

# SUMMARY OF THE ANNUAL REPORT

2022



JUNE 2023

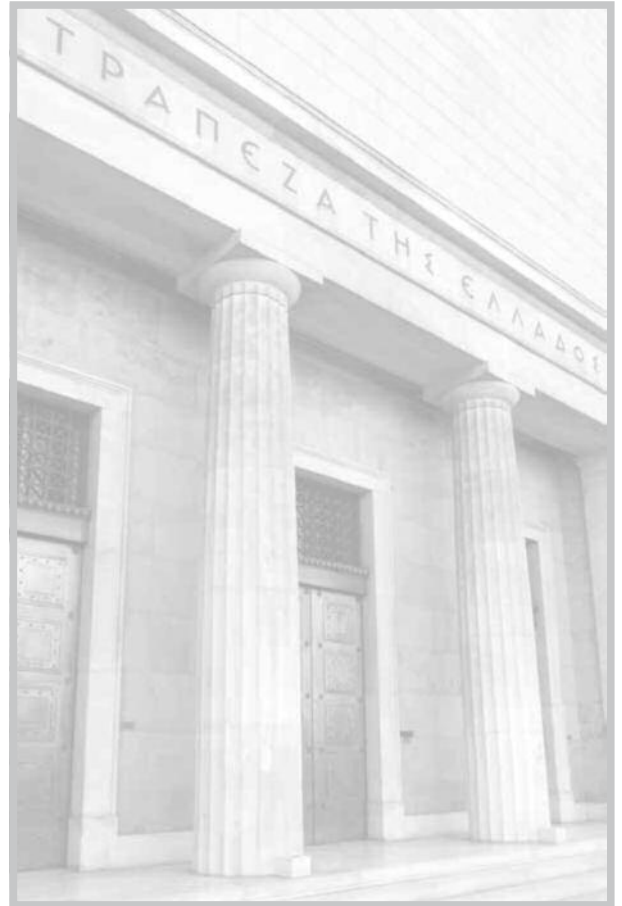


**BANK OF GREECE**  
EUROSYSTEM



# SUMMARY OF THE ANNUAL REPORT 2022

Presented to the General Meeting of Shareholders  
by Governor Yannis Stournaras



JUNE 2023



**BANK OF GREECE**  
EUROSYSTEM

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## FOREWORD BY THE GOVERNOR

The Russian invasion of Ukraine, over a year ago, and the subsequent imposition of sanctions triggered a series of developments in international energy and raw material markets. In the euro area, inflationary pressures recorded in the course of the recovery after the pandemic intensified, thereby leading to higher inflation. The increase in energy costs and the decrease in real disposable income had a negative impact on economic activity, which however proved more resilient than expected. Amid heightened uncertainty and fear of economic recession in the euro area, monetary policy was normalised in order to bring inflation down to its medium-term target. Although the current rise in inflation stems mainly from a negative aggregate supply shock, which central banks cannot easily offset, the dynamic response of the European Central Bank, which increased its key rates, signalled its decisiveness to contain inflation expectations and second-round effects. Uncertainty looms over future developments, however there is ground for optimism as, on the basis of available data, a deceleration of inflation is gradually becoming visible in the euro area.



The Greek economy, despite an unfavourable international environment, kept on growing strongly in 2022. Real GDP rose by 5.9%, mainly on the back of stronger private consumption and investment, as well as on account of the large increase in tourism. Fiscal measures aimed at containing the impact of the energy crisis on households and businesses contributed to this positive development. At the same time, labour market developments were favourable and the unemployment rate declined. The growth rate of the Greek economy is expected to be higher than the euro area average in 2023, though clearly lower than in 2022, with consumption –and especially investment also through the efficient use of available European funds– still making a positive contribution.

The Greek economy, despite numerous and serious challenges, is on a positive track and in a position to overcome obstacles. Over the next years, the implementation of the National Recovery and Resilience Plan is expected to contribute to a further strengthening of investment, while supporting and creating new and better paying jobs. At the same time, the sustainability of Greek public debt is not compromised by higher financing costs over the medium term. However, fiscal support measures have to be targeted and temporary, in order to preserve fiscal credibility and stability and ensure efficient use of EU funds. A credible economic policy will contribute to regaining investment grade in 2023, with positive multiplier effects across the economy.

Over the past two years, the single monetary policy was faced with multiple and interrelated challenges. In this environment, and always within the context of the Eurosystem, the Bank of Greece continued to serve as custodian of monetary and financial stability. It ensured smooth liquidity conditions for the Greek credit system and contributed to easing upward pressures on Greek government bond yields as a result of monetary policy tightening. As the central bank of the country, we will keep on performing our tasks effectively, responsibly and impartially. In this demanding environment, we need to encourage financial markets to flourish and support our economy in a way that fosters economic integration and strong cooperation across Europe.

The Bank of Greece, in response to new challenges and technological advancements, recently completed the Bank's internal reorganisation project "Mellon", which emphasises meritocracy,

efficiency, effectiveness and flexibility of business processes. In this context, the digital transformation of the Bank, aiming at modernising and simplifying procedures by making effective use of technology and innovation, is nothing short of an unwavering aim.

In 2022 the Bank continued to incorporate sustainability principles in its operations and to implement relevant projects as part of its corporate social responsibility. It strengthened its role in issues pertaining to the environment and climate change. Furthermore, the Environmental Management System (EMS), which was certified by ISO in 2022, is a proof of the Bank's commitment to continuously improve its environmental performance. The efficient management of its human capital is a key priority of the Bank, which is constantly investing in knowledge and competence building, always guided by the principles of equality and meritocracy. It is worth noting that, in July 2022, the Bank of Greece co-signed the ESCB & SSM Equality, Diversity and Inclusion Charter. The Bank also fulfilled its role in disseminating culture, through the work of its Centre for Culture, Research and Documentation, while promoting financial literacy through a series of initiatives, e.g. educational programmes at the Bank of Greece Museum and relevant publications, and participating in similar initiatives organised by other members of the Eurosystem.

The Bank of Greece, through the publication of reports, research output and statistical data, informs the general public and provides reliable information on economic policy. It is said that a distinctive feature of institutions is the fact that they abide by consistent behavioural value systems. Over the years, the Bank of Greece has been sounding the alarm to governments and has been a guiding light whenever things were taking a wrong turn. In today's constantly changing global environment, we are committed to continuing to serve as a beacon of stability.

The Bank's vision is to be an effective, credible and innovative central bank, trusted by the society. This vision is shared and served in the best possible way by Bank of Greece employees, who make a crucial contribution to maintaining the high quality of the Bank's work and prestige. This is why I would like to thank them for their diligence and commitment and encourage them to keep up the good work. Lastly, I would also like to thank the members of the General Council for their support and cooperation.

Yannis Stournaras

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# CREDIBLE ECONOMIC POLICIES AS A COUNTERBALANCE TO WIDESPREAD UNCERTAINTY

## 1 INTRODUCTION

**2022 was a year of elevated uncertainty, due to the Russian invasion of Ukraine and a surge in inflation.** Increased inflationary pressures largely stemmed from supply-side shocks, notably reflecting rising energy costs, while a significant contribution also came from demand-side factors, due to the strong post-pandemic economic recovery and the extensive fiscal support measures. The dynamic reaction of monetary authorities worldwide, with drastic increases in policy rates, was deemed necessary to signal their determination to both contain aggregate demand and rein in second-round inflationary effects and anchor inflation expectations, thereby minimising the risk of an upward price-wage spiral and achieving the price stability target in the medium term. In fact, the size of central bank interventions was such that last year saw the most abrupt shift in the monetary policy stance ever recorded in the post-war period, with still uncertain consequences on economic activity.

**Amid unprecedented exogenous shocks and pervasive uncertainty, the Greek economy has made significant progress since the debt crisis of the previous decade, exhibiting high resilience, while also enhancing economic policy credibility.** Over the past two years, Greece has recorded strong economic growth, above the euro area average, achieving real convergence of its living standards towards the European average. In particular, the negative output gap of the Greek economy is estimated to have closed in 2022 after eleven consecutive years.

**The enhanced credibility of economic policy has been the result of the wide-ranging reforms implemented** in the past few years, which have to a large extent corrected the imbalances of the Greek economy. The following areas are particularly worth mentioning:

- **Fiscal policy:** Despite widespread uncertainty and the adoption of additional fiscal support measures, the 2022 budget targets are estimated to have been achieved with a safe margin, thanks to higher growth and inflation than initially projected. The additional fiscal interventions did not burden the State Budget, as they were mostly financed by windfall revenues and by using the fiscal space created by better-than-expected economic activity and the overperformance of tax revenues. Accordingly, the support measures did not cause any deviation of the fiscal balance from the original budget targets. Based on Bank of Greece estimates, the fiscal balance for 2022 turned out better than expected, despite the adverse conditions, thereby strengthening Greece's fiscal credibility.

In 2023, with the pandemic emergency measures no longer in place and with less energy-related fiscal support, a return to a structural primary surplus is expected. This means that the structure of the State Budget is such that it can generate primary surpluses without the need for additional measures; this is a result of the structural fiscal consolidation and the reforms implemented over the past years. Important reforms included improving the tax collection mechanism and addressing the sustainability problem of the social security system, which was recently complemented by the introduction of funded elements in the supplementary pension system and by a stepped-up clearance of pension arrears, with long-term fiscal benefits. The ability to generate structural primary surpluses is a key determinant of Greece's fiscal policy credibility, as it reduces reliance on additional discretionary measures to address fiscal imbalances. This, together with the favourable characteristics of public debt, makes the dynamics of the debt-to-GDP ratio very resilient

to adverse shocks in the medium term, thereby bolstering international investors' confidence in the prospects of the Greek economy.

- **Competitiveness of the economy:** Competitiveness in terms of relative prices and relative labour costs has improved significantly since 2010, having recouped the cumulative losses of the 2000-09 period. This cumulative improvement in competitiveness has been more marked in terms of unit labour costs, especially as the relevant index fell in 2021-22 below the levels observed prior to Greece's entry into the euro area. These hard-won and sizeable competitiveness gains were, to a large extent, due to the reform of the wage-setting framework and the deregulation of the labour market. As a result of past reforms, cost competitiveness continued to improve in 2022, despite strong price rises and mounting wage pressures.

The Greek economy has also made progress in several aspects of its structural competitiveness. This progress, which started with a series of reforms in the post-2010 period and was stepped up in the past few years (digital transformation of the economy, lowering corporate tax rates from 29% to 22% and dividend tax rates from 15% to 5%, etc.), contributes to improving the business and investment environment, bringing additional benefits to export-oriented sectors of the economy.

- **Investment:** In 2021 and 2022, foreign direct investment inflows increased strongly (to 2.8% and 3.1% of GDP, respectively, up from an average of 0.9% in 2002-18) and were a key tool for financing growth, promoting productivity and employment and introducing innovative technologies. This development was mainly due to the gradual restoration of confidence in the prospects of the Greek economy. The acceleration of the privatisation and state property development programme, the participation of foreign companies in the equity of domestic firms and the record merger and acquisition activity observed in 2022 played an important role in boosting investment in recent years.
- **Extroversion:** Despite the deterioration in the current account deficit in the past few years, which was mostly due to temporary factors associated with the pandemic and rising international energy prices, the external sector of the Greek economy has undergone an impressive transformation. Overall, exports of goods and services as a share of GDP have almost doubled relative to 2010, reflecting not only the strong performance of tourism and transport services, but also the significant growth of goods exports, along with an increasing diversification of the Greek economy's export base. Greek exports have also improved in terms of quality, as e.g. exports of high-tech goods have grown remarkably.
- **Labour market:** The improvement in the labour market is now visible, with the unemployment rate falling to around 2010 levels, while the labour market slack has decreased and, for the first time since 2009, the labour force has expanded. These developments are largely attributable to the relaxation of labour market rigidities and the structural reforms implemented over the past decade. These reforms, which have increased labour market flexibility, have helped employment to respond more quickly to GDP growth.
- **Banking sector:** In the past few years, extensive restructuring has taken place in the banking sector. Banks have largely cleaned up their balance sheets, addressing the problem of non-performing loans (NPLs) mainly using the Hellenic Asset Protection Scheme (HAPS). Banks' liquidity has also improved, benefiting from higher deposits and continued access to funding markets. Capital adequacy ratios remain at satisfactory levels, above the minimum regulatory requirements. Moreover, the return of banks to profitability in 2022 is a noteworthy development that improves the chances of a virtuous circle of stronger capital base and capacity to finance sound business plans. The Recovery and Resilience Facility (RRF) provides significant support to domestic bank financing for Greek firms on favourable

terms. Overall, the figures show that the Greek banking sector is now in a better position than in the past to absorb international market shocks like those observed recently, while it is also benefiting from continuing ECB support.

**The support of European institutions to the economic policies pursued in Greece has been a decisive factor in the recovery of the Greek economy and in restoring confidence.** For example, the eligibility of Greek government securities for the ECB's Pandemic Emergency Purchase Programme (PEPP) and the extension of their waiver from collateral eligibility rules for as long as PEPP reinvestments continue (at least until 2024) have greatly contributed to lower borrowing costs during the pandemic and a smooth transmission of monetary policy. Meanwhile, Greece is among the countries expected to benefit the most from the funds available under the NextGenerationEU (NGEU) programme. So far, Greece ranks first in RRF funds absorption, having already made progress in achieving milestones and targets. Greece is also one of the five countries that have collected the second instalment and the only country to have collected part of the third instalment. Absorption of EU structural and investment funds is also well on track. Overall, this European institutional support was a consequence of the design and implementation of credible medium-term fiscal and reform plans, which was recognised by international rating agencies and investors. The utilisation of European monetary and fiscal instruments has improved the Greek economy's medium-term growth prospects and strengthened the sustainability of public finances.

**The benefits of reforms are now visible across the economy, with measurable and undisputable results.** Continued implementation of credible economic policies is a prerequisite for further support by the European institutions and for strengthening investor confidence, with the ultimate aim of regaining and maintaining investment grade status. In this regard, the disbursement of NGEU funds is conditional on the implementation of further structural changes and the promotion of sound investment projects. At the same time, the participation of countries in the ECB's new Transmission Protection Instrument (TPI) is contingent on the adoption of prudent and sustainable fiscal and macroeconomic policies.

**Despite progress in many areas, the Greek economy still has long-standing structural problems, which make it more vulnerable to possible new shocks compared with other countries.** Examples of such inherent weaknesses include delays in the administration of justice, red tape and remaining inefficiencies in some areas of public administration, shortcomings in certain key infrastructures, delays in the completion of the national cadastre (land register), insufficient fight against tax evasion, gaps in the so-called "knowledge triangle" (education–research–innovation) and the quasi-oligopolistic conditions in specific goods and services markets. At the same time, the unemployment rate remains higher than the euro area average (especially for the most vulnerable groups such as the youth and women). In the labour market, skill mismatches remain a problem, with firms finding it difficult to hire suitable staff, as workers lack the skills required for the job or have shifted to other sectors with better employment prospects. The country's GDP is still below 2008 levels, while the government debt-to-GDP ratio remains the highest in the euro area.

**The greatest risk to the prospects of the Greek economy, at a time of successive crises and elevated uncertainty, would be the loss of economic policy credibility, which has been so difficult to recoup, and a return to the bad practices of the past.** It is true that any prolonged political uncertainty could undermine the confidence climate that has been built up in recent years. However, the most significant risk to the economy would be a return to inefficient policies of the past and the halt and/or reversal of reform efforts. The memories of the painful adjustment achieved in previous years are still fresh enough to recall the high economic and social costs needed to correct the chronic imbalances of the economy. Therefore, prudence, responsibility and cooperation by policymakers are needed to preserve the sacrifices of the past decade for the benefit of future generations.

**Greece has the historic opportunity to complete the transformation of its economy, making it more resilient to future crises and converging towards the European average.** The experience of the 10-year debt crisis, the awareness of the merit of fiscal responsibility and the recognition of the benefits of reforms have all contributed to the maturity of the Greek society, enabling it to understand the new international economic environment. The political will for fiscal responsibility and credible reform policies is a factor that helps to turn crises into opportunities so that the country can definitively overcome its chronic weaknesses, transform into a modern, sustainable, extrovert and competitive economy and demonstrate responsiveness and resilience in a highly uncertain international environment.

## 2 THE WORLD ECONOMY

**The Russian invasion of Ukraine has had severe economic consequences across the world, mainly through an unprecedented increase in energy prices and high uncertainty about the duration of the conflict.** Nevertheless, global economic activity continued to show resilience. Although the erosion of real incomes by high inflation, China's weak growth and a sharp tightening of global monetary and financial conditions led to significantly lower global GDP growth in 2022, the slowdown was milder than initially projected, mainly on the back of: (a) the pandemic-related pent-up demand and accumulated savings, which supported consumption; (b) a shift of consumption from goods to services; (c) a strong labour market; and (d) the adoption of temporary policy measures worldwide to contain energy costs.

**Following a strong recovery in 2021, the global economy slowed down significantly in 2022.**

According to the latest IMF forecasts (January 2023), global GDP growth is projected to moderate to 3.4% in 2022 (from 6.2% in 2021) and 2.9% in 2023, with the slowdown being broadly based across advanced, as well as emerging and developing economies. In the latter category, China plays a major role in the expected slowdown, as in 2022 its economy grew at the lowest rate in four decades (excluding the year of the pandemic), mainly due to the property sector crisis and the strict COVID-19 containment measures introduced during the year.

**Global commodity prices, notably gas prices, surged to historical highs, primarily on account of the impact of the war and, to a lesser extent, due to persistent global value chain disruptions.**

Geopolitical uncertainty, Russia's reduced hydrocarbon exports to Europe, EU and US sanctions on oil imports from Russia, as well as strong demand for gas, caused energy commodity prices to soar. Specifically, in 2022, the average price of crude oil increased by 41% and that of gas of all types by 115% in annual average terms. On the other hand, downward effects have been exerted by energy saving measures in Europe, the significant European gas storage filling, a milder winter and China's economic slowdown. These factors eventually contributed to a gradual decline in energy prices, which by early 2023 had come close to the levels observed prior to the war in Ukraine.

**Global trade slowed down significantly in the course of 2022.** In particular, international trade flows were severely affected by: (a) rising commodity prices; (b) a sharp slowdown in the Chinese economy, which disrupted manufacturing and exports and exacerbated problems in global value chains; and (c) a deterioration in the terms of trade for many economies, owing to the appreciation of the US dollar. According to IMF estimates, global trade volume growth slowed to 5.4% in 2022, after a strong recovery of 10.4% in 2021, and is expected to fall further to 2.4% in 2023, in line with the anticipated slowdown in the global economy.

**Global inflation rose sharply in 2022 and proved higher and more persistent than initially projected.** Inflationary pressures stemmed from factors both on the supply side, mainly reflecting increases in energy prices, and on the demand side, including the withdrawal of pandemic-related measures, the recovery of the services sector and the fiscal support measures in response to the energy crisis. According to the IMF, global inflation is estimated to have increased sharply

to 8.8% in 2022 from 4.7% in 2021, while in advanced economies it reached a 40-year high. The expectation of a 6.6% fall in inflation in 2023 is supported by weaker global demand for commodities, but it is also due to the dampening impact of tighter monetary policies.

**2022 saw one of the sharpest monetary policy tightening cycles in many economies world-wide**, in order to counter exceptionally high, persistent and broadly-based (across goods and services) inflation. The pace and size of policy rate hikes, as well as quantitative tightening decisions, varied across economies depending on the prevailing supply and demand conditions. In the course of 2022, the central banks of major economies raised their policy rates drastically, with a view to containing inflation expectations.

**The past year was also challenging for fiscal policy, in its dual goal of reducing deficits and safeguarding public debt sustainability after the pandemic and of addressing the impact of the energy crisis.** Governments adopted temporary fiscal measures at a significant budgetary cost to mitigate the impact of the inflationary shock on household and business incomes. These measures were often generalised and included energy price subsidies, tax cuts and direct income transfers. Nevertheless, fiscal consolidation continued in almost all countries (except China), mainly because the extensive pandemic-related support measures were phased out. At the same time, global government debt is estimated to have decreased significantly to 91% of global GDP in 2022, due to declining deficits, economic recovery and inflation, but remained 7.5 percentage points above pre-pandemic levels.

**In the euro area, economic activity in 2022 proved more resilient than initially expected, despite the impact of the war.** The outlook for the euro area economy deteriorated in the course of the year, amid heightened geopolitical uncertainty, supply chain disruptions and historically high energy commodity prices, which weakened economic sentiment and pushed up inflation. The contraction in real incomes heavily weighed on private consumption and investment prospects. However, euro area governments, benefiting from the extension of the general escape clause of the Stability and Growth Pact, adopted discretionary measures to support households and firms in the face of rising energy costs. These fiscal support packages, together with the recovery of the services sector and a strong labour market, dampened the economic impact of the inflationary shock. At the same time, the adoption of energy saving measures by Member States and the mild winter in late 2022 reduced the risk of significant energy supply shortages and, hence, recession. Moreover, the fiscal support measures and the NGEU funds boosted economic activity and employment prospects in the euro area. GDP growth in the euro area in 2022 declined to 3.5%, from 5.4% in 2021. According to the ECB staff macroeconomic projections of March 2023, a further slowdown to 1.0% is expected for 2023, mainly on account of deteriorating financial conditions and weaker foreign demand.

**In the course of 2022, inflation in the euro area rose sharply, reaching record highs.** Inflation was driven by a combination of factors: (i) increases in energy costs and commodity prices, also due to the impact of the war in Ukraine; (ii) rising food prices, owing to higher transport and fertiliser costs; (iii) supply constraints triggered by disruptions in international trade and shortages of raw materials, equipment and labour; (iv) the release of pandemic-related pent-up demand; and (v) the depreciation of the euro due to the different pace of monetary policy normalisation across central banks. Headline inflation in the euro area, as measured by the Harmonised Index of Consumer Prices (HICP), averaged 8.4% in 2022, up from 2.6% in 2021. In 2023, headline inflation is projected to moderate to 5.3%, as a result of declining energy prices, among other factors.

### 3 THE SINGLE MONETARY POLICY

**During 2022, rising inflationary pressures in the euro area forced the ECB to change its monetary policy stance.** Initially, inflation was expected to decline in the course of 2022, as



the pick-up in prices was assessed to stem from temporary factors linked to the exit from the pandemic. As energy price increases were large and unexpected, it became clear that the war in Ukraine would substantially affect economic activity and inflation. The normalisation of the ECB's monetary policy was decided and announced at the December 2021 Governing Council meeting. Thereafter, a gradual reduction in net purchases under the APP (Asset Purchase Programme) and PEPP (Pandemic Emergency Purchase Programme) was announced. Net purchases were indeed terminated at the end of March 2022 for the PEPP and in early July 2022 for the APP. The actual start of interest rate increases was only decided when the ECB's projections of both headline and underlying inflation in the euro area suggested that inflation would remain at undesirably high levels for an extended period and still by the end of the projection horizon it would exceed the 2% target.

**From July 2022 onwards, the ECB successively raised its key interest rates, ending an eight-year period of negative interest rates and marking the most abrupt shift in the monetary policy stance ever recorded in the euro area.** The ECB indicated that interest rates needed to be raised significantly at a steady pace to reach levels that were sufficiently restrictive to ensure a timely return of inflation to the medium-term target of 2%. It was also decided that the future path of key interest rates would not be signalled through the ECB's forward guidance but would instead be determined based on incoming data and the Governing Council's evolving assessment of the economic and inflation outlook, following a meeting-by-meeting approach. All along this process, the ECB would maintain optionality, gradualism, data dependence and flexibility in the conduct of monetary policy. In its recent March 2023 meeting, the Governing Council stated that future policy rate decisions would be determined by its assessment of the inflation outlook in light of the incoming economic and financial data, the dynamics of underlying inflation, and the strength of monetary policy transmission. Cumulatively, the ECB raised its key interest rates by 250 basis points in 2022 (in successive meetings in July, September, October and December 2022) and by a further 100 basis points in early 2023 (in February and March 2023). By the end of March 2023, the interest rates on the main refinancing operations, the marginal lending facility and the deposit facility had come to 3.50%, 3.75% and 3.00% respectively.

**Along with its interest rate increases, the ECB also adopted a number of other measures** aimed to further normalise monetary policy, reduce excess liquidity and money supply, as well as address any renewed market fragmentation and ensure the smooth transmission of monetary policy across the euro area countries. Specifically:

- In March 2022, net asset purchases under **the pandemic emergency purchase programme (PEPP)** were terminated. Thereafter, the ECB continues to reinvest maturing principal payments from securities purchased under the PEPP until at least the end of 2024. Flexibility in PEPP reinvestments represents a first line of defence against risks to the monetary policy transmission mechanism.
- Also in March 2022, **the minimum credit quality waiver for Greek government bonds** was extended for at least as long as PEPP reinvestments continue.
- In July 2022, the **Transmission Protection Instrument (TPI)** was established, intended to support the effective transmission of monetary policy across euro area economies. The TPI can be activated through secondary market purchases of securities issued in jurisdictions experiencing a deterioration in financing conditions that is not warranted by country-specific fundamentals and poses a serious threat to the smooth transmission of monetary policy across the euro area. A decision to activate the TPI will be based, among other considerations, on certain eligibility criteria, including whether the Member States, whose securities will be purchased, pursue sound and sustainable fiscal and macroeconomic policies.

- In October 2022, **the terms and conditions of targeted longer-term refinancing operations (TLTRO III)** became less favourable to ensure consistency with monetary policy normalisation.

In December 2022, it was decided that, starting from March 2023, **the APP portfolio would decline** at a measured and predictable pace. Net APP purchases were terminated in July 2022, as already mentioned, but the ECB continued to fully reinvest the principal payments from maturing securities purchased under the APP. From the beginning of March 2023 onwards, the Eurosystem does not reinvest all of the principal payments from maturing APP securities. The APP portfolio decline will amount to EUR 15 billion per month on average until mid-2023 and its subsequent pace will be determined over time.

**Inflation in the euro area is projected to remain high for an extended period.** Overall, the ECB's strategy demonstrates its determination to ensure the return of inflation to the medium-term target of 2% and the smooth functioning of the monetary policy transmission mechanism, standing ready to adjust all of its instruments within its mandate.

**The Governing Council is closely monitoring current financial market tensions and stands ready to respond as necessary to preserve price stability and financial stability in the euro area.** The ECB's policy toolkit is fully equipped to provide liquidity support to the euro area financial system, if needed. To this end, the Governing Council will apply flexibility as appropriate. Flexibility in monetary policymaking is essential for ensuring the smooth transmission of monetary policy and achieving price stability without disrupting financial markets.

## 4 THE GREEK ECONOMY: DEVELOPMENTS AND PROSPECTS

### *Macroeconomic environment*

**In 2022, the Greek economy maintained its growth momentum, with GDP growing at a rate of 5.9% (down from 8.4% in 2021), despite strong inflationary pressures and a worsening international environment.** Real GDP exceeded pre-pandemic levels, driven by private consumption, despite the decline in household real disposable income due to high inflation. Factors that sustained consumption included pent-up demand, household savings accumulated during the pandemic, and the fiscal support measures to counter the energy crisis. A positive contribution to growth also came from higher services exports, spearheaded by the buoyant tourism sector, which recovered faster in Greece than in the rest of the world. In particular, travel receipts in 2022 almost reached the 2019 level, thereby supporting incomes and consumption. Investment was another GDP growth contributor, benefiting from higher corporate profitability, the utilisation of NGEU funds and robust foreign direct investment flows. On the other hand, a dampening effect on growth was exerted by higher imports, largely on the back of soaring energy import prices, as well as of increases in industrial production, private consumption and investment.

**As a result of higher energy commodity prices, headline inflation surged in 2022, weighing on real household income and undermining the economic outlook.** The Harmonised Index of Consumer Prices (HICP) increased by 9.3% in 2022 (from 0.6% in 2021), breaking successive all-time records month after month until September. The key drivers of inflation were the energy (+ 41%) and the food components (+ 9.7%). Over the course of the year, the large and continuous rises in energy and food prices gradually fed into the prices of services and non-energy industrial goods, causing core inflation to rise sharply as well (to +5.7% in 2022 from -0.7 in 2021). A moderation of inflation was seen in the last quarter of 2022, associated with the general downward trend in energy prices, but also with horizontal subsidies, mainly on electricity bills.

**In the case of Greece, research by Bank of Greece staff showed that supply and demand shocks have had broadly equal contributions to headline inflation in the recent period. How-**

**ever**, the contribution of supply was clearly more important for the path of core inflation, and even more so in services. **The labour market improved further in 2022**, despite a slowdown in total employment growth during the second half of the year in line with weaker activity. Specifically, headcount employment increased by 5.4% in 2022, compared with 1.4% in 2021. Accordingly, the unemployment rate dropped to 12.4% from 14.7% in 2021, with significant declines in the long-term unemployment rate and the unemployment rate for the 20-29 age group. The labour force expanded for the first time since 2009, recording the highest annual growth rate in 24 years. At the same time, the labour market is showing signs of tightening compared with the previous year, with increased labour supply shortages in specific sectors such as tourism, construction, retail and wholesale trade, manufacturing and industry. And this notwithstanding the fact that the unemployment rate and other labour market slack measures remain relatively high (although they have declined since 2021).

**The international competitiveness of the Greek economy continued to improve in 2022**, in a global environment of soaring prices and nominal labour costs. In particular, it is estimated that competitiveness has continued to improve mainly in terms of unit labour costs, with average wage growth comparatively lower in Greece than in its main trading partners (also reflecting developments in minimum wages). Price competitiveness also improved slightly, as average annual domestic inflation, though high, did not exceed the corresponding weighted average inflation of Greece's main trading partners, both inside and outside the EU. In terms of structural competitiveness, Greece's ranking on the basis of an increasing number of composite indicators is improving, although it remains comparatively low at European and international level. Major factors behind these improvements include efforts to upgrade the business and macroeconomic environment, a stable and credible fiscal policy framework, the reforms implemented, and the successful and timely absorption of RRF funds. This favourable development is also reflected to some extent in increased foreign direct investment in many sectors, with FDI flows in 2021-2022 being the highest in 20 years.

**The current account deficit widened significantly in 2022, to 9.7% of GDP (from 6.8% of GDP in 2021), as growth in goods exports was outpaced by that in imports, in particular of energy goods.** Higher imports of goods were fuelled by stronger consumption, as well as ongoing increases in industrial production and in investment. Rising international fuel prices have also weighed on the current account balance, through a higher oil trade deficit. Negative contributions also came from the primary and secondary income accounts, which turned to deficits, mainly due to higher interest payments and the fact that inflows expected in 2022 were postponed to 2023. These negative developments were partly offset by an increase in the services surplus, owing mainly to an impressive increase in travel receipts, which reached 97% of their 2019 level, and, to a lesser extent, in sea transport receipts.

**The Greek real estate market strengthened significantly in 2022, mainly due to strong investor interest from abroad, despite the adverse effects of the war in Ukraine on borrowing, energy and construction costs in general.** The housing market gained further momentum in 2022, driven mainly by strong foreign investor demand and tourism. House prices and residential investment continued to increase sharply, while business confidence in the residential construction sector rose to even more positive levels. By contrast, the rise in residential construction in the country as a whole came to a halt, after five consecutive years of robust positive rates, while the overall cost of building new residential properties increased significantly. In the commercial real estate sector, property prices continued to increase in the first half of 2022, especially for prime properties. However, total construction activity for commercial real estate recorded negative rates of change in the year to November. Overall, lower construction activity, amid growing costs of materials and energy and rising interest rates, contributed to a further pick-up in prices on account of reduced supply that does not meet the increased demand.



***Fiscal developments***

**Amid renewed uncertainty in 2022 due to the Russian invasion of Ukraine and rising energy and food prices, together with supply chain disruptions, the need remained for emergency fiscal support to households and firms.** A sizeable fiscal support package was therefore introduced in 2022, of which an estimated 85% concerned subsidies on electricity and gas consumption for households and firms, while 9% was in the form of social transfers and only 1% in the form of tax reliefs.

**The additional fiscal measures in response to the energy crisis did not burden the state budget,** as they were mostly financed by windfall revenues and by using the fiscal space created by better-than-expected economic activity and the overperformance of tax revenues. The latter was due both to higher inflation and to more extensive use of electronic transactions, which improved tax compliance. Accordingly, the additional support measures did not cause deviations from the budget targets.

**As a result, fiscal consolidation remained on track in 2022, despite the challenging circumstances.** Following two years of fiscal expansion to cushion the negative impact of the pandemic on the real economy, the fiscal policy stance shifted to contractionary in 2022. The decline in fiscal deficits continued in 2022 at a faster pace, mainly reflecting the withdrawal of pandemic emergency measures.

**In 2021-22, Greece managed to achieve one of the largest fiscal consolidations in Europe and the greatest cumulative reduction of public debt, which dropped to below pre-pandemic levels.** Between 2020 and 2021, the general government primary deficit decreased by around 2 percentage points of GDP to 5% (from 6.9% of GDP in 2020) and the debt ratio fell by 11.8 percentage points of GDP to 194.5%. For 2022, the reduction of the primary deficit is expected to turn out larger than initially projected, due to an under-execution of primary expenditure against the annual target and a better-than-expected performance of tax revenues. The revised forecasts of the Bank of Greece place the 2022 general government primary budget deficit at 1% of GDP and public debt at 171.4% of GDP. A better-than-expected fiscal performance would enhance fiscal credibility and would also bring forward an upgrade of the Greek sovereign to investment grade rating, while making the achievement of the primary surplus target in 2023 safer, in a time of heightened uncertainty and significant slowdown in growth.

**The normalisation of the ECB's monetary policy, which was decided and announced in December 2021 and effectively started in 2022, implied higher borrowing costs for euro area countries, especially for Greece.** Greek bond yields were more sensitive to international market volatility than those of other euro area countries, given their lower credit rating.

**However, the observed rise in Greek bond yields does not jeopardise the sustainability of Greek government debt in the medium term.** This is due to the favourable characteristics of Greek public debt (e.g. its composition and very long maturity), as arising from the agreed short- and medium-term debt relief measures. In addition, the overall issuance strategy of the Public Debt Management Agency and the timely hedging of all variable-rate debt via interest swap contracts in 2017-19 protect public debt dynamics from rising international interest rates, keeping interest payments relatively stable over the medium term. At the same time, there is scope for flexible debt management and debt issuance, with a view to containing borrowing costs and keeping gross financing needs low.

**Despite increased uncertainty and higher borrowing costs, confidence in the prospects of the Greek economy was maintained during 2022, mainly due to the strong resilience of public debt to negative shocks and better-than-expected fiscal outcomes.** In 2022, two rating agencies upgraded Greece to one notch below investment grade, while another two upgraded the country's economic outlook to positive. The ratings are underpinned by Greece's improved

economic fundamentals, the continued implementation of reforms, the effectiveness of the economic policies pursued and the fact that past structural reforms have enhanced the resilience of the economy and fiscal sustainability.

### **Banking sector**

**Bank credit expansion to the private sector accelerated markedly in 2022, remaining at a higher level compared to previous years.** Stronger economic activity and firms' higher financing needs due to input price and energy inflation fuelled demand for bank loans. Also, amid heightened uncertainty related to the war in Ukraine, non-financial corporations (NFCs) had a precautionary motive to build up cash reserves. The withdrawal of earlier COVID-19 support measures, in particular the repayable advance and bank loan moratoria, was another driver of firms' demand for bank loans. On the supply side, the provision of liquidity by the Eurosystem, the sustained growth in bank deposits and the significant reduction in the NPL ratio had a positive impact. The average annual growth of bank credit to NFCs accelerated to 8.3% in 2022 from 5.7% in 2021, with the monthly net credit flow almost tripling on average relative to 2021.

**The strong rebound in new bank loans in 2022 was mainly driven by credit to large firms, while consumer loans also increased.** The average monthly gross flow of loans to large firms more than doubled in 2022 compared with 2021, while the corresponding flow to small- and medium-sized enterprises (SMEs) grew by 35%, accounting for one-fifth of the total flow of loans to NFCs. New loans to SMEs remained significant, supported by the financial instruments of the European Investment Bank. Also, the disbursement of low-interest RRF loans firms started in the second half of the year. The main recipients of new bank credit to NFCs were the sectors of industry (22.7% of the total), energy (16.8%) and retail and wholesale trade (12.8%). Bank credit to households kept contracting on an annual basis in 2022, but its pace of decline was weaker than in 2021, as consumer credit growth, which turned positive in March 2022 for the first time since 2010 and remained so thereafter, partly offset the continued contraction of housing loans.

**Deposits by the domestic private sector continued to rise in 2022, although their annual growth was dampened by lower real deposit rates.** Private sector deposits increased by a cumulative EUR 8.6 billion in 2022, which corresponds to about half of the 2021 flow. Household and business deposits were negatively affected by rising inflation which, together with nominal deposit rates remaining low, led to a decline in the real interest rate.

**Household deposits in 2022 were supported by the strong pace of economic recovery.** Household deposits grew by EUR 6 billion in 2022 (compared with EUR 8.5 billion in 2021) on the back of increases in nominal disposable income, underpinned by higher employment and the fiscal support measures. On the other hand, negative effects on household deposits were exerted by the release of pandemic-related pent-up demand, higher spending as a result of high inflation, and low nominal deposit rates that discouraged saving.

**Business deposits continued to grow in 2022, but at a decelerating pace, albeit faster than in 2019.** Business deposits grew by EUR 3.4 billion in 2022 (compared with EUR 7.8 billion in 2021), driven by significant increases in bank borrowing and a marked recovery in turnover and tourism receipts. On the other hand, increased business costs, largely as a result of higher imported input prices, had a negative effect on NFC deposits.

**The increases in key ECB rates were gradually transmitted to domestic bank rates,** with mixed effects on domestic credit and deposit developments, which, given the associated lags, will take time to fully unfold. Deposit rates remained at very low levels in 2022, despite policy rate increases. In real terms, the interest rate on time deposits for NFCs and households became more strongly negative. On the other hand, bank borrowing costs increased in 2022 across all types of credit, in line with the normalisation of the monetary policy stance. In partic-

ular, the average interest rate on loans to NFCs rose by 50 basis points in 2022 relative to 2021, while household borrowing costs also trended upwards, driven by higher interest rates on both consumer loans (up by 50 basis points) and housing loans (up by 36 basis points). However, increases in nominal lending rates remained below inflation, leading to a sharp decline in real interest rates in 2022.

**Improved bank asset quality and higher interest rates have had a positive impact on the profitability of Greek banks.** In 2022, Greek banking groups posted profits, mainly due to considerably lower provisions for credit risk and higher non-interest income (notably from fees and commissions, financial operations, etc.), as well as reduced operating expenses. Interest income strengthened overall in 2022, reflecting increases in lending rates during the second half of the year.

**Capital adequacy ratios in December 2022 improved relative to one year earlier.** The Common Equity Tier 1 capital ratio increased to 14.5% (from 13.6% in December 2021) and the Total Capital Ratio to 17.5% (from 16.2% in December 2021), both remaining below the respective euro area averages.

**Greek banking groups improved their loan portfolio quality further, but the stock of NPLs as a share of total loans remains significantly higher than the euro area average.** According to the latest available data, the NPL ratio declined further to 8.7% in December 2022 (from 12.8% in December 2021), compared with a euro area average of 2.3% (September 2022 data), while all systemic banks have already reached their single-digit NPL ratio operational target. The stock of NPLs fell to EUR 13.2 billion at end-September 2021, down by EUR 5.2 billion from end-December 2021 and by EUR 95.5 billion from their March 2016 peak. This marked improvement is primarily attributable to loan sales using the HAPS scheme and, to a lesser extent, to recoveries from active NPL management and repayments facilitated by the borrower support measures on the part of the government and banks. Of the total NPL stock, about two-thirds are corporate loans, one-fifth are housing loans and the remainder consists of consumer loans. About 36% of NPLs are subject to forbearance measures. It should be noted, however, that a high share of forborne loans soon falls back into arrears.

#### ***Private insurance undertakings***

**Having weathered well the challenges of the pandemic and of persistently low interest rates, the Greek insurance market also proved resilient to the impacts of the energy crisis, higher inflation and monetary policy tightening.** The insurance market continued to adjust in 2022; notable developments included further concentration of the sector through mergers and acquisitions; higher sales of life insurance products linked to investment; and management of the consequences of the surge in inflation and the associated rise in interest rates worldwide.

**The Greek insurance market is highly concentrated,** especially in the life insurance segment, where the five largest (life and composite) insurers hold a combined market share of 80%. In the non-life segment, the share of the top five insurers is 51%.

**In the first nine months of 2022, trends in gross written premiums varied across the two market segments.** In the January-September 2022 period, life insurance gross written premiums declined marginally year-on-year, while non-life gross written premiums increased.

**The balance sheets of insurance undertakings were affected by the change in market conditions, owing to widespread uncertainty and monetary policy tightening.** In January-September 2022, total assets fell by 10% year-on-year, reflecting the adverse impact of the global surge in yields on the valuation of their government bond holdings, which account for more than one-third of total assets. A decline of 11% was also seen in total liabilities, a significant part of which relates to life insurance business. Own funds were 8% less than in the same period of

2021. With regard to the quality of the eligible own funds of the insurance market, 92% of these funds are classified at the highest quality level (Tier 1), while the SCR coverage ratio for all supervised insurance undertakings is well above 100%.

**Important regulatory developments in 2022 concerned:** (a) adaptation in line with inflation of the amounts laid down in Solvency II Directive (conditions for exclusion from scope due to size, definition of large risks, absolute floor for the calculation of the Minimum Capital Requirement; (b) the adoption of EIOPA guidelines on Legal Entity Identifier; and (c) the adoption of EIOPA's Revised Guidelines on Contract Boundaries and on Valuation of Technical Provisions.

**Investment-based insurance products, which are becoming increasingly popular in recent years, entail a number of risks for policyholders, calling for the attention of insurers and supervisors alike.** Partly in connection with the low interest rates prevailing for long, sales of unit-linked life insurance products have grown in recent years. These products, linked to mutual fund shares or internal variable funds, cover both the insurance and the investment needs of policyholders, offering significant benefits to consumers, notably including potentially higher returns compared with traditional life insurance policies. However, they are also associated with certain risks, such as: (a) investment risk, given the underlying assets' variability and sensitivity to market changes; (b) the risk that returns at maturity may not turn out according to customers' expectations, due to higher-than-expected investment costs; and (c) the risk of misselling these products that are often very complex. Against this background, insurance undertakings should assess the value for money of their unit-linked products, while supervisory authorities have also an important role to play in protecting policyholders against possible bad business practices.

### **Forecasts**

**The Greek economy is expected to continue to grow in 2023 at a rate far above the euro area average, but significantly lower than in 2022.** According to the latest Bank of Greece forecasts, economic activity should grow by 2.2% in 2023, supported by investment and, to a lesser extent, consumption. In particular, the normalisation of consumer demand, low growth of real household income and rising interest rates are expected to lead to moderate growth of private consumption. At the same time, the medium-term outlook for investment is very promising, in terms of both quantity and quality, with a growing share of investment in high value-added infrastructure (especially in green energy production). The upward revision of the 2023 growth rate compared with earlier forecasts reflects a positive carryover effect from the better-than-expected performance of the economy in 2022.

**The tourism sector maintains a positive outlook this year as well, despite continued uncertainty.** Despite the challenges facing global tourism, Greece's travel receipts this year are expected to remain at broadly the same levels as in 2022. However, economic, health-related and geopolitical factors could adversely affect tourism in 2023.

**Headline inflation, while still remaining relatively high, is projected to decline significantly in 2023.** In particular, annual HICP inflation is estimated at 4.4% this year, reflecting falling energy prices, as well as a negative base effect. Developments in the Headline index will be driven mainly by the food and non-energy industrial goods components, whereas energy inflation is expected to turn negative (due to a sharp decline in energy prices and base effects). Core inflation, on the other hand, is expected to remain equally high in 2023, reflecting strong inflationary pressures from the non-energy industrial goods and services components, and continue its convergence with headline inflation observed in the last quarter of 2022.

**Weaker growth dynamics is expected to affect productivity, and wage growth will weigh on the competitiveness of the economy.** A combination of lower employment growth in 2023, in line with weaker GDP growth, and some pick-up in wage growth will result in stagnant productivity and a noticeable increase in unit labour costs.

**The current account deficit is projected to decline both in absolute terms and as a percentage of GDP, although it will remain at high levels.** The expected de-escalation of energy prices, combined with a slowdown in domestic consumption expenditure, should dampen imports of goods. Meanwhile, the recovery of the world economy –albeit at a slowing pace– would have a positive impact on Greek exports of goods. The latter are expected to continue to grow, although less strongly than in 2022, in response to rising foreign demand. The services balance is also expected to show a small improvement, driven by higher travel receipts, which will however be influenced by disposable income developments in the main markets of origin. On the other hand, weaker demand for raw materials relative to 2022 and the euro's appreciation vis-a-vis the US dollar are projected to contain the surplus on the transport balance. At the same time, inflows of EU funds in the form of grants (e.g. under NGEU) will have a direct positive impact on the current account, through the primary and secondary income accounts. Finally, foreign direct investment inflows are projected to remain on an upward path, reflecting the acceleration of privatisations, inflows from European funds, as well as the improved business climate.

**The fiscal stance is estimated to remain restrictive in 2023, as the primary balance is projected to improve further, contributing to a further reduction in public debt.** Based on available data and the policy measures so far announced, the Bank of Greece expects the general government budget to return to a primary surplus of 0.7% of GDP in 2023, after three consecutive years in deficit. Budget consolidation is underpinned by the full withdrawal of pandemic-related emergency measures and a cutback on energy measures, which are only partially offset by the adoption of other fiscal support measures. General government debt is projected to decrease further to 162.5% of GDP in 2023, thanks to the dampening contribution of the implicit interest rate-growth differential to debt dynamics, while the primary balance component will also have a debt-reducing contribution, for the first time since 2019.

**As regards public debt sustainability, the observed increase in borrowing costs does not undermine the declining path of the debt-to-GDP ratio.** This is mainly due to the favourable structure of Greek public debt, about 76% of which is in the form of medium- to long-term liabilities to the official sector, and its very favourable repayment profile. At the same time, the past hedging swap contracts of the Public Debt Management Agency, which locked in historically low interest rates, together with the debt relief measures of 2017-18, have resulted in the stabilisation of interest payments on variable rate debt to the official sector, making Greek public debt more resilient to interest rate risk. Therefore, risks to the sustainability of public debt remain contained over the medium term, provided that: (i) fiscal measures to counter the impact of the pandemic and the energy crisis are temporary; (ii) from 2023 onwards, the government budget runs primary surpluses of close to 2% of GDP on average per year in order to fully cover interest payments on public debt; (iii) effective use is made of all available European resources, making a crucial contribution to closing the investment gap and boosting the economy's potential growth.

## 5 SOURCES OF RISK AND UNCERTAINTY

**The current projections for the global economy are surrounded by heightened uncertainty, and risks remain elevated:** (a) a possible escalation of geopolitical tensions or of the war in Ukraine could cause inflation and global energy prices to remain high for longer, implying a high risk of stagflation in Europe, which is a large net importer of energy and has been severely affected by deteriorating terms of trade; (b) a worsening of geopolitical fragmentation trends in trade would lead to economic de-globalisation, weaker growth and rising prices; (c) further disruptions in global supply chains and in energy supply sufficiency could lead to the emergence of regional solutions, raising issues of strategic autonomy and heightened uncertainty about trade dynamics; (d) an abrupt or generalised re-pricing of financial risk could rekindle fiscal sustainability risks and cause a new debt crisis, especially in developing economies.



**Risks to the outlook for the euro area economy chiefly relate to geopolitical developments and volatility in international energy prices.** The risk of a disruption of Europe's energy supply remains elevated, in particular for 2023-24, in the event of a prolongation or escalation of the war in Ukraine, especially if combined with higher energy demand by China. Moreover, an abrupt deterioration in financial conditions could have adverse effects on the viability of businesses, financial stability and public debt dynamics in several Member States. A sharp correction in real estate prices amid rising borrowing rates would further dampen domestic demand. Also, more persistent inflationary pressures than currently expected, due to second-round effects via wages or renewed energy price hikes, could cause a de-anchoring of inflation expectations to the upside and more persistent increases in core inflation. Reversely, a faster-than-expected fall in inflation, reflecting the effectiveness of monetary policy, and a greater resilience of private consumption and investment, thanks to the use of NGEU funds, would lead to lower inflation and higher growth.

**The inflation outlook in the euro area is subject to considerable risks.** Upside risks to inflation could materialise in the short term in the event of a further reduction in energy supply and a rise in retail prices for energy. It is worth noting that price pressures remain strong, partly because past increases in energy costs are now affecting a wider range of products. The risks to the medium-term inflation outlook are associated with: (a) a contraction of the euro area's production capacity; (b) inflation expectations rising above the Eurosystem's target; (c) higher-than-anticipated wage growth; (d) further increase in energy and food prices; and (e) a stronger pass-through of higher energy and food commodity prices to consumer prices. On the other hand, if aggregate demand and energy costs were to decline, upward pressures on prices would be mitigated over the medium term.

**In a global environment of tighter monetary policy and high uncertainty, ensuring financial stability warrants vigilance by all parties involved.** One factor behind the recent turmoil in financial markets was concerns about the impact of interest rate increases on both the liabilities and the assets sides of bank balance sheets. A bank's exposure to interest rate risk depends on its business model, as well as on supervisory practices. Typically, higher interest rates lead to losses on banks' bond portfolios, as higher interest rates reduce the prices of existing bonds, and even more so for long-term bonds. However, as part of their portfolio risk management, banks have the option to hedge interest risk in order to contain any losses.

**At the euro area level, although the rise in interest rates is expected to positively affect bank income, strong banking supervision and the ECB's policy toolkit provide safeguards that financial stability will be preserved in the event of concerns about the impact of monetary policy tightening on banks' bond holdings and loan portfolio quality.** Overall, the trend towards lower bond market valuations is expected to persist for as long as the ECB normalises its monetary policy by gradually raising its key rates to levels that will ensure a timely return of inflation to the medium-term target of 2%. In addition, an environment of high interest rate expectations, inflationary pressures and heightened geopolitical risks is expected to contribute negatively in this direction. However, the euro area banking sector remains resilient, having strong capital and liquidity positions. At the same time, the ECB's policy toolkit is fully equipped to provide liquidity support to the euro area financial system if needed to ensure smooth monetary policy transmission and safeguard financial stability.

**As regards the Greek economy, maintaining the growth momentum in the period ahead is the key challenge.** In more detail, downside risks to the outlook for the Greek economy include: (i) a deterioration of the external environment due to unfavourable geopolitical developments; (ii) higher and more persistent inflation; (iii) a protracted electoral period, which would exacerbate political uncertainty; (iv) a lower-than-expected absorption rate of NGEU funds; (v) a halt of reforms or reversal of past reforms, which would impair productivity growth and business competitiveness; and (vi) the emergence of a new generation of NPLs, due to the interest rate

hikes and the impact of the energy crisis, after the gradual withdrawal of the government support measures. Upside risks are associated with a stronger decline in inflation and a better-than-expected performance of tourism.

**In the area of public finances, the increased fiscal challenges faced by several European countries call for fiscal prudence and responsibility.** In an international environment of higher interest rates, commitment to restoring fiscal sustainability remains crucial. This is so because higher borrowing costs and slower growth reduce the positive contribution of the interest rate-growth differential, weakening the initial beneficial effect of inflation on the reduction of the debt-to-GDP ratio. Against this background, fiscal prudence is needed to avoid undermining the constantly declining path of public debt and prevent a new debt crisis. In the case of Greece in particular, following a smooth exit from the enhanced surveillance regime, fiscal credibility is of the essence, as sustainable public finances is a crucial factor for a sovereign credit rating upgrade. In the longer term however, there is increased uncertainty regarding public debt dynamics, as the gradual refinancing of accumulated debt to the official sector on market terms will increase the exposure of Greek government debt to interest rate, market and refinancing risks.

**Turning to the banking sector, the monetary policy tightening and the slowdown in economic activity are expected to weigh on the outlook for credit expansion to the private sector in 2023, despite the support provided by European financial instruments.** In particular, the ECB rate hiking cycle will be transmitted to bank lending rates, especially household credit rates that are more responsive to market rates. The higher cost of credit will affect the debt servicing capacity of private sector borrowers with floating-rate loans, in particular households, whose real incomes have already been eroded by inflation. At the same time, the expected economic slowdown in 2023 would increase the credit risk of NFCs and households, due to a deterioration in their financial condition. Also, in view of the risk of a new generation of non-performing loans emerging in 2023 as a result of the energy crisis, banks are more cautious to extend new loans. Overall, the annual growth rate of bank credit to NFCs is expected to decline, but to remain robust, supported by the low-interest co-funded loans generated by the European financing instruments (NSRF, NGEU).

**The exposure of Greek banks' balance sheets to interest rate risk is limited.** More specifically, Greek government bonds held in bank portfolios which are measured at fair value are negatively affected by the decline in their prices amid rising key interest rates. However, the majority (around 80%) of banks' government bond holdings are held to maturity and thus not affected by changes in their prices. It should also be noted that banks have been implementing interest rate risk hedging policies. Nevertheless, interest rate risk could become significant should banks be forced to sell these securities to obtain liquidity. It is therefore important to preserve the liquidity conditions of the banking sector, with the support of monetary authorities, in order to safeguard financial stability.

**Lastly, strengthening the capital base of Greek banks remains an important challenge for the sector,** particularly in the current environment of changing international financial conditions. The quality of bank capital remains relatively low, as deferred tax credits represent 52% of total prudential own funds. Meanwhile, the rise in interest rates implies higher interest expenses at a time when banks have to make progress towards meeting Minimum Requirements for own funds and Eligible Liabilities (MREL) through new bond issuance. This calls for a qualitative and quantitative strengthening of the capital base and an improvement in core profitability. An upgrade of the Greek sovereign credit rating to investment grade would be particularly important for banks, as it would be followed by similar upgrades for banks, thereby reducing their borrowing costs. Additional challenges for the domestic banking sector refer to addressing the consequences of climate change and adopting new, digital technologies.

## 6 POLICY RECOMMENDATIONS

### *Monetary policy*

**Identifying the drivers of inflation is crucial for monetary policy making, with a view to achieving a decline in inflation with the smallest possible output losses.** Underlying inflationary pressures primarily stem from supply shocks, which cannot be effectively addressed by monetary policy. Still, it is important that monetary policy should respond in a resolute and timely manner to protracted supply shocks in order to prevent an entrenchment of higher inflation expectations and control second-round inflation effects. The recent interest rate increases by the ECB are working in this direction.

**The tightening of the monetary policy stance is necessary to achieve the inflation target of 2% over the medium term.** The increase in key interest rates and their maintenance above their neutral levels, until underlying inflation is clearly falling to levels consistent with the price stability objective, will prevent a de-anchoring of inflation expectations and second-round effects from strong wage pressures. In the current conjuncture, central banks need to remain vigilant, clearly communicate the monetary policy outlook and carefully plan their balance sheet contraction, in order to avoid shocks to the real economy and to financial markets.

**The relatively higher contribution of supply-side factors to the recent surge in inflation, particularly in the euro area, calls for structural measures.** The adoption of supply-side policies, towards addressing constraints in the labour market and the production of raw materials, speeding up the development of renewable energy sources and ensuring energy sufficiency, could lead to a faster decline in inflationary pressures and smaller output losses.

### *Fiscal policy*

**The current economic conjuncture calls for complementarity between monetary and fiscal policies, along with a flexible economic policy that can promptly adapt to rapidly changing conditions.** Monetary and fiscal policy complementarity is necessary for achieving price stability in the medium term; anchoring inflation expectations; safeguarding financial stability; containing borrowing costs; ensuring long-term fiscal sustainability; and strengthening the growth momentum.

**Experience from the management of past crises has demonstrated the major importance of counter-cyclical fiscal policies for strengthening the resilience of economies.** Such policies, in good times, can help build the necessary buffers and fiscal space for the adoption of discretionary fiscal policies in bad times. Fiscal policy can play an active role in expanding the productive capacity of the real economy by supporting investment in human capital, green energy and digital technologies.

**Ensuring a restrictive fiscal policy stance during the tightening of monetary policy requires fiscal prudence and discipline.** In the current economic environment, there is pressure on policymakers to take action to mitigate the impact of inflation and energy shocks on household incomes, especially those of the poorer households. Such action is necessary to support private consumption and sustain the growth momentum. However, under the current circumstances, any support measures should be financed by using the available fiscal space and should be: (a) temporary, (b) targeted and (c) tailored to addressing the energy crisis. The temporary and targeted character of measures reduces the risk of demand-driven inflation. In this manner, fiscal policy can facilitate monetary authorities in achieving their target of bringing inflation back to 2% over the medium term. Moreover, given that inflation has significant distributional effects, disproportionately hitting low-income groups with a higher propensity to consume, the measures should be targeted to the most vulnerable. Support to firms should also be targeted, depending on their exposure to energy price increases and energy supply disruptions. Finally, such measures should be tailored to preserving incentives to consume less energy, while supporting en-



ergy efficiency and the green transition. Unless these requirements are met, the measures could exacerbate rather than weaken medium-term inflationary pressures, which would necessitate further monetary policy tightening.

**The credit rating upgrade of the Greek sovereign to investment grade is a very important objective for economic policy in the upcoming period.** Obtaining an investment grade status would lead to a very large expansion of the investor base for Greek government bonds, attracting new high-quality investment funds, thus containing the upward effects of tighter international monetary and financial conditions on sovereign bond yields. It would also have a positive impact on Greek businesses and banks by reducing their borrowing costs and attracting new capital.

**Productive public investment and the implementation of reforms will strengthen the economy's resilience, total productivity and potential output.** Therefore, the focus should be on vigorously implementing the actions outlined in the "Greece 2.0" plan, using NGEU funds, to boost public investment and provide a significant fiscal stimulus, helping to set the economy on a solid path of strong and sustained growth. Promoting the green and digital transition should remain a key policy priority, in line with the REPowerEU initiative and making effective use of RRF and other EU funds.

**A coherent and credible medium-term fiscal framework is needed at a time of elevated uncertainty.** The introduction of new revised fiscal rules in the EU will send a clear signal of alignment of economic policies with explicit fiscal sustainability objectives, while credible fiscal responsibility commitments will help anchor inflation expectations, supporting monetary policy in the fight against inflation.

**The reform of the Stability and Growth Pact and the development of a new, credible EU fiscal framework are key prerequisites for making the euro area as a whole more resilient to future shocks.** This new framework should be geared towards ensuring: (i) public debt sustainability at national level; (ii) the counter-cyclicality of fiscal policies; (iii) a credible enforcement mechanism that would be sufficiently automated, leaving little room for political interventions; and (iv) the transformation of the NGEU into a permanent fiscal instrument to finance investment mainly in the areas of climate change, energy and digitalisation. At the same time, the establishment of a central fiscal capacity should be accompanied by significant changes in economic governance, which could mean that Member States will no longer have control over certain budgetary tools in the conduct of national policies.

**In the long run, uncertainty about public debt dynamics calls for vigilance and fiscal prudence.** The gradual refinancing of accumulated debt to the official sector on market terms will increase the exposure of Greek government debt to interest rate and market risk, which eliminates any room for a relaxation of primary surplus assumptions. Therefore, the next decade provides a unique window of opportunity to rapidly reduce Greek public debt.

### **Competitiveness**

**Improving the competitiveness of the Greek economy should continue, through wage moderation.** In general, any increase in the statutory minimum wage should preserve the economy's competitiveness and price stability, as well as jobs. It should also be prudent and balanced in terms of managing expectations so as to avoid adverse second-round effects on inflation. Wage decisions should also take into account medium-term productivity developments and the current environment of high uncertainty. In this way, raising the minimum wage would not add to persistent inflationary pressures, worsening the competitiveness of the Greek economy and ultimately reducing the real incomes of workers.

**Another important challenge refers to addressing the current account deficit, including by attracting greenfield foreign direct investment.** The widening current account deficit is

largely driven by conjunctural factors related to the pandemic and rising energy prices. A smaller part is attributable to higher imports of capital goods, which however enhance the productive capacity of the Greek economy and, in the medium term –through exports– to an improvement in the external balance. Finally, another significant part stems from intermediate goods, which probably reflects the expansion of Greek industry and its greater integration into global supply chains. Measures should therefore be taken to further strengthen the export-orientedness of the economy and import substitutions. A contribution to this end, in the medium term, should be made by the productive utilisation of the increased flows of foreign direct investment observed recently, as a tool for introducing new innovative technologies. Infrastructure (transport, energy, information and communication), skills, research and development and integration into global value chains are prerequisites for attracting additional investment from abroad.

**In the labour market, skills mismatches remain a significant problem.** Actions to address this problem include upgrading technical education and (re)skilling vulnerable social groups to improve their employability.

**Equally necessary are interventions to increase labour force participation, in particular of women and the youth.** Such interventions are necessary as population ageing reduces total productivity and risks undermining the sustainability of social security systems. Policies that address low birth rates and improve the work-life balance, along with reforming the tax system and reducing incentives for early retirement, can help in this direction, so as to make it easier for more workers to join and remain in the labour market. Institutional interventions to further alleviate or subsidise social security contributions would lower non-wage costs and help tackle undeclared or underreported work.

### **Banking sector**

**In the banking sector, sustained profitability is important** both for safeguarding its soundness and overall financial stability and for banks to provide the necessary credit to the real economy. The increase in net interest margins is expected to have a positive impact on banks' core profitability.

**A stronger effort to further reduce the stock of NPLs is needed, especially as the full impact of the energy crisis and inflation on the quality of bank loan portfolios has not yet been reflected in bank balance sheets.** Also, given that the clean-up of bank balance sheets has been achieved mainly through loan securitisation and sales, the stock of NPLs remains a burden for the real economy and excludes a large number of borrowers from bank credit. Finally, it should be noted that certain non-systemic banks have made little progress in addressing their still high NPL stocks.

**Improving the financial aggregates of Less Significant Institutions (LSIs) will enhance the resilience of the banking sector.** An improved LSI capital adequacy and possible mergers between LSIs would boost competition, enabling the provision of diversified and more competitive services to individuals and firms, especially small- and medium-sized enterprises.

### **European integration**

**The prospects of the Greek economy are of course also linked to developments in European integration.** Currently, the major challenges for authorities relate to striking the right balance between collective European action and the sovereignty of the 27 different Member States. These challenges include developing a common foreign and defence policy, deepening democracy at supranational European level, shaping inclusive societies, reducing inequalities (now directly affecting domestic and international political developments), completing the Economic and Monetary Union (EMU), boosting investment in high technology and transitioning to a green economy.

**One of the greatest challenges that need addressing is the completion of the EMU.** EMU is a full monetary union but, despite major steps towards closer integration, it still remains an incomplete economic fiscal, banking and capital markets union. This gives rise to serious problems and centrifugal forces in times of crisis, accentuating North-South asymmetries.

**The completion of the Banking Union will act as a catalyst for a full economic and monetary union.** In particular, the supervision of all banks and not only the significant institutions, bank resolution and crisis management and, above all, the establishment of a deposit insurance scheme should be based on pan-European frameworks rather than on national arrangements. A European deposit insurance scheme, in particular, can greatly contribute to financial stability in the euro area by providing not just depositor compensation but also risk reduction in the event of a banking crisis. Further delays in completing the Banking Union would hamper the smooth transmission of monetary policy, through ongoing financial barriers and fragmentation, and would put the euro at a competitive disadvantage over other reserve currencies.

**In this regard, encouraging green finance is a very effective way to strengthen the Capital Markets Union.** The transition to a carbon-neutral economy and the achievement of the European climate and energy targets will require an estimated EUR 330 billion in investment annually over the next decade. The need for adequate green finance can act as a catalyst for financial market integration. The strengthening of the CMU is necessary for the completion of EMU because it will reduce market fragmentation and encourage diversification of financial resources. In this context, the development of a Green CMU can support the move to a CMU by adding depth and diversification to the financial instruments available, also enhancing the risk-sharing capacity of the EU financial system.

#### ***Climate change***

**As part of the green transition, a number of interventions would help build resilience to the climate crisis,** including: (a) promoting public investment (alongside private investment) for climate-proofing infrastructure (e.g. public transport and the rail network in particular); (b) investing in clean energy generation and grids; (c) introducing a uniform progressive carbon tax; (d) making insurance mandatory for all buildings; (e) enabling public-private partnerships for effective insurance against natural disasters; and (f) establishing a rainy day fund out of public resources to address the impact of natural disasters linked to worsening climate conditions.

**Progress in tackling the climate crisis has stalled because of the energy crisis, but this gridlock should not become permanent.** The short-term measures deemed necessary to boost energy supplies in the winter of 2022 should not trap Europe into reliance on fossil fuels for many years to come. Energy saving and a shift to renewables are crucial not only for addressing the current energy crisis and ensuring energy sufficiency, but also for achieving climate neutrality. Public awareness of the importance of environmental protection and of the need to reduce countries' dependence on conventional energy products can play an important role in this regard, also in view of evidence that human capital, including environmental literacy, is associated with lower energy consumption and CO<sub>2</sub> emissions.

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**Despite the successive and multi-faceted crises of recent years, the Greek economy has shown remarkable resilience.** This is due to both the continued implementation of structural reforms and the conduct of credible policies as part of a coherent medium-term plan. Greece's exit from the enhanced surveillance regime, the ECB's ongoing support to Greek bonds and actions to prevent fragmentation in euro area money and capital markets, the repeated upgrades of the Greek sovereign credit rating, the strong performance of tourism and the announcement of major investments in Greece by large foreign corporations are important

developments that enhance the medium-term outlook of the economy and also demonstrate the effectiveness of the policies pursued.

**The unfavourable international macroeconomic environment shadows the outlook for the Greek economy in 2023, calling for continued credible policies.** Mitigating the effects of the energy crisis and maintaining the growth momentum in the period ahead are the key challenges facing economic policy. Despite increased risks, the sizeable support from available European funds, coupled with the lower exposure of the Greek economy to the energy crisis compared with the EU average and the favourable characteristics of Greek public debt, creates such conditions that, should a more adverse scenario for the EU materialise, the impact on the Greek economy would not be so severe.

**Pressing further ahead with reforms and investments under the “Greece 2.0” plan will enhance the resilience of the Greek economy to future shocks.** Increasing public and private investment and accelerating structural changes aimed at digital transformation, green transition and higher employment will shield the economy against future crises and solidify sustainable and inclusive economic growth. A healthy and strong domestic banking system, in collaboration with the international financial organisations involved, has a central role to play in achieving the goals of the National Recovery and Resilience Plan.

**Moreover, maintaining fiscal credibility, in terms of achieving sustained primary surpluses over the medium term, could make it possible for the Greek sovereign to obtain investment grade rating in 2023.** This is a very important objective, especially amid monetary policy tightening and deteriorating international financial conditions. In this context, given that 2023 is a year of national elections, there is a need for a common understanding and alignment among political forces in order to implement the key economic policy commitments and safeguard the achievements of the Greek economy over the past decade.

**The road to full European integration is still long and difficult, but delaying the further reform of the EU architecture would lead to the marginalisation of Europe and prosperity losses for its citizens.** Policymakers should act in a timely and proactive manner (i.e. before the outbreak of a new major crisis), with decisive, balanced and well-designed reforms at the euro area level, in a spirit of cooperation and mutual concessions. These changes will make the economies of the Member States more resilient, enhance the acceptance of the euro as a global reserve currency and lay the foundations for sustainable and lasting prosperity of all European citizens.

## Box 1

### THE ROLE OF SUPPLY AND DEMAND AS DRIVERS OF INFLATION IN ADVANCED ECONOMIES

Inflation in advanced economies has risen substantially since mid-2021 to reach historically high levels in 2022, leading to a gradual normalisation of monetary policy after a protracted period of almost zero interest rates and quantitative easing. There seems to be no consensus in the public debate about the relative contribution of supply and demand factors to surging inflation. However, identifying the factors behind rising prices is key to effective monetary policy.

Specifically, when inflation is mainly demand-driven, tight monetary and fiscal policies are seen as key policy tools for addressing high inflation. On the other hand, when the rise in prices is due to supply-side constraints, an overly tight monetary policy can lead to a greater than necessary economic slowdown, or even to a contraction in GDP, without adequately containing inflationary pressures.

This box explores whether the recent exceptional surge in the price level across advanced economies largely reflects demand factors or supply disruptions. First, the major supply and demand factors that affected the price level at the current juncture are presented. Next, the main methodological approaches used to analyse the role of demand and supply in driving inflation in the United States and the euro area during 2022 are described and the key takeaways from recent studies are outlined. Last, some suggestions for enhancing the effectiveness of monetary policy in advanced economies are provided.

#### The determinants of supply and demand at the current juncture

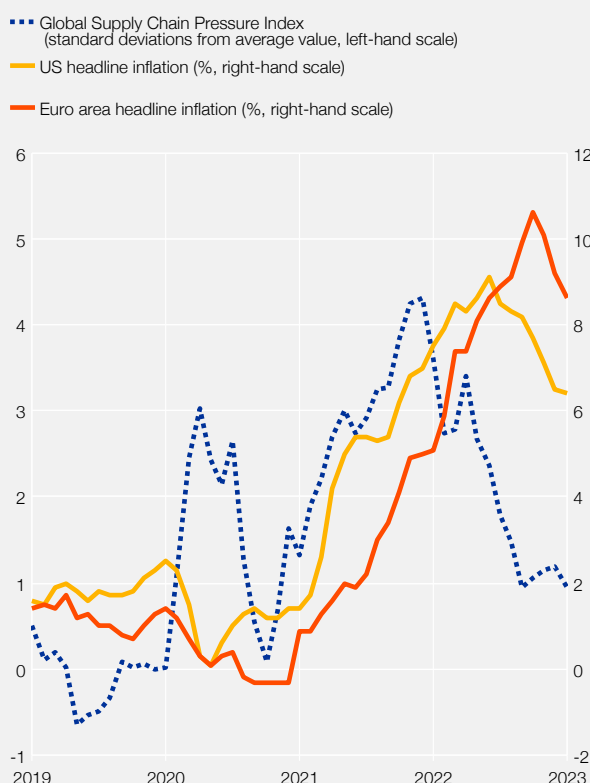
The successive shocks that have hit the global economy since early 2020 were unprecedented and multi-faceted, and had a huge economic impact, resulting in an exceptional surge in the general price level owing to a number of both supply- and demand-side factors, which are difficult to disentangle. Inflation in advanced economies was affected by individual factors to a varying degree depending on each economy's exposure to global supply chains, the contribution of its services sector to output, as well as, more recently, its reliance on Russian natural gas and on energy imports in general.

In particular, in 2020, the COVID-19 pandemic led to an exogenous reduction in the supply of goods and services and subsequently to a sharp decline in demand, mainly in the services sector, as a result of the lockdown measures. Global supply bottlenecks, which were exacerbated by China's zero-COVID policy, sustained supply constraints throughout 2021. Against this backdrop, the deflation observed in 2020 amid an unparalleled recession was followed by a rapid return of prices to their pre-pandemic levels in 2021, with the reopening of economies and the release of pandemic-related pent-up demand.<sup>1</sup> A number of studies suggest that excess demand, stemming from the extensive and coordinated emergency monetary and fiscal policy responses to the pandemic, as well as from the increase in savings during the pandemic, has played a fundamental role in inflationary pressures.<sup>2</sup> This abrupt rebound in demand, combined with the depletion of inventories and the supply chain bottlenecks, have skyrocketed global transport costs and driven commodity prices upwards (see Chart A).

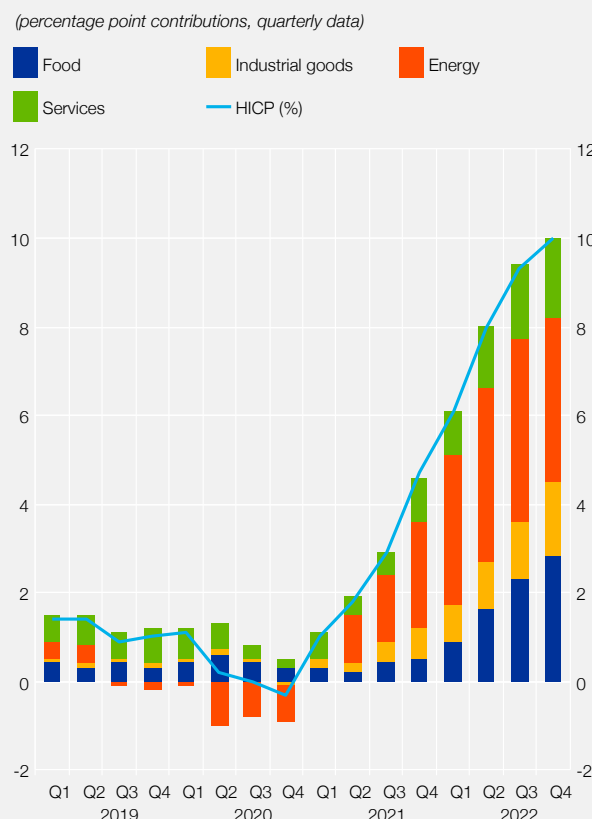
On top of the pandemic-related factors, Russia's invasion of Ukraine in early 2022 was another supply-side shock, primarily to energy prices and secondarily to food prices, further adding to inflationary pres-

1 The rise in inflation in 2021 was in a large part attributed to base effects, which were strong, particularly for the energy component. Nevertheless, base effects explained only 2 percentage points of the total 5.3 percentage point increase in euro area headline inflation in December 2021. See ECB (2022), *Annual Report 2021*, Box 1 "Factors underlying the surge in HICP inflation", and Rubene, I. and G. Koester (2021), "Recent dynamics in energy inflation: the role of base effects and taxes", ECB, *Economic Bulletin*, Issue 3/2021.

2 Furman, J. (2022), "This Inflation Is Demand-Driven and Persistent", *Project Syndicate*, 20.4.2022.

**Chart A Headline inflation and global supply chain pressures**

Sources: Federal Reserve Bank of New York (Global Supply Chain Pressure Index), US Bureau of Labor Statistics (US inflation) and Eurostat (euro area inflation).

**Chart B Euro area headline inflation and its components**

Source: Eurostat.

tures.<sup>3</sup> At the same time, the war-induced oil and gas supply shortages were compounded by an already strong demand for fossil fuels and gas in industry and transport after the lifting of pandemic-related restrictions, driving upwards global energy prices and hence inflation. The new emergency fiscal support measures to tackle the energy crisis and the elevated cost of living have also kept, to a certain extent, energy demand at high levels. It is telling that the contribution of energy to euro area HICP inflation peaked at 4.1 percentage points in the third quarter of 2022, from around 1 percentage point in the second quarter of 2021 (see Chart B). Although the contribution of energy prices to inflation remains high, the stronger contribution of the food and services components to HICP inflation since early 2022 demonstrates the equally important role of demand factors in driving inflation.

### Methodological approaches to inflation analysis

The need to explore the role of supply and demand as drivers of inflation at the current juncture has led to the adoption of methodologies that analyse aggregate data on the Consumer Price Index (CPI) at a more granular level. The simplest approach is to assess price developments by decomposing CPI into those sub-categories of goods and services that are either associated with restrictions on consumption during the pandemic and subsequently with increased demand after the lifting of such restrictions (e.g. services and clothing), or are

3 For the period 2021-22 as a whole, several studies cite as the principal factor behind rising inflation the role of supply disruptions, in the form of prolonged bottlenecks in global supply chains, supply shortages in semiconductors and increased shipping costs, or higher energy prices, because of the war and the ensuing sanctions against Russia. See Attinasi, M.G., R. De Santis, C. Di Stefano, R. Gerinovic and M.B. Tóth (2022), "Supply chain bottlenecks in the euro area and the United States: where do we stand?", ECB, *Economic Bulletin*, Issue 2/2022, and OECD (2021), *Economic Outlook – Interim Report*, Box 1 "The impact of commodity prices and shipping costs on inflation", September.



affected by global value chain bottlenecks and supply shortages (e.g. cars, durable goods and equipment).<sup>4</sup> However, such a simplistic analysis may overlook a significant part of the impact of supply and demand factors on other sub-categories of goods, whilst making difficult a comparison with periods when the impact of these factors is not so clear.

A fundamental methodological approach in the relevant literature is the recent empirical estimation by Shapiro (2022a; 2022b) on the role of supply and demand in driving inflation in the United States.<sup>5</sup> This approach separates the categories of the personal consumption expenditure (PCE) price index on a monthly basis into supply-driven and demand-driven groups.<sup>6</sup> It should be noted that the empirical framework identifies unexpected changes in price and quantity, which means that it does not take into account shifts in the long-run trend that are more likely to reflect structural factors such as technological improvements, cost-of-living adjustments or demographic changes.<sup>7</sup> Recent studies by the OECD and the ECB<sup>8</sup> follow Shapiro's empirical framework, extending the analysis to selected OECD and euro area countries.<sup>9</sup>

### The relative contribution of supply and demand to inflation

The aforementioned studies show that both supply-side and demand-side factors contributed to the rise in inflation between mid-2020 and mid-2022. According to OECD estimates, supply factors account for roughly half of total inflation, on average, in eight selected advanced economies, albeit with notable cross-country differences. Specifically, the contribution of demand factors was stable or increasing over the period under review in the United States, Canada, Australia, the United Kingdom and France, even surpassing in some of these countries (the United Kingdom, Canada and Australia) that of supply factors in the second quarter of 2022.

Turning to the euro area, the ECB finds that the increase in core inflation since the third quarter of 2021 was initially due to supply factors, but the contribution of demand factors became gradually larger to almost match that of supply factors in the first half of 2022. With regard to the goods and services categories, in August 2022 non-energy industrial goods (NEIG) inflation could be attributed to supply and demand factors by 60% and 40%, respectively, whereas services inflation by 30% and 70%, respectively. The weaker increase in services inflation relative to NEIG inflation was entirely driven by the different exposures to global supply shocks, as the demand component was essentially similar for both categories with the post-pandemic reopening of the economy.<sup>10</sup>

4 For an analysis, see ECB (2021), "The role of demand and supply factors in HICP inflation during the COVID-19 pandemic – a disaggregated perspective", *Economic Bulletin*, Issue 1/2021.

5 Shapiro, A.H. (2022a), "How Much do Supply and Demand Drive Inflation?", FRBSF Economic Letter 2022-15, and Shapiro, A.H. (2022b), "Decomposing Supply and Demand Driven Inflation", Federal Reserve Bank of San Francisco Working Paper 2022-18.

6 Demand-driven categories are identified as those where an unexpected change in price moves in the same direction as the unexpected change in quantity in the consumer basket in a given month. Supply-driven categories are identified as those where unexpected changes in price and quantity move in opposite directions. Finally, when a change in price or quantity is close to zero, the category is labelled as "ambiguous". The methodology uses a threshold, so that about 20% of the regression residuals are labelled as ambiguous. See Shapiro, A.H. (2022c), "A Simple Framework to Monitor Inflation", Federal Reserve Bank of San Francisco Working Paper 2020-29.

7 A drawback of the methodology is that it cannot quantify the relative weight of supply and demand, but only assesses their relative role in shaping inflation. Therefore, even in demand-driven categories, supply may still play a role, although not a primary one, so the relative importance of supply in shaping prices could be underestimated.

8 OECD (2022), "Supply- and Demand-driven inflation in OECD economies", Box 1.1, *Economic Outlook*, November, Vol. 22, Issue 2, 19-20, and ECB (2022), "The role of demand and supply in underlying inflation: decomposing HICPX inflation into components", *Economic Bulletin*, Issue 7/2022.

9 Due to lack of monthly data for estimating quantity in the consumer basket, most studies use either quarterly national accounts data on consumer spending in constant prices or the available quarterly deflated turnover data for goods and services. Yet one caveat is that the alternative indices proxying for quantity in the consumer basket are not available for all CPI sub-categories and are thus matched to more than one sub-category in the model estimation. Under an alternative empirical framework, a BIS study estimates a structural factor model using quarterly data for the United States and the euro area. See BIS (2022), "What drives inflation? Disentangling demand and supply factors", BIS Working Paper No. 1047.

10 Lane, P. (2022), "Inflation Diagnostics", *The ECB Blog*, 25.11.2022.

In the same vein, the BIS (see footnote 9) estimates that the surge in inflation between mid-2021 and mid-2022 reflects an interplay of extraordinarily expansionary demand conditions and supply constraints. In the United States, recent inflation dynamics have predominantly been driven by strong demand and to a lesser extent by tight supply. By contrast, in the four major euro area economies, supply factors are estimated to have played a somewhat greater role compared with the United States in the first half of 2022, which is consistent with the greater exposure of the euro area to the energy crisis and the consequences of the war in Ukraine.

The above empirical estimations are subject to high uncertainty. This is evidenced by the case of the United States, for which the quantitative results vary across different studies, despite the availability of highly granular data. For example, in contrast with the aforementioned BIS study, Shapiro (2022a; 2022b; see footnote 5) estimates that supply factors dominate over demand factors in explaining recent developments in US inflation. The methodological challenges, such as separating inflation into supply-driven and demand-driven components or lack of comparable data across countries and across the goods and services sub-categories, as well as the peculiar features of the pandemic period warrant a cautious interpretation of the results.

### Conclusions and policy recommendations

The pandemic and energy crises are posing unprecedented challenges to economic policy makers. A key source of uncertainty is how to accurately diagnose the relative contribution of demand and supply factors to rising inflation at the current juncture. The present analysis shows that the recent surge in prices largely reflects the increased contribution of supply-side constraints, especially in the euro area, compared with the pre-pandemic period. This may be signalling heightened risks for advanced economies, as supply disruptions tend to lead to both higher prices and lower output. However, the contribution of demand remains crucial, despite the variation observed across advanced economies. This cross-country heterogeneity in the relative importance of supply and demand factors driving inflation points to differences in the effectiveness of monetary policy and to possible risks of economic imbalances. Besides, the effect of “ambiguous” factors, which cannot be labelled as entirely supply- or demand-related, remains significant, adding further uncertainty to the effective transmission of monetary policy.

The strengthening in supply-driven inflation at the current juncture means that steep interest rate hikes by monetary authorities aimed at reining in inflationary pressures may be less effective in bringing prices down. This is due to the fact that tight monetary policy affects the price level in an economy via lower domestic demand and employment. Against this backdrop, the adoption of policies on the supply side so as to minimise strains on the labour market, the production of raw materials and energy sufficiency could lead to a faster decline in inflationary pressures and smaller output losses. At the same time, a more gradual increase in nominal interest rates to achieve price stability, as well as the use of an appropriate empirical framework to track the short-term contribution of supply and demand factors to price developments would allow a timely assessment of second-round effects of monetary policy on aggregate demand and thus on output and prices.

### Box 2

#### OVERVIEW OF FISCAL SUPPORT MEASURES AND THEIR MACROECONOMIC EFFECTS IN THE EURO AREA AND THE UNITED STATES DURING THE COVID-19 PANDEMIC

The outbreak of the pandemic, with negative consequences worldwide, and the ensuing imposition of lockdown measures led to a forced suspension of a broad range of economic activities for quite a long time. Faced with the risk of a deep recession, governments provided considerable support to businesses and households. Both the euro area and the United States promptly addressed the economic fallout of the pandemic, by deploying large fiscal packages. However, the recovery has been largely uneven across the two economies, reflecting not only their inherent differences, but also the different approaches taken by the respective governments regarding



support measures.<sup>1</sup> Specifically, euro area countries put emphasis on employment support schemes, whereas the United States opted mostly for measures to support disposable income. This box, first, provides a brief overview of fiscal support measures, with a focus on the euro area and the United States, and, second, discusses the economic recovery achieved so far on both sides of the Atlantic.

**Fiscal policy response to the economic fallout of the COVID-19 pandemic.** In order to stabilise aggregate demand in cases of mild shocks, automatic stabilisers have proved to be effective policy tools in the hands of fiscal authorities.<sup>2</sup> However, the economic shock caused by the lockdowns in spring 2020 was unprecedented in magnitude and duration. For this reason, national governments reacted quickly and introduced a wide range of discretionary fiscal support measures, targeting the businesses and households most hit by the pandemic and the associated restrictions.

Such discretionary measures aimed at cushioning the economic shock, by protecting employment and maintaining existing jobs, containing the fall in private consumption and supporting disposable income. The main fiscal support measures that were adopted can be grouped into two categories. First, directly budget-relevant measures, such as income transfers through benefits or taxes and social security contribution deferrals. Job retention schemes,<sup>3</sup> which provided support both for businesses and households, played a crucial role.<sup>4</sup> Second, measures to support liquidity and solvency through loan moratoria, the provision of public guarantees and government loans, trade credit insurance and capital injections (e.g. to airline companies).

### Euro area

In 2020, in order to contain the coronavirus pandemic and minimise its socio-economic impact, euro area governments adopted considerable fiscal and liquidity support measures at the national level.<sup>5</sup> In particular, according to the European Commission, the discretionary fiscal measures implemented by governments in the euro area in 2020 amounted to around 4% of GDP, on average, at the euro area level, while loan guarantees and other liquidity support measures for businesses, which however have no direct budgetary effect, reached around 17% of euro area GDP.<sup>6</sup> An alternative metric of fiscal support is based on the general government primary surplus. The change in the primary surplus captures the impact of both the discretionary measures that were introduced and expired or expected to expire, as well as the impact of automatic stabilisers (excluding liquidity support and guarantee-providing measures that have no direct budgetary impact). In euro area countries on average, the cumulative change in the primary fiscal balance relative to 2019 is estimated at 13.8% of GDP in 2020-21 and 17% of GDP in 2020-22. If inflows of funds from the Recovery and Resilience Facility (RRF) are also taken into account, support comes to 17.9% of GDP.<sup>7</sup> It should be noted that by the first half of

1 For a discussion of the factors explaining the differences across advanced economies in the depth of the pandemic-induced recession and in their resilience, see Dimitropoulou, D. and A. Theofilakou (2021), "Explaining the cross-country differences in the economic fallout during the COVID-19 pandemic crisis", Bank of Greece, *Economic Bulletin*, No. 53, 29-48.

2 For an analysis of how automatic fiscal stabilisers operated during the pandemic crisis and their effectiveness, see Bank of Greece (2021), *Annual Report 2020*, Box V.1.

3 Employment support programs can take three forms. First, short-time work schemes, such as Kurzarbeit in Germany, under which businesses facing difficulties because of COVID-19 can, subject to conditionality, temporarily reduce their employees' working hours instead of laying them off. Businesses are only burdened with the cost of actual hours worked by their employees, while employees receive a government grant for the hours not worked, thereby securing their full-time employment income. Second, furlough schemes, which provide grants to workers whose employment contracts are suspended, such as the Spanish ERTE scheme. Third, wage subsidy schemes, which entail the subsidisation of businesses for recruiting unemployed persons, such as the Dutch Noodmaatregel Overbrugging Werkgelegenheid (NOW). A crucial aspect of all these schemes is that workers keep the contract they have signed with their employer even if their work is suspended. See OECD (2020), "Job retention schemes during the COVID-19 lockdown and beyond".

4 For more details about job retention schemes across countries, see Eichhorst, W., P. Marx, U. Rinne and J. Brunner (2022), "Job retention schemes during COVID-19: A review of policy responses", IZA-Institute of Labor Economics, IZA Policy Paper No. 187.

5 On top of the national measures implemented, the EU's response has also been significant. Such actions are not included in the present analysis.

6 See European Commission, *European Economic Forecast*, Autumn 2020.

7 See Licchetta, M., G. Mattozzi, R. Raciborski and R. Willis (2022), "Economic adjustment in the euro area and the United States during the COVID-19 crisis", European Economy Discussion Paper No. 160, European Commission.

2022 the pandemic-related support measures that had been introduced over the previous two years had been lifted to a great extent.

Most euro area governments introduced policies to support businesses, with a focus on SMEs, and households during the period of the containment measures. Business support policies mostly included measures to enhance firms' liquidity, in order to prevent lay-offs and/or bankruptcies.<sup>8</sup> Sizeable measures were adopted to improve access to finance of businesses through public guarantees, government loans on favourable terms, or subsidies. On the demand side, many countries provided targeted income support to vulnerable social groups and households or regions most affected by the containment measures, mainly in the form of direct cash transfers.<sup>9</sup>

Yet, there is significant cross-country heterogeneity within the euro area in terms of both the amount and the composition of such measures. The International Monetary Fund (IMF), in an overview of policy responses during the pandemic crisis, classifies discretionary measures into two categories: (i) above-the-line support; and (ii) below-the-line measures and contingent liabilities.<sup>10</sup> On the basis of data on the discretionary fiscal measures that were announced between January 2002 and June 2021 (with an implementation horizon from 2020 onwards), Italy and Germany stand out, with overall measures surpassing 45% and 40% of their 2020 GDP, respectively, followed by France with about 25% and Spain with 22%. The composition of measures is also very different. Large European economies, such as Germany, France, Italy and Spain, announced government loans and guarantees to a much greater extent than above-the-line support. Consequently, the ranking changes if only above-the-line measures are taken into account: Greece ranks first, with overall measures accounting for 17.5% of 2020 GDP, followed by Germany and Austria (around 15% each), Italy (around 11%), France (9.6%) and Spain (slightly above 8%).<sup>11</sup>

It should also be noted that the majority of European countries (including the United Kingdom) had already in place relatively generous unemployment benefit schemes and short-time work schemes prior to the pandemic. With the outbreak of the pandemic and the ensuing imposition of restrictions, all euro area countries introduced such schemes or expanded existing ones to protect employment and support incomes.<sup>12</sup> Overall, the use of job retention schemes was high, as suggested by the OECD, although cross-country differences were observed in their design and implementation.<sup>13</sup>

### United States

In the United States, the cumulative change in the primary fiscal balance relative to 2019 was larger than in the euro area and is estimated at 14.9% of GDP in 2020-21 and 17.4% of GDP in 2020-22.<sup>14</sup> Unlike in euro area countries, discretionary support in the United States was provided mostly through directly budget-relevant (above-

8 Through the temporary SURE instrument, which provides to all EU countries credit (up to EUR 100 billion), in the form of short-term loans at low interest rates, EU Member States can obtain funding for the deployment of new or the extension of already existing job retention schemes, such as short-time work and wage subsidy schemes, as well as for health-related measures. The European Commission estimates that SURE supported about 31.5 million workers and 2.5 million businesses in 2020, and that nine million people participated in SURE-funded job retention schemes in 2021. See [https://www.eca.europa.eu/Lists/ECADocuments/INSR22\\_28/INSR\\_SURE\\_EN.pdf](https://www.eca.europa.eu/Lists/ECADocuments/INSR22_28/INSR_SURE_EN.pdf).

9 For the economic measures taken in 2020 to address the consequences of the coronavirus crisis, see Bank of Greece (2020), *Monetary Policy 2019-2020*, Box II.1.

10 For example, the first category includes measures such as higher public spending on the health sector, extension of unemployment benefits, grants, tax and social security contribution moratoria. The second category comprises measures such as state-guaranteed loans, capital injections and government guarantees.

11 IMF (2021), Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic, October 2021, IMF Fiscal Affairs Department, Washington, DC.

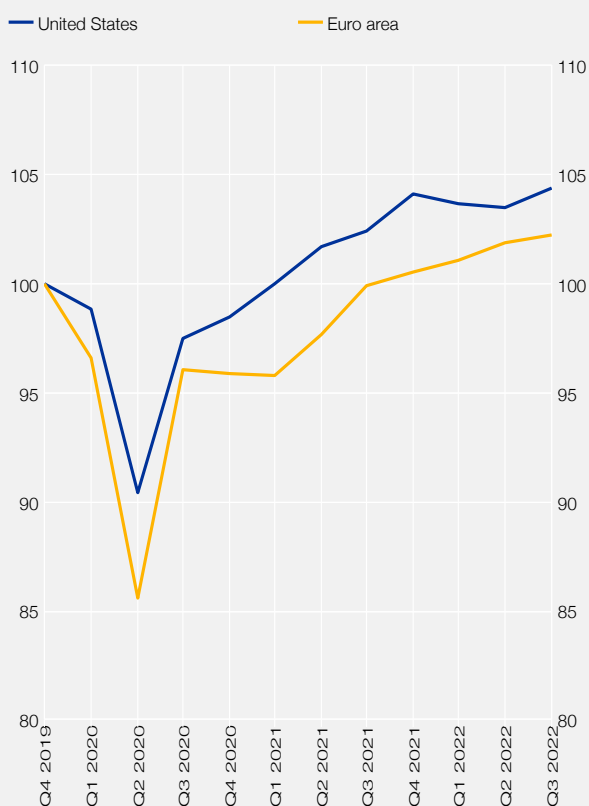
12 In Germany, for instance, the existing short-time work scheme became temporarily more flexible and broader in scope. It is estimated that almost 10 million people had benefited from the Kurzarbeit scheme by mid-May 2020, compared with around 1.4 million people during the global financial crisis (<https://www.bundesfinanzministerium.de/Web/EN/Home/home.html>).

13 For example, during the first wave of the pandemic, the jobs supported by some job retention scheme as a percentage of total dependent employment was 35.2% in France, 30% in Italy, 20.5% in Spain and 15.5% in Germany. By May 2020, job retention schemes had supported about 50 million jobs across the OECD, about ten times as many as during the global financial crisis. See OECD (2020), "Job retention schemes during the COVID-19 lockdown and beyond".

14 See footnote 7.

Chart A Real GDP

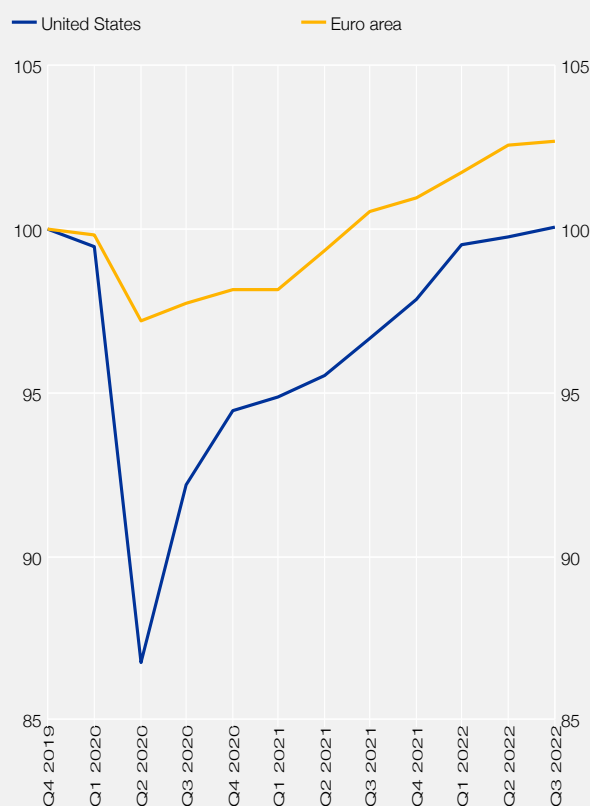
(Q4 2019 = 100)



Source: OECD.

Chart B Employment

(Q4 2019 = 100)



Source: OECD.

the-line) measures. Thus, on the basis of IMF data, out of 28% of GDP discretionary fiscal measures (announced in the United States between January 2020 and June 2021 with an implementation horizon from 2020 onwards), above-the-line measures accounted for slightly more than 25% of 2020 GDP.<sup>15</sup> According to a study by Bruegel, the United States spent USD 561 billion on payment deferrals for taxes and social security contributions to ease liquidity conditions for firms and workers, as well as another USD 560 billion on liquidity-providing measures through government loans and public guarantees to firms. The respective amount for immediate fiscal impulse measures, i.e. additional government spending (such as expenditure for healthcare, job retention schemes, subsidising SMEs, public investment and foregone revenues), was USD 1,940 billion.<sup>16</sup>

Specifically, the Coronavirus Aid, Relief, and Economic Security (CARES) Act<sup>17</sup> in 2020 provided direct economic assistance for American workers, households, small businesses and industries, amounting to about 11% of GDP (USD 2.3 trillion).<sup>18</sup> Through Economic Impact Payments, amounting to about 6% of GDP, households received relief payments of up to USD 1,200 per adult for eligible individuals and USD 500 per qualifying child.<sup>19</sup> At the same time, owing to soaring unemployment and the relatively modest unemployment benefits in the United States

15 It should be recalled that the change in the primary balance reflects the effect of emergency measures and automatic stabilisers, but does not capture the effect of measures without direct fiscal impact, while the IMF definition includes measures with or without fiscal impact and excludes the effect of automatic stabilisers.

16 <https://www.bruegel.org/dataset/fiscal-response-economic-fallout-coronavirus>.

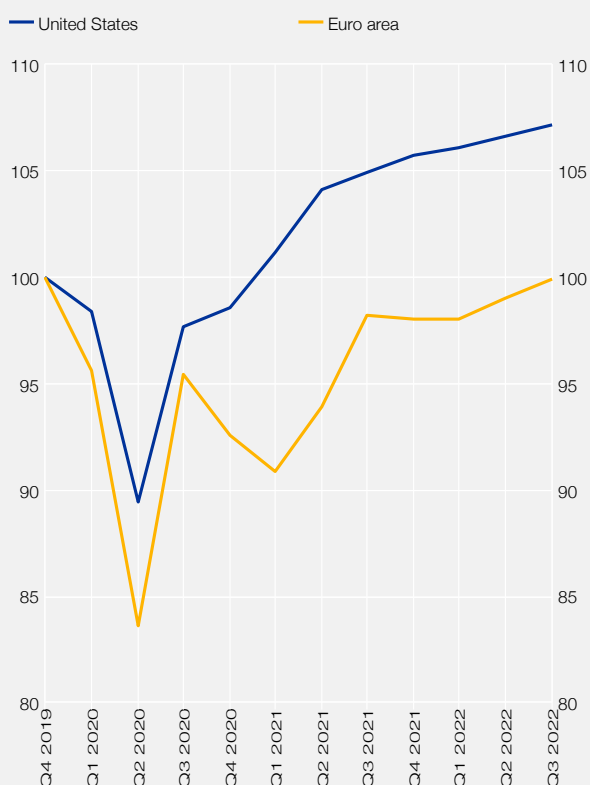
17 <https://home.treasury.gov/policy-issues/coronavirus/about-the-cares-act>.

18 <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#U>.

19 For a four-member family, these payments provided direct economic relief totalling up to USD 3,400 (<https://home.treasury.gov/policy-issues/coronavirus/assistance-for-american-families-and-workers/economic-impact-payments>).

Chart C Private consumption

(real prices, Q4 2019 = 100)



Source: OECD.

led to uneven developments in employment between the two economies (see Chart B). More specifically, employment in 2020 declined by 6% in the United States and recovered to pre-pandemic level in the third quarter of 2022. In the euro area, the decline averaged 2% and employment recovered to pre-pandemic level in the first quarter of 2021, i.e. four quarters earlier than in the United States.

Although the fall in employment was stronger in the United States, private consumption declined less than in the euro area (see Chart C). This was mainly due to the direct transfers to households by the US administration, which boosted real disposable income in 2020 and 2021. Against this backdrop, private consumption in the United States had already returned to pre-pandemic level by the first quarter of 2021, whereas euro area consumption, still to this day, falls short of the level observed in the fourth quarter of 2019.<sup>23</sup>

The increase in private consumption in the United States indicates that rising inflation greatly reflects demand-side effects, alongside supply-side effects. In the euro area instead, inflation was mainly driven by a series of

(compared with Europe), the US administration announced Short-Time Compensation (STC) as part of the CARES Act. However, the use of STC programmes remained rather weak, and the US administration introduced various temporary wage subsidy schemes, such as the Paycheck Protection Program (PPP)<sup>20</sup> and the Employee Retention Tax Credit (ERTC).<sup>21</sup> Notwithstanding this, most employers in the United States opted for temporary lay-offs. Respectively, on their part, many unemployed persons lacked incentives to seek employment, as they received unemployment benefits plus an additional weekly payment of USD 600 for four months under the CARES Act.<sup>22</sup>

### The economic consequences of the pandemic and of the related support measures

Despite the timely response of governments to support their economies, the recession caused by the pandemic was deep, albeit short-lived. The economic slowdown was stronger in the euro area than in the United States and the return of GDP to its pre-pandemic level occurred in the first quarter of 2021 for the United States, compared with the third quarter of 2021 for the euro area (see Chart A).

As already mentioned, the composition of support measures differed across the euro area and the United States, reflecting differences in labour markets and welfare structures, as well as in the targeting of measures. This

20 Under the PPP, businesses employing up to 500 persons could apply for loans in order to cover their payroll costs and retain their employees (<https://home.treasury.gov/policy-issues/coronavirus/assistance-for-small-businesses/paycheck-protection-program>).

21 The ERTC provides a tax credit to businesses whose sales dropped by more than 50% (<https://www.irs.gov/newsroom/covid-19-related-employee-retention-credits-general-information-faqs>).

22 Springford, J. and S. Tilford (2020), "Is the US or Europe more resilient to COVID-19?", Center for European Reform.

23 It should be noted that the slow recovery of euro area consumption is also due to a worsening in the terms of trade, as a result of the euro area's greater energy reliance on natural gas imports compared with the United States, which is reducing disposable income.

supply-side shocks, with high energy costs being the key driver.<sup>24</sup> The successive waves of the pandemic caused major supply chain disruptions that exacerbated with the outbreak of the war, initially leading to higher prices of commodities and food and subsequently pushing inflation upwards due to pass-through effects. Meanwhile, the phasing-out of pandemic-related restrictions released pent-up demand, especially in the services sector, which in turn strengthened upward price pressures. Lastly, the euro area economy had been affected by imported inflation from the United States.<sup>25</sup>

## Conclusions

Both the euro area and the United States responded to the pandemic-induced economic shock with unprecedented fiscal support measures. The quantification of the fiscal measures that were implemented in response to the COVID-19 crisis, as well as a comparison across euro area countries or between the euro area and the United States, can be very challenging. First, the initial estimates of the fiscal cost to euro area countries are often subject to material revisions, especially because of smaller uptakes.<sup>26</sup> Second, it is not always easy to identify which measures are discretionary and which are the result of automatic stabilisers. It should be stressed that European economies have typically incorporated in their economies much stronger automatic stabilisers than in the US economy. In order to achieve an equivalent total stabilisation effect, more sizeable discretionary measures are required in the United States than in Europe.

Both the euro area and the US economies have recovered markedly, with GDP now standing above its pre-pandemic level. Recovery in the United States was mostly led by consumption. In the euro area, while incomes and employment have recouped their losses, this is not the case with demand. Demand still falls short of its pre-pandemic level, because of both consumption and investment, although RRF funds will help to cover the shortfall in investment. These divergent developments suggest that the drivers of high inflation facing both economies (7.2% in the United States and 10% on average in the euro area in the fourth quarter of 2022) are different. In the United States, rising inflation is largely demand-driven. By contrast, the drivers of euro area inflation are complex and reflect the multiple supply-side inflationary shocks hitting the economy.

24 For a detailed discussion on the role of demand and supply in driving inflation in the United States and the euro area, see Box 1 herein.

25 See the opening remarks of Bank of Greece Governor Yannis Stournaras at the panel “Monetary Policy fit for today and tomorrow”, 13th Limassol Economic Forum, 21.10.2022. See also Hall, S.G., G.S. Tavlás and Y. Wang (2022), “Drivers and Spillover Effects of Inflation: the United States, the Euro Area, and the United Kingdom”, Discussion Paper No. 22-13, Department of Economics, University of Birmingham (<https://ideas.repec.org/p/bir/birmec/22-13.html>).

26 For many of the support programmes, actual uptake is considerably smaller and varies from one country to another. The European Systemic Risk Board (ESRB) provides information on the announced volumes and the uptake of measures, based on the reports published by national macroprudential authorities. In the first quarter of 2021, the overall volume of announced fiscal measures stood at 18.7% of GDP, up from 14.6% in the third quarter of 2020 (loan moratoria are not included), while the actual uptake of measures increased to 6.9% from 4.2% of GDP, respectively; see Wieland, V. (2022), “Overview of how major economies have responded to the Covid-19 pandemic: Growth trajectories, debt sustainability, best practices”, European Parliament.

## Box 3

### EU AND EURO AREA POLICY RESPONSES

#### Russia’s war of aggression against Ukraine

The year 2022 was marked by Russia’s invasion of Ukraine and the ongoing war with severe human losses and economic repercussions. The response of the EU institutions was immediate and decisive, focusing on humanitarian, political, economic and military support to Ukraine, as well as unprecedented sanctions against Russia. Since the outbreak of the war, the European Council has adopted ten packages of economic sanctions, including

targeted restrictive measures against a total of 1,473 individuals and 205 entities. Sanctions include a ban on Russian oil imports to the EU and price caps on Russian seaborne crude oil and petroleum products exported to third countries. Total support to Ukraine from the European Union, EU Member States and European financial institutions amount to EUR 67 billion, including EUR 25 billion of macro-financial assistance in the form of highly concessional long-term loans, helping Ukraine to restore critical infrastructure and reconstruct its economy. In June 2022, the European Council granted Ukraine the status of EU candidate country. Finally, the EU's efforts to secure global exports of grain and oilseeds from Ukraine through "Solidarity Lanes" were very important for addressing the food crisis that hit some developing countries.

### **Energy crisis in Europe**

The Russian invasion of Ukraine has triggered an energy crisis in Europe, which required a closer coordination of policy actions at the EU level. These policy actions aimed at securing energy supply, reducing energy demand and mitigating skyrocketing energy prices. In March 2022, the European Council agreed on phasing out the EU's dependency on fossil fuel imports from Russia and diversifying energy supply through higher imports of liquefied natural gas (LNG) from countries other than Russia and a faster development of renewable energy sources (RES). In June 2022, the EU adopted a Regulation to ensure that underground gas storage facilities in Member States are adequately filled ahead of the coming winter. Subsequently, EU energy ministers agreed on a voluntary reduction of 15% in gas consumption from August to March 2023 and of 10% in electricity consumption from December 2022 to March 2023, at their July and September meetings, respectively.

In September 2022, the EU complemented its short-term energy strategy with extraordinary support measures for households and firms. These measures involved redirecting the surplus revenues of electricity producers using the so called "inframarginal technologies" (such as renewables, nuclear energy and lignite) towards supporting and protecting final electricity users (applicable until June 2023), as well as a mandatory solidarity contribution on the surplus profits of energy undertakings active in the crude oil, gas, coal and refinery sectors (applicable until December 2023).

Following difficult and long negotiations at the level of Heads of State and Government, as well as at ministerial level, particularly with regard to the imposition of a cap on gas prices, in December 2022 energy ministers adopted three Council Regulations introducing the following: (a) faster permitting processes and an accelerated and simplified deployment of renewable energy projects as part of the REPowerEU Plan;<sup>1</sup> (b) enhanced solidarity through better coordination of common gas purchases, exchanges of gas across borders and reliable price benchmarks for LNG; and (c) a temporary market correction mechanism to limit episodes of excessive gas prices. The mechanism is activated if the front-month Title Transfer Facility (TTF) derivative settlement price exceeds 180 EUR/MWh for three working days and is EUR 35 higher than the reference price for LNG on global markets during that three-day period.

Finally, in October and December 2022, the European Council called on the European Commission to accelerate work on the structural reform of the EU's electricity market, with a view to decoupling electricity prices from gas prices to better protect households and businesses, increase the resilience of the economy and speed up the green transition by facilitating the use of RES. The European Commission published the relevant legislative proposal on 14 March 2023.

### **Enlargement of the euro area – Croatia becomes the 20th member**

The year 2022 marked the 20th anniversary of the introduction of euro banknotes and coins and was topped off with the decision to include Croatia as the twentieth member of the euro area on 1 January 2023.

<sup>1</sup> Furthermore, as part of the "Fit for 55" package, the EU Council agreed in June 2022 to set a binding EU-level target of 40% of energy from renewable sources in the overall energy mix by 2030, instead of the previous target of 32%.



### **Greece's exit from the enhanced surveillance framework**

On 16 June 2022, the Eurogroup decided Greece's exit from the enhanced surveillance framework after its expiration on 20 August 2022. At its meeting of 5 December 2022, based on the first post-programme surveillance report of the European Commission, the Eurogroup approved the eighth and final tranche of the medium-term debt relief measures (EUR 644 million), the reduction to zero for the second half of 2022 of the 2% step-up interest margin on the EFSF loan used to finance a debt buyback (EUR 123 million) and the abolition of the step-up margin for the period 2023-2049.

### **The EU leads the way in adopting a minimum level of taxation for largest corporations**

In December 2022, EU Member States agreed to implement the minimum taxation component (Pillar 2) of the G20/OECD international tax reform, whereby the profit of large multinational and domestic groups or companies with a combined annual turnover of at least EUR 750 million will be taxed at a minimum rate of 15%. Effective implementation of the relevant Directive will limit the race to the bottom in corporate tax rates and reduce the risk of tax base erosion and profit shifting across countries. The Directive has to be transposed into Member States' national law by the end of 2023.

### **Extension of the general escape clause of the Stability and Growth Pact**

In May 2022, the European Commission assessment was that heightened uncertainty and strong downside risks to the economic outlook in the context of the war in Ukraine, unprecedented energy price hikes and continued supply chain disruptions warranted an extension through 2023 of the general escape clause of the Stability and Growth Pact. The overhaul of fiscal rules forms part of a broader review of the EU's economic governance framework, which is currently under way.

### **Digital markets and digital services**

After their adoption by the Council and the European Parliament, the Regulation on digital services (Digital Services Act) and the Regulation on digital markets (Digital Markets Act) entered into force in November 2022 and will fully apply from 2024. These introduce a single EU-wide set of new rules to create a safer and more open digital space and a level playing field with a view to fostering innovation, growth and competitiveness both in the European Single Market and globally.

### **Adequate minimum wages in the EU**

In June 2022, the Council of the EU reached a provisional agreement on new rules to ensure better and more effective protection for workers. These rules establish procedures for setting and updating the adequacy of statutory minimum wages and for promoting collective bargaining. The relevant Directive, which was adopted in October 2022 and must be transposed into Member States' national law within two years, does not prescribe a specific level of minimum wages.

## **Box 4**

### **BALANCE SHEET NORMALISATION STRATEGIES OF THE EUROPEAN CENTRAL BANK, THE US FEDERAL RESERVE AND THE BANK OF ENGLAND**

In December 2022, the Governing Council of the European Central Bank (ECB) announced the key principles for the gradual reduction of Eurosystem's holdings of securities held for monetary policy purposes, in order to ensure that the central bank balance sheet remains consistent with the normalisation of the Eurosystem's monetary policy stance. The holdings of securities under the asset purchase programme (APP) would be declining by EUR 15 billion per month on average from the beginning of March until the end of June 2023, and the subsequent pace of decline would be determined over time. The Governing Council would regularly reassess the pace of the APP portfolio reduction to ensure it remains consistent with the monetary policy strategy, to preserve market functioning, and to maintain firm control over short-term money market conditions.

In February 2023, the ECB decided on the detailed parameters for reducing APP holdings through partial reinvestment, broadly in line with the practice followed under full reinvestments. In particular, the remaining reinvestment amounts would be allocated proportionally to the share of redemptions across each constituent programme of the APP<sup>1</sup> and, under the public sector purchase programme (PSPP), to the share of redemptions of each jurisdiction and across national and supranational issuers. For the Eurosystem's corporate bond portfolio, reinvestments of maturing securities would be tilted more strongly towards issuers with a better climate performance.

The balance sheet normalisation or reduction policy, also known as quantitative tightening, can be seen as a reversal of quantitative easing, under which central banks embarked on purchase programmes for various assets (mostly public sector bonds) following the global financial crisis and the pandemic, with a view to creating favourable financial conditions and raising inflation from very low rates to levels consistent with the target. The securities purchased under such programmes are held in central banks' monetary policy portfolios. With quantitative tightening, central banks aim at reducing the size of their balance sheets to limit money supply in the economy and contain inflationary pressures. Quantitative tightening implies a reduction of monetary policy portfolios either through the partial or zero reinvestment of maturing securities acquired under the asset purchase programmes or through active sales of such securities.

The other two major central banks, i.e. the US Federal Reserve (Fed)<sup>2</sup> and the Bank of England (BoE), have also started to gradually reduce their balance sheets. The strategies pursued by the three central banks exhibit great similarities as well as several differences. A common feature in all three strategies is the prior announcement of the underlying principles and detailed parameters in advance of the implementation of the balance sheet reduction strategy. These announcements set out the main elements of quantitative tightening and provided forward guidance on key parameters such as definition of the primary instrument for adjusting the stance of monetary policy, desired pace of decline, portfolio sequencing, as well as terminal intended point of the balance sheet normalisation process. The timely and clear communication of the general principles and detailed parameters by all three central banks aimed at preparing the markets, thereby ensuring their smooth functioning during the process of quantitative tightening.

### Timeline

The timeline and the parameters of the balance sheet reduction policy vary markedly across central banks. The ECB applied the most compressed timeline and began unwinding the APP portfolio in March 2023, just three months after the announcement of the underlying principles (in December 2022) and one month after the release of detailed parameters in February 2023 (see Figure A). In normalising their balance sheets, both the Fed and the BoE communicated the key principles six months before the start of quantitative tightening (see Figures B and C).

### Primary instrument

All three banks have stressed that key interest rates remain the primary instrument for setting the monetary policy stance, while the reduction of their portfolios is expected to have an ancillary role in the monetary policy normalisation process.

### Pace

The greatest difference across the three central banks relates to the adopted pace of balance sheet normalisation. The BoE is pursuing the most ambitious strategy, as it has gone straight from a full reinvestment policy to zero reinvestments of government bonds already since February 2022 and began selling off gilts in November that year.<sup>3</sup>

1 The APP comprises the public sector purchase programme (PSPP), the covered bond purchase programme (CBPP3), the corporate sector purchase programme (CSPP) and the asset-backed securities purchase programme (ABSPP).

2 This box will not look into the first phase of monetary policy normalisation pursued by the Fed in the wake of the global financial crisis (2015-19).

3 According to BoE estimates, the balance sheet reduction resulting from zero reinvestments of gilts will amount to roughly GBP 70 billion for 2022-23. See Bank of England, Monetary Policy Report, Box A "The MPC's strategy for the mix of monetary policy instruments to deliver tighter policy", August 2021, <https://www.bankofengland.co.uk/-/media/boe/files/monetary-policy-report/2021/august/monetary-policy-report-august-2021.pdf?la=en&hash=BBCA21B8254B381928385A615F0DEC51E111FE43>. This amount was complemented with active sales of securities on a quarterly basis from November 2022 onwards, see <https://www.bankofengland.co.uk/markets/market-notice/2022/october/asset-purchase-facility-gilt-sales-market-notice-20-october-2022>.



Figure A Timeline of ECB balance sheet normalisation

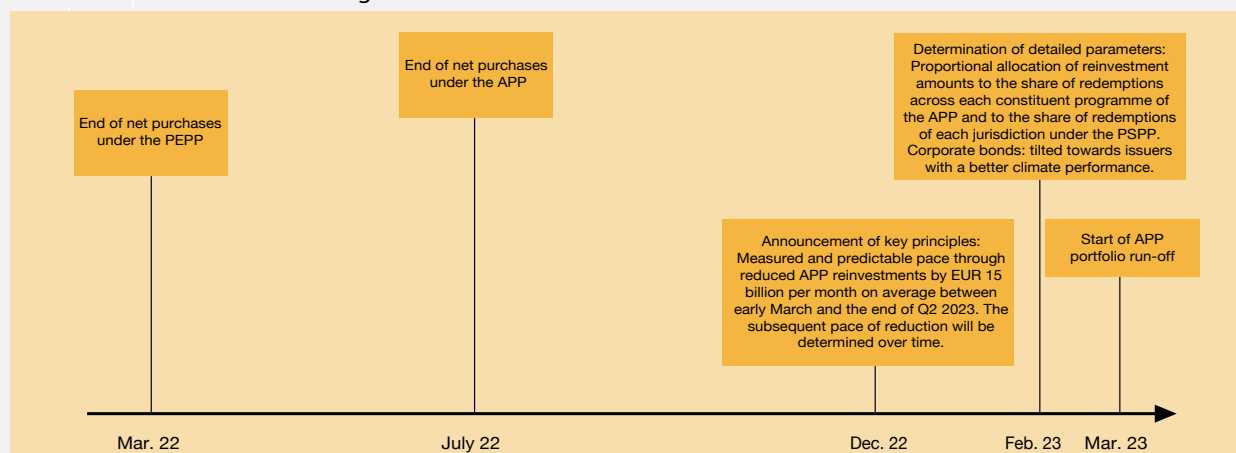


Figure B Timeline of Fed balance sheet normalisation

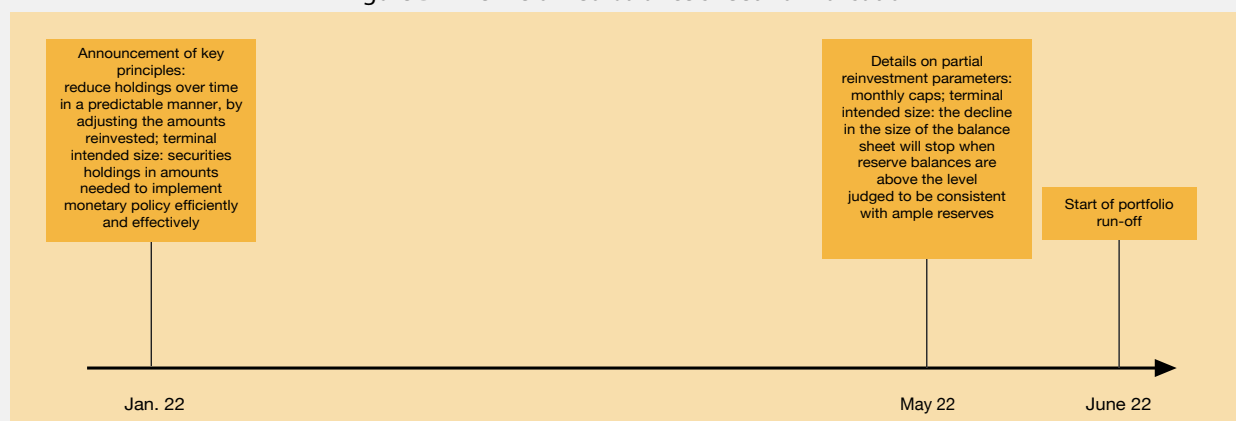
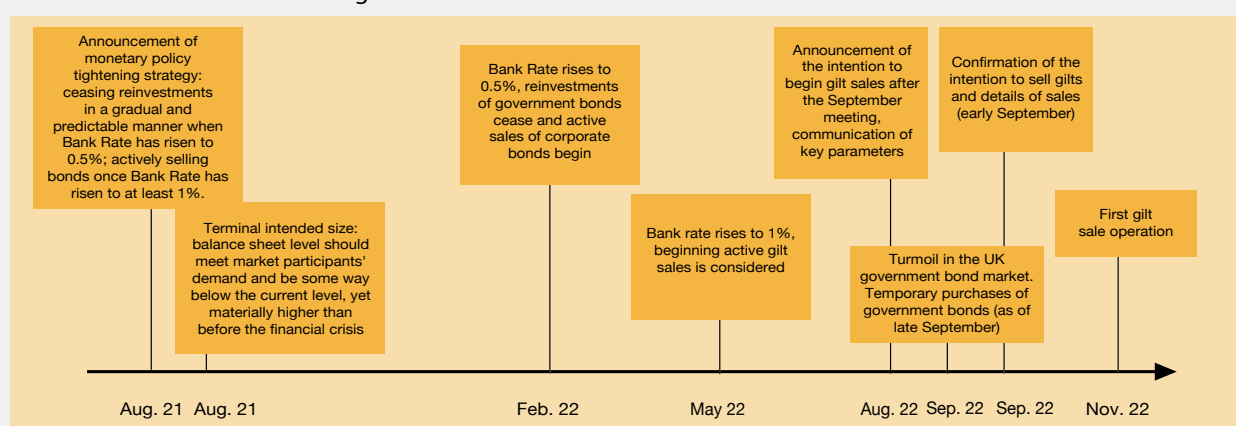


Figure C Timeline of BoE balance sheet normalisation



On the other hand, the ECB and the Fed initially turned to a partial reinvestment policy, at a predictable and measured pace. Specifically, limiting reinvestments by EUR 15 billion per month on average, as pursued by the ECB between March and June 2023, corresponds to around 50% of maturing securities held in the APP portfolio. Besides, the current cap of USD 95 billion per month, in excess of which the Fed continues to reinvest, implies that the Fed is not expected to have a presence in the markets for certain months.<sup>4</sup>

<sup>4</sup> The cap was initially set at USD 47.5 billion for the first three months and was subsequently raised to USD 95 billion, which is split into USD 60 billion for maturing US Treasury bonds and USD 35 billion for maturing mortgage-backed securities.

### Predictability

All three banks have chosen to provide some predictability about the conditions that must be met for the unwinding of their balance sheets. The ECB provided time-contingent forward guidance on the process of balance sheet reduction, by offering a precise indication of timing and pace,<sup>5</sup> while the Fed and the BoE implemented state-contingent forward guidance, by citing explicitly the circumstances that would warrant a balance sheet reduction. For instance, in August 2021 the BoE announced its intention to start reducing the stock of purchased assets when the Bank Rate reaches 0.5% and, if appropriate given the economic circumstances, by ceasing to reinvest government bonds. The BoE also announced that it would consider actively selling some of the stock of purchased assets only once the Bank rate reached at least 1%. On its part, the Fed announced in January 2022 that the shrinking of its balance sheet will commence after the process of increasing the target range for the federal funds rate has begun.

### Terminal intended size

In their initial communications, both the Fed and the BoE provided some indication of the terminal intended size of their balance sheets, by determining the level of reserves needed in line with their operational frameworks. Against this backdrop, while the Fed has announced its intention to maintain securities holdings in amounts needed to implement monetary policy “efficiently and effectively” in an ample reserves regime, the BoE has stressed that it will continue its balance sheet normalisation until reserves “have fallen to the level demanded by market participants at the prevailing level of the Bank Rate.” The BoE assesses that this level of reserves is likely to be somewhat below the current level, yet materially higher than it was before the financial crisis, at any given level of the Bank Rate, given a range of changes over that period, such as changes to funding markets and liquidity regulation. Turning to the ECB, it has announced that the ongoing review of its monetary policy implementation framework will provide information regarding the terminal intended state of its balance sheet normalisation process.

### Flexibility

Lastly, as monetary policy gradually becomes less accommodative, all three central banks acknowledge the importance of incorporating flexibility in the principles governing quantitative tightening, so as to ensure a smooth balance sheet reduction process, without disrupting the functioning of financial markets. Flexibility relates to the reinvestment horizon and asset classes, as well as to the possibility of discontinuing quantitative tightening or resuming net asset purchases, if deemed necessary given the prevailing circumstances. This flexibility has proven very useful in practice, with the BoE embarking on temporary purchases of UK government bonds in September 2022 to contain financial market turmoil.

### Conclusions

With the reduction of their balance sheets, central banks have entered an era of quantitative tightening, on which there is extensive literature but relatively little practical experience. The unwinding of expanded balance sheets is a major challenge to both central banks and market participants. In any event, central banks will be regularly reassessing their strategy to ensure that it remains consistent with the appropriate monetary policy stance and that firm control over financial market conditions is maintained.

<sup>5</sup> Until summer 2022 the ECB had been providing forward guidance that linked the reinvestment horizon to the lift-off of its key interest rates.

### Box 5

#### DRIVERS OF INFLATION IN THE GREEK ECONOMY: THE ROLE OF SUPPLY AND DEMAND

In recent decades, inflation stabilised in all advanced economies, having dropped from double digit levels in the 1980s to around 2% from the 1990s onwards. In Greece, disinflation took a longer time to achieve, but after the fulfilment of the convergence criteria for joining the Economic and Monetary Union (EMU), inflation fell to historic

lows, never exceeding an annual rate of 5%, and even turned negative for several years in the mid-2010s, during Greece's economic adjustment (see Chart A).

Starting in the second half of 2021, inflation in most advanced economies started to rise sharply and, in 2022, reached levels not seen in decades. Russia's invasion of Ukraine triggered a surge in energy costs, primarily for Europe, feeding into headline inflation and, later on, core inflation as well. This added to the upward effect on inflation which resulted from the COVID-19 global pandemic shock and the associated supply chain bottlenecks. Moreover, the unprecedented monetary and fiscal support measures introduced by central banks and governments to mitigate the economic impact of the pandemic are also likely to have played a role in inflation developments (see Box 2 in this publication).

This box aims to investigate the drivers of inflation in the Greek economy over the recent period. The exercise uses the model of Shapiro (2022),<sup>1</sup> which provides a flexible framework for identifying the sources of inflationary pressures, distinguishing between supply and demand shocks. The model has been used extensively in similar analyses by the Federal Reserve, the ECB, and the OECD (see Box 1 in this publication).

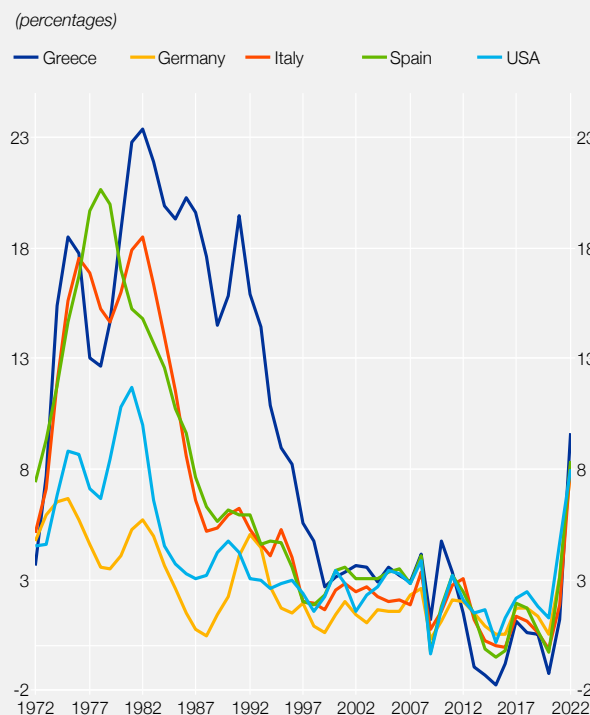
### Drivers of inflation

Inflationary pressures typically have three possible sources. First, they can be the result of supply shocks that increase the cost of inputs, typically energy or imported intermediate goods. This is also known as cost-push inflation. Second, they can be the result of higher demand for a given level of supply, e.g. due to capital inflows or fiscal and monetary easing. This is commonly known as demand-pull inflation. Lastly, they can be the result of rising inflation expectations, which incentivises economic agents to renegotiate long-term contracts at higher prices (e.g. property rents, wages).

Analysing the drivers of inflation is highly relevant for monetary policy. Typically, monetary policy reacts effectively to demand shocks by raising borrowing costs and reducing liquidity, to contain aggregate demand. On the other hand, monetary policy does not react to small and temporary supply shocks, which increase input prices and reduce output, as monetary policy tools cannot affect supply in the short term. Moreover, any change in the monetary policy stance affects the real economy with a lag of several months, implying that a response to temporary shocks could generate undesirable volatility with little gain to be achieved.

However, large supply shocks risk affecting prices in other sectors or industries, especially when they involve intermediate inputs for the rest of the economy, such as energy, thereby raising medium-term inflation expectations and potentially leading to a further, self-sustaining increase in inflation. The oil crisis of the 1970s was such a shock. The consensus view is that the belated response of monetary authorities to rising oil prices at the time allowed inflation expectations to drift up and, together with other measures (wage indexation), led to a large and prolonged rise in inflation. In the current context, to avert a repetition of the 1970s episode of high inflation, central banks in developed countries responded by an initial normalisation and then by a tightening of the monetary policy stance, so as to contain inflationary pressures before they became entrenched and avoid more drastic action in the future.

Chart A Inflation in selected economies (1972-2022)



Source: Ha, J., M.A. Kose and F. Ohnsorge (2021), "One-Stop Source: A Global Database of Inflation", Policy Research Working Paper No. 9737, World Bank, Washington, DC.

<sup>1</sup> Shapiro, A.H. (2022), "Decomposing supply and demand driven inflation", Federal Reserve Bank of San Francisco Working Paper No. 2022-18.

### Model methodology

This box uses a new model to decompose inflation into supply-related and demand related shocks, namely the model developed by Shapiro (2022), as mentioned above. This approach distinguishes between supply-driven and demand-driven contributions to the personal consumption expenditure (PCE) price index. Demand-driven components are identified as those where an unexpected change in prices moves in the same direction as an unexpected change in quantity in the consumption basket each month. Supply-driven components are identified as those moving prices and quantities in opposite directions. For each consumption category, price and quantity regressions are run for the 2001-2022 period.<sup>2</sup> For each quarter in which price and quantity errors (deviations of actual values from those estimated by the model) have the same sign, the shock is assumed to be demand-driven; if they have a different sign, the shock is supply-driven. In reality, supply and demand shocks co-exist, thus the model can identify the relative strength of shocks. Statistically insignificant shocks are categorised as ambiguous.

Consumer price indices are used for 24 categories of goods and services. As consumption data are not available on a quarterly basis for individual sectors, seasonally adjusted sectoral turnover indices are used instead, following the approach of Gonçalves and Koester (2022).<sup>3</sup> Consumer price indices are available at the level of individual goods components.<sup>4</sup> As suggested by Gonçalves and Koester (2022), the matching is experimental and informal, so the results are indicative.<sup>5</sup> The same applies for the analysis in this box, as official seasonally adjusted data for consumer price indices at the level of individual goods are not available. The seasonal adjustment of official ELSTAT data is based on the X13 TramoSeats methodology. The final sample accounts for around 85% of the total consumption basket, as no turnover indices are available for certain consumption components.<sup>6</sup>

### Drivers of inflation in Greece

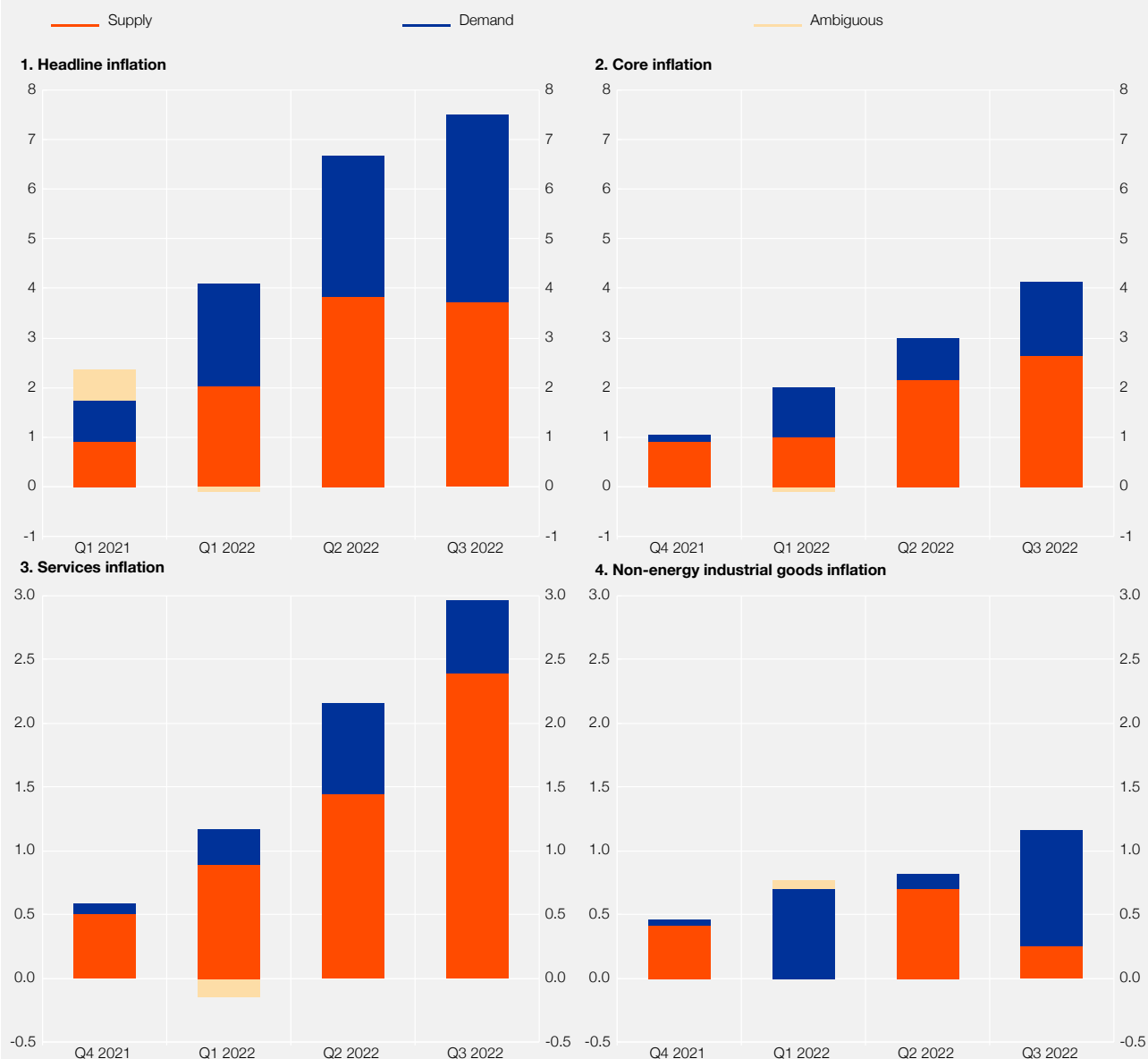
Chart B reports the results of the empirical investigation for inflation, as measured by the Harmonised Index of Consumer Prices (HICP), and its components, on a quarterly basis.

According to the empirical results, at the initial stages of a rise in inflation, when inflation was still moderate, the individual impacts balanced out each other. In the fourth quarter of 2021, there was a significant ambiguous component; however, when inflation peaked in 2022, the supply component became increasingly important, accounting for 52% of headline inflation. A similar picture emerges for core inflation, which excludes energy and food (see Chart B2). Core inflation is used to calculate structural inflation, i.e. inflation that depends on the structure of the economy. Energy and food are often subject to exogenous shocks and their prices are highly volatile, although they do not affect prices in other sectors of the economy in the medium term. Supply shocks had an even larger contribution to core inflation, especially in the second and third quarters of 2022, when in-

- 2 Regressions are in the form of  $x_{it} = \alpha_0 + \alpha_1 q_{it-1} + \alpha_2 q_{it-2} + \alpha_3 q_{it-3} + \alpha_4 q_{it-4} + \beta_1 p_{it-1} + \beta_2 p_{it-2} + \beta_3 p_{it-3} + \beta_4 p_{it-4} + \varepsilon_t$ , where  $q_{it}$  is consumption for any given sector  $i$  in period  $t$  (proxied by the sectoral turnover index),  $p_{it}$  is the price and  $x_{it}$  is the price or consumption, as the case may be. Consumption and prices are expressed in logarithmic increases compared with the preceding period. To abstract from the exceptional impact of the COVID-19 shock, when turnover collapsed, making all series unstable, a statistical sample is used for the period up to and including the fourth quarter of 2019. Moreover, the use of four lags means that the measurements refer to the period from the fourth quarter of 2021 onwards, to exclude the two quarters particularly affected by the pandemic (second and third quarters of 2020).
- 3 While official disaggregated consumption and price data are available in a timely manner in the United States, in European Union countries similar/granular product-level consumption data are only available on an annual basis, i.e. at a frequency not adequate for the purpose of this exercise. See Gonçalves, E. and G. Koester (2022), "The role of demand and supply in underlying inflation – decomposing HICPX inflation into components", European Central Bank, *ECB Economic Bulletin*, Issue 7/2022.
- 4 The matching of sectors and products is based on the methodology proposed by Cai, M. and T. Vandyck (2020), "Bridging between economy-wide activity and household level consumption data: Matrices for European countries", *Data in Brief*, Vol. 30.
- 5 This mainly applies for goods, which are typically sold by intermediary retailers/intermediaries (retailers), implying some distance between the point of production and the point of distribution. For example, retail turnover of the food and beverages sector (NACE G47) covers the following categories of goods: food (CP011), non-alcoholic beverages (CP012) and alcoholic beverages (CP021), weighted according to their respective significance for the sector. As the retail categories are less granular than the categories of goods, some smaller goods items correspond to two sectors.
- 6 Tobacco, furniture repair, education, health services, etc.

Chart B Drivers of inflation (2021-2022)

(inflation in percentages; contributions in percentage points)



Source: Bank of Greece estimates.

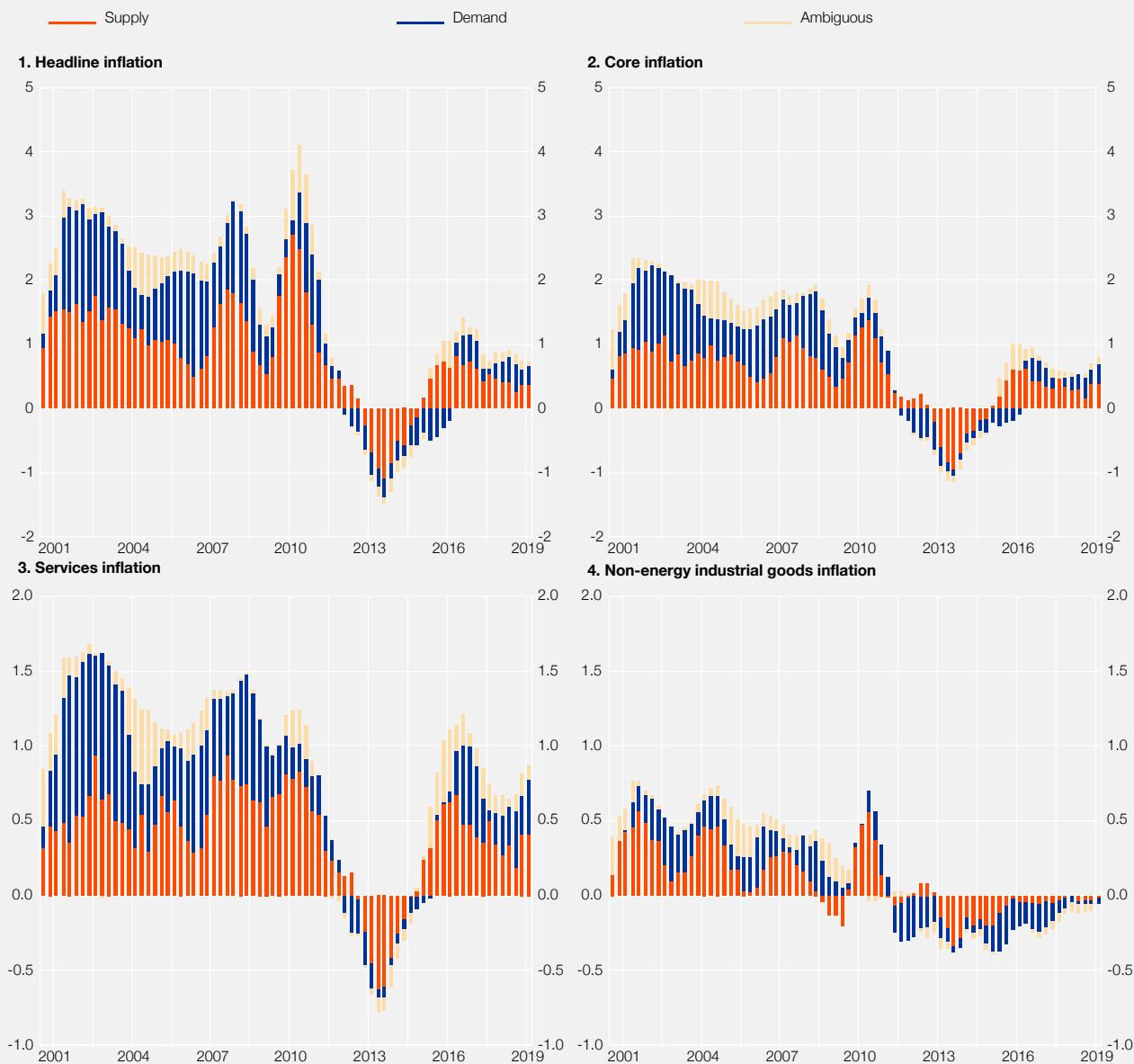
flation hit a more than 20-year high. Overall, about two-thirds of core inflation in these two quarters are attributable to supply shocks.

Core inflation can be further decomposed into services inflation and non-energy industrial goods (NEIG) inflation. Services inflation is typically thought to reflect underlying pressures on inflation, as, in addition to energy costs, it is strongly influenced by labour costs. According to the empirical results for the services inflation (see Chart B3), the contribution of supply appears to be even larger, accounting for three-quarters of the services inflation. In non-energy industrial goods inflation, on the other hand, supply has a smaller contribution and demand plays a more important role overall, relative to the aggregate (see Chart B4).<sup>7</sup>

<sup>7</sup> Non-energy industrial goods only have five sub-components, all of which can, under certain circumstances, be subject to the same shock, as was the case in the fourth quarter of 2021.

Chart C Drivers of inflation (2001-2019)

(inflation in percentages; contributions in percentage points)



Source: Bank of Greece estimates.

It should be noted that the model ignores global market and demand shocks, which are particularly relevant for import-intensive goods items, such as non-energy industrial goods. Shocks in such goods reflect a combination of domestic demand, domestic distribution costs and international production costs. For example, when a global supply shock is combined with strong domestic demand, the model is likely to attribute simultaneous price and consumption growth to a demand shock, while in fact domestic demand does not affect prices.<sup>8</sup> Therefore, the model inherently tends to overestimate the role of demand for imported products.<sup>9</sup>

<sup>8</sup> This is graphically represented by a flat supply curve for the domestic economy, implying that prices depend solely on the supply shock, while consumption on both supply and demand shocks.

<sup>9</sup> According to the literature, large multinational manufacturing companies apply a similar pricing policy across countries sharing the same currency. See Cavallo, A., B. Neiman and R. Rigobon (2014), "Currency unions, product introductions, and the real exchange rate", *The Quarterly Journal of Economics*, 129(2), 529-595.



Finally, Chart C shows the decomposition of inflation into its three components for the 2001-19 period. As in Shapiro (2022) for the United States, supply plays a larger role over time. At the same time, it illustrates how exceptional the current period is compared with the previous decade, particularly in terms of the behaviour of non-energy industrial goods inflation.

### Conclusions and policy recommendations

The pandemic and the energy crises have induced upward pressures on inflation. A key source of uncertainty is the difficulty of delineating the relative contributions of demand and supply factors to this inflation surge. The analysis above uses a new model designed to address this concern and estimates a decomposition of Greek inflation into supply and demand drivers. Results show that supply and demand shocks have had similar contributions to headline inflation in the recent period; however, supply had a clearly stronger impact on core inflation, particularly in services. Underlying inflation pressures therefore emanate mainly from supply shocks, for which the usefulness of monetary policy instruments is limited. On the other hand, it is important for monetary policy to respond to prolonged supply shocks in a timely manner, so as to prevent a build-up of inflationary expectations, and the recent interest rate increases by the ECB should work in this direction. If supply shocks remain contained at low levels, it is likely that disinflation can be achieved without a significant decline in economic activity.

## Box 6

### THE DISTRIBUTIONAL IMPACT OF MEASURES TO ADDRESS THE ENERGY CRISIS IN 2022

The inflation crisis, which started in 2021 due to global supply bottlenecks, escalated in 2022 with Russia's invasion of Ukraine, as high worldwide energy dependency on Russia pushed further upwards the prices of fuels and, subsequently, of other products as well. Rising inflation weighs on household real income, putting pressure on fiscal policy to contain losses. Moreover, given that inflation disproportionately affects lower-income households, which have a higher propensity to consume and a larger share of energy products in their consumption basket,<sup>1</sup> it has negative distributional effects. Therefore, fiscal policy is called upon to support the most vulnerable citizens, not only in order to stimulate consumption and growth, but also to maintain social cohesion by mitigating the adverse distributional effects of inflation.

In Greece, the first fiscal interventions to address the energy crisis were introduced in 2021. They mostly involved subsidies on energy consumption (amounting to EUR 630 million), as well as extraordinary direct financial support to households, such as the one-off lump-sum transfers to low-paid pensioners, disabled people and the uninsured elderly and the double instalment of minimum guaranteed income (totalling EUR 266 million). Similarly, the household and business support measures adopted in 2022 mostly involved<sup>2</sup> subsidies on electricity and gas consumption (EUR 8.1 billion, out of a total fiscal package of EUR 10.7 billion<sup>3</sup>). Other interventions concerned subsidies to farmers and breeders, return of 60% of the increase in electricity bills for households, a pre-paid card for transport fuel (Fuel Pass), support to vulnerable households, an increase in the heating allowance, etc. Regarding in particular financial support to vulnerable households, two fiscal support packages (totalling EUR 816 million) were disbursed in April and December 2022, targeting low-paid pensioners, the long-term unemployed, child benefit claimants, the uninsured elderly receiving OPEKA (Organisation of Welfare Benefits and Social Solidarity) benefits and recipients of disability benefits.

This box aims to analyse the impact of inflation on household disposable income and assess how the latter was affected by the fiscal measures adopted in Greece in 2022, focusing on their distributional effects.

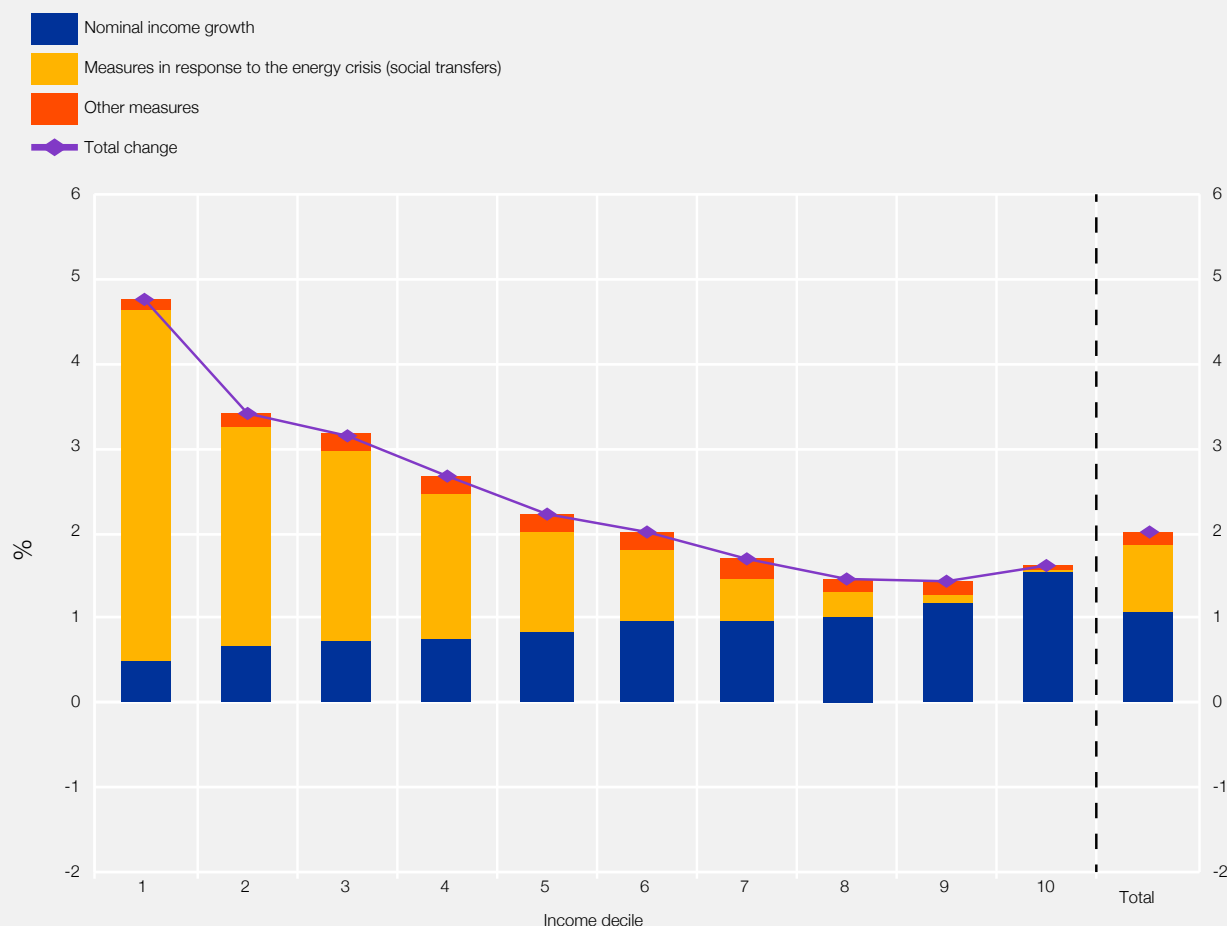
1 Villani, D. and G. Vidal Lorda (2022), "Whom does inflation hurt most?", European Commission, JRC129558.

2 For the composition of the fiscal measures to address the energy crisis in 2022, see Chart V.2, Bank of Greece, *Annual Report 2022*.

3 It should be noted that most of the interventions in response to the energy crisis were financed by revenues from the Energy Transition Fund (TEM), reducing the budgetary cost of support measures to EUR 4.8 billion.

## Change in nominal disposable income\* (2021-2022)

(percentage change by decile of income distribution)



Source: EUROMOD simulations based on EU-SILC 2020 data.

\* Household (equivalised) disposable income is calculated using the OECD equivalence scale, which gives a weight to all members of the household, i.e. 1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; and 0.3 to each child aged under 14. This enables to take into account economies of scale in household consumption, as well as household composition and the different needs of adults and children.

### Methodology

The distributional effects were estimated using the EUROMOD tax-benefit microsimulation model,<sup>4</sup> based on data from the 2020 Household Income and Living Conditions Survey (EU-SILC). As the income reference period for the EU-SILC 2020 is the year 2019, incomes were adjusted to their nominal levels for the years 2021 and 2022. That is, two artificial income distributions were created, which may not fully reflect actual changes.

Next, the change in household disposable income in 2021-22 was decomposed into the change resulting from: (a) the nominal adjustment of income; (b) gains arising from the energy measures; and (c) the impact of other measures.

The analysis focuses on household income support measures in 2022, i.e. it examines a subset of the overall fiscal support package. Specifically, the simulated measures are: (a) support of EUR 200 in April 2022 and EUR 250 in December 2022 to pensioners with a monthly income of up to EUR 600 and EUR 800, respectively; (b) support of EUR 200 in April 2022 and EUR 250 in December 2022 to the uninsured elderly OPEKA; (c) support of EUR 200 in April 2022 and EUR 250 in December 2022 to beneficiaries of disability benefits; (d) a double in-

4 Version I.4.113. For more information on the EUROMOD model, see <https://euromod-web.jrc.ec.europa.eu/>.

stalment of minimum guaranteed income in April 2022 and December 2022; (e) one and a half additional monthly instalments of OPEKA child benefit in April 2022 and December 2022; (f) support of EUR 250 in December 2022 to the long-term unemployed; and (g) an increase in the heating allowance. The total cost of these measures amounted to around EUR 1 billion and accounted for 9% of the total fiscal package.

### Empirical results

Based on the above analysis, the nominal disposable income of households is estimated to have increased by 2% on average in 2022, only partly compensating for higher consumer prices.<sup>5</sup> In addition, a considerable part (about 39%) of the nominal disposable income is attributable to the energy measures. A marginal positive effect is estimated to have come from other measures, mainly related to reduced social security contributions and higher unemployment benefits as a result of the increase in the minimum wage.

Given that income support measures in response to the crisis predominantly target lower-income households that are more vulnerable to inflation, they are progressive in nature, increasing by 4.1% the income of households in the bottom decile where they contribute for almost the entire (87%) of the overall growth in nominal disposable income. The contribution gradually drops as we move to higher income brackets, reaching about 0.03% for the top decile. Therefore, these support measures appear to mitigate inflation-induced income inequality and the disproportionate impact on the purchasing power of lower-income households.

### Concluding remarks and clarifications

Overall, it is estimated that in 2022 the social transfers to households in response to the energy crisis partially compensated for inflation-related losses of household real income and mitigated the impact of rising consumer prices on income inequality. However, the analysis does not address price measures under the energy package, which are of a significantly larger size and less targeted, and may thus have a regressive distributional impact.<sup>6</sup> Moreover, the analysis does not take into account changes in household behaviour but rather looks at first-round distributional effects.

Finally, despite their estimated progressive distributional impact, the energy-related income support measures should remain targeted and temporary, be financed by using the available fiscal space and be accompanied by energy-saving actions and incentives to reduce energy consumption.

<sup>5</sup> See Section 5.1, Bank of Greece, *Annual Report 2022*.

<sup>6</sup> See Amores, A.F., H. Basso, S. Bischl, P. De Agostini, S. De Poli, E. Dicarolo, M. Flevotomou, M. Freier, E. Garcia-Miralles, M. Pidkuyko, M. Ricci and S. Riscado, "Inflation, fiscal policy and inequality -The distributional impact of fiscal measures to compensate consumer inflation", ECB Occasional Paper (forthcoming).

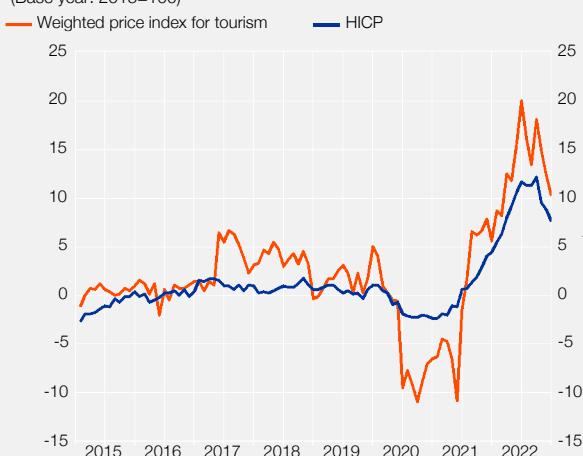
## Box 7

### THE GREEK TOURISM SECTOR: PERFORMANCE AND CHANGES FOLLOWING THE PANDEMIC

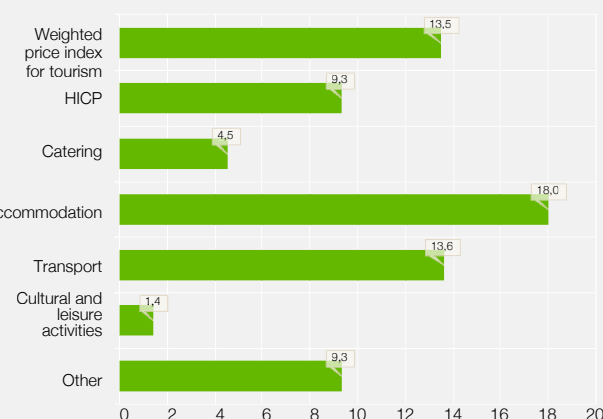
Tourism is a major component of the Greek economy and a sector hard hit by the pandemic worldwide. 2022 was the first year to see a return of tourism activity to pre-pandemic levels, with the relevant aggregates coming quite close to the levels observed in 2019, which had been a very good year for tourism. At the same time, higher energy prices led to a rise in inflation, affecting prices across the sector, as well as travel spending. This box reviews the evolution of total nominal and real tourism receipts and the changes in the sector after its post-pandemic reopening, mainly in comparison with 2019. It also discusses the price competitiveness of the Greek tourism product relative to its major competitors, the changes in demand for and supply of hotel services, with a reference to investment and employment, and, lastly, the tax burden on Greek hotels compared with EU-27 competitor countries.

Chart A Weighted price index for tourism

**1. Evolution of the HICP annual rate of change and the price index for tourism (Jan. 2015 - Dec. 2022)**  
(Base year: 2015=100)



**2. Annual rate of change of the weighted price index for tourism and its components (2022)**



Source: Eurostat, Bank of Greece calculations.

### Travel receipts in nominal and real terms

The tourism sector is made up of a number of closely related activities, including hotels, transport and restaurants.<sup>1</sup> The main goods and services items under travel spending are accommodation (49.2%), restaurants (14.2%), transport<sup>2</sup> (20.4%), cultural and leisure activities (3.5%) and purchase of goods (12.7%).<sup>3</sup> Prices do not evolve in a consistent manner across these categories. The nominal increase in travel receipts is affected by the level of prices. At the same time, rising prices due to the re-emergence of inflation have a negative impact on demand for tourism-related services, as they reduce the disposable income of travellers.

The calculation of the deflated tourism revenue and the estimation process involve two steps.<sup>4</sup> In particular, given the nature of tourism activity, which is made up of the categories mentioned above, neither the headline inflation index nor the hotel-restaurants subindex could adequately proxy the change in prices in the sector, although they have been used in relevant studies.<sup>5</sup> Rather, the appropriate deflator is a composite index based on the weight of each category in total travel expenditure, with the latter being derived from the Border Survey; this index has also been used to develop the pilot tourism satellite accounts for Greece. It should be noted that, instead of the national Consumer Price Index (CPI), the Harmonised Index of Consumer Prices (HICP) was used, which better captures non-residents' expenditure.<sup>6,7</sup> Weighted price developments for the tourism industry are presented in Chart A, which shows that recently these prices increased more than the headline HICP (up by

1 See Bank of Greece (2020), *Monetary Policy 2019-2020*, Box IV.3 "The impact of the COVID-19 pandemic on tourism and the economy".

2 Cross-border transport is not included.

3 See Hackl, P. and S. Hatzimarinakis (2017), "Tourism Satellite Accounts: Potentials and Needs. Technical Assistance action to support tourism planning and policy for the promotion of sustainable tourism development in Greece", EU funded grant project implemented within the framework of the European Commission's Structural Reform Support Service (SRSS).

4 In the first step, total tourist spending is allocated to the individual categories mentioned above. In the second step, the prices in each category are deflated using the respective price subindices for hotels, restaurants, transport and cultural activities and leisure, and the headline HICP for the category of "other goods".

5 See e.g. Morley, C. (1994), "The use of CPI for tourism prices in demand modelling", *Tourism Management*, 15(5).

6 Kasimati, E., E. Kondelis and K. Lagopoulos (2021), "An estimate of international receipts and the turnover of the hotel and food sectors during the second year of the pandemic", KEPE, *Economic Developments*, Issue 46.

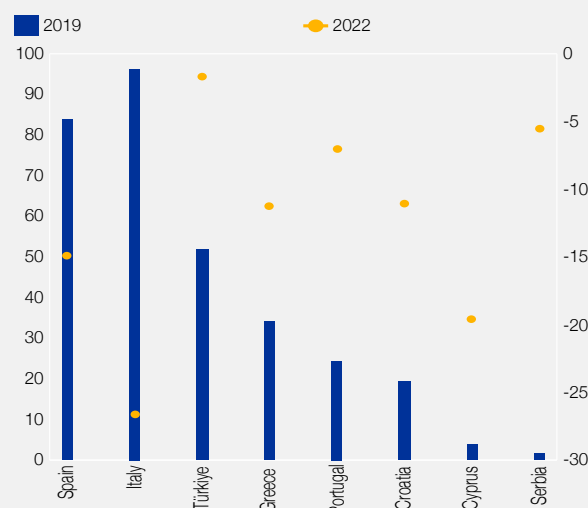
7 Kasimati, E., E. Kondelis and K. Lagopoulos (2020), "Greek tourism during coronavirus: Estimation of non-residents' travel receipts and the turnover of enterprises in accommodation and food service activities", KEPE, *Economic Developments*, Issue 43.

9.3% and 13.5%, respectively, in 2022). Hotel prices rose significantly more than the HICP (18%), while the rise of restaurant prices was milder (4.5%). Transport prices, having also been affected by higher fuel costs, increased by 13.6%. Travel receipts in nominal terms grew by 68.3% between 2021 and 2022, reaching 97.2% of their 2019 level. Receipts growth in real terms, as proxied by the weighted consumer price index for tourism, reached 48.9% in the same period, with a recovery rate<sup>8</sup> of 90.2% at constant prices. In 2022, non-residents' arrivals increased by 89.3% relative to 2021, with a recovery rate of 88.8%.

### Price changes compared with competitor countries

The ranking of Mediterranean countries in global tourism, based on their aggregate share in the global tourism market, improved in the January-September 2022 period, benefiting from the strict lockdowns in other parts of the world, notably in Asia.<sup>9</sup> Greece remained fourth in terms of arrivals (after Spain, Italy and Türkiye), having increased its share of tourist arrivals surpassing its competitors (Spain and Italy). Chart B shows the number of inbound travellers in Greece and in its Mediterranean competitors in 2022, as well as the percentage change compared with 2019. Based on available data for 2022, the smallest declines compared with 2019, thus the strongest recovery to 2019 levels, were recorded by Türkiye and Serbia (-2% and -6%, respectively, in the eleven-month period). While Türkiye remains a popular destination, Serbia is a visa-free country for Russian passport holders. The inflow of Russian travellers to Serbia in 2022 may have been used as a pretext, as many are likely to have left the country due to the war in Ukraine and its impact on their lives in an increasingly isolated Russia. A strong recovery is also observed for Portugal (-7% in the eleven-month period), followed by Croatia and Greece (-11% for 2022 as a whole). By contrast, according to the European Travel Commission,<sup>10</sup> the largest drop in tourist arrivals (over 36%) was seen in the Baltic States, Finland, Romania and Slovakia. Currently, the Baltic States have banned the entry of Russian travellers due to the war, while Slovakia has suspended applications for tourist visas from Russians.

Chart B Tourist arrivals in 2022 and 2019 in Greece and in competitor countries



Sources: Bank of Greece and European Travel Commission (2023). Note: Left-hand scale: Non-residents' arrivals in 2019 (million travellers); right-hand scale: percentage change in tourist arrivals, available data for 2022 vis-à-vis corresponding data for 2019.

Chart C depicts developments in tourism prices in Greece and in a selected set of competitor countries in each month of 2022,<sup>11</sup> based on the overall weighted price index for tourism (panel 1) and the subindices for restaurants and hotels (panel 2). Among Greece's main Mediterranean competitors (apart from Cyprus, which records lower figures), Italy appears to have contained prices in 2022, in stark contrast with Portugal. Moreover, the large depreciation of the Turkish lira and high inflation in Türkiye are factors that attract travellers. Greece appears to lie in the middle in terms of prices vis-à-vis its major competitors. Prices in the Greek restaurant/catering sector remain competitive, having increased less than any other competitor country. On the other hand, accommodation prices in Greece are on the rise, as constrained supply is unable to meet increased demand in popular destinations, but also because higher new investment in the construction of luxury tourist accommodation may have shifted prices upwards.

<sup>8</sup> The recovery rate shows to what extent the relevant variable size returned to its 2019 level. If travel receipts were deflated by the headline HICP, the recovery rate would be 89.6%.

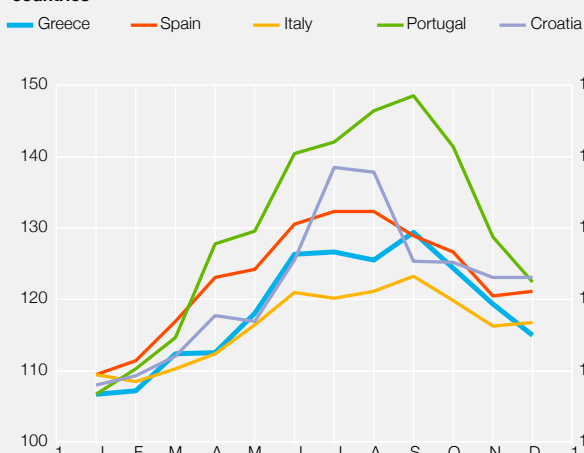
<sup>9</sup> Bank of Greece (2022), *Monetary Policy – Interim Report 2022*, December.

<sup>10</sup> European Travel Commission (2023), *European Tourism, Trends & Prospects*, Quarterly report – Q4 2022.

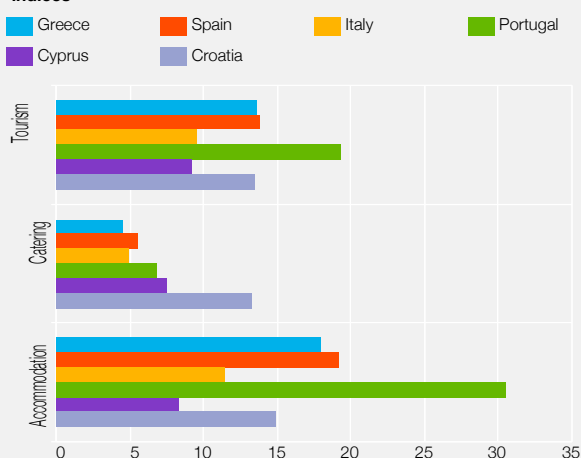
<sup>11</sup> Applying the same allocation of travel spending into categories for all selected countries.

Chart C Price developments compared with competitor countries (2022)

## 1. Monthly evolution of the weighted index for tourism in selected countries



## 2. Total weighted index for tourism and catering &amp; accommodation sub-indices



Source: Eurostat, Bank of Greece estimates.

**Tax burden and competitiveness**

An important factor affecting demand for a country's tourism product is taxation. According to the European Travel Commission (2020),<sup>12</sup> demand has increased for destinations which discount value added tax (VAT) for accommodation. Chart D shows, for each EU-27 country, the standard VAT rate for goods and services, as well as the accommodation-specific VAT rate. As can be observed, all countries except Denmark apply lower VAT rates on accommodation than the standard rate. In Greece, the accommodation tax rate is 13%, the fourth highest in the EU-27, but well below the standard VAT rate of 24%. Most of Greece's competitors in the tourism market apply lower accommodation VAT rates compared with Greece. Specifically, the VAT rate on hotels and other accommodation is 10% in Italy and Spain, 9% in Cyprus and 6% in Portugal. Croatia's accommodation tax rate is 13%, same as in Greece, while its standard tax rate is marginally higher than in Greece (25%). Lastly, in Türkiye, the VAT on hotels and other accommodation was close to zero and was increased to 2%, effective from 1 January 2023.

**Hotels: contribution to economic recovery**

A sector's contribution to the national economy depends on its size and its interactions with other sectors. In terms of their share in active demand, travel spending in Greece accounted for 11% of nominal GDP in 2019, up from 7% in 2021. On the supply side, the share of hotels and restaurants in total gross value added (GVA) was 7% in 2019 and 6% in 2021. Employment in the sector stood at 325 thousand persons in 2021, most of whom worked in full-time jobs.

**Demand for hotel services: a strengthening following the COVID-19 crisis**

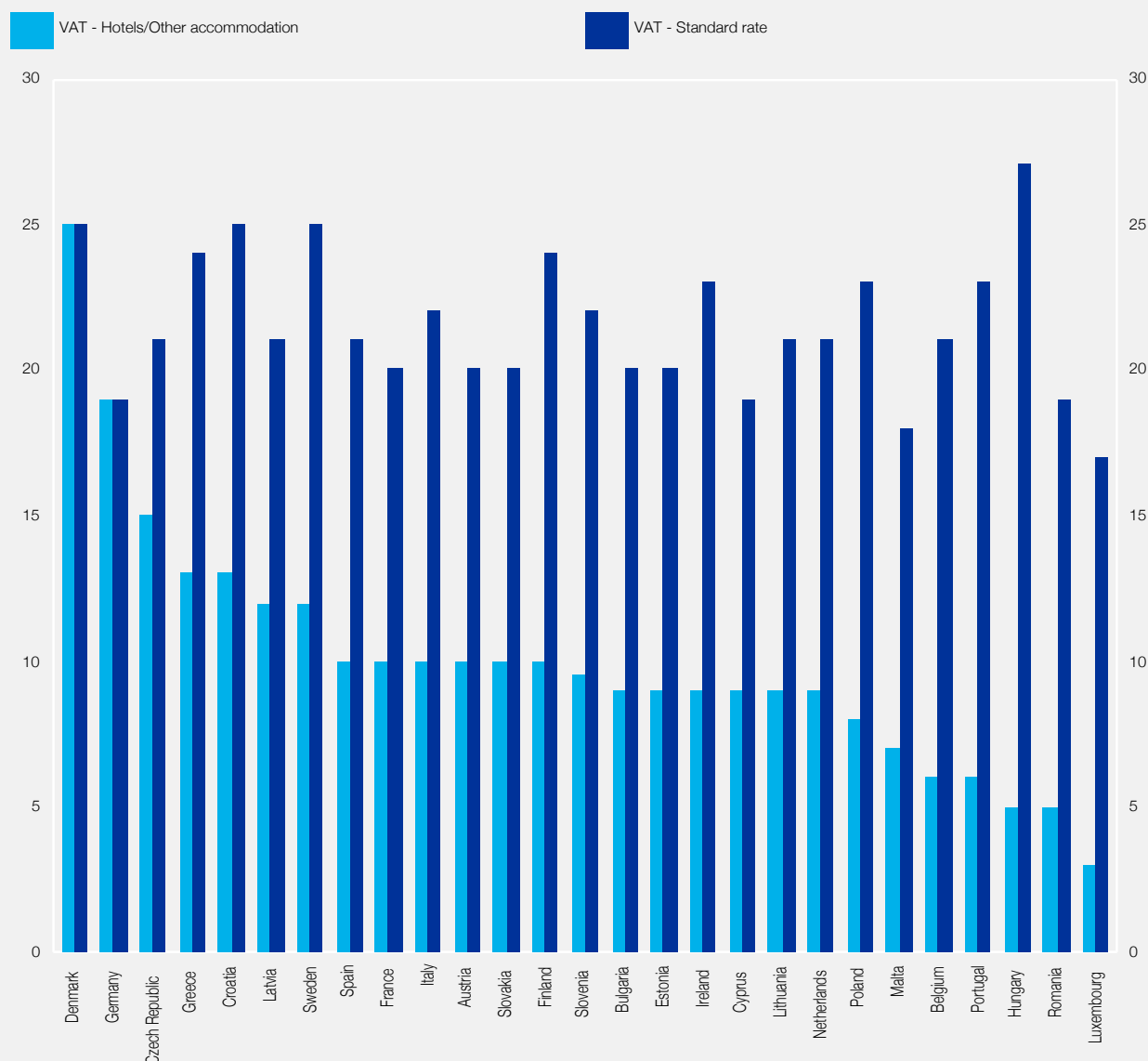
In the past couple of years, as well as before the pandemic, a significant strengthening of tourist flows, along with an upgrading and expansion of the country's hotel capacity and improved tourism services in other sectors (e.g. catering), led to a rise in demand for hotel services. On the basis of data for the first nine months of 2022, arrivals and overnight stays of non-residents at hotels in Greece exceeded prepandemic levels, while the average number of overnight stays per arrival was the same as in 2019 (4.8 nights spent per arrival) (ELSTAT 2022).<sup>13</sup> It should be noted that non-residents make up the vast majority of Greek hotel guests, accounting for around 86% of total overnight stays in 2022.

<sup>12</sup> European Travel Commission (2020), *European Tourism – Trends & Prospects*, Quarterly report (Q4 2019).

<sup>13</sup> Hellenic Statistical Authority (2022), "Arrivals and nights spent in hotels, similar establishments, short-stay accommodation and tourist campsites, January-September 2022 (provisional data)", press release, 22.12.2022.



Chart D Value added tax on hotels in EU-27 countries



Source: European Commission (2021).

The occupancy rate of bed places in hotels recovered in January-September 2022 to 58%, exceeding its prepan-demic level (55% in the same period of 2019) (ELSTAT 2022). Overall, the occupancy rate of hotel accommoda-tion in Greece varies over the year, reflecting strong seasonality given the focus on summer and seaside tourism. Occupancy rates vary widely across Greek regions. In 2021, the highest occupancy rates were seen in the Ionian Islands, the South Aegean and Crete, followed by the region of Attica. Particularly low rates are recorded in re-gions that are less developed tourismwise, such as Western Macedonia, Western Greece and Central Greece (ELSTAT 2022).<sup>14</sup>

#### Supply of hotel services: expanding and upgrading infrastructure

In 2022, the Greek hotel sector expanded its capacity relative to prepan-demic levels. Specifically, 10,133 hotels operated in Greece in 2022, up by 2% from 2019 (9,971). The number of rooms reached 444,597 in 2022, com-

<sup>14</sup> Hellenic Statistical Authority (2022), "Arrivals and nights spent in hotels, similar establishments, short-stay accommodation establishments and tourist campsites, year 2021 (final data)", press release, 21.7.2022.

pared with 43,689 in 2019 (up by 3%), while the number of bed places in hotels came to 886,861, up by 4% from 856,347 in 2019.<sup>15</sup>

Between 2019 and 2022, hotel capacity grew in terms of both number of rooms per hotel (44 rooms in 2022, from 43 in 2019) and number of bed places per hotel (88 bed places in 2022, from 86 in 2019). Moreover, the quality of the country's hotel capacity has been steadily improving since 2019. This development is particularly important, as it is driven by five-star hotels which offer highclass services, thereby boosting Greece's reputation as a destination, and also bring more tourism revenue. In 2022, five-star hotels accounted for 7% of the total, compared with 6% in 2019. Five-, four- and three-star hotels together made up 54% of all hotels in 2022, up from 50% in 2019. Hotel capacity significantly expanded and upgraded across all Greek regions in 2019-22. The largest increase in bed places in five-star hotels was recorded in the regions of Western Macedonia and Epirus through upgrades in existing facilities, as well as in Attica, which overtook Crete and the Southern Aegean at the top of the ranking in terms of number of five-star hotels.

### Conclusions – Way forward and policy recommendations

Tourism activity in 2022 showed a strong momentum, with receipts and arrivals largely recovering to their levels seen in 2019, a very good year for tourism. Importantly, the tourism industry has a direct and an indirect impact on GDP through its interactions with other sectors of the economy. At the same time, this momentum is being dampened by rising prices and the impact on the disposable income of travellers in the main countries of origin.

Greek tourism staged a recovery in the summer of 2022, outperforming other destinations in the Southern Mediterranean region. This encouraging trend reflected growing demand following the lifting of pandemic-related travel restrictions. The recovery in tourism is expected to continue, but at a slower pace as a result of inflationary pressures, weak economic growth and the ongoing war in Ukraine. Increased cost of living is expected to cause a shift in traveller preferences towards cheaper destinations closer to home.

As travel demand returns to its pre-pandemic levels, the sector is faced with major challenges. The European Travel Commission (2022)<sup>16</sup> reports that the erosion of consumers' disposable income is becoming a major concern for both European and long-haul travellers in general. Furthermore, there is an urgent need to strengthen the sector's resilience and competitiveness through innovative and more sustainable approaches for the benefit of society and the planet, while addressing overtourism and environmental concerns.

15 Hellenic Chamber of Hotels (2022), "Greek Hotel Capacity 2022 – Nationwide data. Breakdown of hotel capacity in 2022 by class and region at country level" [in Greek].

16 European Travel Commission (2022), *European Tourism, Trends & Prospects*, Quarterly report – Q3 2022.

### Box 8

#### BREAKDOWN OF FOREIGN DIRECT INVESTMENT FLOWS IN GREECE IN 2021-2022

Foreign direct investment (FDI) flows attract growing attention from policymakers worldwide, as they are a key tool for financing growth, boosting productivity and employment, and introducing innovative technologies<sup>1</sup> in recipient countries. Greece witnessed a significant increase in FDI inflows over the past decade. This box identifies the underlying factors of this development, based on a breakdown of FDI inflows in Greece by type, by country of origin and by industry, and recommends policies to further attract FDI.

1 See Arbatli, E. (2011), "Economic policies and FDI inflows to emerging market economies", IMF Working Paper No. 2011/192; Zairis, A. (2016), "The course of direct investment in the Greek economy", *East-West Journal of Economics and Business*, Vol. XIX, No. 2; Petroulas, P. (2008); "Foreign direct investment in Greece, productivity and technology diffusion", Bank of Greece, *Economic Bulletin*, No. 31; and Bank of Greece (2013), *Annual Report 2012*, p. 105.

In 2021 and 2022, FDI flows into Greece grew markedly (reaching 2.8% and 3.1% of GDP, respectively, up from an average 0.9% for the 2002-18 period). This is attributable to a gradual restoration of confidence in the prospects of the Greek economy, backed by the improved business and economic environment, political stability, stronger public finances and lower tax and social security contributions. The upward trend of FDI started as early as 2019 (2.4% of GDP) and has continued since. It was only interrupted in 2020, as FDI flows remained weak amid the global pandemic crisis. However, the bulk of FDI growth for 2022 was recorded in the first quarter, followed by quarterly declines of 28% and 58%, respectively, in the second and third quarters. This pattern, also seen at a global level, reflected a deterioration of investment climate due to the impact of the war in Ukraine and higher inflation, interest rates and energy prices.<sup>2</sup> Despite the progress achieved in certain areas, the structural competitiveness of the Greek economy falls short of European and international levels, and there is considerable room for further improvement.<sup>3</sup>

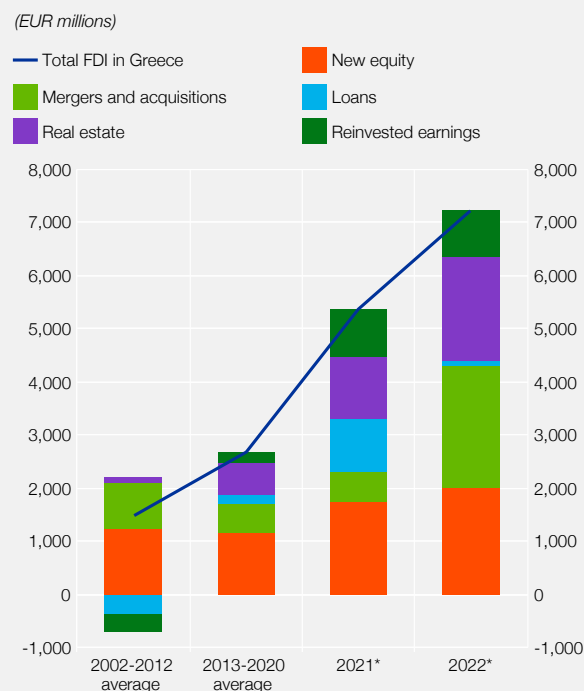
During the 2021-22 period, significant efforts were made to attract foreign investors, and the strong FDI inflows to Greece can be attributed to the completion of planned privatisation deals (which had been delayed in 2020 due to the pandemic) and the spin-off and subsequent sale of the merchant acquiring business by Greek systemic banks. 2022 was the first year of implementation of the three-year strategic plan of the Hellenic Republic Asset Development Fund (HRADF/TAIPED), which involved significant new initiatives and actions.<sup>4</sup> The most significant transactions concerned the partial acquisition of the Hellenic Electricity Distribution Network Operator (HEDNO S.A.) by Spear WTE Investments Sarl; the sale of 100% of DEPA Infrastructure to the Italian group Italgas SpA; and the disbursement of the first tranche from the sale and transfer of Hellinikon S.A. to Hellinikon Global I S.A. (a subsidiary of Lamda Development).<sup>5</sup>

#### A. Breakdown of FDI flows in Greece by financial instrument

Based on balance of payments data compiled by the Bank of Greece, FDI inflows are primarily directed to share capital increases and acquisitions and, secondarily, to real estate investment (see Chart A). Already since 2013, investor interest in real estate has been strong and is associated with the “Golden Visa” programme of the Ministry of Migration and Asylum, offering a residence permit for non-EU citizens (and their family members) who invest EUR 250,000 or more in Greek real estate.<sup>6</sup>

It should be noted that greenfield FDI in Greece remains very low in terms of value,<sup>7</sup> and the number of relevant new projects announced for Greece (2003-21) shows no significant upward trend.<sup>8</sup> Nevertheless, greenfield in-

Chart A Breakdown of FDI flows in Greece by type



Source: Bank of Greece.  
\* Provisional data.

2 OECD, Foreign direct investment in figures, 28.10.2022.

3 Bank of Greece (2022), *Monetary Policy – Interim Report 2022*, December.

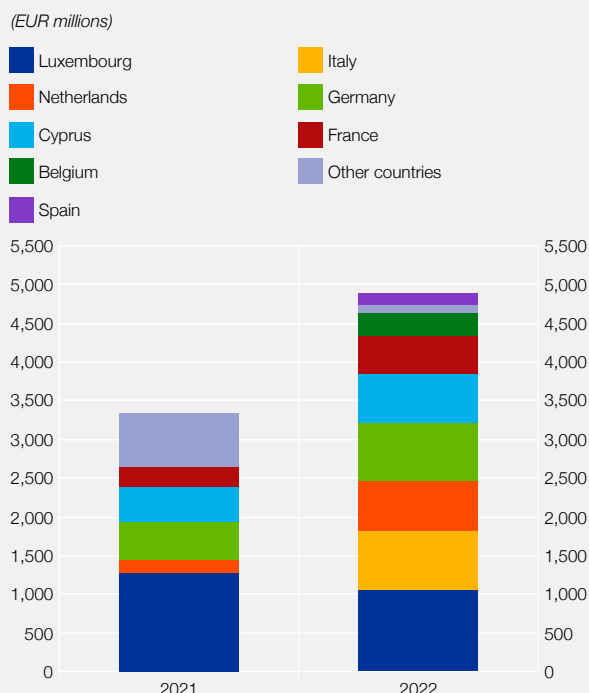
4 Ministry of Finance, *Introductory Report on the 2023 Budget*, November 2022 [in Greek].

5 The deal concerns the largest urban development project in Europe, at the former Ellinikon International Airport area and the coastal zone of Agios Kosmas, see <https://hradf.com/elliniko/>.

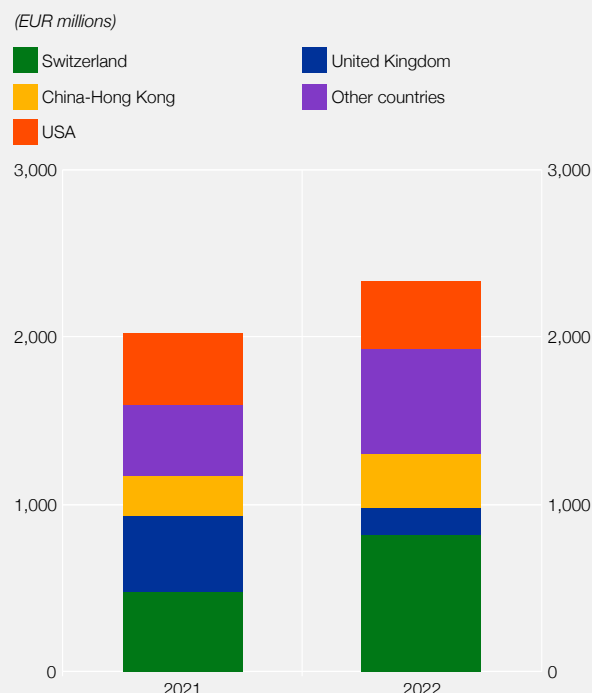
6 The qualifying threshold will be adjusted to EUR 500,000, effective from 2024; the amount refers to the minimum acquisition cost of real estate property or the total contractual rent for hotel accommodation facilities or furnished tourist accommodation in the regional units of North, Central and South Athens (parts of the Attica Region), as well as on the islands of Mykonos and Santorini and in the Municipality of Thessaloniki.

7 Bank of Greece, *Annual Report 2016* [in Greek].

8 UNCTAD, *World Investment Report*, Annex table 14: Value of announced greenfield FDI projects, by destination, 2003-2021, and Annex table 17: Number of announced greenfield FDI projects, by destination, 2003-2021.

**Chart B Breakdown of FDI flows in Greece by partner country (EU countries)**

Source: Bank of Greece.  
Note: Provisional data.

**Chart C Breakdown of FDI flows in Greece by partner country (non-EU countries)**

Source: Bank of Greece.  
Note: Provisional data.

vestment plays a crucial role in increasing available funding for investment in the economy and could attract additional private and foreign investment (crowding-in effect), boosting the growth potential.<sup>9</sup>

#### **B. Breakdown of FDI flows in Greece by partner country and by industry<sup>10</sup> of the direct investment enterprise**

FDI inflows to Greece in 2021-22 mostly originated from advanced economies (see Charts B and C), particularly EU countries (2021: 62% of the total; 2022: 69%), led by Italy and Germany.<sup>11</sup>

The opposite was the case with investment in real estate, where non-EU countries have the largest share (2021: 54%, 2022: 65%), most notably the United States, Hong Kong, Switzerland, the United Kingdom, Singapore and Israel (see Section A above on the “Golden Visa” programme).

Turning to a sectoral breakdown, FDI is mostly directed to manufacturing (food-beverages-tobacco products and other manufacturing industries), services (financial and insurance activities, energy, and real estate management) and private purchases and sales of real estate (see Chart D).

It should be noted that financial activities also include enterprises operating as SPEs (e.g. transactions through financial holding companies) between the direct investor and the ultimate direct investment enterprise (see the partial acquisition of the Hellenic Electricity Distribution Network Operator (DEDDHE) via the MSCIF Dynami Bidco Single Member<sup>12</sup>).

9 Bank of Greece, *Annual Report 2019*, Box II.1 [in Greek].

10 According to OECD methodology, industry allocation is based on the immediate counterparty's economic activity (OECD Benchmark Definition of Foreign Direct Investment – 4th Edition).

11 The geographical allocation of FDI is based on the location of the immediate counterpart, which fails to clearly reflect the origin of investment, as exceptionally high FDI levels are recorded for certain countries (e.g. Cyprus, Luxembourg and the Netherlands) that are significant financial hubs.

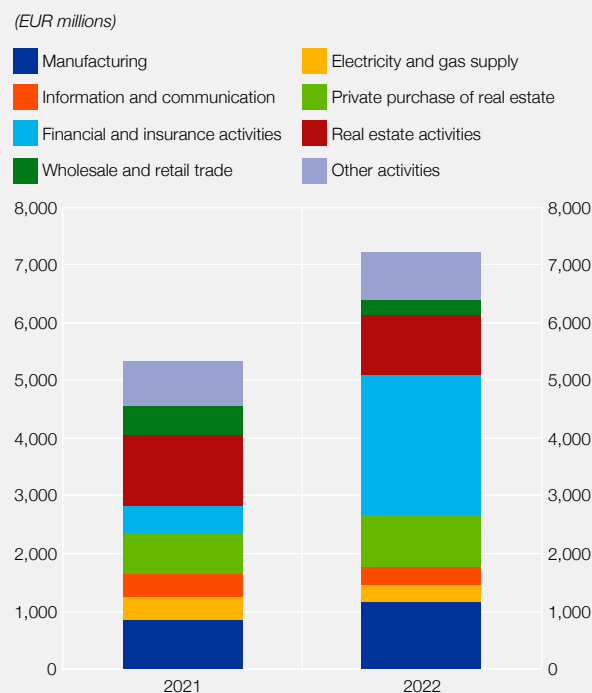
12 Announcement, Public Power Corporation, 20.10.2021.

### Conclusions and policy recommendations

During the 2021-22 period, FDI inflows to Greece registered a continuous upward trend, which was due to structural and temporary factors, as well as to faster implementation of the HRADF strategic plan for the utilisation of public real estate. Moreover, FDI featured high on the policy agenda, and government officials intensified their contacts with potential foreign investors. Yet, green-field FDI remains weak. Key prerequisites for attracting more FDI include upgrades in infrastructure (transport, energy, IT) and skills, fostering research and development (R&D) activity, and the country's integration into global value chains<sup>13</sup>. Additionally, it is important to identify the scope for new opportunities for investment. The Greek government has already been implementing the "Synergassia" programme, including various information activities to promote to the international business community the Greek regions and sectors that show significant growth opportunities.

13 OECD, "The geography of foreign investment in OECD member countries – How investment promotion agencies support regional development", 15.12.2022.

Chart D Breakdown of FDI flows in Greece by industry



Source: Bank of Greece.  
Notes: Provisional data. Other activities: mining and quarrying; agriculture, forestry and fishing; construction and other service activities.

### Box 9

#### CLIMATE CRISIS AND FISCAL RISKS: MACROECONOMIC IMPACTS AND THE ROLE OF THE NGEU

The climate crisis has been characterised as "a potentially catastrophic global externality and one of the world's greatest collective action problems".<sup>1</sup> It is a potential threat to macroeconomic balance as well as to financial and fiscal stability and one of the top systemic risks<sup>2</sup> for the world economy. It is associated with extreme weather events<sup>3</sup> that disrupt social and economic balance, affecting all areas of the economy, including the primary sector, the energy sector, infrastructure, public health and safety and, thus, supply and demand. An effective response to the climate crisis involves a productive transformation of the economy towards green growth. This transition has to take into account cross-country differences and spillovers, especially in the current context of economic volatility, as well as transition costs.

Therefore, the climate crisis is one of the most important collective action problems facing the world, calling for common frameworks for action and cooperation between countries. As a follow-up to the Paris Agreement, which has been ratified by all Member States, the EU has adopted ambitious action plans to achieve climate neutrality by 2050.

This box seeks to identify the channels whereby the impacts of the climate crisis affect fiscal stability and provides policy recommendations for addressing such impacts.

1 IMF, *World Economic Outlook – Housing and the Business Cycle*, April 2008.

2 European Economy, "Global Imbalances: False Alarm or Genuine Source of Concern?", Economic Brief 074, November 2022.

3 For example, the greenhouse effect and global warming, floods, fires and natural disasters.

### The impacts of climate change on fiscal stability

The impacts of climate change on fiscal stability are transmitted via two main channels: (i) through the effect on GDP (macroeconomic effect); and (ii) through the effect on tax revenues and public expenditure relating to measures adopted to address the phenomenon and, thus, on fiscal balance and public debt sustainability.

The macroeconomic effects of climate change on GDP are linked to disruptions to supply and demand in the economy caused by climate change and environmental degradation (physical risks).<sup>4</sup> Extreme weather events damage the productive capacity of the primary sector, cause losses in capital equipment, infrastructure and assets (buildings, etc.) and also weigh on labour productivity, income, employment and wealth, hence consumption, investment and economic growth. It is also worth noting the impact on the current account balance (e.g. via changes in infrastructure investment) as a result of extreme climate conditions,<sup>5</sup> particularly in tourism<sup>6</sup> (through the changing suitability or unsuitability of geographical areas – see the figure).

Fiscal effects and the impact on public debt sustainability can be indirect (resulting from the above-mentioned effects on GDP) or direct (resulting from increased costs of response measures). Extreme weather events are associated with higher expenditures on infrastructure, transfers to affected households and firms, as well as on health and safety; to the extent that they are not budgeted, such expenditures constitute additional costs in the form of contingent liabilities. Moreover, addressing climate migration flows could be linked to social tensions as well as possible additional fiscal costs. The revenue side of the budget would thus reflect both the indirect effects of changes in the tax base (consumption, wages, profits) and in labour productivity and any direct effects of tax relief to affected persons.<sup>7</sup>

Climate shocks affect public debt sustainability through their impact on the primary budget balance, GDP growth and borrowing costs, insofar as these reflect the ease (difficulty) of market access for a country that has (or has not) taken steps towards green transition.<sup>8</sup> As regards the sustainability of Greek public debt, the European Commission's projections<sup>9</sup> consider two global warming scenarios (by 1.5°C and 2°C). They show that, on average, the debt-to-GDP ratio increases in 2032 by 2.6 and 2.8 percentage points, respectively, relative to the baseline debt sustainability analysis scenario.

At the global level, tackling the climate crisis requires the design and implementation of appropriate policies to prevent and address its adverse impacts, while respecting the specificities of each country and its economy, laying the groundwork for smooth and sustainable growth and preserving macroeconomic and fiscal stability.

### Climate crisis and green taxonomy: roadmap for sustainable finance

Besides its negative consequences on people's lives, the climate crisis also has adverse effects on the sustainability of the financial sector and public finances, as it influences decision-making by economic agents (governments, investors, consumers); the latter therefore need tools to better assess, supervise and manage climate risks,<sup>10</sup> but also more broadly to safeguard the green transition of economies.

4 See Batten, S. et al. (2016), "Let's talk about the weather: The impact of climate change on central banks", Bank of England Working Paper No. 603.

5 For quantified results, see IMF (2022), *External Sector Report – Pandemic, War, and Global Imbalances*, August.

6 See Gagliardi, N., P. Arevalo and S. Pamies (2022), "The Fiscal Impact of Extreme Weather and Climate Events: Evidence for EU Countries", European Commission Discussion Paper No. 168, July.

7 Tax revenues per capita equal tax revenues/GDP multiplied by labour productivity (GDP/workers) and by workers/population; see e.g. OECD (2021), "Climate change and long-term fiscal sustainability".

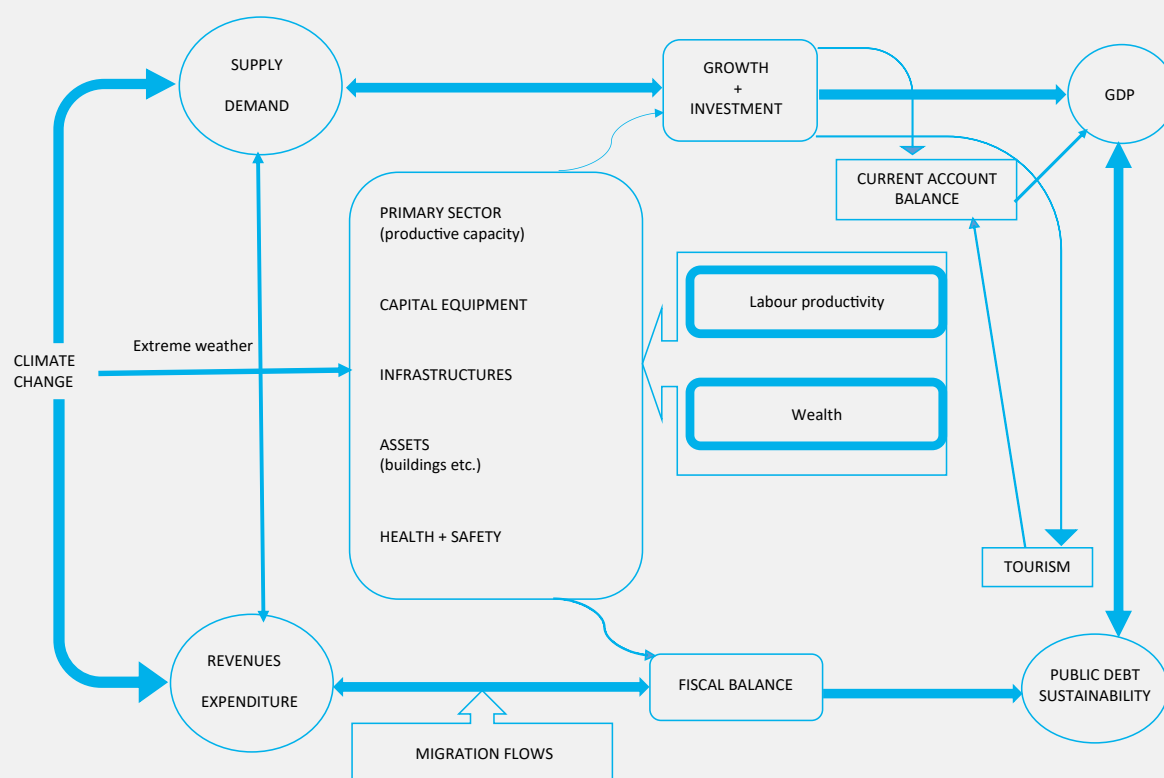
8 See Zenios, S.A. (2022), "The risks from climate change to sovereign debt", *Climatic Change*, 172, 30.

9 European Commission (2022), *Quarterly Report on the Euro Area*, 21(2).

10 For an analysis of these risks see Tobias, A., P. Grippa, M. Gross, V. Haksar, I. Krznar, S. Lamichhane, C. Lepore, F. Lipinsky, H. Oura and A. Panagiotopoulos (2022), "Approaches to Climate Risk Analysis in FSAPs", IMF Staff Climate Note No. 2022/05, <https://www.imf.org/en/Publications/staff-climate-notes/Issues/2022/07/12/Approaches-to-Climate-Risk-Analysis-in-FSAPs-519515>.



Transmission channels of the impacts of the climate crisis to fiscal stability



Against this background, it is crucial to define a set of uniform rules, tools and incentives for a smooth environmental transition.<sup>11</sup> At the European level, this gap is bridged by the EU Green Taxonomy. This is a common classification system establishing a list of environmentally sustainable economic activities, covering more than 90 sectors of the private and public economy, with a view to successfully redirecting investment flows towards projects that help address environmental challenges and protect biodiversity.<sup>12</sup> This is achieved through a five-step process: (1) identification of activities; (2) verification of whether the screening criteria for energy generation are met; (3) verification that no significant harm is caused to the environment; (4) disclosure of quantitative performance data based on sustainability criteria (environmental, social and governance – ESG);<sup>13</sup> and (5) alignment of at least 50% of a firm's turnover with these steps.

Through transparency and information, the EU taxonomy enables market participants and the government to identify any environmentally harmful investment activities. Clearly, by introducing practicable legislation incorporating ESG criteria, governments can strengthen the absorption of EU funds, primarily under the Recovery and Resilience Fund, as compliance with the new European legislation (EU Taxonomy and SFDR<sup>14</sup>) is a key factor

11 See also Bank of Greece, *Annual Report 2021*, Box II.3 “Investment with a positive environmental impact: concept and financing”.

12 In other words, it sets the carbon emission levels and all specific criteria that need to be met for a private or public firm's activities or a financial product to be considered eligible for funding. See European Commission (2020), “Financing a Sustainable European Economy. Technical Report”, March, [https://finance.ec.europa.eu/system/files/2020-03/200309-sustainable-finance-teg-final-report-taxonomy\\_en.pdf](https://finance.ec.europa.eu/system/files/2020-03/200309-sustainable-finance-teg-final-report-taxonomy_en.pdf), and Crabbendam, N. and C. Descio (2022), “The EU taxonomy explained – Here's what it means for your company”, Carbon Trust Insights, <https://www.carbontrust.com/news-and-events/insights/the-eu-taxonomy-explained-heres-what-it-means-for-your-company>.

13 For a company, the three sustainability criteria refer to: (i) its actions for the environment; (ii) its stance towards society; and (iii) its corporate governance.

14 Regulation (EU) 2019/2088 (Sustainable Finance Disclosure Regulation – SFDR) aims to provide greater transparency on the sustainability of financial products in order to direct private capital towards sustainable investments, while preventing greenwashing. Its phasing-in started in March 2021.

in the eligibility of private and public investment. At the same time, the effectiveness of control mechanisms remains a major challenge, given that, under the new legislative framework for EU financing, the competitiveness of Greek firms depends directly on compliance with the above sustainability criteria.<sup>15</sup>

### Green transition targets for the Greek economy

After 2010, and in the context of the three economic adjustment programmes, the Greek energy market was an area of policy action towards the opening-up of energy markets, stronger competition, integration into the single European energy market and increasing investment in renewable energy sources (RES). A distinct feature of the energy reform agenda was a focus on the economic benefits to consumers and firms from the opening-up of markets and less on the need to move to a new green growth model.<sup>16</sup>

The first attempt to specify the main objectives and policy measures for the green transition was made after the end of the third adjustment programme, through the National Energy and Climate Plan (NECP 2019).<sup>17</sup> The initial NECP<sup>18</sup> goals and measures were later revised and modernised by the Climate Law (Law 4936/2022, see Box 19 herein), and further supplemented by the national Recovery and Resilience Plan (Greece 2.0)<sup>19</sup> as part of the NGEU, aiming to accelerate green transition.

With respect to agreed policy objectives, the most profound changes related to the stronger reduction of carbon emissions from 43% to 55% by 2030, aiming at zero net emissions by 2050. A number of additional policy measures have also been adopted, such as the timetable for eliminating the use of fossil fuels, the increase in electricity generation from RES in large buildings, as well as the exclusive sale of electric and hybrid cars as from 2030. The recent Law 4951/2022 on the modernisation of the RES licensing procedure, electricity storage and the framework for the development of pilot floating photovoltaic stations are also steps in that direction.

Further to the initial target-setting, the national Recovery and Resilience Plan (Greece 2.0)<sup>20</sup> helps to achieve these environmental goals and provides essential financing to additional projects aimed at the green transition of the economy.<sup>21</sup> These projects concern, inter alia, the development of infrastructure for electricity storage, power grid interconnection of remote areas, renovation and energy upgrades of public and private buildings, de-

15 Empirical research has found a statistically significant relationship between the calibration of credit risk and the fulfilment of sustainability criteria. See Dumrose, M., S. Rink and J. Eckert (2022), "Disaggregating confusion? The EU Taxonomy and its relation to ESG rating", Finance Research Papers, <https://doi.org/10.1016/j.frl.2022.102928>.

16 For a more comprehensive overview of the main reforms in the Greek energy market during the three successive economic adjustment programmes, see Ioannidis, A. (2022), "Energy Reforms in Greece during the Economic Adjustment Programmes", European Commission, Discussion Paper 166.

17 Ministerial Decision no. 4/23.12.2019 of the Governmental Economic Policy Council (Government Gazette B 4893) ratified the [National Energy and Climate Plan \(NECP\)](#).

18 Consultation is ongoing on a revised NECP, including a significant increase in the share of RES for various uses (electric mobility, heating and cooling, energy saving).

19 At the same time, additional resources to promote the green transition at EU level are also expected through the EU REPowerEU programme, following the proposal to revise the Regulation establishing the Recovery and Resilience Facility towards the inclusion of REPowerEU in the updated national Recovery and Resilience Plans.

20 The EU Regulation establishing the Recovery and Resilience Facility requires at least 37% of the national recovery and resilience plan's total allocation to support climate objectives. In the case of the Greek plan (Greece 2.0), a significant part (37.5%) concerns goals related to green transition, the implementation of which will be supported through grants and loans. Moreover, according to a recent assessment by the European Commission ([European Commission \(2022\), Review report on the implementation of the Recovery and Resilience Facility](#)), reforms and investments proposed by Member States exceed on average the 37% target, with some dedicating as much as 50% of the allocated resources for environmental purposes. Total estimated climate expenditure in the adopted plans amounts to EUR 198 billion, about 40% of the total plans' allocation.

21 According to the assessment of the National Recovery and Resilience Plans against green transition goals ([Green Recovery Tracker](#)) based on implementation data by the end of 2021, the National Recovery and Resilience Plan (including grants and loans) achieved a green spending share of 14%, which increases to 24% if grants only are taken into account.

velopment of electric car charging stations, public transport electrification, as well as the funding of research and development (R&D) to reduce emissions in maritime navigation. In addition, resources are allocated to implement urban and spatial planning reform, as well as to promote important projects such as the creation of infrastructure for urban waste treatment in sensitive areas, e.g. tourist areas – evidently, such actions will create long-term sustainable green jobs.<sup>22</sup>

### Fiscal policy recommendations for green growth

Fiscal policy tools are also instrumental in addressing the consequences of climate change. According to the World Bank,<sup>23</sup> preventive public investments (complementary to private investments) with a scope to mitigate the effects of the climate crisis deliver better results (imply lower economic and social costs) compared to the ex-post corrective fiscal interventions/policies imposed after the occurrence of severe climate events.

According to an OECD country report,<sup>24</sup> in the case of Greece, the State budget could more thoroughly and regularly analyse the environmental impact on fiscal aggregates by applying a risk analysis method. It also stresses the need for a more systematic categorisation of costs according to their contribution to the achievement of environmental objectives (green budgeting).

On the revenue side, in addition to the positive effects of Greenhouse Gas pricing on this type of emissions,<sup>25</sup> the introduction of a single progressive tax on the cost of fossil fuel emissions<sup>26</sup> would create additional fiscal space for targeted support to households (mitigating widening inequalities due to environmental degradation<sup>27</sup>) and firms<sup>28</sup> (to generate fewer greenhouse gases).

Ensuring the effectiveness of fiscal interventions to strengthen the green transition requires: (a) budgetary neutrality intertemporally (e.g. financed through increased taxation or expenditure cuts rather than through budget deficits) and (b) carefully planned financing of preventive actions in the same direction.

Lastly, interventions such as tighter energy efficiency standards for existing buildings, replacing financial support with state-subsidised loans for energy upgrading of buildings (instead of direct cash transfers), higher public investment with a very clear focus on the green transition of the economy,<sup>29</sup> such as through investment in public transport (rail network), clean energy infrastructure and energy networks, targeted assistance to tackle energy costs as well as the horizontal introduction of mandatory building insurance will help to drastically reduce contingent liabilities from climate change and more frequent natural disasters. Similarly, the accumulation of public resources in the form of a Rainy Day fund would help the Greek economy to smooth its way towards green transition.

22 Pissarides, Ch., D. Vagianos, N. Vettas and K. Meyir (2020), "Development Plan for the Greek Economy" ([Pissarides Committee Report](#)). [in Greek]

23 World Bank (2019), *Fiscal policies for development and climate action* (ed. Pigato, M.), Washington, DC.

24 OECD (2023), *OECD Economic Surveys: Greece 2023*, OECD Publishing, Paris.

25 A mechanism that, in environmental terms, acts as an incentive to limit emissions and adopt innovations and new technologies towards green transition.

26 Price levels obtained through the EU Emissions Trading System.

27 According to Cevik, S. and J. Jalles (2022), "[For Whom the Bell Tolls: Climate Change and Inequality](#)", *IMF Working Papers*, No. 103, the effect of climate change on income distribution in developing countries is seven times greater than in advanced economies, as the former tend to have weaker capacity to adapt to its consequences.

28 Moreover, the additional fiscal space could also be used to provide tax incentives towards sustainable private investment financing tools (e.g. green bonds). For details, see IOBE (2023), "[Adaptation to climate change: Challenges and opportunities for the Greek economy](#)". [in Greek]

29 According to Delgado-Téllez, M., M. Ferdinandusse and N. Carolin (2022), "Fiscal policies to mitigate climate change in the euro area", ECB, *Economic Bulletin*, Issue 6/2022, Greece ranks among the countries with the largest share of the requested Recovery and Resilience Plan (RRP) directed towards green transition.

## Box 10

## CONTRIBUTION OF FINANCIAL INSTRUMENTS TO THE EXTERNAL FINANCING OF DOMESTIC BUSINESSES AND PROFESSIONALS

In 2022, financial instruments (FIs) helped direct resources from the European Structural Funds into supporting the liquidity of Greek enterprises and implementing strategic investment. The use of FIs to channel public resources into the real economy was promoted considerably at a European level in 2020 – to compensate for the economic and social consequences of the pandemic – and has been a standard and efficient policy tool ever since.

### 2022 results

In Greece, the liquidity of domestic enterprises was supported in 2022, as in the previous year, mainly through debt and guarantee instruments.<sup>1</sup> These instruments utilise public national and European resources and were mostly deployed with the intermediation of the domestic banking system. More specifically, in 2022, non-financial corporations (NFCs) and professionals received new loans amounting to EUR 4.2 billion backed by instruments managed by the European Investment Bank (EIB) Group<sup>2</sup> and the Hellenic Development Bank (HDB) (see Chart A). Compared with 2021, 2022 saw an increase in disbursements of bank loans related to FIs, which is mainly attributable to the utilisation of available resources under the PanEuropean Guarantee Fund – EGF.

In 2022, in aggregate terms, around 1/5 of new bank loans to NFCs and professionals was associated with programmes offered by the EIB Group and the HDB (a little less than in 2021, see Chart B). These instruments gave a major boost to the liquidity of micro-, small- and medium-sized enterprises (SMEs). Indicatively, during the period under review, more than half of the bank loans to micro enterprises, SMEs and professionals were associated with guarantee or co-financing schemes (EUR 2.9 billion,<sup>3</sup> out of a total of EUR 5.0 billion<sup>4</sup>). The greater contribution of FIs to SMEs' financing is mainly attributable to quotas related to the allocation of funds offered. Moreover, SMEs' demand for cheaper borrowing through FIs is expected to be comparatively higher, due to their limited access to alternative sources of finance.

Among individual programme categories, the largest share (85%) referred to guarantee programmes, under which the State assumes part of the credit risk, otherwise to be carried by the lender. Thus, the bank is obliged to reduce its collateral requirements. At the same time, capital requirements for credit institutions are lower compared with typical lending without State guarantees. In terms of volumes, the Pan European Guarantee Fund contributed the most,<sup>5</sup> covering loans amounting to EUR 3.3 billion (i.e., around 4/5 of total bank lending associated with FIs), with EUR 2.5 billion granted to SMEs.

### Comparison with other euro area countries

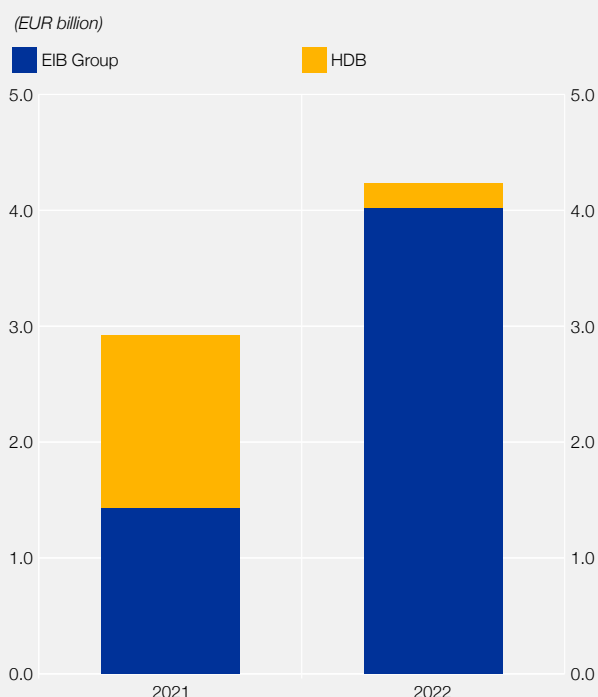
Greece showed remarkable performance in absorbing EU structural and investment funds through FIs during the 2014-20 period. According to a recent report by the European Commission,<sup>6</sup> in terms of total value, Greece ranked first among EU Member States regarding debt instruments and third regarding guarantees.

### Recovery and Resilience Facility

In addition to FIs, domestic businesses have been assisted by low interest loans granted in 2022 under the Recovery and Resilience Facility (RRF). These are in essence co funded loans, with co financing arrangements in

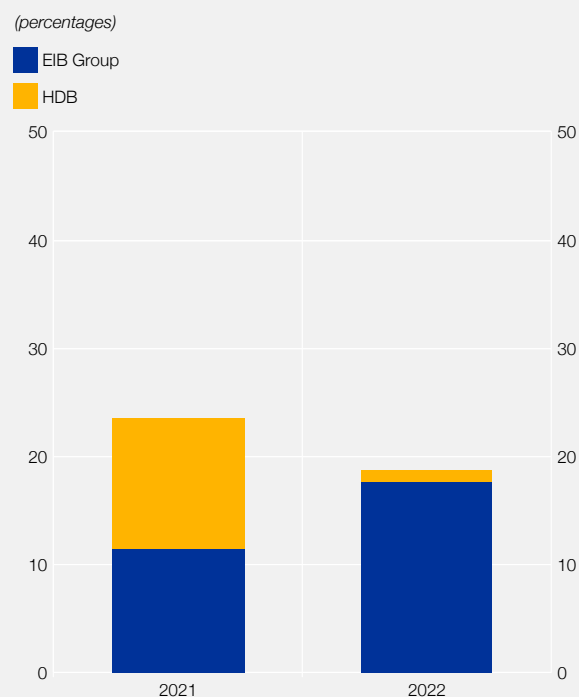
- 1 The most important financial instruments include: (a) debt instruments; (b) risk sharing instruments/guarantees; and (c) equity instruments.
- 2 The EIB Group consists of the European Investment Bank (EIB) and the European Investment Fund (EIF).
- 3 Financial programmes for SMEs include all programmes under the European Investment Fund (EIF) as well as the share of HDB loans to SMEs and micro-enterprises.
- 4 The amount of credit covered by public funds, for which the credit risk is carried by the State (fiduciary loans).
- 5 This was activated in 2020 as part of the emergency measures in response to the pandemic.
- 6 See European Commission, "Summaries of the data on the progress made in financial instruments – Situation as at 31 December 2020" (November 2022).

**Chart A Bank loan disbursements associated with financial instruments to non-financial corporations and professionals**



Sources: Hellenic Development Bank and Hellenic Bank Association.  
Note: HDB: Hellenic Development Bank; EIB Group: European Investment Bank (EIB) and European Investment Fund (EIF).

**Chart B Share of financial instruments in new bank loans to non-financial corporations**



Sources: Hellenic Development Bank and Hellenic Bank Association.  
Bank of Greece calculations.  
Note: HDB: Hellenic Development Bank; EIB Group: European Investment Bank (EIB) and European Investment Fund (EIF).

the total investment expenditure: up to 50% participation of public resources (RRF loans),<sup>7</sup> a minimum of 30% banking leverage (bank loans) and a minimum of 20% own participation. In 2022, loan contracts amounted to EUR 2.5 billion. The minimum interest on RRF loans was 0.35% and, since 24 October, it has remained at 0.35% for small and very small businesses and rose to 1% for other businesses.<sup>8</sup> In aggregate terms, in 2022 and in January February 2023, domestic businesses received bank lending amounting to EUR 0.6 billion, with the bulk of disbursements carried out since the fourth quarter of 2022.

## Outlook

In the future, domestic businesses are expected to benefit from:

(a) Supply of new loans under the Recovery and Resilience Facility: in addition to the EUR 5.3 billion already received, an inflow of EUR 7.4 billion is expected, aiming to co-finance private investment.<sup>9</sup>

(b) Setting up new programmes, by utilising resources under the new Multiannual Fiscal Framework 2021-2027. The new programmes seek to support European Commission priorities and new national priorities, including a reinforced methodology for climate related actions. They might also co-finance Hellenic Development Bank (HDB) schemes, such as the “Economise Autonomise” scheme, aiming to support energy autonomy in housing, or the “Entrepreneurship Fund”, focusing on financing SMEs by providing loans for investment purposes and working capital on favourable terms.

<sup>7</sup> Includes credit covered by public funds under the Recovery and Resilience Facility.

<sup>8</sup> See Joint Ministerial Decision, Government Gazette B 5473/24.10.2022.

<sup>9</sup> Investment pillars: (a) digital transformation; (b) green transition; (c) extroversion; (d) achieving economies of scale through collaborations, acquisitions, and mergers; and (e) innovation-research and development.

## Box 11

## FINANCING CONDITIONS FOR SMES: INSIGHTS FROM THE SAFE SURVEY

The results of the latest round of the Survey on the Access to Finance of Enterprises (SAFE) show that in April-September 2022 small and medium-sized enterprises in Greece reported an increase in the availability of bank loans, supported by banks' increasing willingness to provide credit, although, according to firms, the general economic outlook had a negative impact (albeit not as much as in the euro area). By contrast, in the euro area the availability of bank loans declined, mainly on account of banks' reduced willingness to provide credit, but also due to a significant deterioration in the economic environment. At the same time, financing terms and conditions deteriorated, as enterprises reported a large increase in bank interest rates as well as in other charges, fees and commissions on bank lending in Greece. In fact, the euro area experienced the largest deterioration since the launch of the survey in 2009.

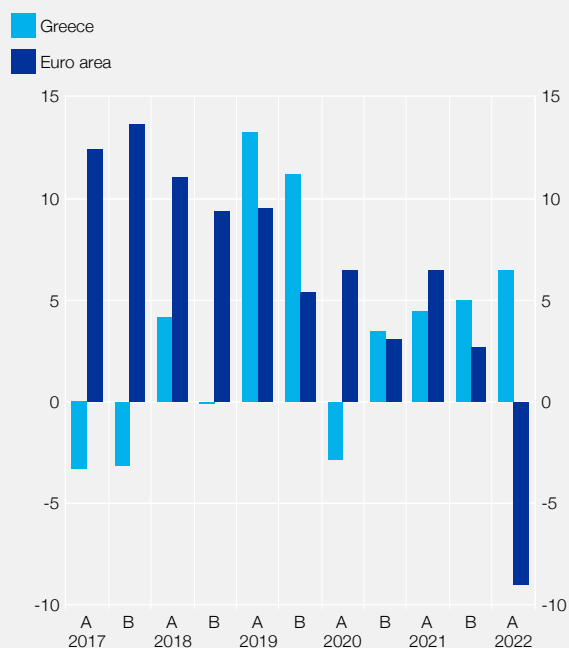
## Availability of external financing to small and medium-sized enterprises

In the most recent survey round, SMEs in Greece reported a positive net percentage<sup>1</sup> in terms of the evolution of the availability of fixed-term bank loans (6%) (see Chart A) as well as credit lines or overdrafts (10%). By contrast, for the first time since the April-September 2014 period, euro area firms reported a deterioration in the availability of bank loans (-9%) (see Chart A) as well as credit lines or overdrafts (-5%). With regard to their access to other non-bank sources of external financing, after a deterioration over the October 2021-March 2022 period, in the latest survey round SMEs in Greece signalled increases in the availability of leasing or hire-purchase<sup>2</sup> (2%) and trade credit (8%). At the same time, in the euro area firms reported no change in the availability of leasing and hire-purchase services and a deterioration in the availability of trade credit (-3%).

With respect to factors affecting the availability of external financing, firms in Greece continued to report a positive impact of banks' willingness to provide credit (12 %), while in the euro area firms reported a negative impact in the most recent round of the survey (-2 %). In Greece, contrary to the previous period, the overall impact of the factors determining firms' solvency<sup>3</sup> was positive, while in the euro area firms reported a positive but significantly weaker impact. By contrast, firms reported a negative impact due to the general economic outlook<sup>4</sup> in Greece (-13%) and much more so in the euro area (-44%). In ad-

Chart A Change in the availability of bank loans to SMEs in Greece and the euro area

(in the corresponding six months, <sup>1</sup> net percentage of respondents<sup>2</sup>)



Source: EC/ECB, Survey on the access to finance of enterprises in the euro area (SAFE).

1 The survey is conducted every six months and covers the periods of April-September (round A) and October-March (round B).

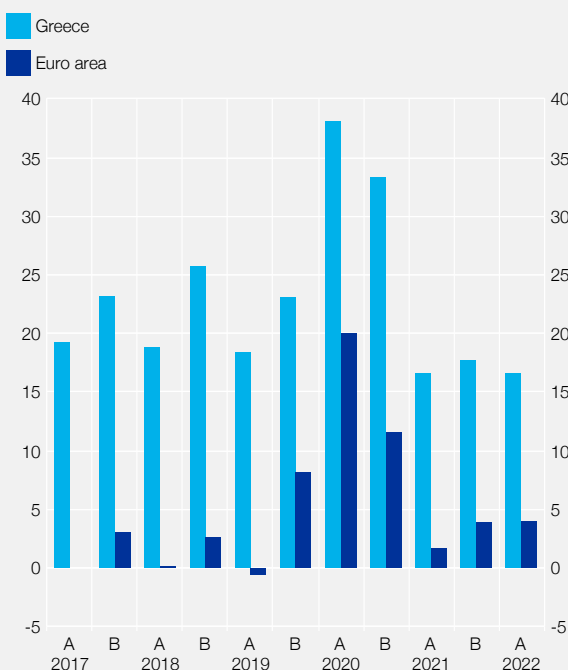
2 The net percentage is the percentage of firms reporting that the availability of bank credit increased minus the percentage of firms reporting that it decreased.

- 1 The results refer to net percentages of respondents, which are defined as the percentage of enterprises reporting that during the past six months a given factor (e.g. availability of bank loans) increased minus the percentage of those reporting that it declined.
- 2 In the survey, leasing or hire-purchase is treated as a financing source which enables firms to obtain the use of a fixed asset (for example, cars or machinery) in exchange for regular payments, but without immediate ownership of the asset.
- 3 This is a sum of the net percentages of three separate factors: (a) firm's credit history; (b) firm's own capital; and (c) firm-specific outlook.
- 4 A negative net impact means that the enterprises reporting that macroeconomic developments favourably affected the availability of external financing were less than those reporting a negative impact.



**Chart B Change in the SMEs' needs for bank loans in Greece and the euro area**

(in the corresponding six months,<sup>1</sup> net percentage of respondents<sup>2</sup>)



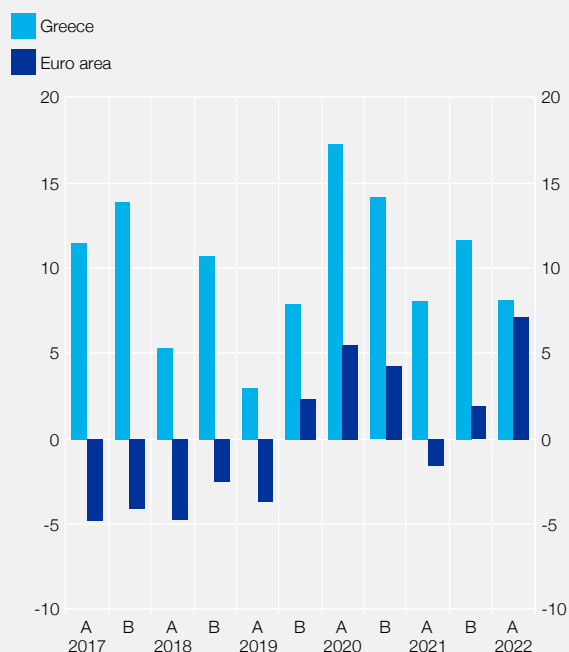
Source: EC/ECB, Survey on the access to finance of enterprises in the euro area (SAFE).

1 The survey is conducted every six months and covers the periods of April-September (round A) and October-March (round B).

2 The net percentage is the percentage of firms reporting that firms' needs for bank loans increased less the percentage of firms reporting that they decreased.

**Chart C Change in SMEs external financing gap indicator in Greece and the euro area**

(in the corresponding six months,<sup>1</sup> weighted net percentage of respondents<sup>2</sup>)



Source: EC/ECB, Survey on the access to finance of enterprises in the euro area (SAFE).

1 The survey is conducted every six months and covers the periods of April-September (round A) and October-March (round B).

2 The external financing gap indicator is calculated as the weighted average of financing gaps (needs minus availability) for each of the five sources of external financing: a) fixed-maturity bank loans, b) credit lines or bank overdrafts, c) trade credit, d) equity, and e) debt securities.

dition, in contrast with successive previous findings after the April-September 2020 period indicating the supportive role of fiscal measures,<sup>5</sup> in the latest survey round firms reported that the fiscal support measures had a negative impact on the availability of external financing (Greece: -4%, euro area: -16%).

### SMEs' external financing needs

Compared with the findings in the period immediately after the outbreak of the COVID-19 pandemic, in the latest round of the survey firms reported for the third consecutive round weaker increases in their needs (i.e. demand) for fixed-term bank loans (Greece: 17%, euro area: 4%) (see Chart B) and for credit lines or overdrafts (Greece: 28%, euro area: 11%), as well as for trade credit (Greece: 22%, euro area: 13%) and leasing or hire-purchase (Greece: 11%, euro area: 11%).

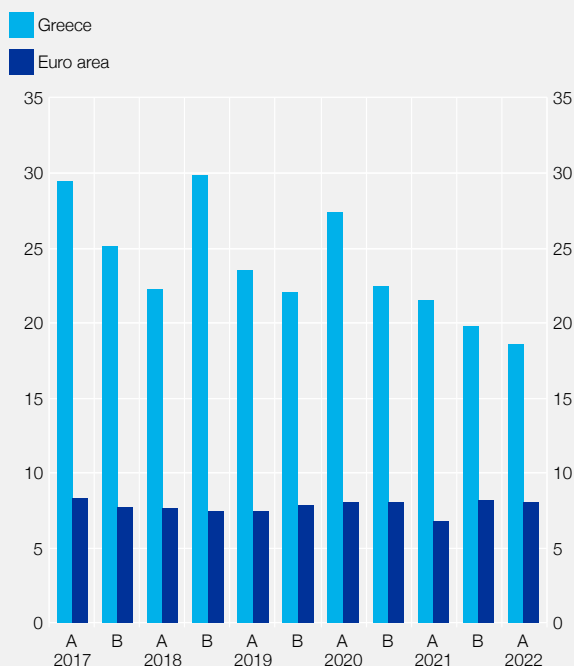
The improvement in the availability of bank credit, coupled with a decline in firms' external financing needs, contributed to a decline in the external financing gap indicator in Greece, to levels similar to the euro area average (Greece: 8%, euro area: 7%), as the significant reduction in the availability of bank loans in the euro area led to a widening in the respective financing gap indicator (see Chart C). At the same time, firms reported that the overall financing obstacles indicator decreased slightly in Greece (19%), while it remained unchanged in the euro area (8%) (see Chart D).

In the period under review, the decline observed after the first phases of the pandemic in the percentage of firms that applied for bank loans continued (Greece: 20%, euro area: 22%), while the percentage of SMEs that were di-

5 SMEs' access to public financial support measures includes, *inter alia*, public co-financing or guarantee schemes for bank loans.

**Chart D Change in the SMEs financing obstacles indicator in Greece and the euro area**

(in the corresponding six months,<sup>1</sup> sum of net percentages of respondents<sup>2</sup>)



Source: EC/ECB, Survey on the access to finance of enterprises in the euro area (SAFE).

<sup>1</sup> The survey is conducted every six months and covers the periods of April-September (round A) and October-March (round B).

<sup>2</sup> The overall financing obstacles indicator is calculated as the sum of the percentages of firms reporting loan applications that were rejected or loan applications for which only a limited amount was granted, as well as the percentage of firms which refused to take the loan due to high borrowing costs and those that did not apply at all out of fear of rejection by the bank.

## Conclusions

In contrast to the euro area, small and medium-sized enterprises in Greece reported an increase in the availability of bank loans, which, coupled with firms' reduced external financing needs, contributed to the narrowing of the external financing gap indicator to levels close to the euro area average. Reflecting the increase in ECB interest rates, small and medium-sized enterprises in Greece and, to an even larger extent, in the euro area, reported exceptionally high increases in bank lending rates. At the same time, both in Greece and the euro area, the main problems of most of the small and medium-sized enterprises in the sample were increased production or labour costs and finding skilled labour.

<sup>6</sup> Respondents were asked whether the level of interest rates on bank loans, overdrafts and credit lines increased.

scouraged from applying for fear of rejection remained low (Greece: 15%, euro area: 5%). The percentage of firms that did not apply for loans due to sufficient internal funds increased in Greece (38%), while it decreased slightly in the euro area (44%). As regards the outcome of bank loan applications, the percentage of applications that were fully or mostly granted increased significantly in Greece (64%), approaching the record highs of the April-September 2010 period, bringing it close to the European average (70%). At the same time, the rejection rate fell in Greece (9%) to its lowest level since the launch of the survey in 2009, while it recorded a small increase (6%) in the euro area, though remaining at relatively low levels.

## Main problems of small and medium-sized enterprises

In the most recent survey round, most SMEs of the sample reported that their main concerns were the lack of skilled labour (Greece: 23%, euro area: 28%) and the increase in production or labour costs (Greece: 18%, euro area: 18%); the next major problem of firms in Greece was access to external financing in Greece (14%) and finding customers in the euro area (12%).

## Bank financing terms and conditions

As regards bank financing terms and conditions, firms reported exceptionally high increases in bank interest rates<sup>6</sup> and other charges, fees and commissions on bank lending (net percentages: 30% and 46% respectively), while the euro area recorded the highest net percentages (63% and 53% respectively) since the launch of the survey in 2009.

## Box 12

### THE BANK LENDING SURVEY<sup>1</sup>

The latest rounds of the Bank Lending Survey, which look at developments in 2022, provide evidence of increasing demand for business and consumer credit in Greece. At the same time, initial growth in loan demand in the euro

<sup>1</sup> The Bank Lending Survey (BLS) is conducted by the Eurosystem on a quarterly basis, using a sample of about 140 banks across the euro area, including the four Greek systemic banks.

area was subsequently offset by negative developments, particularly in housing loans and gradually in consumer and corporate loans. On the supply side, banks in Greece reported that credit standards remained broadly unchanged, but overall terms and conditions on business financing eased somewhat. In the euro area, banks mostly reported a tightening in credit standards, as well as in terms and conditions across all loan categories.

### Loan demand

Credit institutions in Greece estimate that firms' demand for loans recorded a quarter-to-quarter increase in 2022 (see Chart A). Regarding the factors contributing to this development, banks mainly reported firms' increased needs to finance fixed investment, as well as inventories and working capital, while the need for mergers/acquisitions and restructurings contributed to a lesser extent. In the first nine months of 2022, euro area banks reported small increases in the demand for business loans (see Chart A), mainly supported by firms' needs for inventory and working capital financing. By contrast, in the fourth quarter, euro area credit institutions recorded a decline in demand for business loans, mainly reflecting lower needs for fixed investment financing and the impact of the rise in the general level of interest rates.

Banks also reported mixed changes in households' demand for loans. Specifically, demand for housing loans declined in Greece in 2022, except in the first quarter, driven mainly by an increase in the general level of interest rates and deteriorating consumer confidence, although improved housing market prospects played a supportive role. Similarly, in the euro area, demand for housing loans declined during most of 2022, driven mainly by the higher general level of interest rates, as well as by deteriorating consumer confidence and housing market prospects. By contrast, with the exception of the first quarter, credit institutions in Greece reported increases in demand for consumer credit and other loans, supported by increased spending on durable consumer goods. In the euro area, the initial growth (first and second quarter) in demand for consumer credit was offset by ensuing negative developments.

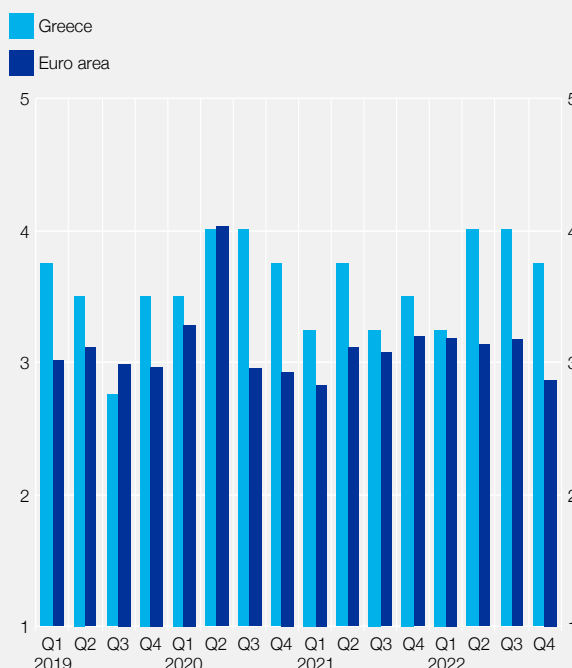
### Loan supply

According to the banks surveyed, credit standards in Greece remained unchanged across all loan categories (see Chart B). In the euro area, credit standards for business loans recorded a small but durable tightening in 2022 (see Chart B), mainly due to the deteriorating outlook of the economy in general, and the industry- or firm-specific situation in particular, as well as banks' lower risk tolerance. As regards housing loans, credit standards in the euro area tightened somewhat following an unchanged first quarter, reflecting an overall deterioration in the economic outlook, as well as in households' solvency and housing market prospects, and also the contribution of banks' lower risk tolerance. With regard to consumer credit, in the euro area the initial slight easing of credit standards in the first quarter was offset by the tightening observed during the remainder of the year, also driven by the deterioration in the economic outlook, as well as in consumers' solvency.

As regards terms and conditions on loans in Greece, the sample reported that they remained unchanged for loans to households, while they relatively eased for business loans in the second quarter (see Chart C), mainly due to pressure from competition and the subsequent narrowing of margins on average-risk loans, as well as on

**Chart A Change in demand for loans by non-financial corporations in Greece and the euro area<sup>1</sup>**

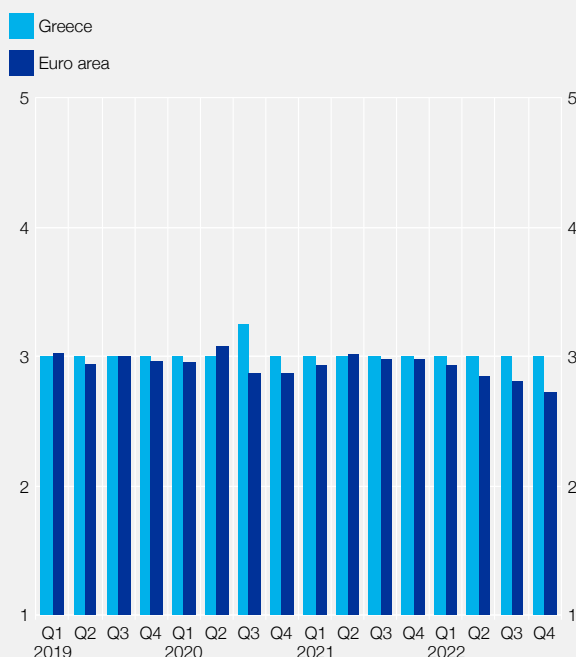
(in the corresponding calendar quarter; average<sup>2</sup>)



Source: ECB/ Bank of Greece, Bank Lending Survey.

<sup>1</sup> Banks' perceptions of changes in demand for loans over the corresponding calendar quarter.

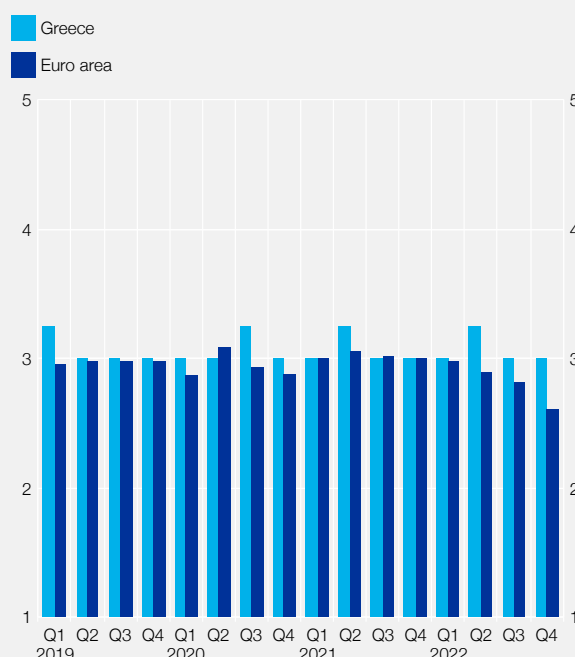
<sup>2</sup> Average of banks' responses using a five-point scale, where demand for loans 1 = "decreased considerably", 2 = "decreased somewhat", 3 = "remained unchanged", 4 = "increased somewhat", and 5 = "increased considerably".

**Chart B Change in credit standards on loans to non-financial corporations in Greece and the euro area<sup>1</sup>***(in the corresponding calendar quarter; average<sup>2</sup>)*

Source: ECB/ Bank of Greece, Bank Lending Survey.

1 Banks' perceptions of changes in credit standards for loans in the corresponding calendar quarter.

2. Average of banks' responses using a five-point scale, where credit standards 1 = "tightened considerably", 2 = "tightened somewhat", 3 = "remained unchanged", 4 = "eased somewhat", and 5 = "eased considerably".

**Chart C Changes in terms and conditions on bank loans to non-financial corporations in Greece and the euro area<sup>1</sup>***(in the corresponding calendar quarter; average<sup>2</sup>)*

Source: ECB/ Bank of Greece, Bank Lending Survey.

1 Banks' perceptions of changes in terms and conditions on loans over the corresponding calendar quarter.

2 Average of banks' responses using a five-point scale, where terms and conditions on loans 1 = "tightened considerably", 2 = "tightened somewhat", 3 = "remained unchanged", 4 = "eased somewhat", and 5 = "eased considerably".

riskier loans. In the euro area, following an unchanged first quarter, credit institutions reported a small tightening of terms and conditions on business loans (see Chart C), mainly driven by banks' lower risk tolerance and the widening of margins on average-risk loans, as well as on riskier loans. In addition, euro area banks reported a tightening in their terms and conditions on housing and consumer loans.

Credit institutions reported that the share of rejected applications for loans to firms remained unchanged in Greece, while in the euro area it recorded a small increase in the third and fourth quarters, following an unchanged first half of the year. As regards loans to households in Greece, the share of rejected applications increased slightly, while it remained unchanged for most of 2022 for consumer credit and other loans, except for a small increase in the second quarter. In the euro area, the share of rejected applications for loans to households increased slightly during most of the year.

### Survey results on ad hoc questions

In their replies to the ad hoc questions regarding their funding sources, banks mostly reported a slight deterioration in their access to medium to long-term debt financing. At the same time, credit institutions in Greece continued to report an improvement in their access to short-term deposits, while a deterioration was reported in the euro area in the third and fourth quarters, following improvements in the first half of the year.

In addition, credit institutions in Greece reported that the evolution of the ratio of non-performing loans had a slight easing effect on credit standards, as well as on terms and conditions on loans to households, while it had a neutral impact on business loans. In the euro area, the evolution of this ratio led to some tightening of credit standards and terms and conditions on business loans, while it had a broadly neutral impact on loans to households.

Regarding the new regulatory and supervisory measures, banks in Greece reported that the measures had a neutral impact on their total assets, but they favourably affected their capital position and financing conditions. In the euro area, credit institutions reported a favourable impact on their total assets and capital positions, but also a small tightening in their financing conditions. Over the past 12 months, the new regulatory and supervisory measures have generally not affected banks' credit standards and lending rate margins in Greece, while they have led to some tightening in the euro area.

As regards funding obtained through TLTRO III, banks reported that their participation had improved their financial situation and increased their lending volumes. Concerning the impact of TLTRO III on credit standards and terms and conditions on loans, credit institutions in Greece reported a neutral impact, while a relative easing was reported in the euro area across all loan categories.

Banks' responses in Greece since the third quarter have been reflecting the results of the increase in the ECB deposit facility rate, indicating a slight improvement in their overall profitability and net interest income, unlike the euro area, where a negative impact was reported.

Credit institutions in Greece reported that the APP had a neutral impact on lending volumes, as well as credit standards and terms and conditions on loans, while an improvement in lending volumes was reported in the euro area, together with some easing of credit standards and terms and conditions on business and housing loans. Banks in Greece reported at the beginning of 2022 that the APP strengthened their assets, liquidity and financing conditions and also improved their profitability and capital position while, following reduced APP financing, they reported a neutral impact on their liquidity, financing conditions and capital position. In the euro area, banks initially recorded improvements in their liquidity and funding conditions and simultaneous deterioration in profitability while, following reduced APP financing, they reported a deterioration in their liquidity position, as well as in their financing conditions and profitability.

### Box 13

## DETERMINANTS OF BANK PROFITABILITY IN GREECE AND IN THE EURO AREA

Improvement of banks' profitability enhances their capacity to absorb adverse external shocks and constitutes a significant motive for them to expand lending, thereby supporting, in turn, economic activity. This box examines the evolution of two profitability indicators for Greek and euro area banks, i.e. the return on equity (RoE) and the net interest margin (NIM), for the period Q2 2015-Q3 2022.<sup>1</sup> In addition, it investigates the determinants of these indicators, putting them into the context of macroeconomic and financial developments.

### Return on equity

According to the literature, bank profitability is determined by macroeconomic as well as financial factors, by sector-specific (e.g. market concentration) and by bank-specific factors.<sup>2</sup> For euro area banks in particular, previous studies have identified real GDP growth and the non-performing loan (NPL) ratio as the key drivers of bank profitability in the period 2007-16.<sup>3</sup>

- 1 For this period, there are published data on euro area banks supervised by the ECB's Single Supervisory Mechanism (SSM) (Supervisory Banking Statistics).
- 2 See e.g. Claessens, S., N. Coleman and M. Donnelly (2018), " 'Low-For-Long' interest rates and banks' interest margins and profitability: Cross-country evidence", *Journal of Financial Intermediation*, 35, 1-16; and Mirzaei, A., T. Moore and G. Liu (2013), "Does market structure matter on banks' profitability and stability? Emerging vs. advanced economies", *Journal of Banking & Finance*, 37, 2920-2937.
- 3 Indicatively, see Elekdag, S., S. Malik and S. Mitra (2020), "Breaking the bank? A probabilistic assessment of euro area bank profitability", *Journal of Banking & Finance*, 120, 105949.

**Chart A Euro area banks' return on equity and economic activity in the euro area**



Sources: ECB, Supervisory Banking Statistics, and Eurostat.

Chart A illustrates the negative impact of the pandemic on bank profitability and its subsequent recovery, in line with the recession and the ensuing rebound of economic activity. More specifically, following the outbreak of the pandemic in early 2020, negative growth rates were accompanied by a decrease in euro area banks' net interest margins and loans and advances to customers by 4.7% and 1.0%, respectively, in 2020. By contrast, in 2021, a year of positive GDP growth in the euro area, both profitability measures increased, by 0.6% and 4.2% respectively. Moreover in 2020, on the one hand, the euro area non-performing loan ratio continued its downward course, helped by the economic support measures, whereas, on the other hand, euro area banks booked increased provisions, fearing a new wave of NPLs. This latter development contributed to a decrease in euro area banks' profitability.<sup>4</sup>

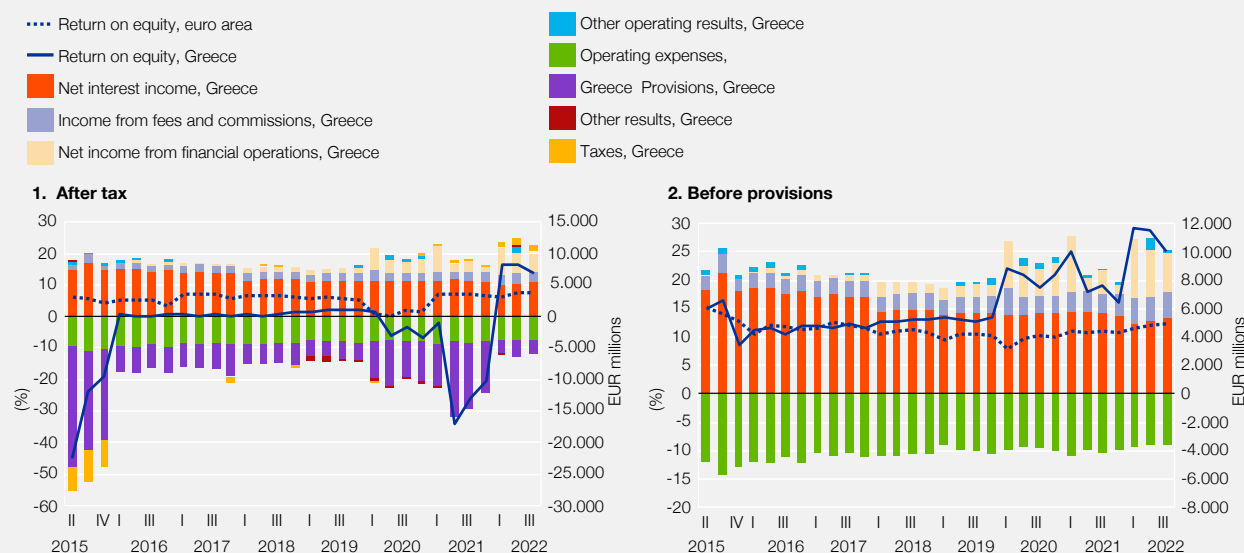
The need to tackle NPLs leads to a decline in bank profitability. In particular, during 2015 and 2020-21, provisioning for credit risk was the main factor behind the

decrease in the Greek banking sector's profitability (see Chart B, panel 1). Excluding the impact of this factor, the return on equity of the Greek banking system would be similar to that of the euro area (see Chart B, panel 2).

More specifically, in the Greek banking sector, while net interest income declined over the reviewed period, the net interest income to equity ratio remained relatively stable, being slightly higher than that of euro area banks in Q3 2022 (21.0% and 17.5%, respectively). Moreover, as part of banks' efforts to diversify their income

**Chart B Return on equity**

(left-hand scale: return on equity; right-hand scale: profit and loss figures)



Sources: Bank of Greece and ECB, Supervisory Banking Statistics.

Note: Return on equity of Greek and euro area banks is calculated on the left-hand panel by dividing net profit/loss by equity at the end of each period and on the right-hand panel by dividing income before provisions by equity. Profit and loss statement figures have been annualised for the purposes of comparability between quarters.

<sup>4</sup> Euro area banks increased their loan-loss provisions by 80.6% in 2020, while they reduced them by 53.1% in 2021.



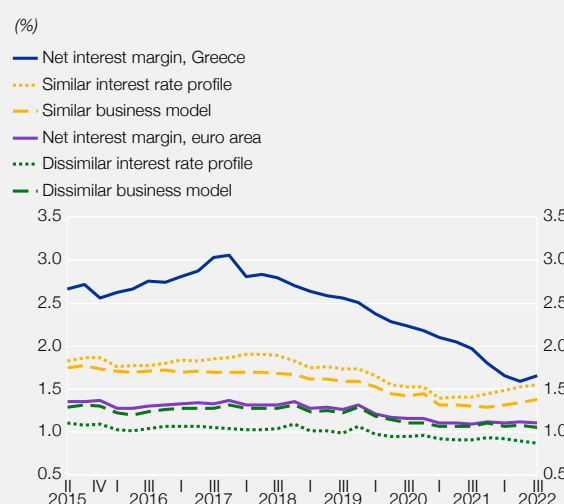
sources,<sup>5</sup> net fee and commission income has increased in recent years. The net fee and commission income to equity ratio has followed an upward trend, yet it remains lower than that of euro area banks, which has been relatively stable over the reviewed period (Q3 2022: 6.6% and 10.1%, respectively). There is also an upward trend in both profits from financial transactions and their ratio to equity, which exceeded the corresponding euro area figure in Q3 2022 (11.2% and 2.9%, respectively). It should be noted, however, that results from financial transactions are subject to significant volatility. As far as operating expenses are concerned, Greek banks have made substantial efforts to contain them, leading to a downward trend, while both their ratio to assets and their ratio to operating income are lower than those of the euro area (Q3 2022: Greece: 1.09% and 35.9%, euro area: 1.15% and 61.4%, respectively).

### Net interest margin

In the current period, during which the ECB raises its key interest rates to fight inflation, banks pass on these increases to lending and deposit rates. Thus, a significant effect on the main source of bank income, i.e. net interest income, is expected. In order to draw conclusions about the potential impact of interest rate increases on bank profitability, the net interest margin is employed.<sup>6</sup> According to the literature, net interest margin is related with monetary policy, macroeconomic variables, whether loans are granted mainly at fixed rates or floating rates, as well as bank-specific factors such as the business model.<sup>7</sup> During periods of monetary policy tightening, banks' net interest margins tend to rise, as the increase in deposit rates is usually slower than that in lending rates, while in floating rate loans the increase is immediate.

The net interest margin is illustrated in Chart C both for Greek and euro area banks. The same chart also presents the net interest margin for different categories of banks, so as to facilitate the comparison with euro area banks which have similar characteristics with Greek ones. It is important to distinguish between banks primarily granting loans at floating rates and banks with predominantly fixed rate loans, as an increase in key interest rates translates faster into a larger net interest margin for the former compared to the latter. For the purposes of the present analysis, euro area countries were classified into those where the majority of loans are granted at floating rates, including Greece and hence labelled "similar interest rate profile" in the chart, and those with the highest proportion of loans granted at fixed rates ("dissimilar interest rate profile").<sup>8</sup> Furth-

**Chart C Net interest margin of Greek and euro area banks**



Sources: Bank of Greece (data and calculations) and ECB, Supervisory Banking Statistics (data).  
Notes: The net interest margin is calculated as:  $(\text{Interest income} - \text{Interest expenses}) / \text{Interest-bearing assets}$ . The latter comprise loans, securities, derivatives and cash and balances with central banks. Other margins are calculated by dividing net interest income from loans, securities or derivatives by the corresponding elements of the assets. Euro area banks with an interest profile similar (dissimilar) to that of Greece include those registered in countries where more floating (fixed) interest rate loans are granted on average. Banks' business models are classified according to the Single Supervisory Mechanism classification. Euro area banks with a business model similar (dissimilar) to that of Greece include those whose funding is based more (less) on deposits by NFCs and households.

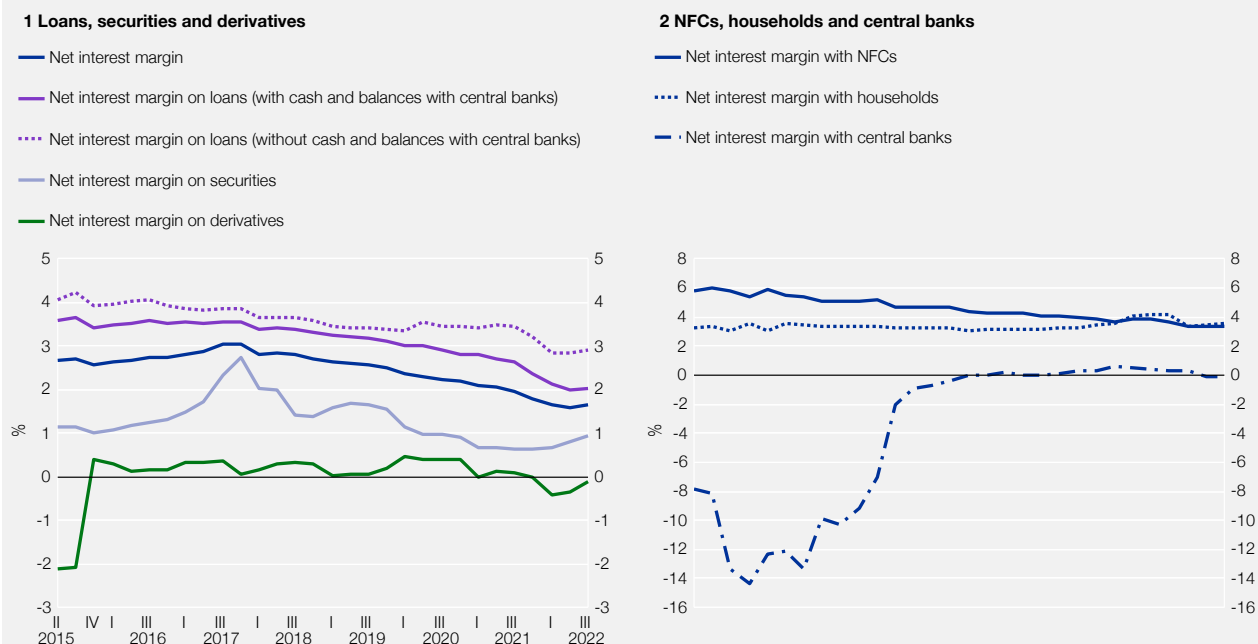
<sup>5</sup> According to the literature, greater income diversification is associated with higher profitability among European banks; see Mergaerts, F. and R.V. Vennet (2016), "Business models and bank performance: A long-term perspective", *Journal of Financial Stability*, 22, 57-75.

<sup>6</sup> The net interest margin is calculated as net interest income over the stock of interest-bearing assets. The numerator comprises the net interest income from loans, securities, derivatives and other assets, and the denominator includes the respective assets that generate interest income.

<sup>7</sup> See ECB (2015), *Financial Stability Review*, Box 5: "Euro area banks' net interest margins and the low interest rate environment"; Borio, C., L. Gambacorta and B. Hofmann (2017), "The influence of monetary policy on bank profitability", *International Finance*, 20, 48-63; and Mergaerts, F. and R.V. Vennet (2016), *op. cit.*

<sup>8</sup> Fixed rate countries: Belgium, France, Germany and the Netherlands. Floating rate countries: Austria, Greece, Estonia, Ireland, Spain, Italy, Cyprus, Lithuania, Luxembourg, Malta, Portugal, Slovenia and Finland. The classification of countries is based on the ECB's MFI interest rate statistics (Statistical Data Warehouse, Risk Assessment Indicators), with "fixed rate countries" identified as those in which the average ratio of fixed-rate new loans to NFCs and households to total new loans exceeds the corresponding euro area average, and with the remaining countries identified as "floating rate countries".

Chart D Net interest margin of Greek banks



Source: Bank of Greece.

Notes: The net interest margin is calculated as:  $(\text{Interest income} - \text{Interest expenses}) / \text{Interest-bearing assets}$ . Other margins are calculated by dividing net interest income on loans, securities or derivatives by the corresponding elements of the assets. The net interest income on loans is presented with and without the effect of the margin with central banks, which is calculated as:  $(\text{Interest income on cash and balances with central banks} - \text{Interest expenses on cash and balances with central banks}) / \text{Cash and balances with central banks}$ .

Moreover, it is meaningful to distinguish banks depending on their business model, which seems to play an important part in profitability. Greek banks mainly focus on retail and corporate credit and have a broad deposit base.

As can be seen in Chart C, the net interest margin in Greece is larger than that of the euro area, but it has shown a convergence trend since early 2018, mainly reflecting a continued decline in Greek banks' net interest income amid NPL sales<sup>9</sup> and weak credit growth. Going forward, the evolution of the net interest margin will be determined by the structure of the Greek banking sector and by the higher funding costs faced by Greek banks, relative to their euro area counterparts, due to their below investment grade credit ratings. Furthermore, it can be seen that the interest margin of euro area banks with a similar business model to that of Greek banks is larger than that of banks with different models; this finding is consistent with evidence in the literature that mainly deposit-funded euro area banks have higher profitability indicators.

Focusing on the most recent period of key interest rate hikes, it appears that the net interest margin of euro area banks operating in countries with a similar interest profile to that of Greece has been on an upward trend since Q4 2021, in contrast with the net interest margin of euro area banks operating in countries where lending is primarily done at fixed interest rates.<sup>10</sup> This finding is also consistent with evidence that changes in the short-term rate mainly affect banks' net interest margins in countries where lending is predominantly done at floating interest rates.<sup>11</sup> Recent reports by credit rating agencies<sup>12</sup> have also pointed out that rising interest rates will

9 The non-performing loans sold typically carry higher interest rates, in line with the associated higher credit risk; as a result, the sale has a disproportionate effect on interest income.

10 It is clarified that the net interest income in absolute terms, i.e. the numerator of the net interest margin, increased in 2022 for banks with both similar and dissimilar interest rate profiles and business models, in response to ECB key interest rate increases.

11 The net interest margin of banks in countries where lending is primarily done at fixed interest rates is mainly affected by the slope of the yield curve and is related to new loan origination. See ECB (2015), *op. cit.*

12 See e.g. Fitch Ratings, *Western European Banks Outlook 2023*, 5.12.2022.

favour banks in southern euro area countries, where the majority of loans are granted at floating rates, while the factors that are expected to weigh on profitability measures, as a result of higher interest rates, are a rise in non-performing loans and the increased cost of market-based funding. It should be noted that an increase in the key interest rates that would be passed through equally to loans and deposits would lead to a decrease in the net interest income in most euro area countries and particularly in Greece where the loan-to-deposit ratio is low.<sup>13</sup>

In the Greek banking sector, the net interest margin followed a slightly upward trend in the period 2016-17, mainly driven by the net interest margin on securities (see Chart D, panel 1). During that period, the net interest margin on loans, including the net interest margin on transactions with the central bank,<sup>14</sup> remained relatively stable, as the benefit from the lower recourse to the more costly ELA (Emergency Liquidity Assistance) funding was offset by a decline in the net interest margin on loans to non-financial corporations (NFCs) (see Chart D, panel 2). In the subsequent period Q1 2018-Q1 2022, the net interest margin trended downwards, mainly due to NPL sales (see footnote 9). The increase in the key interest rates since June 2022, as it was passed on more to loan rates than to deposit rates, led to a slight increase of the net interest margin in Q3 2022.

### Conclusions

Sustained profitability in the Greek banking sector is important both for safeguarding its soundness and overall financial stability and for providing the necessary credit to the real economy. The main factors expected to boost profitability indicators in the foreseeable future are interest rate increases, which will boost net interest income, a potential upgrade of Greece's credit rating to investment grade, which would contain banks' funding costs, continued credit expansion utilising NextGenerationEU funds, a containment of operating expenses by investing in digitalisation and innovation, as well as a strengthening of the fee and commission income from non-credit activities, such as insurance products and asset management. On the other hand, any substantial increase of credit risk as a result of higher interest rates, persistently high inflation, and economic slowdown, coupled with increased market-based funding costs, in a time when there is a heightened issuance activity to meet the minimum requirement for own funds and eligible liabilities (MREL), are expected to have a negative effect on profitability indicators.

13 The ratio of loans to NFCs and households to deposits by NFCs and households in September 2022 was significantly lower in Greek banks compared to that of the euro area (65.5% and 104.8%, respectively).

14 The net interest margin on transactions with central banks is calculated as follows: (Interest income on cash and balances with the central bank – Interest expenses on loans from the central bank) / Cash and balances with the central bank.

### Box 14

#### RISKS TO POLICYHOLDERS ARISING FROM INVESTMENT-LINKED INSURANCE PRODUCTS

Life insurance undertakings offer, among other things, products that cover both the investment and the insurance needs of customers. These types of products concern life insurance linked to investments (or investment funds) and are referred to as "unit-linked". In the Greek insurance market, gross written premiums for unit-linked business have increased in recent years, almost doubling their share in total life insurance written premiums (from 21% in 2019 to 39% in 2022).

#### Benefits and risks of unit-linked products

Unit-linked products offer significant advantages to consumers, primarily because of their potentially higher returns than traditional life insurance policies. The prolonged low-interest rate environment of previous years and the generalized escalation of inflation worldwide in recent years have highlighted the products carrying investment characteristics, as an attractive solution for policyholders.

However, in addition to the potentially higher returns, these products are also associated with certain risks that policyholders should be aware of. First, given that such products are either linked to mutual funds or variable internal funds, i.e., funds managed by the insurance company, they are susceptible to market changes and therefore carry investment risk, which is typically borne by the policyholders themselves. Second, these products come with investment costs, which are transferred to policyholders, which means that the returns at maturity may not turn out according to their expectations. Third, unit-linked products are often characterized by high complexity, thus increasing the risk of misselling (i.e. they do not match the customer's investment and insurance profile), as well as the risk of a mismatch between the policyholder's expectations and the realized returns.

### **Value for money and the role of insurance undertakings**

Insurance undertakings must ensure a fair relationship between the costs and benefits (value for money (VfM)) of unit-linked products; in fact, the Product Oversight and Governance (POG)<sup>1</sup> process requires that customer value is considered throughout a product's lifecycle. However, deviations are observed across the European Union (EU) about how the VfM requirement is perceived by the insurance undertakings and their distributors, as well as in how its application is supervised. For this reason, the European Insurance and Occupational Pensions Authority (EIOPA), as a follow-up to its relevant supervisory statement,<sup>2</sup> developed a methodology for assessing value for money in the unit-linked market,<sup>3</sup> outlining a common supervisory approach across EU and safeguarding that consumer needs are considered throughout a product's lifecycle, namely from the design to distribution stage.

Pricing of unit-linked products is one of the key elements of VfM. According to the latest report of EIOPA on costs and past performance of insurance-based investment products (IBIPs),<sup>4</sup> some products carry high costs, which have material impact on the policyholders' future returns. Insurance undertakings should maintain a structured pricing process with clearly defined and justified charges.

In addition, insurance undertakings, before they launch the unit-linked products, should test them using scenario analysis, and afterwards adapt them accordingly whenever any significant change happens either with regard to the needs, objectives and characteristics of the target market or to market risks. This implies that insurance undertakings should constantly monitor and regularly review their unit-linked products to identify events that could materially affect the main features, the risk coverage, or the guarantees of these products.

Concerning distribution practices, insurance undertakings offering unit-linked products should ensure the completeness and transparency of pre-sale information provided to prospective customers, enabling them to make informed decisions in full awareness of the risks associated with the transaction in question. Moreover, insurance undertakings, as manufacturers of such products, should assess the level of product complexity and consider this when determining the target market and the appropriate distribution strategy.

### **Supervision of the risk of business conduct**

The question of value for money of unit-linked products is of paramount importance to supervisors and is among the priorities of both EIOPA and national supervisory authorities. In this context, the Bank of Greece monitors the efforts of insurance undertakings to offer reasonable value for money to their customers. For this purpose it develops internally appropriate systems for the measurement and evaluation of the risk of business conduct, aiming to identify products that do not seem to comply with the concept of VfM for the policyholders and takes appropriate supervisory actions when necessary.

1 [EIOPA's approach to the supervision of product oversight and governance](#) (October 2020).

2 [Supervisory statement on assessment of value for money of unit-linked insurance products under product oversight and governance](#) (November 2021).

3 [Methodology for assessing value for money in the unit-linked market](#) (October 2022).

4 [Costs and past performance report 2023](#) (January 2023).

## Box 15

## LEADING FINANCIAL INDICATORS OF ECONOMIC ACTIVITY

The rise of inflation to levels last seen in the 1970s prompted a series of sharp and swift interest rate increases by central banks. Against this background, the debate on the economic impact of interest rate hikes has intensified, as have concerns of an imminent recession in major global economies, also as a result of the ongoing war in Ukraine.<sup>1</sup>

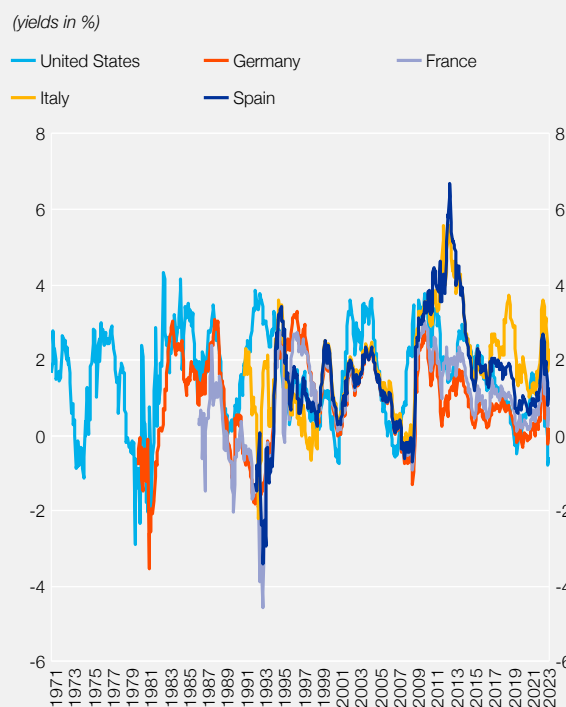
Because of the central role the process of discounting plays in valuations, financial market indicators contain forward-looking information, which may be extracted by using appropriate econometric techniques to separate forward-looking information from other pricing factors. As a result, financial indicators may reflect investor expectations for global economic conditions in the remainder of 2023. In this box, we consider a set of financial variables from the bond and stock markets and assess their predictive power for economic activity. Finally, we econometrically analyse the forward-looking information they provide about economic activity in a number of major euro area economies and the US.

### The yield curve as a predictor of recessions

The slope of the yield curve, i.e. the difference between yields on long- and short-term bonds, is an important leading indicator, frequently used to obtain forward-looking information about economic conditions. In particular, previous research, focusing on the US and other highly-rated economies, has established the relationship of an inverted yield curve as a reliable indicator of impending recession.<sup>2</sup> The reason is that the mechanism for determining long-term yields is based on discounting the expected path of short-term rates. So, an inverted yield curve is associated with an upcoming recession, as investors anticipate that, some time in the future, the monetary policy stance will become easier in order to support economic activity.<sup>3</sup>

Consequently, the observation of an inverted yield curve in the United States, but also in a number of major euro area economies such as Germany (see Chart A), is feeding concerns that a recession may be imminent. This is also corroborated by the downward revision of expected growth rates, as a result of the initial estimates of the economic impact of the war in Ukraine.<sup>4</sup> However, relying solely on yield curve signals to assess the probability of an

Chart A Yield curve slope



Source: Refinitiv.

Note: Data shown for selected euro area economies and the US refer to spreads between yields of 10-year benchmark bonds and rates of 3-month notes.

- 1 See e.g. "Slowing global economic growth is increasingly evident, high-frequency data show", IMF Blog, 13.11.2022 (retrieved on 26.1.2023).
- 2 See, among others, Estrella, A. and G.A. Hardouvelis (1991), "The term structure as a predictor of real economic activity", *Journal of Finance*, 46(2), and Estrella, A. and F. Mishkin (1996), "The yield curve as a predictor of recessions", *Current Issues in Economics and Finance*, 2(7).
- 3 In the United States, each time the 10 year-3 month term spread has turned negative since 1973, a recession has ensued within the next two years (see Box A "Yield curve inversion and recession risk", *BIS Quarterly Review*, September 2019, 7-8).
- 4 Indicatively, the European Commission's February 2022 forecast for Germany had been for a rate of GDP growth of 3.6% in 2022; this fell to 1.6% in the autumn 2022. For 2023, the November 2022 forecast projected a recession of 0.6% as opposed to the 2.6% economic growth assumed in the February 2022 forecast. Turning to the euro area as a whole, the February 2022 forecast had been for economic growth of 2.7% in 2023; this figure dropped to 0.3% in the November 2022 forecast.



impending recession would be precarious, considering the strong cyclical nature of this indicator. Specifically, recent work has highlighted the need to take into consideration, in addition to the yield curve signals, the initial conditions of the economy.<sup>5</sup> For instance, when employment dynamics are strong, as is currently the case in the United States, a negative impact on economic activity, such as that caused by the rises of interest rates, will take some time before it is actually reflected as an increase in the unemployment rate, ultimately delaying the occurrence of a recession.

### The relationship between the stock market and economic activity

Similar forward-looking information about economic conditions, although at shorter horizons than is the case for the yield curve, can also be extracted from stock markets. Equity returns are typically associated with the performance of the real economy, as the business cycle influences corporate profitability. The valuations of listed companies and the decisions of economic actors are then based on said profitability. Hence, this relationship is expected to be bidirectional, with stock returns being influenced by economic activity due to the effect of the business cycle on listed firms' profitability, and stock prices acting as conveyors of forward-looking information on economic activity owing to their content embedded in expectations. Thus, while the separation of information from noise presents an important challenge to the modeller, especially for the analysis of stock market developments, it is possible to extract information from stock price movements about investor expectations of future economic conditions.

Recent work has highlighted the usefulness of listed firms' balance sheet data as leading indicators of economic activity.<sup>6</sup> At the same time, however, stock valuations are expected to be driven by the evolution of corporate profitability, as well as by a set of monetary and financial factors embedded in discount rates. Accordingly, a representative stock portfolio, such as the one that makes up a stock market index, can reflect systemic factors associated with listed firms' profitability, including the outlook for economic activity.<sup>7</sup>

Moreover, stock price movements may influence economic actors' decisions in different ways. For example, according to Tobin's Q model, the information contained in stock prices is useful for determining whether the company can profit by expanding its business (e.g. by raising capital in order to proceed to investments). In this context, in an environment of high stock market valuations, corporate investments are enabled and economic activity is enhanced. Also, this relationship can be bidirectional, given that expected profitability influences listed firms' investment decisions, and ultimately also influences economic growth.<sup>8</sup>

Chart B illustrates the relationship between real stock returns and real economic growth rates by showing annual stock market index returns and annual GDP growth rates (at constant prices) for five selected euro area economies (France, Germany, Greece, Italy and Spain) and the US over the period from 1.1.1971 to 1.1.2023.<sup>9</sup> As

5 See Kiley, M.T. (2023), "Recession signals and business cycle dynamics: tying the pieces together", Federal Reserve Board, *Finance and Economics Discussion Series*, No. 2023-008.

6 See e.g. Abdalla, A.M., J.M. Carabias and P.N. Patatoukas (2021), "The real-time macro content of corporate financial reports: a dynamic factor model approach", *Journal of Monetary Economics*, 118, 260-280, and Abdalla, A.M. and J.M. Carabias (2022), "From accounting to economics: the role of aggregate special items in gauging the state of the economy", *The Accounting Review*, 97(1), 1-27.

7 In the standard Capital Asset Pricing model (CAPM), it is expected that security returns will be affected by market returns and the risk-free rate with some sensitivity coefficient ( $\beta$ ). This relationship, together with each firm's accounting data, seems to explain between 70% and 90% of stock returns (see Fama, E.F. and K.R. French (1993), "Common risk factors in the returns on stocks and bonds", *Journal of Financial Economics*, 33, 3-56, and Fama, E.F. and K.R. French (1993), "A-five factor asset pricing model", *Journal of Financial Economics*, 116, 1-22). Valuation factors associated with a firm's accounting data have been shown to incorporate information pertaining mostly to GDP growth expectations (see Vassalou, M. (2003), "News related to future GDP growth as a risk factor in equity returns", *Journal of Financial Economics*, 68, 47-73).

8 This relationship is described in Allen, F. (1993), "Stock markets and resource allocation", Chapter 4, 81-108, in Mayer, C. and X. Vives (eds.), *Capital Markets and Financial Intermediation*, Cambridge University Press.

9 The real stock return is the return on a country's main stock market index from one year to the next, adjusting for inflation. The real economic growth rate is the rate at which a country's GDP (at constant prices) changes from one year to another. The methodology of calculation of real returns is described in Jorda, O., K. Knoll, D. Kuvshinov, M. Schularick and A. Taylor (2019), "The rate of return of everything, 1870-2015", *Quarterly Journal of Economics*, 134(3), 1225-1298.

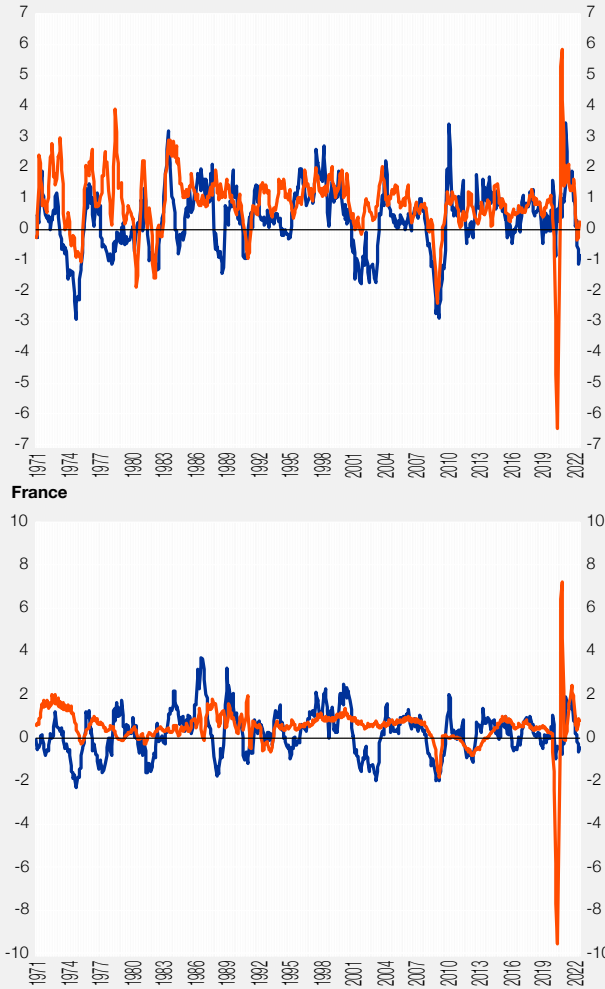
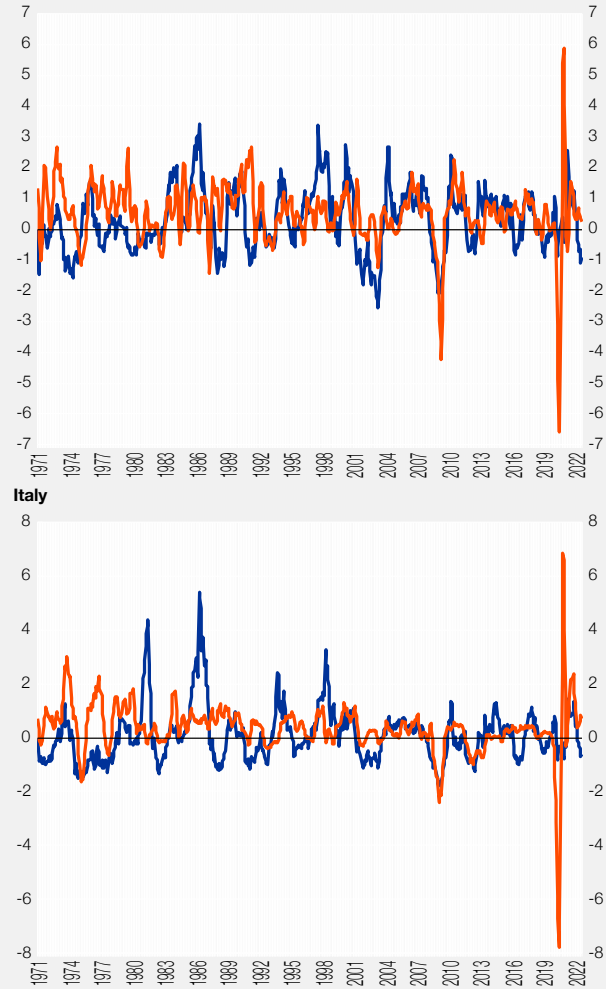
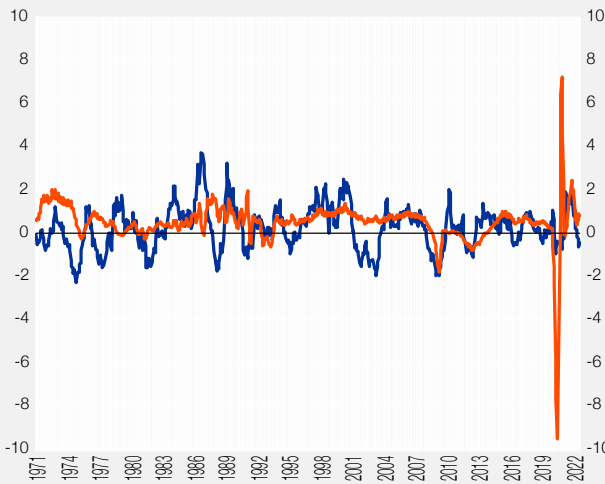
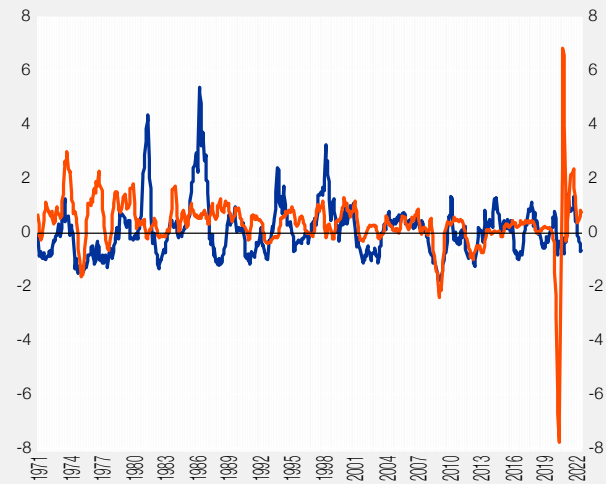
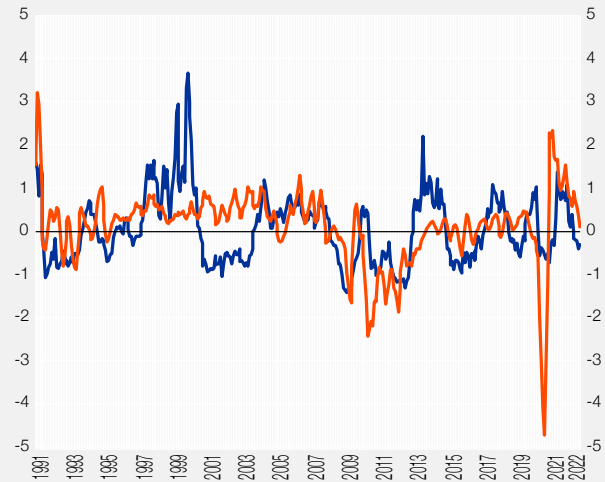
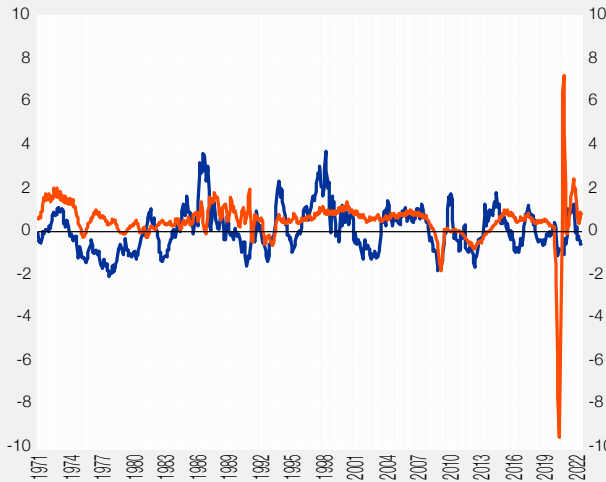


Chart B Real stock returns and real GDP growth

(%)

— Annual stock returns

— Annual GDP growth

**United States****Germany****France****Italy****Greece****Spain**

Sources: Refinitiv data and Bank of Greece calculations.

Note: For each country, the blue lines represent the time-series of annual stock returns, after adjusting for annual inflation, while the orange lines represent the time-series of annual GDP growth (at constant prices), with a conversion from quarterly to monthly data. All time-series are normalised by their respective standard deviations.

shown by the various panels of the chart, negative annual real stock market returns are very likely to precede negative annual real GDP growth. This, in turn, seems to confirm the existence of a strong link between investors' growth expectations and stock returns: during periods in which investors expect an economic slowdown, stock prices fall and negative stock returns are realised.

However, on the one hand, falling stock prices can reflect other factors as well, including negative spillover effects within an integrated financial system. On the other hand, in an environment of imperfect predictability, investor expectations may not materialise. In this respect, as shown in the panels of Chart B, there are cases of negative stock market returns that have not been followed by a downturn in economic activity. As a result, the monitoring of stock returns needs to be combined with additional information, before conclusions about the information content of stock market movements can be drawn with a high degree of confidence.

### Estimation of recession probabilities

Bearing in mind the abovementioned considerations already identified in previous studies, we estimate a discrete variable (ordered probit) model to predict the probability of a recession.<sup>10</sup> This model has as its dependent variable a discrete variable (recession), and as explanatory variables the term spread (with a three-to-four quarter lag) and annual stock market index return (with a one-quarter lag).<sup>11</sup> Chart C shows the predicted probabilities of recession for each economy for which the model was estimated.<sup>12</sup>

The panels of Chart C show that our estimated model is quite accurate in predicting recessions and has good predictive power for recessions 3 to 6 months ahead. For instance, in the United States each time the US economy had two or more consecutive quarters of negative GDP growth, the model-implied recession probability had exceeded 50% at least 3 months earlier. For Germany, our model gave earlier signs of recession in 7 of the 10 cases, when the predicted recession probability exceeded 30% up to 6 months in advance of the actual recession. An equally good predictive power is found for France. Turning to Italy and Spain, although increases in the respective model-implied recession probabilities appear to have predicted actual recessions, especially those that occurred after the 1980s, they also appear to give more "false-positive" recession signals than the average for the other countries.

Overall, our model is found to have a good predictive power for actual recessions, especially in a predictive horizon of 3 to 6 months and in particular for major global economies, such as the United States and Germany. Its error distribution tends to be skewed towards predicting recessions more frequently than they occur, i.e. it is asymmetric, with a longer tail in the direction of false-positive recession signals. All in all, according to our empirical results, the likelihood of a recession occurring within the next few quarters in the economies considered is low.

### Conclusions

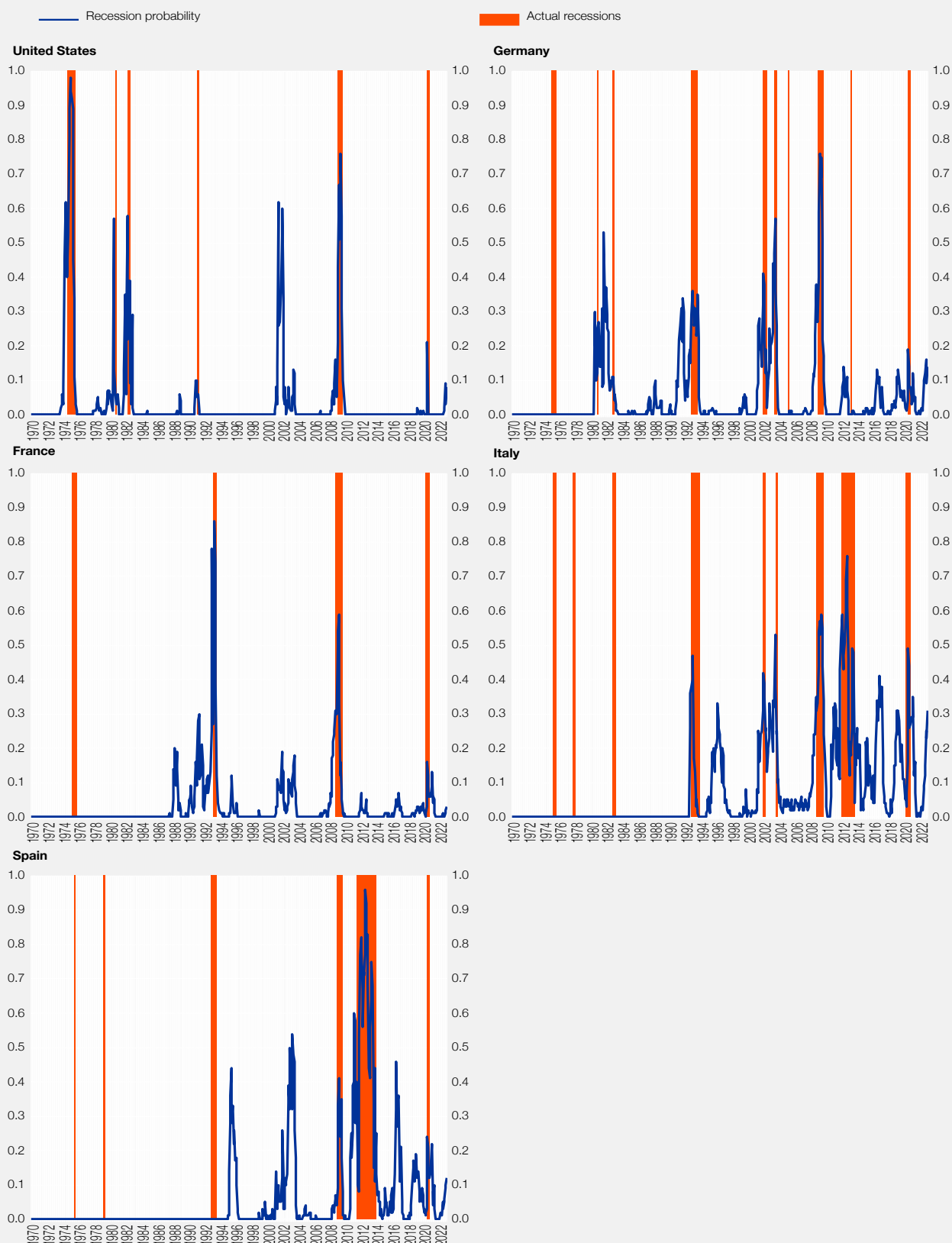
The implied probabilities of two consecutive quarters of negative GDP growth in the United States, or in any of the major euro area economies considered herein are low. The financial variables examined do not provide signals for an upcoming recession during the first half of 2023. This bodes well for Greece as demand for Greek exports would remain unaffected.

10 For the purposes of this estimate, a recession is defined as two consecutive quarters of negative GDP growth. Since the data are at a monthly frequency, this definition is applied by assigning a value of 1 to the first month of each sixth-month period of continuous negative annual GDP growth (at constant prices) and a value of 0 to the remaining months. The sample period used for the estimation was from 1971:1 through 2022:9. The last three months of 2022 were used as an out-of-sample forecasting period to assess the model's out-of-sample performance.

11 We also examined the performance of a simpler model that excluded the variable of real stock returns. In each case, the Root Mean Squared Error (RMSE) of the forecast was significantly lower when the model included both the slope variable and the real stock returns. Listed companies' realised and expected profitability measures were also used as alternative explanatory variables for real stock returns, without significantly improving the model's predictive power.

12 Greece is excluded due to the lack of past data on short-term interest rates.

Chart C Recession probabilities for selected euro area economies and the US



Source: Refinitiv data and Bank of Greece's econometric estimates.

Note: For each country, the blue lines show the recession probability predicted by a probit model that uses financial variables, while the orange shaded areas show actual recessions.

## Box 16

## THE DRIVERS OF AN UPGRADE IN GREECE'S SOVEREIGN CREDIT RATING

Sovereign credit ratings are determined on the basis of information about the creditworthiness of the assessed issuers, as captured by a combination of their economic fundamentals and outlooks.<sup>1</sup> Thus, credit ratings are important inputs to portfolio allocation decisions.<sup>2</sup> As a matter of fact, in recent years their use as a valuable tool for making investment decisions has increased considerably, in line with the surge in debt issuance by sovereigns and corporations. Moreover, investment funds' mandates usually limit risk-taking in portfolios, so that their holdings consist to a great extent, reaching up to 90%, of debt securities that belong to the Investment Grade (IG).<sup>3</sup>

In the second quarter of 2022, international investment funds holding bonds managed assets worth around USD 28 trillion.<sup>4</sup> In this regard, it is evident that, if a bond issuer, e.g. the Greek government, has a sovereign rating in the Investment Grade, a vast pool of funds may invest in its bonds. Besides, it is easily understood that the broadening of the investment base that would result from Greece's upgrade to the IG would counterbalance the upward pressures on Greek government bond yields exerted by the tighter global monetary and financial conditions. This event would have considerable positive spillovers to the credit ratings of corporations and banks in the Greek economy, thereby attracting new capital and leading to lower borrowing costs.

## Developments in the determinants of Greece's credit ratings

Against this backdrop, the upgrades of Greece's credit rating in 2022 by DBRS and S&P and by Fitch in early 2023 have been important developments, as Greece's sovereign credit rating is now marginally lower than the Investment Grade. In particular, the ratings assigned by the aforementioned credit rating agencies (CRAs) are currently BB+/BB-high, i.e. just one notch below the investment grade threshold (which is set at BBB-/Baa3/BBB-low), with all ratings beyond this threshold belonging to the investment category. According to reports published by these three CRAs, the developments that contributed to Greece's upgrade in 2022 and early 2023 mainly related to (a) the reduction in public debt as a percentage of GDP, (b) the robust performance of the Greek economy, given that its growth rate outperformed both expectations and the respective growth rates of most euro area economies, and (c) the decreasing stock of Greek banks' non-performing loans.

It is worth noting that this development has been anticipated<sup>5</sup> by the Bank of Greece econometric model of the parameters of sovereign credit ratings.<sup>6</sup> The application of the model to the fundamentals of the Greek economy

1 See IMF, *Global Financial Stability Report*, October 2010, Chapter 3: "The uses and abuses of sovereign credit ratings". Of course, the analysis of the economic outlook is based on expectations, which are subject to uncertainty, with several *ex post* studies, especially in the wake of financial crises, calling into question the accuracy of credit ratings (see *inter alia* Skreta, V. and L. Veldkamp (2009), "Ratings shopping and asset complexity: a theory of ratings inflation", *Journal of Monetary Economics*, 56:5, 678-695; and Heshki, B.I. and J. Shapiro (2011), "Credit ratings accuracy and analyst incentives", *American Economic Review*, 101:3, 120-124).

2 See U.S. Securities and Exchange Commission (2003), "[Report on the Role and Function of Credit Rating Agencies in the Operation of the Securities Markets](#)".

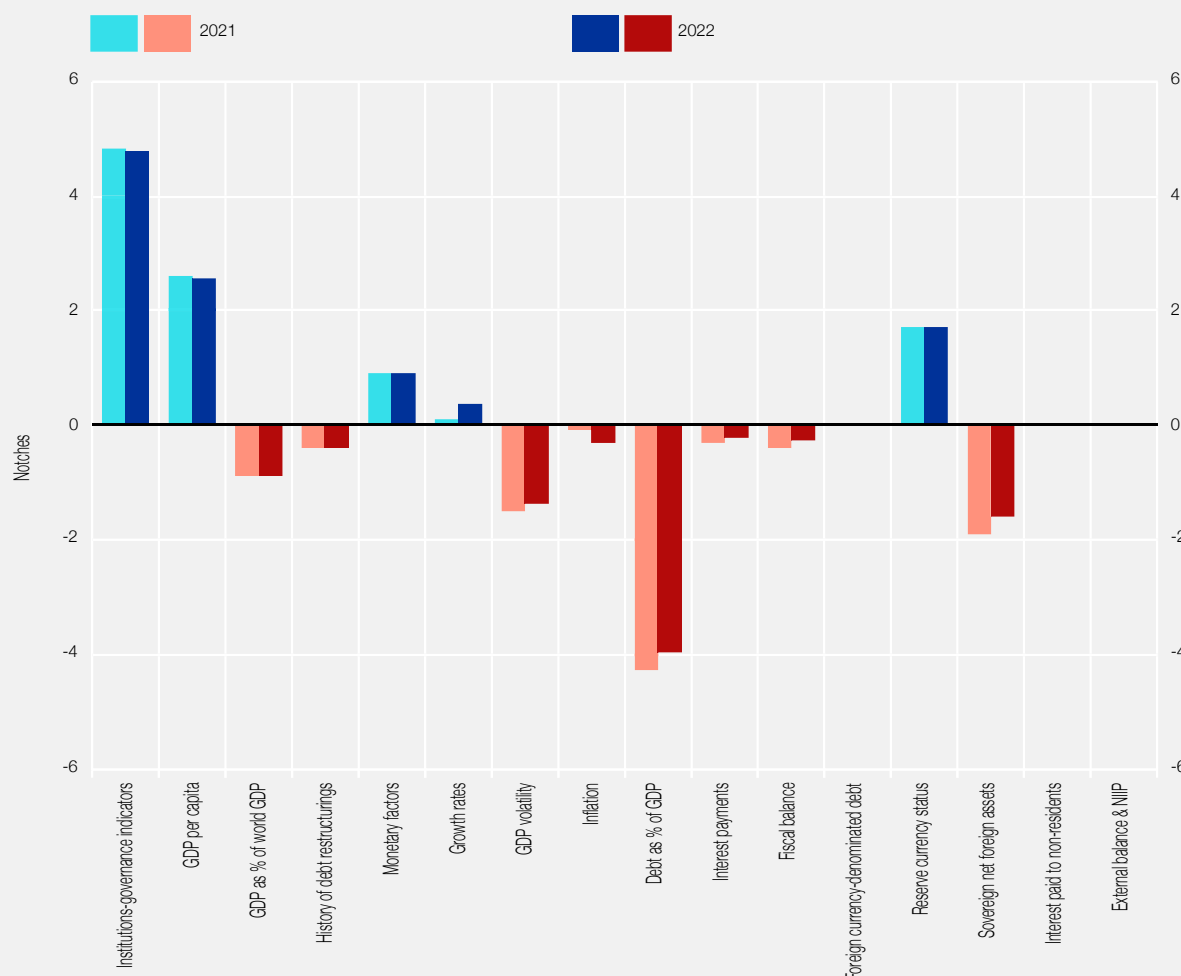
3 See Baghai, R., B. Becker and S. Pitschner (2020), "The use of credit ratings in financial markets", European Corporate Governance Institute Working Paper No. 612/2019. As suggested by the findings of the study, funds extensively use in their investment policies legally binding terms vis-à-vis investors, which refer to investment grade ratings. Specifically, 93% of US funds' investment policy mandates refer to credit ratings as a portfolio allocation criterion, and 88% refer to the investment grade threshold. Lastly, bonds that are rated BBB-/Baa3 or better account for 90% of the portfolios that are managed by investment funds bound by the investment grade threshold in their mandates.

4 Referring to bond funds, mixed fund and money market funds. Out of the total amount of USD 28 trillion, around USD 14 trillion is managed by US investment funds and USD 9 trillion by European funds. Data refer to the second quarter of 2022 and are drawn from the International Investment Funds Association (see "Worldwide Regulated Open-End Fund Assets and Flows Second Quarter 2022").

5 See Bank of Greece, *Monetary Policy – Interim Report 2021. Executive Summary and Boxes*, Box 10 "Determinants of Greece's sovereign credit rating", pp. 59-63, December 2021.

6 See Malliaropoulos, D. and P. Migiakis (2020) "Sovereign credit ratings and the fundamentals of the Greek economy", Bank of Greece, *Economic Bulletin*, No. 51, 43-72.

Chart A Determinants of Greece's sovereign credit rating



Sources: Credit rating agencies and Bank of Greece.

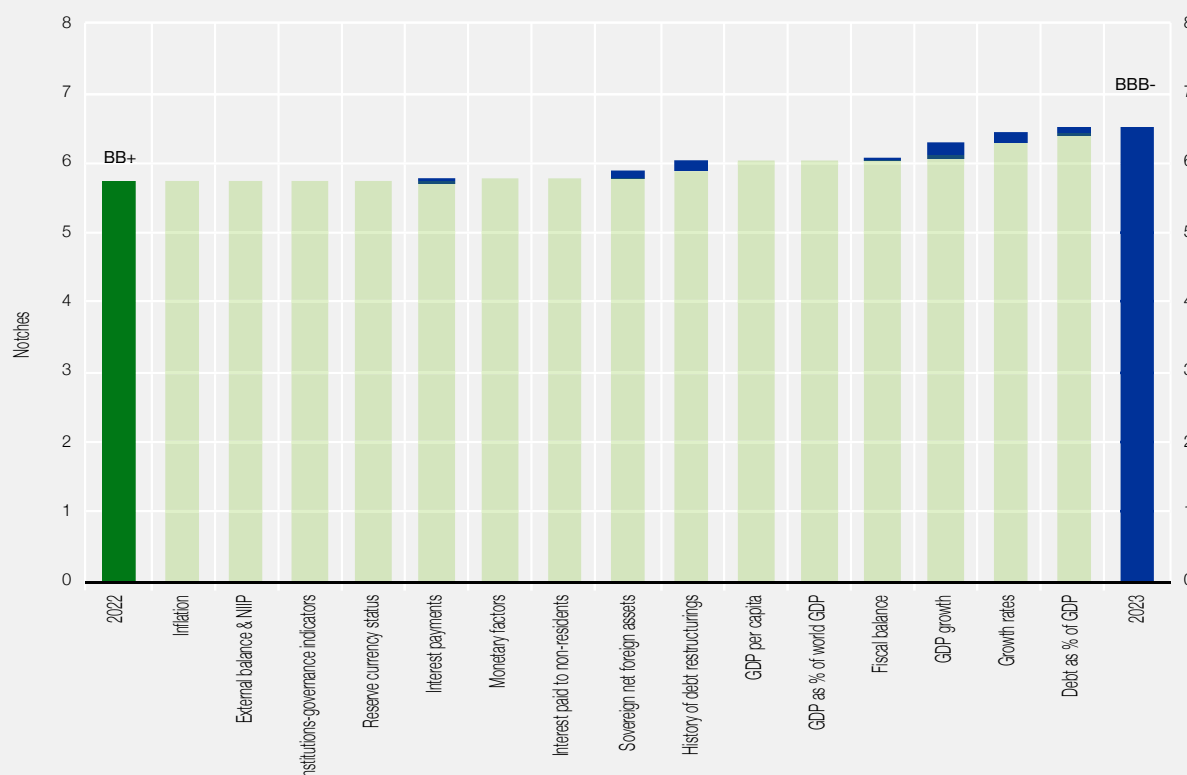
Note: The blue bars denote the factors with an upward effect on the quantitative component of the Greek economy's credit rating assessment, whereas the red bars denote the factors with a downward effect.

for 2021 and 2022 can lead to conclusions regarding the contributions of fiscal aggregates, economic activity, external balance and structural factors.

Chart A shows the contribution of each variable of the quantitative assessment underlying the Greek economy's credit ratings in 2021 and 2022.<sup>7</sup> A comparison between these two years reveals that the recent upgrades have come mainly as a result of improvements in fiscal fundamentals, such as debt and budget balance. Specifically, the expected decline in public debt to 169% of GDP during 2022, from 193% of GDP in 2021, led to an increase of around 0.5 notches in the respective quantitative variable, and at the same time drove upwards by 0.4 notches the variable of sovereign net foreign assets, as a result of Greece's reduced liabilities to non-residents. In addition, the further improvement of the budget balance made a contribution of 0.15 notches. Thus, the positive development of public finances in 2022 fully accounts for the one-notch upgrade, i.e. from BB to BB+.

<sup>7</sup> CRAs' assessment for assigning a credit rating to an issuer entails two stages, a quantitative and a qualitative one. The qualitative assessment refers to non-quantifiable factors, e.g. a country's EU/euro area membership, and its contribution to the final rating may have an upward or downward effect on the score resulting from the quantitative assessment.

Chart B The contribution of the expected aggregates for 2023 to Greece's sovereign credit rating



Source: Bank of Greece.

Notes: The green bar denotes the initial rating, based on the fundamentals of the Greek economy in 2022, from the quantitative assessment performed by DBRS, Fitch and S&P. The blue bar denotes the final rating from the quantification of the expected outcomes after their realisation in 2023. The bars in between denote the contribution of each determinant by aggregating its previous contributions.

### The outlook for 2023

The parameters of credit ratings for Greece, on the one hand, provide an ex post validation of the ratings reported by CRAs, while on the other hand they can help formulate expectations about upcoming developments. In this regard, using the above model, it is possible to quantify the contribution of the expected macroeconomic and other developments for 2023 to the determination of credit ratings. Chart B illustrates the numerical changes that are expected to occur in each of the parameters of Greece's sovereign credit rating, on the basis of expected outcomes for GDP growth, fiscal balance and public debt in 2023.<sup>8</sup>

In particular, changes are calculated assuming that in 2023 GDP will grow by 2.2%, public debt will decrease to about 159% of GDP and a primary surplus of 0.7% of GDP will be achieved. These developments also affect other variables of the quantitative assessment towards the same direction. For instance, a positive growth rate is expected to raise GDP per capita, as well as the share of Greek GDP in world GDP, while a further reduction in public debt is set to further improve Greece's sovereign net foreign assets.

As shown in Chart B, the achievement of fiscal targets and the expected macroeconomic outcomes for 2023 is set to increase the score resulting from the quantitative component of the Greek economy's assessment by about 0.8 notches. The chart shows that the expected fiscal developments and the expected macroeconomic performance contribute almost equally to this development (by 0.32 and 0.33 notches, respectively). All in all, these

<sup>8</sup> Data sources are the Introductory Report on the 2023 Budget and the Bank of Greece forecasts – see “Credible economic policies as a counterbalance to widespread uncertainty” herein.



expected outcomes suggest that a one-notch upgrade in Greece's sovereign credit rating is feasible, which in turn will lead to the ultimate goal of investment grade.

Therefore, an upgrade to investment grade in 2023 is feasible. Nevertheless, this upgrade is not to be taken for granted, particularly in the light of concerns about an upcoming global economic slowdown in 2023 accompanied by deteriorating financial conditions globally, which contribute to a credit rating cycle of downgrades rather than upgrades.<sup>9</sup> As a result, CRAs are likely to incorporate any positive developments into their credit ratings only after these have materialised, i.e. once the fiscal targets and the macroeconomic outcomes have been achieved. Of course, any better-than-expected macroeconomic and fiscal outcomes for the Greek economy, or a further improvement in factors such as its institutional environment, will strengthen the outlook for upgrades.

### Conclusions

After successive upgrades, Greece's sovereign credit rating is very close to the Investment Grade. The outlook for further upgrades, which will result in obtaining an IG rating, is favourable, especially if the primary surplus target is met and the economic growth forecasts are confirmed in 2023. Such an upgrade would be of critical importance, as it would lead to a much broader investment base for Greek government bonds, containing the upward pressure exerted on yields by the tightening of global monetary and financial conditions. It would also have a positive impact on Greek businesses and banks by reducing their borrowing costs and attracting new capital.

Yet, as a result of an economic slowdown globally and a worsening outlook for sovereign and corporate credit ratings, owing to increased borrowing costs, it should not be expected that the upgrade to investment grade will occur automatically with the attainment of some fiscal or macroeconomic targets. Furthermore, it should also be taken into consideration that the determinants of credit ratings affect them only after the expected outcomes have materialised. Against this background, the upgrade of Greece's sovereign credit rating to investment grade is very likely once it becomes apparent that the path of macroeconomic and fiscal aggregates in 2023 confirms the positive outlook.

9 For instance, in its report on global credit rating outlook for 2023, S&P notes that downward pressures on credit ratings are expected to intensify, mainly as a result of slowing economic growth rates and higher borrowing costs (see "Global credit outlook 2023: no easy way out", S&P, 1.12.2022).

### Box 17

#### THE FAILURE OF SILICON VALLEY BANK (SVB)

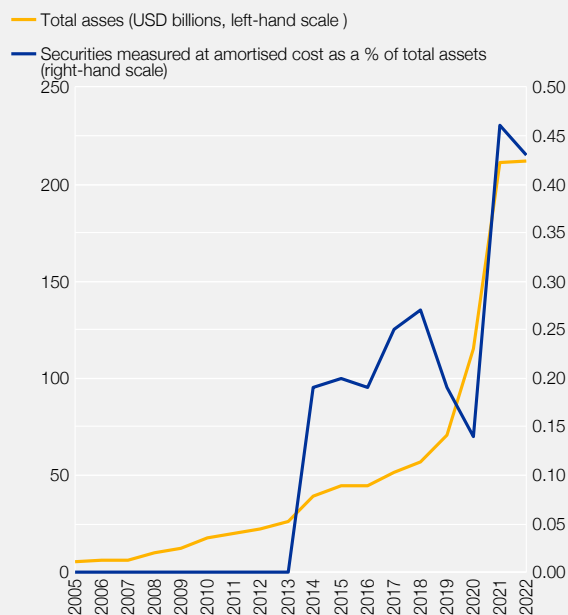
On 10 March 2023, the regulatory authority of California placed Silicon Valley Bank (SVB) into receivership, following a massive outflow of deposits by the bank's customers. The crisis was triggered by news that SVB had suffered heavy losses on its bond portfolio, putting its non-guaranteed deposits at risk. In response, US authorities announced a blanket guarantee of all SVB deposits<sup>1</sup> to preserve public confidence in the domestic banking system. The main purpose of this box is to briefly describe the conditions that led to SVB's collapse, the systemic implications for the United States and beyond, and what this may mean for monetary policy going forward.

Silicon Valley Bank was the 16th largest bank in the US based on total assets and was heavily focused on catering to the high-tech sector.<sup>2</sup> Although the bank was founded in 1983, its balance sheet remained below USD 10 billion until the global financial crisis, when it started to grow, reaching USD 211 billion by 2021 (see Chart A). The high-tech boom during the COVID-19 pandemic and the consequent increase in funding for companies in

1 The guarantee also applied to deposits at Signature Bank, which US regulators closed on 12 March 2023, just two days after SVB's failure.

2 See [FRB: Large Commercial Banks – December 31, 2022 \(federalreserve.gov\)](https://www.federalreserve.gov/monetarypolicy/largecommercialbanks.htm).

Chart A SVB balance sheet data



Sources: Refinitiv and Bank of Greece calculations.

the industry, together with the dominant position of the bank in the Silicon Valley ecosystem, led to a further growth of the bank, through a trebling of its customer deposits between 2019 and 2021. With deposits being a valuable funding source for any bank, three-quarters of this deposit growth was invested in long-term debt such as US Treasuries and, to a lesser extent, US agency securities, which, in an environment of low interest rates in 2021, offered more attractive yields.

However, rising interest rates brought about severe losses on SVB's bond portfolio. With higher interest rates, the prices of existing bonds fall, and this fall is greater for long-term bonds. By the end of 2022, unrealised losses had reached 8.5% of total assets, making SVB more vulnerable to a bank run. Amid signs of recession in the high-tech sector during 2022, SVB's customers increasingly drew down their deposits to finance their operations. At the same time, a further rise in short-term interest rates, which resulted in an inverted yield curve, triggered shifts out of SVB deposits towards higher-yield assets, such as government bonds or money market funds.

As bonds in the SVB's portfolio had long maturities, their prices fell substantially following increases in policy rates. Valuation losses on securities affect a bank's profit and loss account when the securities are sold or when they are measured at fair value, but not when they are valued at amortised cost. SVB's securities were classified as "held-to-maturity" and valued at amortised cost; so, under normal conditions, the decline in their market value would not have impacted on the bank's financial results.

The need for recapitalisation of the SVB arose because the bank liquidated part of these positions to meet liquidity needs, resulting in realised losses of about USD 1.8 billion. Thus SVB had to increase its capital. On 8 March 2023, SVB announced plans for a USD 1.75 billion capital increase. It soon became obvious, however, that this amount would be hard to cover, as investors were unwilling to participate. This triggered a massive run on the bank's deposits.

Deposits are typically a valuable funding source for banks, as they are not subject to large short-term fluctuations. In the United States, they are insured up to USD 250,000 per depositor, per bank. However, given SVB's unusual business model, the majority of customer deposits were corporate deposits (which are less stable than household deposits, especially as SVB's corporate customers were active in a recession-hit high-tech sector) largely exceeding the deposit insurance ceiling. The bank's failure to raise new capital to meet deposit outflows led to its closure.

Consequently, SVB's collapse, although it is the biggest bank failure in the US since 2008 and the second largest in US history (measured in nominal value terms), has different qualitative characteristics compared with the bank failures that occurred during the global financial crisis. There was no lending to high-risk borrowers, nor exposures to opaque and risky products. Rather, it was due to an underestimation of portfolio risk, as high exposure to long-term bonds was not hedged by swap contracts, thereby exposing SVB's assets to interest rate risk, while its liabilities had already been exposed to such risk, as the high-tech sector, which had thrived amid the low interest rate environment of the previous few years, was the almost exclusive source of deposits for SVB. At the same time, as a result of too little diversification, SVB could not benefit from a commensurate decline in the value of its liabilities, as would have had with a higher share of long-term liabilities. Therefore, SVB's problems may not be relevant for banks with more diversified portfolios.

### Systemic implications and institutional responses

The likelihood of systemic implications from SVB's collapse was initially small, as this bank did not have significant ownership or other links with other banks. Notwithstanding that, the US Treasury, the Federal Reserve and the Federal Deposit Insurance Corporation (FDIC) jointly stated that all SVB depositors would be satisfied for the total of their deposits, while they also announced the launch of a new lending facility encompassing depositors across all credit institutions. In this manner, the US financial authorities in effect provided an ex-post guarantee for all depositors, aiming to bolster confidence in the US banking system and prevent a new bank run episode.<sup>3</sup> Under normal conditions, deposits are insured and protected by the FDIC up to USD 250,000 only. Any amounts in excess of this ceiling are subject to the regular insolvency proceedings and are only compensated if the failed bank's assets are sufficient, with depositors still enjoying priority ranking over bondholders and shareholders.

A new Bank Term Funding Program (BTFP)<sup>4</sup> is based on funding from the Fed and provides liquidity for up to one year to financial institutions against collateral of high-quality bonds. The unique feature of the BTFP is that lending is based on the par value of collateral rather than market value. This is particularly important for banks that, like SVB, had suffered losses on their balance sheets due to the increase in interest rates and the resulting decline in the value of their long-term fixed-rate bond portfolios.

An important lesson from SVB's failure is the significant role of the regulatory policies developed in the wake of the global financial crisis to reduce systemic risk in the financial system. In 2018, the threshold for a bank to be considered systemically significant was raised from USD 50 billion to USD 250 billion. These policies included, among other things, a requirement on regulators and supervisors to conduct periodic stress tests of banks' balance sheets, so that appropriate measures can be implemented should risks be identified. If SVB had been subject to the more stringent regulatory regime, it might have been forced to hedge its interest rate risk exposure, thereby offsetting the losses resulting from rising interest rates.

### The impact of SVB's failure on international capital markets

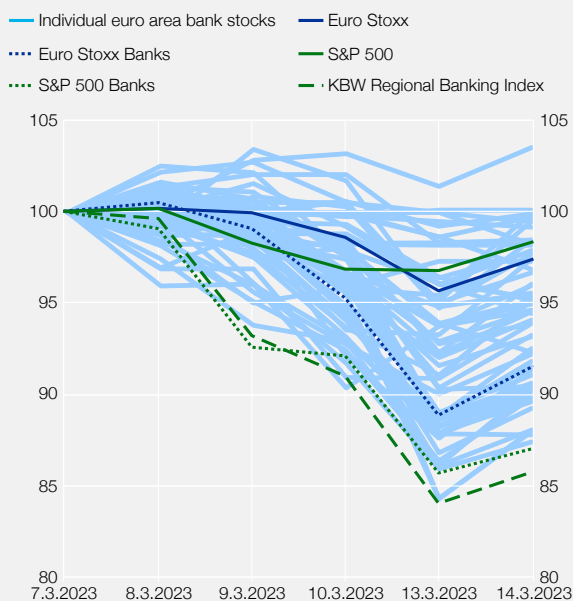
The developments at SVB affected global financial markets, with a decline in stock prices and a bout of volatility as soon as the bank announced realised losses and the need for a capital increase, which seemed doomed to fail amid widespread risk aversion from investors. As can be seen in Chart B, US bank stock prices fell sharply in the United States between 9 and 13 March 2023. On 14 March, stock prices recorded positive returns, implying that FDIC's ex-post guarantee of all deposits at SVB was effective in smoothing out the strong negative initial reaction. A comparison between the KBW Bank Index, which tracks regional US banks, and the S&P 500 Banks Index, which is used as a proxy for the US banking industry, shows that stock prices for regional banks fell more than those for global systemically important banks (G-SIBs), suggesting that markets have priced in a greater risk of an SVB-like episode occurring in one or more of the regional US banks.

The collapse of SVB and the response of US authorities to bolster depositor confidence in the financial system have also influenced market expectations of the future path of monetary policy (see Chart C). In greater detail, high uncertainty is observed in investor expectations regarding the next moves of central banks, particularly the Fed, in the meetings of 2023.

The measures taken by central banks to stem the nascent crisis have helped shore up market sentiment. However, the significant increase in the MOVE implied volatility index for US Treasuries (see Chart D) suggests ongoing investor concerns about the impact of rising interest rates on bond prices. Investor concerns were initially reflected to a lesser extent in the implied volatility indices for stocks, with VIX and VDAX increasing with a few days' delay to levels well above their long-term averages, indicating persisting investor concerns. Of course, the observed pick-up in volatility may be unrelated to the SVB case but rather it may reflect concerns that the combination of low-yielding assets and rising interest rates could affect more banks.

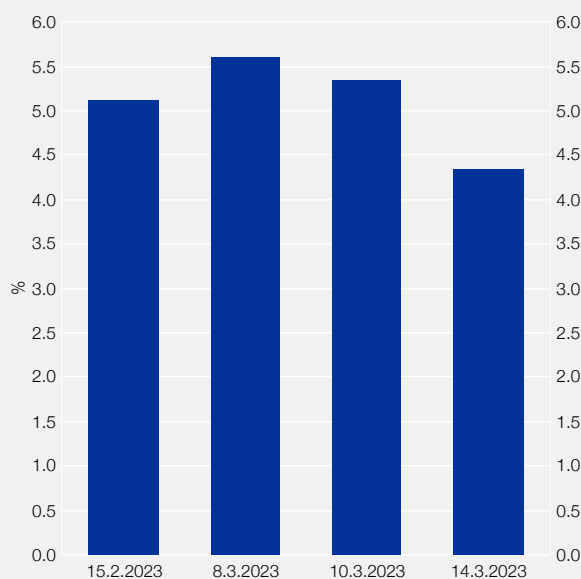
<sup>3</sup> See [Joint Statement by Treasury, Federal Reserve, and FDIC](#), 12.3.2023.

<sup>4</sup> See [Fed press release](#), 12.3.2023.

**Chart B Change in bank stock prices during the SVB episode**

Sources: Refinitiv and Bank of Greece calculations.

Note: The stock indices have been rebased to 100 on 7.3.2023, i.e. the day before SVB announced the need for a capital raise and losses on its bond portfolio. Observations after that day reflect the evolution of the stock indices until 14.3.2023. In addition to the Euro Stoxx, Euro Stoxx Banks, S&P 500 and S&P 500 Banks indices, the chart shows the performance of 63 euro area bank stocks, the total assets of which accounted for 64% of the total assets of banks supervised by the Single Supervisory Mechanism (SSM) as of the end of September 2022.

**Chart C Expected interest rates in the US**

Sources: Refinitiv and Bank of Greece calculations.

Note: The bars show, at four different dates, the expected level of the federal funds rate at the FOMC's December 2023 meeting, as inferred by CME futures contracts.

In the euro area, the prices of bank shares fell as well, albeit less than in the United States, with the biggest euro area losers recording similar returns to US banking stock indices. In both economic regions, general stock market indices were far less affected than the banking sub-indices. Finally, in the euro area market for corporate bonds issued by financial corporations, yields increased for subordinated and lower-rated bonds, which exhibit greater sensitivity to changes in monetary and financial conditions (see Chart E).

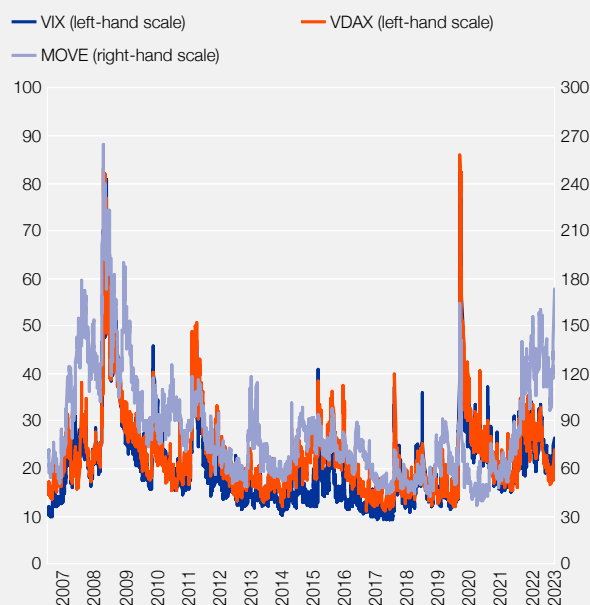
### Conclusions

Following interventions by US financial authorities to contain the impact of SVB's collapse, the risk of contagion has diminished, as has the risk of a confidence crisis. However, the case of SVB is indicative of the impact of rising interest rates on both the asset and liability sides of bank balance sheets. In SVB's case, the fall in the value of its bond portfolio and the forced selling to meet liquidity needs in the face of mass withdrawal of deposits resulted in losses and the need for a capital increase. Given that the same factors may be at play in other US regional banks, the interventions of US financial authorities have bolstered depositors' confidence and staved off the risk of a confidence crisis in other banks.

Of particular interest are also the possible implications of the BTFP. Central banks traditionally provide liquidity against high-quality collateral, valued at market prices. Instead, BTFP values collateral at par, which means that it removes duration risk from bank balance sheets, while at the same time it enables the Fed to pursue its monetary policy objectives without having to worry about financial stability; this greatly facilitates the tightening of monetary policy.

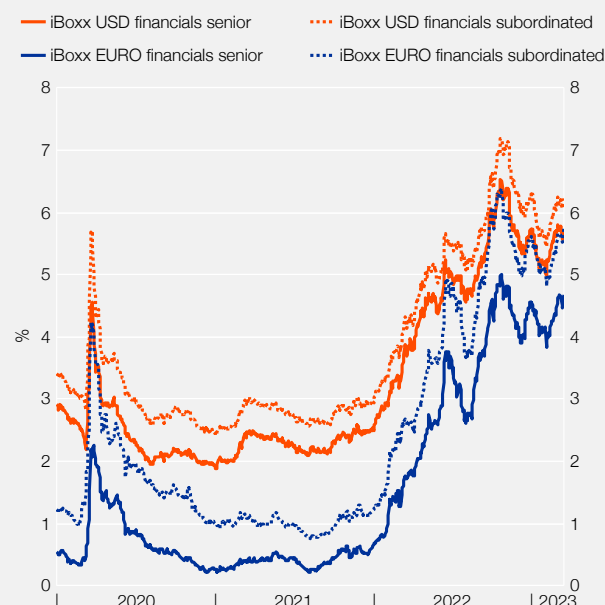
The case of SVB may also impact on the financing of intangible assets. A key feature of the digital economy is the central role of intangible capital, whose share has risen rapidly in recent decades. Intangible capital (ideas, software, etc.) is hard to value and to resell, so it is more difficult for firms with more intangible assets to borrow from traditional banks. This explains the important role of specialised firms providing venture capital (VC) financing to the high-tech sector, supporting business ideas based on complex technologies. Financial companies have tried to address this issue through venture debt (VD), a financial product pioneered by SVB. VD involves lending to startups with venture capital backing – the presence of VC backing is a sign to the bank that the project has a positive net present value (NPV). Such networks are hard to build, so SVB's collapse will probably be a setback to the development of VD.

Chart D Implied volatility indices



Source: Refinitiv.

Chart E Funding costs



Source: Refinitiv.

This business model was expensive to run, because it relied on customer service, and became profitable by combining VD with other banking products. But this was not sufficient to cover the costs, so the bank sought moderate returns by investing in long-term bonds. Large banks do not offer venture debt, so it is unclear whether this model can coexist with the risk management benefits of a typical bank. The failure of this model could be especially troubling for Europe, where innovative debt financing ideas are needed, but the United States' depth of VC is lacking.

## Box 18

### THE IMPACT OF THE CURRENT ENERGY CRISIS ON CLIMATE CHANGE AND THE ENVIRONMENT

The health and energy crises have affected climate and the environment, both directly and indirectly. Energy and environment issues are interrelated, as it is almost impossible to generate, transport or consume energy without significant environmental impact. Environment issues related to energy production and consumption include air pollution, climate change, water pollution, thermal pollution and solid waste disposal.<sup>1</sup> Moreover, the energy sector is the largest source of greenhouse gas emissions, in particular carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O),<sup>2</sup> accounting for almost 3/4 of global greenhouse gas emissions,<sup>3</sup> with multiple negative effects, including climate change and environmental destruction. The present box examines the impact of the current energy crisis on climate change and the environment.

#### Impact

Just as the COVID-19 pandemic was getting under control in mid-2021, the energy crisis broke out, primarily due to the reopening of the global economy. The energy crisis worsened and was prolonged after the Russian invasion of Ukraine in 2022.

1 See <https://www.eea.europa.eu/help/glossary/eea-glossary/environmental-impact-of-energy>.

2 International Energy Agency (2021), *Net Zero by 2050: A Roadmap for the Global Energy Sector*.

3 World Meteorological Organization (2022), *2022 State of Climate Services: Energy*.



Initially, the reopening of industries worldwide after the pandemic led to higher demand for energy. In 2021, global carbon dioxide (CO<sub>2</sub>) emissions from the energy sector and industrial processes recorded their highest rise so far (6% y-o-y), pushing greenhouse gas emissions to 36.4 gigatons (Gt).<sup>4,5</sup> This resulted in a slowdown of the effort to reduce greenhouse gas emissions, while the share of renewable energy sources (RES) remained virtually unchanged.<sup>6</sup> Burning fossil fuels (oil, natural gas and coal) is the main cause of global warming, as greenhouse gases released into the atmosphere trap the sun's ultraviolet rays, thereby increasing average global temperature, fuelling extreme weather, causing biodiversity losses and generally having a negative impact on ecosystems and living conditions.<sup>7</sup> As a result, the years 2015-21 have been the seven warmest consecutive years on record, while 2018-22 is the fourth warmest five-year period on record. The global warming outlook in the coming years is nothing but bleak. There is a 48% chance that the annual mean global temperature will temporarily be 1.5°C above pre-industrial levels (1850-1900) for at least one of the next five years (2022-26) and a 93% chance that at least one year out of these five years will see a higher temperature increase than in 2016 (which has been the hottest on record).<sup>8</sup> At the beginning of 2023, the European Copernicus Climate Change Service announced that 2022 has been the second warmest year in Europe and the fifth worldwide.<sup>9</sup>

Subsequently, the war in Ukraine caused problems and generated uncertainty regarding the supply of energy in Europe, leading to increases in energy prices. Energy insecurity directly affects the European Union (EU) energy and climate policy and targets.<sup>10</sup> For the EU, the implementation of the UN 2030 Agenda for Sustainable Development and in particular the fulfilment of Goal 7 "Ensuring access to affordable, reliable, sustainable and modern energy for all" is a top priority. Some European countries (Iceland, Sweden, Finland, Denmark, Estonia,<sup>11</sup> but also Germany, France and Italy<sup>12</sup>), in response to the energy crisis, are accelerating the transition to and are investing in renewable energy. In addition, Austria, Germany, the Netherlands, the United Kingdom and Greece<sup>13,14</sup> are planning – in order to mitigate uncertainty and secure the required volume of energy – to restore or prolong the operation of lignite plants in the short term, thereby changing their energy transition plans.<sup>15</sup>

As Europe tries to prevent a widespread energy crisis, higher energy prices, among other things, made many European households turn to wood as a complementary or primary source of heating. However, this has negative consequences on the environment, air quality and human health.<sup>16</sup> Last autumn, the National Observatory conducted a simulation for the city of Athens, where it isolated the particulate matter pollution from domestic heating and found a 10-20 mg higher concentration per cubic meter during evening hours, aggravating the already existing air pollution load.<sup>17</sup> This forecast is also in line with the strong demand for firewood observed this autumn in the Greek and the European market. Furthermore, burning wood for home heating creates additional problems of illegal and arbitrary logging, which in turn causes pressure and losses on European forests. Many European

4 International Energy Agency (2022), *Global Energy Review: CO<sub>2</sub> Emissions in 2021*.

5 See <https://www.icos-cp.eu/science-and-impact/global-carbon-budget/2021> and carbon dioxide emissions chart from 1990 to 2021 ([https://www.icos-cp.eu/sites/default/files/inline-images/essd2021\\_FossilFuel\\_and\\_Cement\\_emissions\\_1959.png](https://www.icos-cp.eu/sites/default/files/inline-images/essd2021_FossilFuel_and_Cement_emissions_1959.png)).

6 European Environment Agency (2022), *Trends and Projections in Europe 2022*, EEA Report 10/2022.

7 Sengupta, S. and M. Edy, "War and warming up end global energy supplies and amplify suffering", *The New York Times*, 20.7.2022.

8 WMO, UNEP, GCP, UK Met Office, IPCC and UNDRR (2022), *United in Science 2022*.

9 Copernicus Climate Change Service (2022), *Global Climate Highlights 2022*.

10 See footnote 6.

11 European Environment Agency (2022), *Share of energy consumption from renewable sources in Europe*.

12 See <https://www.statista.com/statistics/267233/renewable-energy-capacity-worldwide-by-country/>.

13 International Institute for Strategic Studies – IISS (2022), *Europe's energy crisis and the pace of transition*.

14 Business News, "Ministry of Environment and Energy: Three-year extension to PPC's lignite-fired plants, due to the energy crisis" (in Greek), 16.12.2022.

15 UN Department of Economic and Social Affairs (DESA) – Sustainable Development Goal 7.

16 Öztürk, Y., "Escalating concern about air pollution with energy crisis in Europe", *Synergy*, 3.10.2022.

17 Athanasopoulou, E. and E. Gerasopoulos, "What will we inhale this year in Athens atmosphere if we massively turn to burning wood for our heating?", (in Greek), *Kosmos*, 30 November 2022.



governments (Poland, Romania, Lithuania and Hungary) are relaxing their forest protection rules, in an effort to provide households with alternative and cheaper forms of heating.<sup>18</sup> Illegal logging contributes to deforestation, loss of biodiversity and, in particular, to reduced capacity of forests to bind and store carbon and thus contribute to climate change mitigation. Moreover, existing forests currently reduce greenhouse gas emissions generated by human activities by around one third.<sup>19</sup> But in 2021, burning wood released more carbon dioxide than would have been released if fossil fuels had been used.<sup>20</sup>

## Conclusions

A critical challenge of the current energy crisis is to avoid a direct confrontation between the two targets: ensuring low-priced supply of energy on the one hand and transition to renewable energy on the other. Environmental awareness and willingness to mitigate climate change were a prerequisite for the most basic needs: living and security. If these were called into question, then the social consensus currently in favour of energy transition would be undermined.<sup>21</sup> In response to the difficulties and disruptions in the global energy market and seeking to support its climate target as part of the “Fit for 55” package, the EU proposed, by means of the REPowerEU Action Plan, a number of measures. The measures include an increase of the target for RES participation in the energy mix to 45% (from 40%) by 2030.<sup>22</sup>

In recent years, alongside climate change, one global crisis has been followed by another. The health crisis that broke out at the end of 2019 and the energy crisis of 2021 have put their own mark on climate and the environment. Undoubtedly, the manifestations of the current energy crisis are particularly noticeable. The increase in global greenhouse gas emissions resulting in higher temperatures and climate change, both detrimental to natural ecosystems and the anthropogenic environment, has adverse effects inter alia on human health and causes forest losses that negatively affect biodiversity.

Climate change is a real threat linked to various environmental issues and tipping points. It triggers and exacerbates economic and social problems, disproportionately burdening less developed countries. Global action is urgently needed, as today's actions will determine not only the future of the global climate system, but also the lives and livelihoods of all humanity for the decades to come.<sup>23</sup> After all, climate change is perhaps the longest-lasting crisis and the question of whether it will be overcome, or at least mitigated, cannot be answered with certainty.

18 Olden, M. and M. Pigeon (2022), “Europe’s Dark Winter: How will people and forests survive the energy crisis?”, Fern, Briefing Notes.

19 Ceurstemont, S. (2022), “Protecting forests on the front line of the climate-change battle”, European Commission, *Horizon*, The EU Research & Innovation Magazine.

20 Hurtes, S. and W. Cai, “Europe is sacrificing its ancient forests for energy”, The New York Times, 7.9.2022.

21 Makantasi, F. and I. Valentis, “The energy crisis in Greece: what is happening exactly with energy costs, what are their origins, how should they be addressed and what lessons are to be learned?”, (in Greek) diaNEOsis, November 2022.

22 See footnote 6.

23 OECD (2022), The Climate Action Monitor 2022: Helping Countries Advance Towards Net Zero, Paris (<https://doi.org/10.1787/43730392-en>).

## Box 19

### NATIONAL CLIMATE LAW

In May 2022, the first climate law<sup>1</sup> was passed in Greece, establishing, among other things, the framework for the adaptation to climate change and the gradual mitigation of anthropogenic greenhouse gas emissions. In

1 Law 4936/2022 “National climate Law – Transition to climate neutrality and adaptation to climate change, emergency provisions to address the energy crisis and protect the environment”.

order to achieve the long-term objective of carbon neutrality<sup>2</sup> by 2050, intermediate emission reduction targets are set for the years 2030 and 2040 (a reduction of 55% and 80%, respectively) relative to 1990 levels.

Successfully implementing the measures and achieving the objectives of the new law is crucial for limiting the temperature increase to 1.5° C above pre-industrial levels, pursuant to the Paris Agreement, which was ratified by Law 4426/2016 (Government Gazette A 187), and in accordance with the climate-neutrality objective of the European Union (EU).

The climate law strengthens considerably the pre-existing institutional framework for tackling climate change, also in line with the provisions in force at the European level, setting national climate targets, a system of governance and implementation measures. In particular, the new law includes:

#### **Measures and policies to enhance mitigation and adaptation**

- A National Adaptation Strategy to Climate Change (NASCC), prepared by the Ministry for Climate Crisis and Civil Protection, which spans ten years and is subject to review and/or revision every five years at least. The NASCC is further specified by the Regional Adaptation Action Plans (RAAPs), which define and prioritise the necessary adaptation measures and actions at the regional level.
- Adoption of five-year sectoral carbon budgets for specific sectors<sup>3</sup> of the economy. The drafting of the first sectoral budgets is planned for 2024 (for the period 1.1.2026-31.12.2030), and it will thereafter be repeated every five years.
- Regular assessment of the progress towards climate neutrality on the basis of the latest available scientific data and annual progress reports, with the possibility to review and/or set new intermediate climate targets.

#### **General and specific measures and policies to reduce emissions**

- Implementation of general measures aimed at: (a) saving the greatest possible amount of energy and increasing energy efficiency; (b) attaining the greatest possible penetration of renewable energy sources (RES); (c) phasing out all fossil fuels and substituting them with RES, with a view to securing energy supply and in line with technological advances; (d) gradually substituting natural gas with renewable gases, such as bio-methane and green hydrogen, particularly in transport and industry; (e) promoting electromobility; (f) promoting sustainable urban mobility and the use of means of public transport; (g) improving the carbon footprint of buildings and infrastructures; (h) reducing greenhouse gas emissions; (i) increasing the greenhouse gas removal; and (j) fostering synergy between policies that are jointly related to the mitigation of the impacts of climate change and to the improvement of air quality.
- Permanent withdrawal of lignite-fired plants and a ban on electricity generation from solid fossil fuels. The implementation of the measure will start as of 31 December 2028, with a specific clause for the review of de-lignitisation in 2025, should the above date be brought forward.
- Faster penetration of electromobility to reduce air pollution, by implementing measures to promote the use of very low- or zero-emission vehicles, with a focus on specific sectors. As of 2026, new passenger cars for public use (taxis) and one-third of new vehicles for rental/leasing purposes will be zero-emission vehicles. In addition, as of 2024, at least a quarter of new private company cars will be purely electric or hybrid electric vehicles.
- Ban on the sale and installation of heating oil burners as of 2025. Sale, exclusively, of heating oil blended with renewable liquid fuels at a percentage of 30% by volume as of 2030. Applications for the issue of building permits

2 Climate neutrality or net-zero greenhouse gas emissions: the balance between anthropogenic greenhouse gas emissions from sources and their removal by sinks. Sinks include any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.

3 (a) Electric power and heat generation; (b) transport; (c) industry; (d) buildings; (e) farming and livestock breeding; (f) waste and (g) land use activities and land use change, and forestry.

for specific types of buildings (with coverage >500 m<sup>2</sup>) with an obligation to install electric power generation systems from photovoltaic or thermal solar systems corresponding to at least 30% of the coverage as of 2023.

- A quantitative emission reduction target of at least 30% by 2030 relative to 2019 is set for specific types of activities<sup>4</sup> and an annual reporting requirement is introduced from 2026 onwards in order to monitor compliance with the defined target.
- An annual reporting requirement is introduced for specific types of undertakings<sup>5</sup> regarding their carbon footprint (as of 2023, with 2022 as the reference year). The report will include voluntary emission reduction or offsetting targets and actions, verified by a certified body and updated annually.
- Speeding up the interconnection with the mainland electricity grid of the non-interconnected islands, as well as the substitution of liquid fossil fuel power plants by plants using RES and storage systems. An 80% reduction in the emissions of non-interconnected islands by 2030 compared with 2019. As of 2030, the use of fuel oils (mazut) for electricity generation on non-interconnected islands will be prohibited.

### **System of governance and participation of the public for engaging in climate action**

#### ***Governance and public participation system for climate action***

- Establishment of a National Observatory for Climate Change Adaptation, under the Ministry for Climate Crisis and Civil Protection, with a view to supporting the national adaptation policy.
- Creation of an online climate discussion forum by the Natural Environment and Climate Change Agency (NECCA<sup>6</sup>) for consultation on the main results of the proposal submitted by the Minister of the Environment and Energy to the Governmental Committee for Climate Neutrality<sup>7</sup> as regards the sectoral carbon budgets, the assessment of progress towards the achievement of goals and the annual progress report.
- Preparation of an annual progress report on climate change mitigation and adaptation issues by the Ministry of the Environment and Energy, the Ministry for Climate Crisis and Civil Protection, and the NECCA, comprising, among other things, national data on emissions and greenhouse gas removal by sector of economic activity, as well as a description of climate change actions and progress by sector of economic activity.
- Establishment of a National Climate Change Adaptation Council under the Ministry for Climate Crisis and Civil Protection to act as the main advisory body of the State for the coordination, monitoring, adoption and evaluation of climate change adaptation policy actions.
- Establishment of a Scientific Climate Change Committee (SCCC) under the Ministry of the Environment and Energy, which will be responsible, among others, for proposing and developing science-based climate change policies, issuing opinions to the Governmental Committee for Climate Neutrality on the five-year carbon budgets for all sectors of the economy, assessing whether it is needed to update the long-term and intermediate climate targets, or the actions and methods to achieve these targets, and for any issue related to tackling climate change.

4 Type of activity: (a) environmental infrastructure systems; (b) tourist facilities and urban development projects; building projects, sports and recreation projects; (c) poultry-livestock establishments; (d) aquaculture; and (e) industrial activities and relevant facilities.

5 These include (a) listed companies; (b) credit institutions; (c) insurance undertakings; (d) investment firms; (e) fixed and mobile telephony companies; (f) water supply and sewerage companies; (g) couriers; (h) electricity and natural gas supply companies; (i) retail chains; (j) logistics companies; and (k) civil transport companies.

6 The NECCA was founded in 2021 as the sole successor of the National Centre for Environment and Sustainable Development (NCESD). It is a legal person governed by private law, which aims at implementing the policy formulated by the Ministry of the Environment and Energy for the management of protected areas in Greece, biodiversity conservation and the promotion and implementation of sustainable development actions and climate change mitigation.

7 Governmental committee established pursuant to Article 8 of Law 4622/2019 to act as a coordinator on issues related to emissions reduction and adaptation to climate change.

## Box 20

## FURTHER STEPS BY THE ECB TO INCORPORATE CLIMATE CHANGE INTO ITS MONETARY POLICY OPERATIONS

In July 2022, the Governing Council of the European Central Bank (ECB) decided to take further measures to include climate change considerations in the Eurosystem's monetary policy framework.<sup>1</sup> These measures follow up on the actions announced in 2021 as part of the ECB's strategy review<sup>2</sup> and are designed in full accordance with the Eurosystem's objective of maintaining price stability.<sup>3</sup> They aim to reduce climate-related financial risk in the Eurosystem balance sheet, encourage transparency and support the green transition of the economy in line with the European Union's (EU) climate neutrality objectives.

Briefly, the ECB decided to: (i) take into account the climate performance of corporate bond holdings in the Eurosystem's monetary policy portfolios; (ii) adjust its collateral framework; (iii) introduce climate-related disclosure requirements; and (iv) enhance its risk management practices. In more detail:

**(a) Corporate bonds:** The Eurosystem aims to gradually decarbonise its corporate bond holdings, along a path aligned with the goals of the Paris Agreement. Starting from October 2022, the Eurosystem has been tilting reinvestments of principal payments from maturing corporate securities purchased under its asset purchase programmes<sup>4</sup> towards better climate-performing issuers. In September 2022, the ECB announced further details on the implementation of this measure.<sup>5</sup> Effectively, the assessment of the performance of corporate bond issuers in relation to climate change considerations will be based on a score calculated as the sum of three individual scores, involving: (i) the historical greenhouse gas emissions of each issuer; (ii) the issuer's greenhouse gas emission reduction targets; and (iii) the quality of the issuer's greenhouse gas emission disclosures. In any event, the level of corporate bond purchases will continue to be driven by monetary policy considerations and the achievement of the price stability objective. The ECB started in the first quarter of 2023 to publish, on a regular basis, climate-related information on its corporate bonds.

**(b) Collateral framework:** The Eurosystem will limit the share of assets issued by entities with a high carbon footprint that can be pledged as collateral by counterparties when borrowing from the Eurosystem. In addition, the Eurosystem will consider climate change risks when reviewing haircuts applied to corporate bonds used as collateral. In any case, all measures will ensure that ample eligible collateral remains available, allowing monetary policy to continue to be implemented effectively.

**(c) Climate-related disclosure requirements for collateral:** The Eurosystem will only accept marketable assets and credit claims from companies and debtors that comply with the Corporate Sustainability Reporting Directive (CSRD) as collateral in Eurosystem credit operations, once the directive is fully implemented.

**(d) Risk assessment and management:** The Eurosystem will further enhance its risk assessment tools and capabilities to better include climate-related risks. It will encourage credit rating agencies to more transparently disclose how they integrate climate-related risks into their ratings and to take more ambitious steps with regard to climate risk disclosure requirements. In addition, the Eurosystem agreed on a set of common minimum standards for integrating climate risks into the ratings provided by the national central banks' internal credit assessment systems (ICASs).

1 "ECB takes further steps to incorporate climate change into its monetary policy operations" press release, 4 July 2022.

2 "ECB presents action plan to include climate change considerations in its monetary policy strategy", press release, 8 July 2021.

3 For more information on initial initiatives to integrate the impact of climate change into the Eurosystem's operational framework, see Bank of Greece (2021), *Monetary Policy 2020-2021*, Box III.1.

4 In particular, under the Corporate Sector Purchase Programme (CSPP) and the Pandemic Emergency Purchase Programme (PEPP).

5 "ECB provides details on how it is intended to decarbonise its corporate bond holdings", press release, 19.9.2022.

These decisions are part of the climate action plan announced in July 2021. The ECB's work is progressing as outlined in the climate roadmap<sup>6</sup> and may have to be aligned if and when the timetable in EU legislation changes. In addition, the ECB will regularly review the above methodologies and criteria, which are likely to be adjusted as available data, analytical tools, legislation and risk assessment capabilities are enhanced and enriched over time.

6 "Detailed roadmap of climate change-related actions", July 2021.

## Box 21

### CENTRAL BANK DISCLOSURES ON ISSUES RELATED TO CLIMATE CHANGE IN APPLICATION OF THE TCFD RECOMMENDATIONS

Central banks are constantly stepping up their efforts to find ways to integrate the impact of climate change in the development and implementation of monetary policy, in supervisory practices as well as in the processes for safeguarding financial stability.

Measuring and reporting information on climate change-related risks and opportunities is an important step in this direction. The Recommendations of the Task Force on Climate-related Financial Disclosures (hereinafter the "TCFD recommendations")<sup>1</sup>, which was created by the Financial Stability Board, form a basic framework for the disclosure of climate change-related information and are already being implemented by governments, central banks, public organisations and corporations.<sup>2</sup>

#### Summary of TCFD recommendations

The TCFD recommendations are based on a set of principles that, among other things, allow for flexibility in their implementation. The recommended disclosures can be applied to central bank portfolios (both monetary policy portfolios and other portfolios), to the provision of credit facilities as well as to issues of financial stability and central bank operations.<sup>3</sup> The TCFD recommendations are implemented on a voluntary basis (except in the event of their transposition into national legislation) and in any case they do not prevail over any disclosures set out in the legislation in force. Finally, the recommended disclosures are structured around four interrelated thematic pillars that represent the core elements of how organisations operate: a) Governance, b) Strategy, c) Risk Management and d) Metrics and Targets.

As early as 2019, the European Commission published guidelines on the disclosure of climate-related information by firms, incorporating the TCFD recommendations.<sup>4</sup> The NGFS (Network of Central Banks and Supervisors for Greening the Financial System) emphasises the importance of a robust and internationally consistent climate and environment-related disclosure framework and its members have collectively pledged their support for the TCFD recommendations.<sup>5</sup> At the same time, since December 2021, the NGFS has incorporated the TCFD recommendations into a guide for central banks on how to make climate-related disclosures.<sup>6</sup>

1 Recommendations of the Task Force of the Financial Stability Board on the disclosure of climate-related financial information: Recommendations on Climate-Related Financial Disclosures.

2 As evidenced by the [list of supporters](#) of disclosures in accordance with the TCFD recommendations and the alignment of their formal reports with the requirements, this applies to a wide geographical and sectoral scale worldwide. The list comprises central banks, including the Bank of Greece.

3 In addition, a relevant [guide](#) was published by INSPIRE (International Network for Sustainable Financial Policy Insights, Research and Exchange), tailored to central banks' specificities, containing practical advice and guidance on the implementation of the TCFD framework. The Bank of Greece contributed to the writing of the guide, in cooperation with distinguished scientists from INSPIRE.

4 [Communication from the Commission – Guidelines on non-financial reporting: Supplement on reporting climate-related information \(2019/C 209/01\)](#), June 2019.

5 NGFS, *A call for action: Climate change as a source of financial risk*, April 2019.

6 NGFS, *Guide on climate-related disclosure for central banks*, December 2021.

### Implementation of the TCFD recommendations by the Eurosystem and the Bank of Greece

In February 2021, the Eurosystem committed to start making climate change-related disclosures, aligned with the TCFD recommendations for its non-monetary policy portfolios (NMPPs), comprising bonds<sup>7</sup> and equities. This was followed by the ECB's commitment in July 2022 for similar disclosures for corporate bonds held under CSPP and PEPP. The disclosures will be annual and will start at the end of the first quarter of 2023 at the latest.<sup>8</sup> According to the Eurosystem's common stance, which was finalised in November 2022, Eurosystem NCBs are required, as a minimum, to proceed to the disclosures mentioned in the thematic area "Metrics and Targets". At this early stage, in particular, they are required to disclose the climate footprint of euro-denominated non-monetary policy portfolios and to commit to the alignment of their investment policy with the goals of the Paris Agreement and the EU objectives for carbon neutrality by 2050. Disclosures relating to portfolios invested in foreign currency or to the other thematic pillars of the TCFD recommendations (Governance, Strategy and Risk Management) are currently optional.

The Bank of Greece, in line with the Eurosystem's common stance, is expected to disclose for the first time at end-March 2023 the climate footprint of its euro-denominated non-monetary policy portfolios for the financial year 2022, incorporating the TCFD recommendations outlined in the "Metrics and Targets" pillar.<sup>9</sup>

Disclosures under the TCFD recommendations mark an important step towards understanding climate-related risks to which central bank investment portfolios are exposed and providing information about their environmental footprint.

By continuously pursuing enhanced transparency about their investment activities, central banks can help improve the quality and availability of climate-related data and provide knowledge leading to a better understanding of the risks and opportunities that may arise due to climate change. In addition, all relevant actions are aimed at reducing the environmental footprint and more broadly at raising awareness of climate action.

<sup>7</sup> These include: sovereign bonds, corporate bonds, covered bonds, and supranational and agency bonds.

<sup>8</sup> Members of the Eurosystem that face legal and operational constraints in disclosing information prior to their relevant annual report for 2022 have the option of making the disclosures during the second quarter of 2023.

<sup>9</sup> The key metrics of portfolios' climate footprint, as recommended by the TCFD, are the following: (1) Weighted Average Carbon Intensity, (2) Total Carbon Emissions, (3) Carbon Footprint and (4) Carbon Intensity. In accordance with the common minimum disclosure framework approved at Eurosystem level, disclosure of the first three metrics is mandatory, while the fourth is optional.





