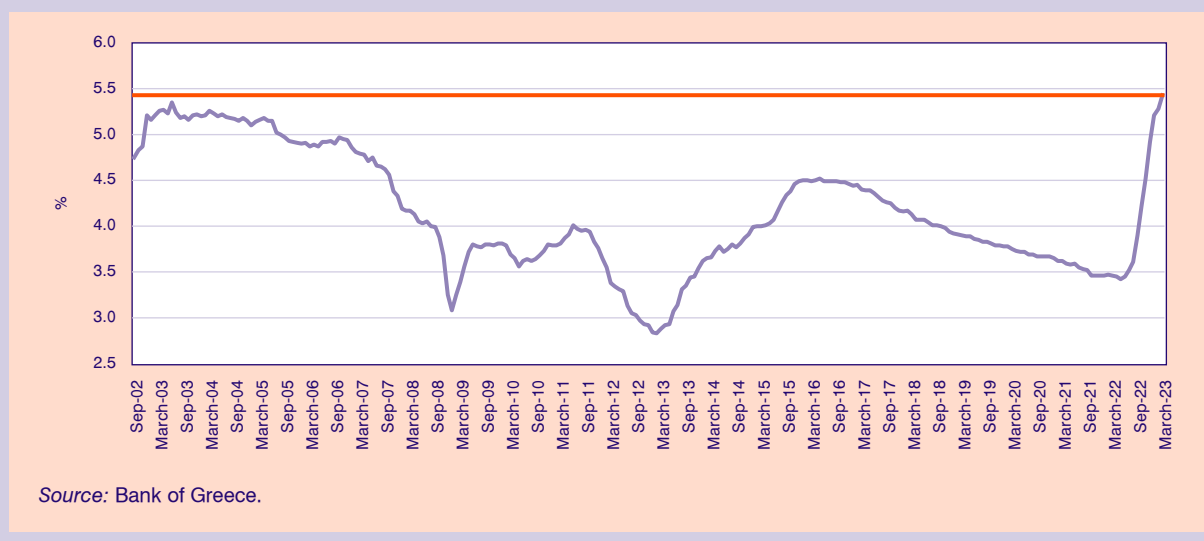


FIGURE 6
Interest rate spread between outstanding amounts of loans and deposits



We should note that interest rates on loans and deposits are recorded for outstanding amounts of loans and outstanding amounts of deposits, as well as for new loans and new deposits.

A first observation that can be made, according to Figure 5, is that the two series seem to move together in most of the time periods. In fact, their correlation coefficient is about 81%.

The ECB initiated a series of cuts (10 in total) in its key interest rates from 9 November 2011 to 18 September 2019, and the interest rates on outstanding amounts of loans in the Greek banking sector reduced from 6.44% in October 2011 to 6.39% a month later. That is, there was an immediate reduction in the interest rates on outstanding amounts of loans following the ECB's interest rate cut. Gradually, the interest rates on outstanding amounts of loans declined to 3.48% in June 2022. Similarly, there is an immediate response of the Greek banking system, with increases in the interest rates on outstanding amounts of loans, right after the ECB's interest rate hikes (the starting point of the successive rate hikes was 27 July 2022). The interest rates on outstanding amounts of loans in the Greek banking industry went from 3.48% in June 2022 to 3.55% one month later. In March 2023, they reached 5.69%.

However, things are different for the interest rates on outstanding amounts of deposits relative to those of loans. While the ECB started cutting interest rates from 9 November 2011, the outstanding amounts of deposits continued to rise. From 2.50% in October 2011, they gradually climbed to 2.97% in February 2013.¹⁸ Since then, however, they have started to fall, reaching a historic low of 0.03% in July 2022, at which they were frozen between February 2022 and August 2022. To put it differently, there is a delay (about 16 months) in the adjustment of the outstanding amounts on deposits in the Greek banking industry following the ECB's interest rate cuts. A respective (ongoing) delay is observed, right after the successive interest rate increases by the ECB, starting on 27 July 2022, in the interest rates on outstanding amounts of deposits in the Greek banking sector. From 0.03% in July 2022, it went up to 0.05% in November 2022, reaching 0.26% in March 2023.

Therefore, following the changes in key interest rates by the ECB, the Greek banking system, on one hand,

responds instantly and adjusts the interest rates on outstanding amounts of loans in the same direction. On the other hand, however, it significantly delays adjusting the interest rates on outstanding amounts of deposits in the same direction.

Figure 6 shows the interest rate spread between outstanding amounts of loans and deposits.

In July 2022, the interest rate spread between the interest rates on outstanding amounts of loans and deposits was 3.55% and has been rising rapidly thereafter. In fact, in March 2023, the interest rate spread skyrocketed and hit a historic record high of 5.43%. Similar results are obtained for the interest rate spread should we change the weighted average interest rate on outstanding amounts of deposits with that of deposits for households, or with that for non-financial corporations, with an agreed maturity up to 2 years. The new historic record high could be explained by the oligopolistic structure of the Greek banking industry, which has been characterized by a high degree of concentration in recent years, as mentioned in the previous section. Finally, the historical average and the historical median of the interest rate spread based on new loans and deposits are 4.14% and 4.00%, respectively.

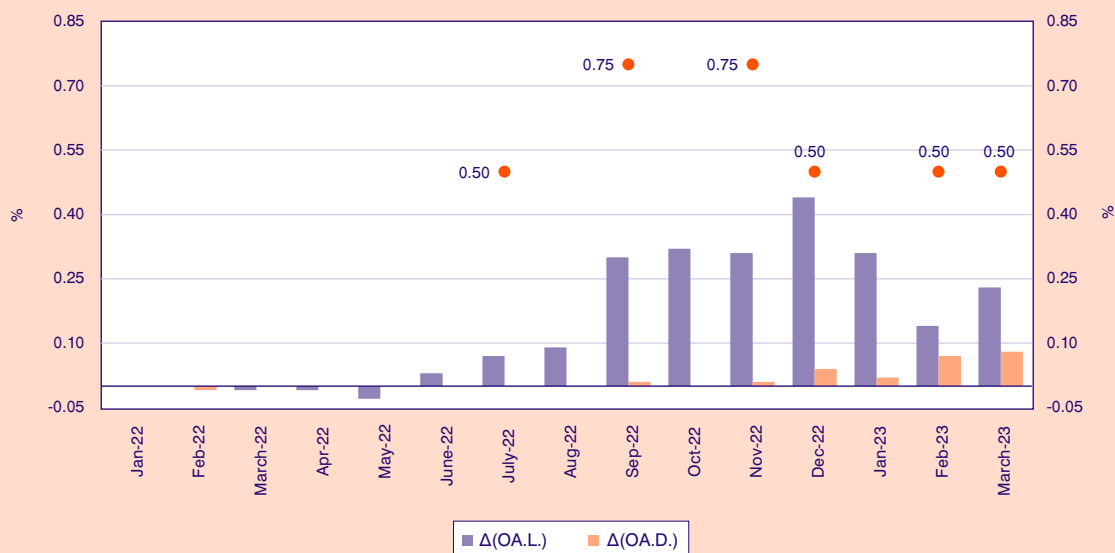
Figure 7 displays the changes in interest rates on outstanding amounts of loans and outstanding amounts of deposits over the last 1.5 years after the interest rate increases by the ECB. More specifically, there is an asymmetric response to the ECB's interest rate hikes, as interest rates on outstanding amounts of loans have risen by 2.14% in total from August 2022 to March 2023, and interest rates on outstanding amounts of deposits have risen by just 0.23% over the same period. To put it differently, the fact that interest rates on outstanding amounts of loans increased more than 9 times compared to the interest rates on outstanding amounts of deposits is indicative of the competitive conditions in the Greek banking industry.

A similar pattern prevails with the interest rates on new loans and new deposits. Figures 8, 9 and 10 are the corresponding Figures 5, 6 and 7 for the interest rates on new loans and new deposits.

Based on Figure 8, one can notice that the time series of interest rates on new loans and deposits generally move together. In fact, the correlation coefficient of these two series is almost 88%.

18. Perhaps the turbulent developments in Greece at that time contributed to this behavior of banks on the interest rates of outstanding amounts of deposits, so that massive deposit outflows were avoided. A similar pattern applied to the interest rates on new deposits, which fluctuated around 2.82% in the period November 2011-February 2013, before starting to gradually decline a month later.

FIGURE 7
Interest rate changes on outstanding amounts of loans and deposits



Source: Bank of Greece, raw data.

Notes: Orange dots at the upper part of the figure indicate changes in key interest rates by the ECB.

After the start of the ECB's decreasing interest rate period (9 November 2011), the interest rates on new loans in the Greek banking sector fell from 7.02% in October 2011 to 6.90% a month later. That is, there was an immediate reduction in interest rates on new loans following the ECB's interest rate cuts, as in the case of interest rates on outstanding amounts of loans. Next, the interest rate on new loans fell gradually to 3.98% in June 2022, when the period of ECB interest rate cuts ended. Moreover, an immediate response of the Greek banking system is recorded regarding the increases in interest rates on new loans, following the interest rate hikes by the ECB in July 2022. The interest rate on new loans in the Greek banking industry increased from 3.71% in July 2022 to 4.00% a month later. In March 2023, the interest rate on new loans ended at 5.73%.

However, there are differences relative to the interest rates on new deposits. As mentioned above, the ECB started cutting interest rates on 9 November 2011. Interest rates on new deposits were at 2.62% in October 2011 and climbed to 2.68% a month later. They peaked in June 2012 at 2.94%, 8 months earlier than the peak in interest rates on outstanding amounts of deposits (February 2013). In the intervening period (July 2012 – February 2013), the interest rate on new

deposits fluctuated around 2.79%, and, from March 2013, it started to decline substantially. Hence, there is a similar delay (of about 16 months) in the adjustment of new deposit rates in the Greek banking system following the interest rate cuts by the ECB, as in the case of the interest rates on outstanding amounts of deposits. Interest rates on new deposits continued their downward trend, dipping to 0.04% in July 2022. The historic low of 0.03% was recorded one month earlier. Moreover, there is an (ongoing) delay, right after the ECB's successive interest rate increases, starting on 27 July 2022, in the interest rate on new deposits in the Greek banking sector. From 0.04% in July 2022, it went up to 0.06% in November 2022, reaching 0.23% in March 2023.

Therefore, after the changes in the key interest rates by the ECB, the Greek banking system, on one hand, responds immediately and adjusts the interest rates on new loans in the same direction. On the other hand, it significantly delays the adjustment of interest rates on new deposits in the same direction. In other words, the same pattern exists as with the interest rate on outstanding amounts of loans and deposits.

Figure 9 highlights the interest rate spread between new loans and new deposits. The interest rate spread reached 3.67% in July 2022 and has been growing

FIGURE 8
Interest rates on new loans and deposits

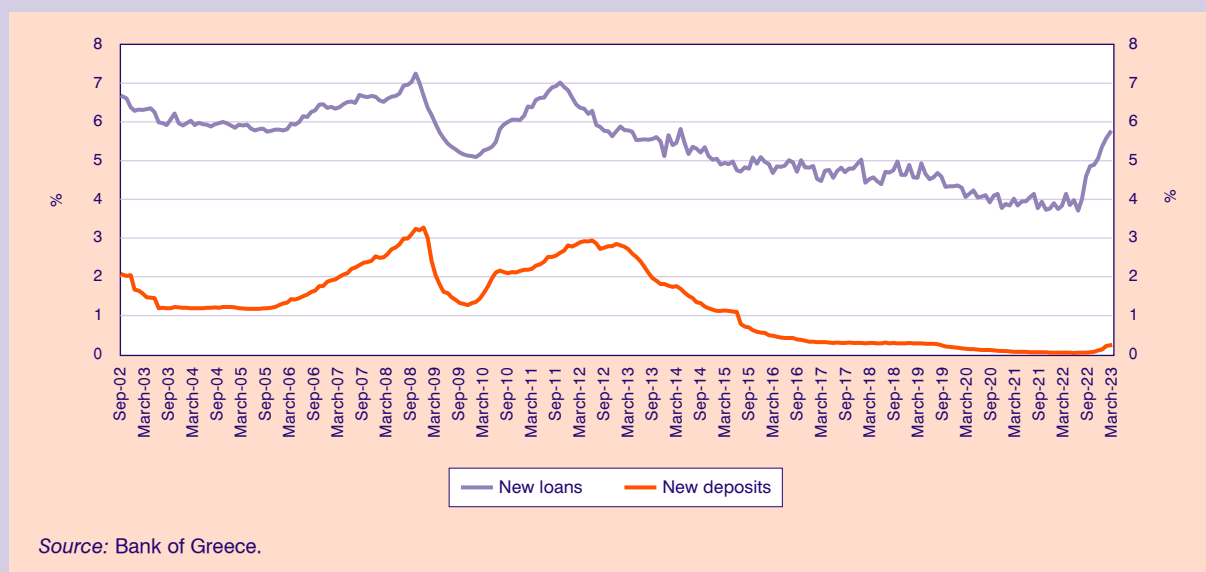
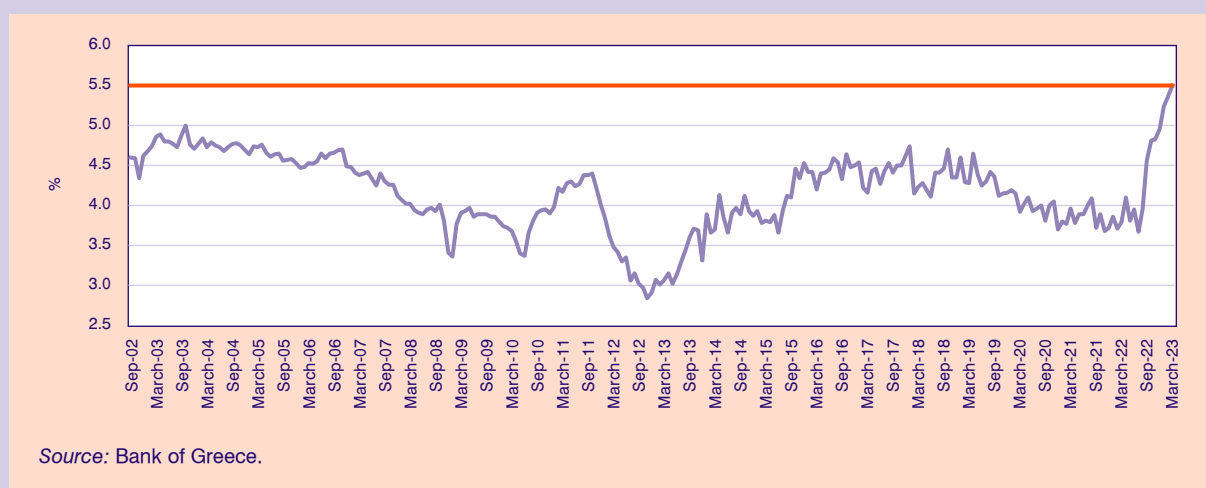


FIGURE 9
Interest rate spread between new loans and deposits



rapidly since then. In addition, in March 2023, the interest rate spread skyrocketed to 5.50%, hitting a historic high.¹⁹ This, as in the case of the record high of the interest rate spread based on the outstanding amounts of loans and deposits, could be attributed to the oligopolistic structure of the Greek banking indus-

try, which has been characterized by a high degree of concentration and low competition lately. Finally, the historical average and the historical median of the interest rate spread based on the outstanding amounts of loans and deposits are 4.16% and 4.19%, respectively.

19. Similar results are obtained for the interest rate spread should we replace the weighted average interest rate on new deposits with the interest rate on new deposits for households, or with that for non-financial corporations, with an agreed maturity of up to 1 year. In addition, if we use the weighted average interest rate on new deposits with agreed maturity over 1 year, then the resulting interest rate spread with the weighted average interest rate on new loans in the period July 2022 – March 2023 equals 4.04% on average, while in the previous period (with available monthly data) December 2020 – June 2022, the resulting interest rate spread is 3.79% on average. Namely, the interest rate spread, following the ECB's interest rate hikes, has increased irrespective of the different types of deposit products used.

FIGURE 10
Interest rate changes on new loans and deposits

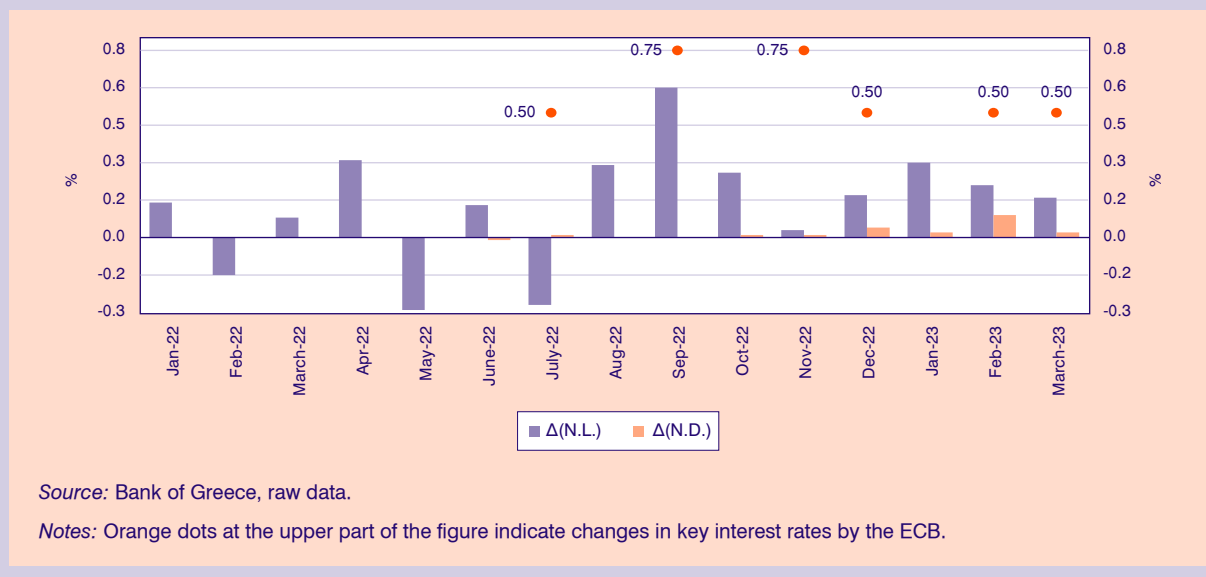


Figure 10 portrays the changes in interest rates on new loans and new deposits over the last 1.5 years, after the interest rate increases by the ECB.

It turns out that there is an asymmetric pass-through to interest rates on new loans and deposits after the interest rate increases by the ECB, as in the case of interest rates on the outstanding amounts of loans and deposits. Interest rates on new loans have risen cumulatively from August 2022 to March 2023 by 2.02% and interest rates on new deposits by 0.19%. Alternatively, interest rates on new loans increased about 11 times relative to interest rates on new deposits, verifying low competitive conditions in the pricing of lending and deposit products in the Greek banking sector.

Finally, a similar pattern regarding (new and outstanding amounts of) loan and deposit interest rates prevails in the Eurozone, according to the Hellenic Banking Association. However, according to the Bank of Greece and its May 2023 Financial Stability Report, Greece exhibits a higher interest rate spread, higher lending interest rates and lower deposit interest rates than the Eurozone (median and weighted average).

Conclusions

We argue that high inflationary pressures are due to a series of sequential global crises, and that current in-

flation is cost-push inflation driven by the supply side. Dealing with such an inflation through multiple interest rate hikes by central banks, aiming to reduce demand, will cause collateral damage; several successive bank failures in the US and Switzerland have taken place so far. Such failures, combined with the Damocles' sword hanging over balance sheets due to unrealized losses, echo in the markets the end of the banking lull that prevailed over the last decade. This is why immediate actions are required by policy makers to prevent a global banking crisis, namely, a reconsideration [1] of central banks' policy of hiking key interest rates, and [2] of the relationship between interest rate risk and regulatory bank capital.

European banks keep deposit interest rates low and sharply increase loan interest rates. This will result in higher interest income and thus, bank shareholders will enjoy higher profits. However, such practices undermine the intermediary and existential role of banks, with depositors withdrawing funds in search of more lucrative and attractive investments (e.g., in "shadow banking" or non-banking financial institutions which, unlike banks, are generally unregulated). Traditionally, banking institutions borrow money from depositors and then use it to finance the real economy.²⁰ If one of these two fundamental principles of banking fails, then we have to do with a problematic banking industry. The inability to provide loans (of high quality) and/or the lack of de-

20. However, there is another documented approach, i.e., that of endogenous money creation. For example, McLeay et al. (2014) argue that banks initially decide how much to lend, depending on the available lending opportunities, and then the amount of loans granted determine bank deposits to be created.

positor confidence are likely to trigger the next banking crisis, with severe socioeconomic consequences magnified by the major problem of soaring prices.

In Greece and the Eurozone, interest rate spread rises due to the asymmetric pass-through of the consecutive increases of key interest rates by the European Central Bank to the bank interest rates (in favor of loans and against deposits). However, Greece faces a higher interest rate spread than the Eurozone. In the case of Greece, this asymmetric interest rate response and the ever-widening interest rate spread could be explained by the high concentration and low competition in the Greek banking system; the concentration ratio of the 4 systemic banks is above 96%, and the Herfindahl-Hirschman Index scores more than 2300 points in recent years.

Focusing on the recent developments in Greece with the hiking inflation from mid-2021, if the goal of policy makers is [1] to substantially reduce the degree of concentration and significantly improve competition in the domestic banking system, and [2] to reconsider the pricing of bank interest rates –bearing in mind a positive impact on the social sector and non-financial corporations– then, there is a need for breakthroughs and more substantial actions in the domestic industry under consideration. Finally, the ever-growing spread of bank interest rates should be curbed and repricing of all types of banking products (see fees and commissions) should be considered.

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