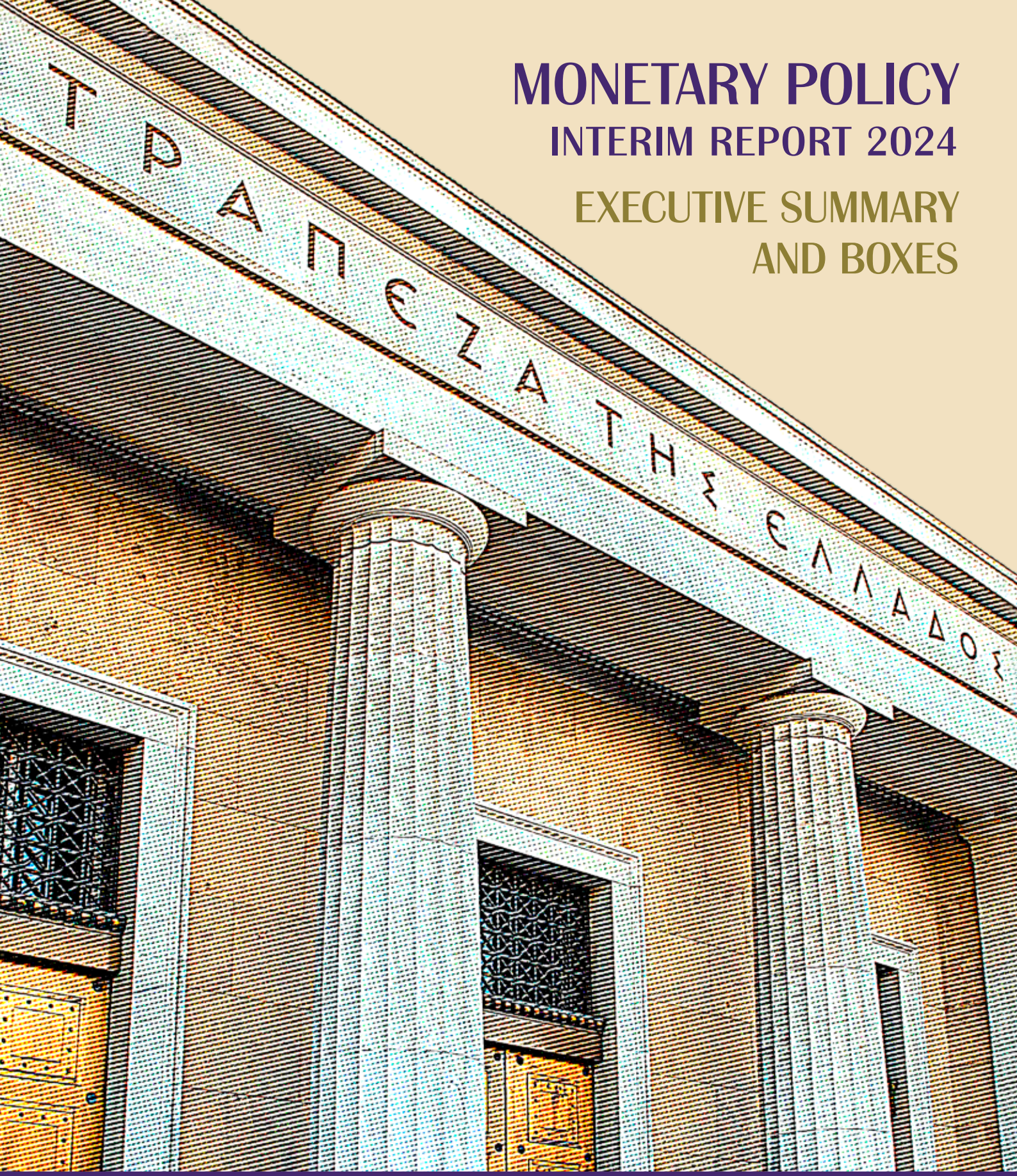
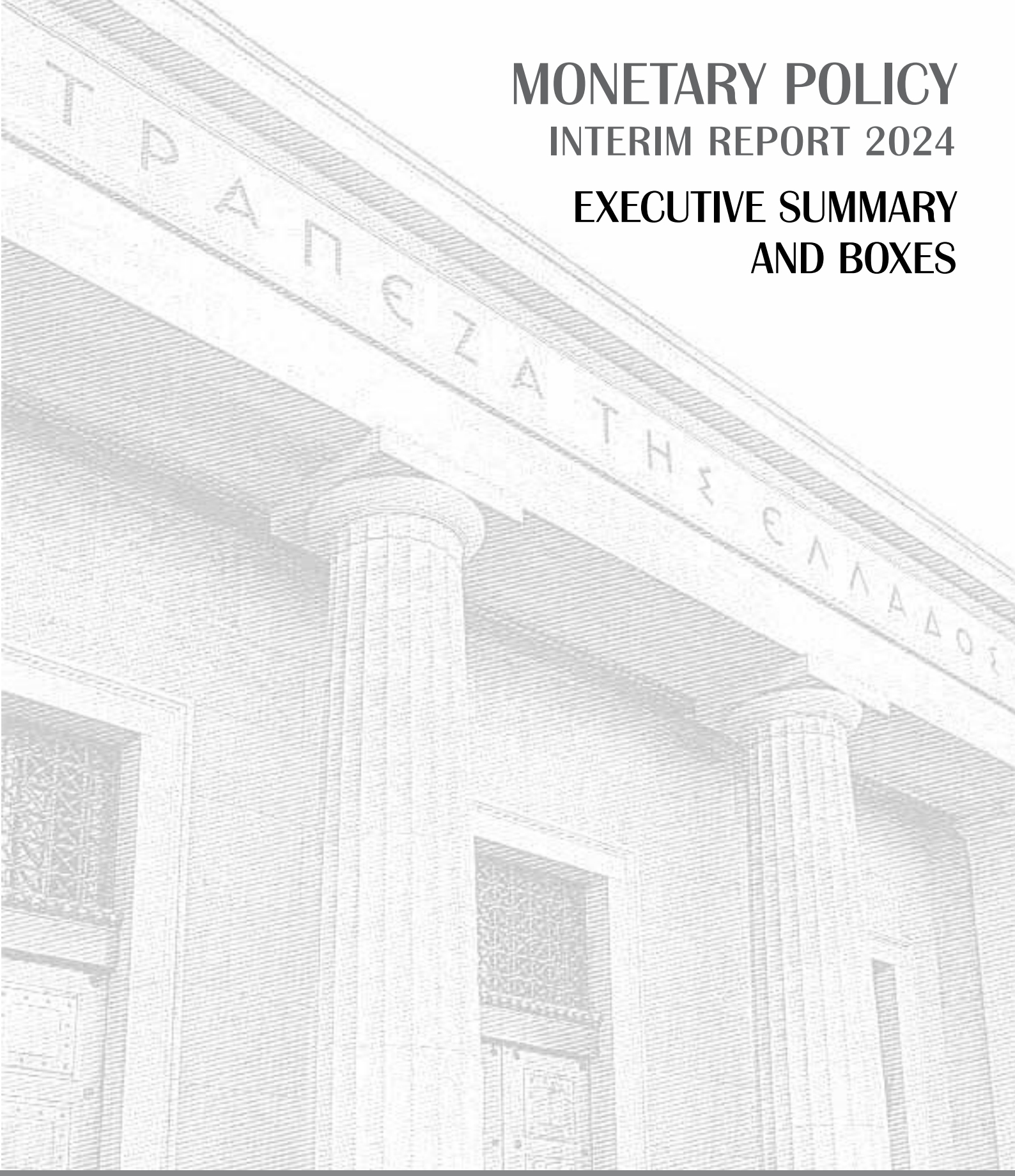
MONETARY POLICY
INTERIM REPORT 2024
EXECUTIVE SUMMARY AND BOXES



DECEMBER
2024

BANK OF GREECE
EUROSYSTEM



MONETARY POLICY
INTERIM REPORT 2024
EXECUTIVE SUMMARY AND BOXES

DECEMBER
2024

BANK OF GREECE
EUROSYSTEM

BANK OF GREECE

Economic Analysis and Research Department

DOI: https://doi.org/10.52903/monpol.en202412sp.ed

https://www.bankofgreece.gr/Publications/Inter_NomPol2024_en_Summary_Boxes.pdf

ISSN: 2732-9593 (online)

TABLE OF CONTENTS

EXECUTIVE SUMMARY

POSITIVE ECONOMIC DEVELOPMENTS IN AN INTERNATIONAL ENVIRONMENT OF HEIGHTENED UNCERTAINTY

1 INTRODUCTION

The world economy remained resilient in 2024, despite restrictive monetary policies and the uncertainty relating to the ongoing conflicts in Ukraine and the Middle East. Headline inflation continued to decline significantly in advanced economies, also as a result of monetary policy tightening. However, services inflation remains high, hence the rate-cutting cycle on which monetary authorities in several economies embarked in 2024 is progressing with cautious steps. In any event though, global financial conditions are currently more favourable than twelve months earlier, world trade has rebounded and international commodity and energy prices have broadly stabilised.

Regarding the euro area, although conjunctural indicators suggest that economic activity was marginally weaker than expected, the economy is recovering and is set to gather pace with time as higher real incomes allow households to consume more and as investment is expected to rebound. The gradual removal of monetary policy restriction is expected to support consumption and investment.

In the course of 2024, euro area headline inflation continued its downward path that had started in 2023, while most measures of long-term inflation expectations stand at around 2%. Against this backdrop, the Governing Council of the European Central Bank (ECB) lowered the deposit facility rate in June, September, October and December, by 25 basis points each time. The Governing Council has made clear that it is not pre-committing to a particular rate path.

The outlook for global and European GDP growth remains positive, but is subject to significant downside risks, related to mounting geopolitical uncertainty and a potential increase in trade protectionism. For the euro area in particular, recent political developments in large European economies are adding to the uncertainty.

The Greek economy continued to grow at a robust pace in the course of 2024, outperforming by far the respective euro area average. Headline inflation declined further in 2024, but ended up higher in Greece than in the euro area, as persistently high services inflation contained a faster decline. The labour market remained strong and fiscal aggregates improved, but the current account deficit widened. The weighted average lending rates fell and bank credit increased relative to 2023. Banks' fundamentals improved and Greek government and corporate bond yields followed a downward path, benefiting from the successive positive developments in Greece's sovereign credit rating and from the declining bond yields of the other euro area countries.

Given the uncertainties and risks stemming from the international economic environment, but also the new challenges facing the Greek economy, such as the green and digital transition, the climate crisis and the utilisation of artificial intelligence, it is essential that economic policy remains committed to the implementation of reforms. Such reforms will ensure a new sustainable growth model that will help the country to attract foreign investment and thus to achieve faster economic growth. This requires, among other things, a speedier implementation of actions under the National Recovery and Resilience Plan. Meeting the above-mentioned objectives, as well as safeguarding fiscal credibility and financial stability, should strengthen the positive outlook for the Greek economy and lead to further upgrades in Greece's sovereign credit rating.

In turn, this would help reduce borrowing costs for the public and the private sector, boost economic growth and secure the long-term sustainability of public debt.

2 THE GREEK ECONOMY: DEVELOPMENTS AND PROSPECTS

2.1 Real economy: Sustained growth momentum – Slow disinflation process

Economic activity: Economic activity in Greece continued to grow at a robust pace in the first nine months of 2024 (2.3% year-on-year). The key driver of growth was domestic demand, mainly private consumption but also investment. Stronger consumption was supported by higher household incomes, as employment continued to rise and nominal wages increased markedly. Exports of services also showed positive developments. Yet, the contribution of net trade was marginally negative, as exports of goods were likely dampened by subdued foreign demand, while at the same time imports of goods and services rose considerably. Finally, lower government consumption made a negative contribution to GDP growth.

Short-term activity indicators for industrial output, construction and services remain on positive territory, except for the retail sales volume index, which has edged downwards. Still, business confidence continues to be elevated, with some fluctuations, compared with the euro area, unlike consumer confidence, which has deteriorated. Moreover, the Purchasing Managers' Index (PMI) is in expansion territory – and above the euro area average – despite a marked slowdown over the past few months.

Inflation: Headline inflation, as measured by the Harmonised Index of Consumer Prices (HICP), declined year-on-year, averaging 3.0% in the available eleven months of 2024, down from 4.2% in 2023. Turning to individual HICP components, food inflation and non-energy industrial goods inflation fell visibly during 2024 compared with the previous year. However, persistently high services inflation prevented a faster decline in headline inflation, which ended up higher in Greece than in the euro area. Provided that geopolitical conditions do not worsen, a further slowdown in headline inflation should be expected in 2025.

Real estate market: In 2024 the Greek real estate market remained buoyant, despite uncertainties related to geopolitical instability and rising construction and operating costs. Demand remains strong for specific property uses and locations, although market players appear to be rather reluctant to invest in some types of real estate, in particular commercial properties. The housing market was supported by tourism and short-term property leases, as well as by, mostly foreign, investor interest in house purchases – including the Golden Visa programme. Low supply of quality spaces across the real estate market has boosted construction activity, which however failed to gather enough momentum to fully meet pent-up demand, especially in the residential segment. Under the current circumstances, property prices, especially house prices, are expected to continue rising – albeit at a weaker pace than previously – until the balance between demand and supply is restored on the back of increased supply of quality spaces.

Labour market: The labour market continued to expand strongly over the first nine months of 2024. Employment rose by 1.9% and the unemployment rate dropped further to 10.3% (from 11.3% in the respective period of 2023). It should be noted that the second and third quarters of 2024 saw a faster decline in the unemployment rate, which reached a single-digit level for the first time since the third quarter of 2009. Furthermore, dependent employment, based on dependent employment flows data from the ERGANI information system, remained high in the first nine months of 2024, albeit slightly lower year-on-year. The rise in the number of employees was driven in almost similar amounts by shifts of both unemployed and economically inactive persons towards employment. The short-term prospects for employment in the first eleven months of 2024 improved in the services sector, while employment prospects in construction,

trade and manufacturing remained positive, but weakened. Nevertheless, job vacancies continued to increase in the first half of 2024, as firms are faced with greater difficulties in recruiting suitable staff. High job vacancy rates are observed in tourism-related activities, construction, professional, scientific and technical activities, and manufacturing.

Competitiveness: The international competitiveness of the Greek economy in 2024 has worsened slightly in terms of relative prices, as the appreciation of the nominal effective exchange rate more than offset the favourable – for Greece – domestic inflation differential vis-à-vis the corresponding weighted average of major trading partners, mainly non-euro area ones. On the other hand, the real effective exchange rate index based on unit labour costs for the total economy has improved, as the annual growth rate of unit labour costs in Greece, although remaining high, fell short of the equally high growth rates in other major trading partners.

Although Greece's ranking on global composite structural competitiveness indicators has improved significantly in recent years, gaps in terms of innovation, technology and productive investment as a percentage of GDP persist, maintaining the existing competitiveness gap vis-à-vis most advanced economies. In this context, foreign direct investment (FDI) shrank in 2024 year-on-year. As in 2023, FDI flows have continued to be channelled towards manufacturing, communications, real estate and transport.

Current account balance: The current account deficit over the first ten months of 2024 widened by EUR 220.6 million year-on-year and came to EUR 8.0 billion. This development is due to a worsening mainly in the balance of goods and, to a lesser extent, the primary income account, which was almost entirely offset by higher surpluses in the secondary income account and the services balance. In particular, the deficit in the balance of goods grew, as the value of exports decreased by 3.4% and the value of imports increased by 1.5%. The higher surplus in the services balance over the first ten months of 2024 is associated with improvements in the travel and other services balances, whereas the transport balance deteriorated. It should be noted that in January-October 2024 tourist arrivals and receipts continued to rise, yet at a slower pace relative to January-October 2023, by 9.2% and 5.5% respectively, while average expenditure per trip fell. The deficit in the primary income account widened in the period under review, chiefly on account of lower net receipts from other primary income, which are mainly due to reduced receipts of EU farming subsidies, despite lower net interest, dividend and profit payments. Conversely, the secondary income account posted a higher surplus in the first ten months of 2024 year-on-year, as net receipts of the sectors other than general government outweighed general government net payments.

2.2 Fiscal developments: Higher-than-expected primary surplus due to increased tax revenue – Significantly lower public debt-to-GDP ratio

According to the second EDP notification of fiscal data for 2020-2023 by the Hellenic Statistical Authority (ELSTAT) in October 2024, the general government primary balance for 2023 turned out a surplus of 2.1% of GDP, against a balanced primary budget in 2022. In nominal terms, public debt increased in 2023 year-on-year, on account of a methodological change in its recording. But, as a percentage of GDP, it declined significantly to 163.9% from 177.0% of GDP in 2022. The biggest contribution (10.3 percentage points) to the reduction of the debt ratio came from the so-called "snowball effect", i.e. the implicit interest rate-nominal GDP growth differential.

In January-October 2024, tax revenue overshot the targets of the 2024 Budget as well as the Medium-Term Fiscal-Structural Plan 2025-2028, mainly owing to a reduction in tax evasion and rises in incomes, corporate profitability and employment.

According to the Introductory Report on the 2025 Budget, the general government primary balance (based on ESA) is estimated at a surplus of 2.5% of GDP in 2024, surpassing earlier es-

timates during the year, while general government debt is estimated to decline substantially by 9.9 percentage points of GDP to 154.0% of GDP compared with 2023, mainly owing to the debt-reducing contribution of the "snowball effect".

The projections of the Bank of Greece foresee a primary surplus of 2.5% of GDP and a debt ratio of 154.2% of GDP in 2024.

2.3 Financial developments: More favourable financial conditions

Market-based inflation expectations in the euro area and the United States have been declining and have converged towards the inflation targets of the ECB and the US Federal Reserve (Fed). In particular, as early as the end of the third quarter of 2023, investors anticipated interest rate cuts by major central banks worldwide. Indeed, the ECB has started to reduce its key interest rates since the second quarter of 2024 and the Fed since mid-September. As a result, global financial conditions are now more favourable compared with one year earlier. In this context, government and corporate bond yields have declined, especially for shorter maturities, contributing to a significant improvement in financial conditions around the world. Yet, financial conditions could be adversely affected by increased international geopolitical and macroeconomic uncertainty.

Greek government bond yields have largely tracked developments in the other euro area sovereign bond yields. Meanwhile, Greece's sovereign credit rating upgrades are leading to considerably stronger investor participation in new issues of Greek government bonds, supporting a continued decline in government borrowing costs.

2024 saw upgrades in Greek banks' credit ratings. This reduces banks' cost of borrowing from international capital markets, thereby benefiting their net interest income. In the same vein, yields on bonds issued by Greek non-financial corporations have been declining since early 2024, on the back of successive positive developments in Greece's sovereign credit rating, coupled with expectations of lower policy rates.

Between early 2024 and end-October, global stock prices, after the sizeable increases of the previous year, continued their upward path, mainly driven by the technology sector in the United States and by the banking and industrial sectors in the euro area, reflecting among other things investor expectations about key interest rate cuts. It should be noted however that, as evidenced by the bout of market volatility in August, equity prices are vulnerable to geopolitical and economic surprises. In this environment, share prices on the Athens Exchange (Athex) rose strongly until late October. The banking sub-index outperformed the Athex composite index, mainly in line with the Greek sovereign's upgrade to investment grade, as well as banks' increased profitability and credit rating upgrades.

2.4 Banking sector: Increased deposits, falling lending rates and stronger loan growth

Interest rates on time deposits, after trending upwards for about a year, remained almost unchanged in the fourth quarter of 2023 and in the first ten months of 2024 for most categories, despite the cuts in Eurosystem policy rates. Banks seem to delay adjusting their deposit rates, probably to forestall shifts from time deposit accounts to alternative investment options. The weighted average interest rate on total time deposits by non-financial corporations (NFCs) stood at 3.1% in the first ten months of 2024 on average (Jan.-Oct. 2023: 2.1%), 1.3 percentage points higher than the respective deposit rate for households. For the largest volume category of time deposits, namely deposits with an agreed maturity of up to 1 year, the Greek interest rate over the first ten months of 2024 was 0.9 percentage points lower than the respective euro area average.

In the first ten months of 2024, the stock of private sector deposits increased by a cumulative EUR 0.7 billion, reflecting a recovery in business deposits, whereas the rise in household de-

posits was weaker. By October 2024, the stock of private sector deposits came to EUR 195.5 billion. It should be stressed that shifts were observed away from deposit accounts (especially time deposits) and into Greek Treasury bills and other investment instruments offering higher remuneration than deposit rates.

Bank borrowing costs for NFCs and households have decreased this year, in line with Eurosystem policy rate cuts and an observed decline in banks' funding costs on capital and bond markets. More specifically, interest rates across most categories of bank loans to NFCs showed trends of stabilisation and/or decline, thus bringing the weighted average interest rate on business loans with a fixed maturity down to 5.5% in January-October on average (2023 average: 5.8%). Most interest rates on consumer loans had already started to fall since the third quarter of 2023. Thus, the weighted average interest rate on consumer loans with a fixed maturity dropped by around 0.5 percentage points relative to 2023 and stood at 10.8% over the first ten months of 2024 on average. Interest rates on housing loans also declined, but their fall has begun more recently – since early 2024 – and cumulatively so far does not suffice to reverse the past interest rate hikes. As a result, the weighted average interest rate on housing loans was 4.1% over the first ten months of 2024 on average, unchanged from its 2023 average. The years-long convergence of Greek nominal lending rates towards the European average continued throughout 2024, with their differential narrowing to less than one percentage point in both sectors (NFCs and households).

Annual growth in bank loans to NFCs averaged 8.5% in January-October 2024, up from an average of 6.5% in 2023. Stronger credit expansion to businesses is associated with higher demand for bank loans, especially by large firms. Business credit was underpinned by the co-financing and loan guarantee schemes of development organisations, as well as by banks' co-funded loans for investment projects under the Recovery and Resilience Facility (RRF). In greater detail, business loan disbursements under the co-financing and loan guarantee schemes of development organisations in January-October 2024 amounted to 14% of new loans with a fixed maturity to NFCs over the same period, while RRF-related business loan disbursements accounted for about 10%, respectively. Small and medium-sized enterprises (SMEs) greatly benefited, as more than 40% of their bank borrowing during the period under review was backed by such schemes.

Average annual growth in bank loans to households turned less negative in January-October 2024 (-1.1%), compared with an average of -2.4% in 2023. This development stemmed from housing loans, which declined at a weaker pace, and consumer credit, whose positive rate of change kept accelerating. The continuous upward trend in consumer credit is consistent with the path of private consumption. Turning to housing loans, rising residential property prices continue to favourably affect the annual increase in the average gross flow of housing loans. By contrast, as bank interest rates on housing loans remained relatively elevated on average over the first ten months of the year, their impact on demand for housing credit was negative. On the other hand, many borrowers benefited from the co-funded programme "My Home", under which 75% of the loan was interest-free.

Looking ahead, annual NFC credit growth is expected to remain strong in the short term, supported by GDP growth. Low-interest rate loans under the RRF or under the new co-funding and guarantee schemes of the Hellenic Development Bank (HDB) and the European Investment Bank (EIB) Group have critically benefited the terms and conditions as well as the availability of business and housing loans, and should continue to do so in the near future. Moreover, "My Home II" is set to be launched in 2025, offering a zero interest rate on 50% of the loan, and should stimulate housing credit. Finally, in tandem with the ongoing withdrawal of monetary policy restriction, new declines in lending rates and a further reduction in the domestic private sector's bank borrowing costs should be expected.

Banking system: Improved fundamentals

Banks' fundamentals improved further over the first nine months of 2024. More specifically, liquidity and capital adequacy ratios improved, as did the quality of loan portfolios, while the profitability of banking groups remained broadly unchanged on an annual basis. These developments were supported by, among other factors, the robust performance of the Greek economy and the 2023 Greece's sovereign credit rating upgrade to investment grade. As a consequence, rating agencies have recently upgraded the credit ratings of significant banks, maintaining a positive outlook.

System-wide profitability remained broadly unchanged over the first nine months of 2024, as the improvement in core profitability on the back of stronger net interest and fee income was offset by higher provisioning, mainly due to the clean-up of Attica Bank's loan portfolio.

Banks' capital adequacy ratios improved thanks to an increase in regulatory capital, which resulted from internal capital generation and issuance of bonds accounted for as equity, while risk-weighted assets remained almost unchanged. It should be noted that 40% of Greek banking groups' regulatory capital consists of deferred tax credits (DTCs), but the quality of their capital is set to improve over the medium term amid expectations of high profitability and taking into account their announcements about a faster whittling down of DTCs.

The ratio of non-performing loans (NPLs) to total loans, on a solo basis, dropped considerably in September 2024 compared with December 2023, standing at its lowest level since Greece joined the euro area. This was due to actions aimed at cleaning up the loan portfolios of certain banks in the context of the upcoming inclusion of NPL securitisations in the Hellenic Asset Protection Scheme (HAPS), better known as "Hercules".

With regard to bank liquidity, the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) rose over the same period, remaining well above the prudential requirements and the respective euro area averages. Greek banks maintain adequate liquidity, despite a further reduction in Eurosystem funding (TLTRO repayments), while the loan-to-deposit ratio is also well below the euro area average.

2.5 Projections: Faster growth and further disinflation for 2025 – New significant reduction in public debt

According to the current projections of the Bank of Greece, GDP growth is expected to turn out at 2.3% in 2024, picking up to 2.5% in 2025 and moderating slightly to 2.3% in 2026 and 2.0% in 2027. Consumption is anticipated to be the key driver of growth, while investment and exports should continue making positive contributions. Overall, the contribution of net trade to GDP is projected to be slightly negative in the coming years, as buoyant investment activity and stronger consumption should lead to imports rising at broadly the same pace as exports.

The unemployment rate is projected to stand at 10.6% in 2024 and to keep declining fast before reaching 8.5% in 2027, reflecting an ongoing recovery of economic activity in the years ahead. With regard to labour costs in the total economy, nominal compensation per employee should keep rising strongly at an average rate of around 4.5% in the coming years, mostly as a result of labour market tightening, but also on the basis of recent collective agreements in several private sector industries. Labour productivity in the total economy is expected to grow at a weaker pace than real compensation per employee, denting the international competitiveness of the Greek economy.

HICP inflation is projected at 3.0% in 2024, down from 4.2% in 2023, reflecting a large slowdown in food inflation. By 2026, inflation should converge towards but remain slightly above the ECB's target of 2%. However, a one-off rise in HICP inflation to 2.5% is anticipated in 2027, due to the impact on the energy component from the expanded EU Emissions Trading System that will

then become operational. Services inflation is set to be more persistent than other HICP components, mainly reflecting expected increases in labour compensation. Lastly, core inflation is projected to drop considerably to 3.5% in 2024 and 3.1% in 2025, mainly driven by falling non-energy industrial goods inflation.

In 2024, the current account balance as a percentage of GDP is estimated to have worsened relative to 2023, while for 2025 a small contraction in the current account deficit as a percentage of GDP is anticipated. Muted economic growth in the EU, which is the primary market for Greek exports, should not allow any meaningful rise in exports of goods. Furthermore, the pick-up in domestic investment, partly supported by RRF-funded projects, is expected to lead to higher imports of investment goods, thereby weighing on the balance of goods. The surplus in the services balance is expected to grow further in 2025, as the anticipated rise in tourist arrivals, also as a result of extended tourist seasons, and the sustained momentum of the cruise sector should lead to an – albeit weaker – increase in tourism receipts. The outlook for sea transport receipts remains positive, as freight rates are expected to edge up, owing to a strengthening in world trade, as well as to the longer routes taken because of geopolitical developments. Finally, inflows from the Multiannual Financial Framework 2021-2027 and the RRF are anticipated to have a favourable effect on the current account balance.

Turning to fiscal aggregates, the Introductory Report on the 2025 Budget forecasts a general government primary surplus of 2.4% of GDP in 2025, as revenue from taxes and social security contributions is projected to rise amid continued economic expansion and an expected further increase in the minimum wage, while primary expenditure growth has been contained (within the limits that ensure compliance with the new EU fiscal rules). General government debt in 2025 is forecast to stand at EUR 365 billion or 147.5% of GDP, down by 6.5 percentage points of GDP compared with 2024, mainly thanks to the debt-reducing contribution of the "snowball effect". These forecasts fulfil the fiscal sustainability criteria of the revised Stability and Growth Pact with a safe margin.

The projections of the Bank of Greece foresee a general government primary surplus of 2.4% of GDP and a debt ratio of 145.9% of GDP in 2025.

2.6 Risks and uncertainties: Heightened external risks

Risks to the growth forecasts of the Bank of Greece are tilted to the downside and concern: (i) an aggravation of the geopolitical crisis in Ukraine and the Middle East and the implications for the global economic environment; (ii) increased trade protectionism worldwide; (iii) lower-than-expected absorption and utilisation rates for RRF funds; (iv) a tightening labour market and possible wage pressures; (v) slower-than-expected implementation of the necessary reforms; and (vi) possible natural disasters related to the climate crisis.

It is estimated that risks to the sustainability of public debt remain contained in the medium term, contingent upon a commitment to meeting the fiscal targets and an efficient use of EU resources. In the long term, however, increased uncertainty should be expected, 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 risk and market risk, leaving no room for fiscal policy relaxation.

3 THE EXTERNAL ENVIRONMENT OF THE GREEK ECONOMY

3.1 Developments and prospects outside the euro area: Recovering global trade and sustained growth momentum with considerable cross-country variation

The world economy has shown remarkable resilience in the face of successive crises. World GDP grew by 3.2% in the first half of 2024 year-on-year, with varying developments across major economies. Short-term activity indicators point to similar growth rates for the second half

of the year, with services remaining more buoyant. Global trade, which recovered faster than anticipated even amid increased transport costs, is expected to gradually boost the goods sector as well. Overall, according to the IMF (October 2024), world GDP is estimated to grow at an annual rate of 3.2% both in 2024 and in 2025, compared with 3.3% in 2023.

The IMF estimates that growth in 2024 will pick up slightly in advanced economies to 1.8% (and is expected to remain stable in 2025) from 1.7% in 2023, as the US economy decelerated less than initially projected, economic recovery in the United Kingdom proved stronger than expected and the euro area economy showed signs of recovery, in spite of a marked slowdown in the Japanese economy. In emerging market and developing economies as a whole, GDP growth is estimated by the IMF to slow to 4.2% in 2024 (and is expected to steady at around this level in 2025) from 4.4% in 2023, mainly reflecting lower growth rates for China and India. The slowdown in the Chinese economy is projected to continue throughout 2025, as the recovery in industrial production and exports cannot counterbalance the weakening in private consumption, which is dragged by an ongoing correction in the real estate market.

The impacts from persistently high inflation, tighter monetary policies and stronger services demand relative to goods weighed on international trade flows in 2023. By contrast, in 2024 the outlook has improved for global trade, which is expected to grow in lockstep with global economic activity. According to the IMF, the volume of global goods and services trade is projected to rise by 3.1% in 2024 and 3.4% in 2025, against a trifle 0.8% in 2023, though remaining below its recent historical average (2000-22: 4.6%). Despite the imposition of more stringent trade restrictions between distant geopolitical blocs, increased intra-bloc trade and trade with third, neutral countries have been compensating so far. The possibility of an all-out conflict in the Middle East or an escalation of the war in Ukraine as well as a potential intensification of trade protectionism constitute the main downside risks to global trade over the medium term. On the other hand, gradually restored traffic of commercial ships through the Panama Canal since September 2024 and recent stimulus measures (October 2024) in China are upside risks to international trade flows.

Global inflation continued to decline in 2024, as a result of restrictive monetary policies and the waning impact of supply disruptions due to the energy crisis. Headline inflation fell more in advanced economies, despite a projected modest pick-up in their growth rate, while the decline in core inflation is slower, primarily driven by services inflation, which remains high in many large economies. Global inflation is expected to fall to 5.8% in 2024 and 4.3% in 2025 from 6.7% in 2023 (IMF, October 2024). Disinflation will be faster in advanced economies, thanks to monetary policy determination to combat inflation.

3.2 Euro area developments and prospects: Resilience, muted recovery, disinflation

The euro area economy is exhibiting resilience, rebounding in 2024 from the challenges that were mostly associated with the energy crisis and geopolitical developments. GDP growth followed an upward path in the first half of 2024, mainly on the back of improvements in foreign demand and world trade, and picked up in the third quarter to 0.4%, quarter-on-quarter, underpinned by a recovery in domestic demand. While services supported growth, the industrial sector made a negative contribution. The labour market remains resilient, with the unemployment rate standing at historic lows. Over the medium term, real GDP is projected to increase at rates similar to historical averages, supported by rising real incomes, stronger foreign demand and the receding headwinds of restrictive monetary policy. Under the baseline scenario in the Eurosystem staff projections (December 2024), GDP is estimated to grow by 0.7% in 2024, compared with 0.5% in 2023. For 2025, GDP growth is projected to pick up to 1.1%.

Euro area inflation continues to decline. After a temporary rise anticipated in the fourth quarter of 2024, inflation is expected to progressively fall below 2.0% by 2026. HICP inflation stood at 2.3% in November, up from 2.0% in October, reflecting base effects, as well as persistently high

food and services inflation. According to the December 2024 Eurosystem staff projections, HICP inflation will drop to 2.4% in 2024 and 2.1% in 2025, from 5.4% in 2023. The projected drop in inflation will largely come from an easing of labour cost pressures, also as a result of rising labour productivity, as well as from the unwinding of second-round effects due to the energy crisis and the pandemic. Euro area core inflation is expected to continue falling but it is anticipated that it will end up higher than headline inflation.

3.3 Risks and uncertainties: Armed conflicts, geopolitical fragmentation and trade protectionist trends

Risks to the growth and inflation outlook for the global and European economies remain heightened. The war in Ukraine and conflicts in the Middle East are posing severe geopolitical risks, which may disrupt global trade and dampen firms' and households' activity. Geopolitical rifts, geo-economic fragmentation and trade protectionist trends, if intensified, could lead to a renewed surge in import prices, hurting global trade and investment and undermining economies' productivity and resilience in the long run. Furthermore, extreme weather events, and climate change more broadly, could drive up food prices. Growth could be adversely affected in the event of a slower moderation in inflation, possibly leading to smaller-than-expected key interest rate cuts. Conversely, growth may surprise upwards if inflation declines faster, supporting confidence, real incomes and consumer spending. Major challenges for the economic policy pursued by most economies include (i) the return to fiscal stability with a view to ensuring the sustainability of public finances and the build-up of adequate buffers for addressing potential risks in the future, but also, especially in the EU, (ii) the implementation of structural reforms and the stimulation of productive investment in research and innovation, so as to raise low productivity growth.

4 THE SINGLE MONETARY POLICY

Lower policy rates as the disinflation process is well on track

After September 2023 and up until May 2024, key Eurosystem interest rates remained unchanged. In June 2024, the Governing Council of the ECB lowered key interest rates by 25 basis points, as it was assessed that the timing was appropriate to moderate the degree of monetary policy restriction, given that, since September 2023, inflation had fallen by more than 2.5 percentage points and the inflation outlook had improved markedly.

Further cuts in the deposit facility rate followed suit in September, October and December 2024, by 25 basis points each time. The decisions by the Governing Council of the ECB to lower key interest rates are based on its updated assessment of the inflation outlook, the dynamics of underlying inflation and the strength of monetary policy transmission.

More specifically, in the second half of 2024 headline inflation and several measures of underlying inflation in the euro area declined further, while most measures of long-term inflation expectations stood at around 2%. The Governing Council confirmed that inflation will stabilise around its 2% target in 2025 on a sustained basis. The convergence of inflation towards target is expected to be driven by wage growth moderation, the still restrictive financing conditions in the euro area due to the lagged effects of past monetary policy tightening, as well as the fading impact on prices from the energy crisis, input shortages and the post-pandemic reopening of the economy.

Interest rate policy decisions rely on a data-dependent and meeting-by-meeting approach, whereby the Governing Council continuously re-assesses economic developments, in particular the inflation outlook.

It should be recalled that in March 2024 the Governing Council of the ECB revised its operational framework for implementing the single monetary policy. On the basis of this revision, the

deposit facility rate (DFR) is now the rate through which the Governing Council steers the monetary policy stance. As from 18 September 2024, the rate on the main refinancing operations (MROs) will be adjusted such that the spread between the rate on the MROs and the DFR will be 15 basis points, while the rate on the marginal lending facility (MLF) will also be adjusted such that the spread between the rate on the MLF and the rate on the MROs will remain unchanged at 25 basis points.

With regard to monetary policy measures other than key interest rate changes, in the second half of 2024 the Eurosystem's holdings of securities under the pandemic emergency purchase programme (PEPP) was reduced by EUR 7.5 billion per month on average, as the principal payments from maturing securities were not reinvested in full, but only in part. At end-2024 such reinvestments will be discontinued.

5 THE GREEK ECONOMY: PROGRESS, CHALLENGES AND POLICY RECOMMENDATIONS

Progress

The Greek economy has accomplished remarkable achievements over the past years and has proven very resilient to several external shocks, such as the COVID-19 pandemic, the energy crisis and the war in Ukraine with the ensuing surge in inflation. The growth rate of the Greek economy has been outpacing the EU average since 2019, accelerating the convergence of Greece's real GDP per capita with the average European level. Employment is on the rise and the unemployment rate has fallen to single-digit levels despite a substantial increase in the minimum wage. As a consequence, disposable income is rising and the share of population at risk of poverty or social exclusion decreased between 2019 and 2023.

Investment as a percentage of GDP has increased considerably in recent years, with business investment having returned to levels last seen before the debt crisis. Moreover, the composition of investment favours potential output growth, as the bulk now relates to productive rather than housing investment as was the case in the past. Improved cost competitiveness, the implementation of flagship reforms in the labour market and increased extroversion resulted in a significant rise in exports of goods and services over the past few years, while the share of high-tech exports in total exports of goods has also risen.

The prudent fiscal policy pursued over the past years and the efforts to combat tax evasion are bearing fruit, as high primary surpluses are generated without a need for austerity measures and the public debt-to-GDP ratio is declining. Meanwhile, the past decade's pension reforms have ensured the long-term sustainability of the social security system. Besides, banks' fundamentals have improved and the NPL ratio has been reduced.

The solid economic performance in recent years has resulted in Greece's sovereign credit rating upgrade to investment grade. A further confirmation of the progress achieved so far is the recent credit rating upgrade of Greek government bonds by Scope Ratings to BBB from BBB-. These favourable developments have led to credit rating upgrades for large Greek banks and non-financial corporations, as the operating environment is considered to be a key determinant of credit ratings by major agencies. All in all, the upgrades have not only bolstered confidence among domestic and foreign investors in the prospects of the Greek economy, but have also improved the availability and the terms and conditions of credit to the private and public sectors.

Challenges

In spite of the undeniable progress of the economy so far and the positive outlook, there is no room for complacency. Greece's achievements in recent years indicate that the economy is on

the right path. Nominal GDP is expected to return to its pre-crisis level in 2024, while nominal GDP per capita has already reached its 2008 level since 2023. However, the effort to recover from the 10-year debt crisis has yet to be completed. In real terms, both GDP and GDP per capita still fall short of their pre-crisis levels, while catching up with the European averages, after five years of effort, requires even higher growth rates. It is telling that, despite the recent upgrades, the credit rating of Greek government bonds remains well below the average credit rating (A) of euro area sovereign bonds.

Furthermore, foreign demand from major trading partners is still subdued. This is reflected in reduced exports of goods and a worsening current account balance, while, amid global uncertainty, foreign direct investment has also weakened. Moreover, investment growth, despite the satisfactory rates of absorption of RRF funds, continues to be weaker than initially expected for the second year in a row, due to delays in the execution of relevant expenditure and in the disbursement of funds to final recipients.

At the same time, despite the gradual decline in inflation, the inflationary pressures of the past few years mostly affected lower-income households, which spend a higher share of their income on energy and essential goods and are thus harder hit by price increases. In the same vein, soaring real estate prices and rents after 2017 have exacerbated the housing crisis for Greek households.

Furthermore, several domestic structural weaknesses, some of which pre-date the debt crisis, linger on. For instance, lack of competition in a number of economic sectors, which adds to the international high cost of living problem; high public debt; a large investment gap; low savings; weak structural competitiveness that worsens the current account balance; low labour force participation of women and youth, as well as ageing population, which both increase labour market tightness over time, remain a drag on the economy's growth dynamics.

Such domestic weaknesses are compounded by global challenges, such as the intensification of geopolitical confrontations, geo-economic fragmentation and a renewed trade protectionist trend, the climate crisis, energy security, the transition to a sustainable and circular economy, as well as the advent of new digital technologies and of artificial intelligence (AI) in particular.

Policy recommendations

In light of the above, economic policy should remain committed to safeguarding fiscal credibility and stability, as well as to the implementation of the necessary investments and reforms under the National Recovery and Resilience Plan "Greece 2.0", which will facilitate the green and digital transition and speed up growth in the years ahead. This is a key prerequisite for boosting incomes, providing relief to poorer households and further reducing inequalities, while also ensuring gradual improvements in the credit rating of the Greek economy.

Nevertheless, although timely absorption and effective use of RRF funds are crucial for the economy's path going forward, it would be a misconception that this alone suffices to sustainably recoup the ground lost as a result of the 10-year debt crisis. Therefore, efforts must be stepped up to strengthen potential output growth over the medium-to-long term. This can only be achieved by promptly addressing the Greek economy's inherent weaknesses.

Indicatively, demographic ageing is expected to shrink the working age population. This calls for active labour market policies and education and training programmes aimed to raise female and youth labour force participation, reduce the number of long-term unemployed persons and reintegrate those discouraged into the labour force. At the same time however, targeted policies are required to integrate immigrants into the labour force and attract foreign workers, so as to overcome labour shortages already observed in agriculture, tourism-related sectors and construction.

Given the constraints posed by demographic developments, it is necessary to enhance labour productivity in order to maintain the growth momentum. Labour productivity had been trending upwards from the run-up to Greece's EMU entry until before the outbreak of the global financial crisis of 2008-09. It then followed a downward path as a result of the debt crisis, reaching a trough in 2020. In recent years, labour productivity has rebounded, returning to a path of convergence with the European averages. More specifically, in 2024 it is expected to stand at 57.9% (63.3%) of labour productivity in the euro area (in the EU 27). Notwithstanding this, the labour productivity gap that the Greek economy must close is very large and calls for a long effort.

Given the investment gap facing the Greek economy, increasing investment is key to strengthening labour productivity and accelerating economic growth rates. This hinges upon the full absorption and productive use of funds under both the RRF and the EU's Multiannual Financial Framework 2021-2027.

Yet at the same time, it also requires a strengthening of the banking sector and its ability to tackle the existing challenges and effectively finance investment and economic growth. Vigilance is therefore warranted, so as to further clean up banks' assets, avert new net inflows of NPLs, as this is expected to contribute to a further improvement in capital ratios, and reduce deferred tax credits (DTCs), which currently account for 40% of banks' regulatory capital.

In view of future demographic constraints as well as the environmental and climate change-related challenges, the notion of total factor productivity (TFP) becomes increasingly important. Higher TFP enables an economy either to increase its total income without using more inputs or, alternatively, to maintain its income level using less production inputs. Thus, improved TFP would help maintain or raise living standards, while protecting natural resources and the environment.

Enhancing TFP requires an improvement of education and training especially in new technologies, with a view to increasing human capital. Furthermore, the Greek economy's extroversion must be enhanced, as firms' access to the global market enables them to benefit from economies of scale and increase their technology content, while international competition tends to reward the most productive businesses.

Moreover, labour and capital markets should operate in a way to ensure allocative efficiency, by channelling labour and capital inputs into the more productive firms in an industry, enabling them to thrive, while the less productive ones exit the market. Allocative efficiency leads to higher total factor productivity and economic growth. By contrast, economic growth and productivity would gradually decline if labour and capital remained with relatively non-productive firms. This could occur if e.g. the labour market is overly regulated, if favourable provisions or barriers to market entry allow non-viable firms to remain in business, or if new, more dynamic firms face difficulties in accessing finance. As a consequence, regulatory barriers, rigid labour markets, financial constraints and lack of access in global markets are factors that lead to resource misallocation, lack of allocative efficiency and low productivity. Therefore, the adoption of targeted measures and the promotion of appropriate reforms aimed at addressing such distortions would greatly enhance total factor productivity and stimulate growth. Policies to this end involve reducing entry barriers to goods and services markets as well as increasing competition. Better-functioning financial markets can contribute in the same direction, enabling access to external financing that firms need to grow and innovate. Against this backdrop, firms with high productivity potential can secure the necessary capital for expanding their business, rather than remain small in size due to financial constraints. Reducing labour market rigidities is equally important for bolstering the dynamism and adaptability of the labour force. This in turn could lead to a better matching between labour demand and supply, thereby boosting total factor productivity.

Meanwhile, addressing other issues that hamper the efficient allocation of resources is also of vital importance for long-term growth. Such issues are corruption, the complexity and poor quality of legislation, delays in the delivery of justice, an unclear spatial planning framework, inadequate connection of education with the labour market, infrastructure deficiencies, high cost of electricity, a heavy tax burden on labour income, high indirect taxes, labour shortages and SMEs' inadequate access to bank credit. To tackle these issues, better governance and institutional reforms are warranted. An improved legal and regulatory framework as well as transparent and fair market practices can create a more dynamic and productive economic landscape. In this connection, a diversification of the sources of financing, through a wider use of microcredit and access to alternative types of market-based funding, is important for meeting the investment needs of SMEs, in particular start-ups and innovative SMEs, that do not have sufficient tangible assets to offer as collateral for obtaining bank credit.

The aforementioned reforms should enable the most dynamic and extrovert economic sectors to thrive, thereby supporting employment growth and economic activity in general. Such sectors are the industrial sector, logistics, construction, technology firms, services providers, the financial sector, trade, transport and tourism. As suggested in the Draghi report, special emphasis should be placed on bolstering the industrial sector, which over the past few years has greatly contributed to higher employment, exports, innovation and total value added. For instance, it should be stressed that gross value added (GVA) in the industrial sector, at constant 2023 prices, rose by 43.3% over the 2019-23 period, compared with 13.3% in the remaining economic sectors over the same period. As a result, between 2019 and 2023 the share of the industrial sector in total GVA of the Greek economy increased from 14.3% in 2019 to 15.4% in 2023. In the same vein, labour productivity in the industrial sector grew by 27.8% over the 2019-23 period, compared with 7.4% in the remaining economic sectors. The effective use of available European resources, coupled with the mobilisation of increased private investment, can facilitate the green and digital transformation of the Greek industrial sector and further enhance its competitiveness and extroversion.

However, in addition to the above, total factor productivity gains can also stem from higher firm-level productivity through technological, organisational and process innovation. Innovation, especially with regard to emerging technologies such as biotechnology and green technologies, information and communication technology (ICT), supercomputers, automation and artificial intelligence (AI), can raise productivity and boost economic growth. In particular, the advent of AI is expected to have a favourable effect on science and technological research, from biology to physics and materials science, elevating them to key drivers of energy transition.

Thus, firms adopting cutting-edge technologies and attracting top talent can greatly improve their productivity. For example, a technology firm investing in cutting-edge research and development (R&D) can launch new products or improve existing ones, expanding its market share and raising its productivity. Overall, technological advances are of vital importance for enhancing productivity, as they allow firms to operate more efficiently and be competitive in the global market.

Beyond actions by businesses themselves, government interventions are also needed, in the form of subsidies and tax incentives to foster an innovation ecosystem in which businesses, research institutes and universities can work together to promote the conduct, as well as commercialisation, of basic research. At the same time, it is imperative to promote policies that improve workers' digital skills and ensure the diffusion and accessibility of new technologies.

***

To sum up, enhancing total factor productivity through reforms and innovation, alongside increasing investment and labour force participation, is crucial for boosting economic growth, raising living standards and accelerating the convergence of Greece's GDP per capita with the

European average. On the back of higher productivity, challenges such as high public debt, the current account deficit and pressures on pension and healthcare expenditures due to ageing population become much more manageable. In the same vein, the implementation of increased investment in new technologies, climate change mitigation actions and projects promoting green transition is facilitated.

Nevertheless, it should be noted that the international economic environment has visibly changed in just a few years. Armed conflicts, geopolitical tensions, geopolitical fragmentation and fierce economic competition, even between partners, are some of the challenges that not only Greece but also all European countries have to deal with. The challenges facing Europe as a whole are related to technology, environmental, energy and security issues. Yet, although as a country we must remain committed to the implementation of the required reforms, the response to the new global trends and challenges cannot possibly come from any single country alone. Rather, there is a need for a common approach, a joining of forces and cooperation at the European level, along the lines suggested by the recent Letta report on the necessity of completing the Single Market and the Draghi report on the future of EU competitiveness. A key prerequisite for closing the innovation, productivity and competitiveness gaps and for safeguarding the sovereignty, security and resilience of Europe is coordination and joint action by Member States, also building on the successful experience with the NextGenerationEU recovery instrument.

Box 1

GLOBAL TRADE FRAGMENTATION: IMPACT AND RISKS TO THE GLOBAL ECONOMY

The growing participation of advanced and emerging market economies in global value chains and the expansion of global trade were an important driver of economic growth in the past decades. However, the shocks that hit the global economy in recent years have called into question the benefits of globalisation. Thus, inward-looking trade policies, such as subsidies and export restrictions, which had been on the rise already before 2019, gained momentum worldwide in the post-pandemic era, amid intensified geopolitical tensions.

This box investigates recent developments and implications of global trade fragmentation. Trade fragmentation is defined as a reversal of globalisation through the introduction of trade restrictions, motivated by domestic economic policy objectives and geopolitical or strategic considerations. First, we examine the characteristics of global and bilateral trade flows among the United States, the EU and China, as well as restrictions on trade in goods and critical raw materials. Then, we assess the impact on economic growth and inflation of a possible rise in trade protectionism and discuss the resulting policy challenges.

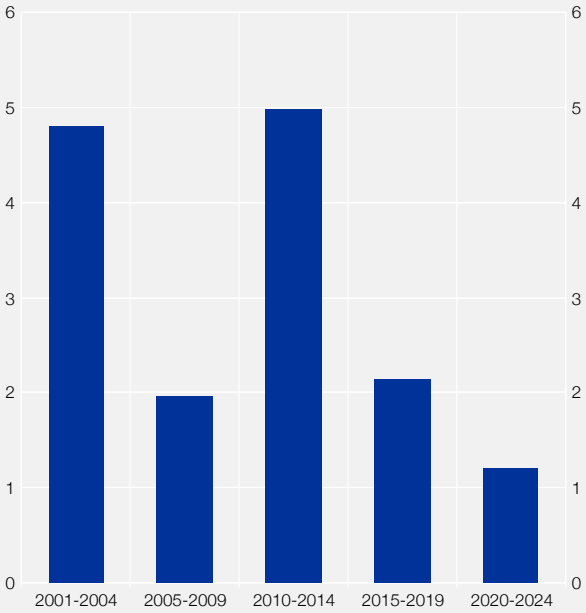
Global trade developments and protectionism

In the past few decades, the volume of global trade has been growing at a slower pace, with the lowest growth rates recorded in 2020-2024 amidst the pandemic, the energy crisis and geopolitical tensions (see Chart A). Moreover, global trade is currently concentrated in a smaller number of countries compared with the 1990s, while global exports are two times more concentrated than imports.[1]

Although trade dependencies between geographical areas have become stronger than in previous decades,[2] their evolution has been asymmetric over the past few years. For instance, the recent crises and the need for strategic autonomy, as well as the escalating US-China trade disputes since 2018, have reduced the bilateral trade flows between the two economies in the post-pandemic era, while the EU and China have maintained or increased their trade interdependencies.[3] Between 2018 and 2023, the US reduced its imports of goods from China, thereby narrowing its bilateral trade deficit by 33%. By contrast, the EU's trade deficit with China doubled, with imports from China coming to account for about one-fifth of total EU imports and with China's share of EU exports declining.

Chart A Global trade volume

(%, average annual changes)



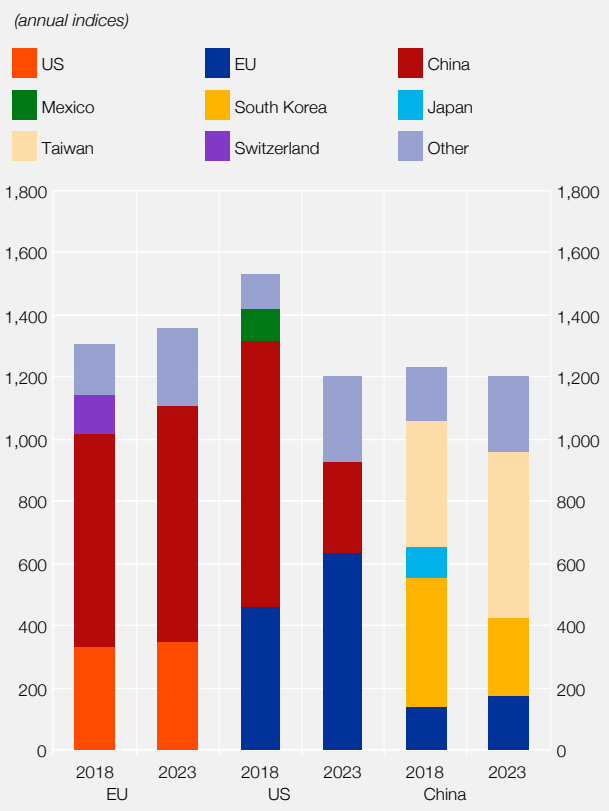
Sources: CPB World Trade Monitor and Bank of Greece calculations.
Note: Year 2024 refers to only the first four months.

1 A possible explanation for the higher concentration of exports is that countries produce and export goods in which they have a comparative advantage in terms of production technology or available resources. By contrast, consumer preferences are less diversified across countries, thus imports are less concentrated. See OECD (2024), "Towards demystifying trade dependencies. At what point do trade linkages become a concern?", *OECD Trade Policy Papers*, No 280, April.

2 OECD countries now depend on China for imports of "strategic" industrial inputs three times more than in the late 1990s, while China's import dependencies on OECD countries in "strategic" industries such as production of machinery and manufacture of pharmaceuticals, chemical and botanical products, etc. have also increased, reaching 70%. Source: OECD (2024), op. cit.

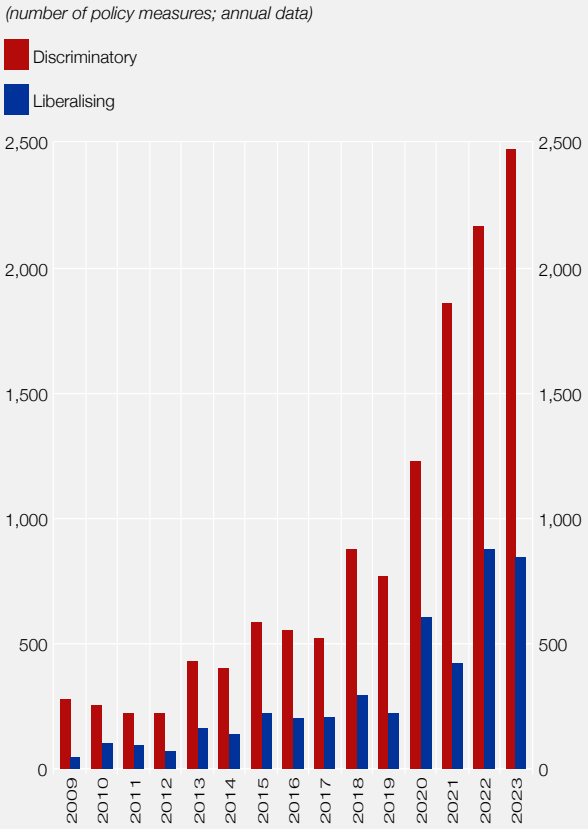
3 Lovely, E.M. and J. Yan (2024), "While the US and China decouple, the EU and China deepen trade dependencies", Peterson Institute for International Economics, *RealTime Economics*, 27.8.2024.

Chart B Import concentration indices for high-skill and technology-intensive manufactured goods: US, EU and China



Sources: Lovely and Yan (2024) and Bank of Greece calculations.
Note: The Herfindahl-Hirschman (HHI) market concentration index is calculated as the sum of squared market shares. Higher values denote higher concentration of import sources, whereas lower values denote higher diversification. The countries presented in the chart account for at least 10% of these imports.

Chart C Policy measures affecting global trade of goods



Source: Global Trade Alert.
Note: Data adjusted for reporting lag up to and including 31 December 2023.

Moreover, post-pandemic Europe shows less diversification in terms of industrial import sourcing compared with the US or China, which makes it more vulnerable to economic shocks and geopolitical tensions.[4] Specifically, high-technology imports, i.e. aircraft, laptops and mobile phones, were concentrated on a smaller number of trading partner countries in 2023 relative to 2018 for the EU, while they became more diversified for the US and China. As regards these products, China remains the most important supplier for the EU, while the EU import penetration in China increased only slightly. By contrast, during the same period, the US significantly reduced the share of its respective imports from China, which implies lower trade dependencies between these two economies in terms of technology-intensive products (see Chart B).

A significant factor behind weaker global trade dynamics is trade protectionism policies that have surged following the pandemic (see Chart C). In 2023, almost 2,500 trade-restrictive measures[5] were introduced worldwide, about three times as many as in 2019, which is indicative of a growing trend towards global trade fragmentation, particularly in technology-intensive industries that are critical to strategic autonomy and competitiveness. From 2019 to 2023, 49% of total trade restrictions involved subsidies to domestic production (excluding exports), 20% accounted for export-enhancing measures, including export subsidies, and a mere 11% referred to tariffs.

Economic competition between China and the US is at the heart of growing trade fragmentation. Typical examples are the adoption of the Made in China 2025 plan by China in 2015 and of the Inflation Reduction Act and the

4 See footnote 3.
5 See Global Trade Alert database.

CHIPS and Science Act by the US in 2022.[6] Many of the trade-restrictive measures introduced by the two economies in the past few years focus on cutting-edge technologies, such as semiconductors, software development, electric vehicles and green technology. Recent estimates suggest that the adoption of an industrial subsidy measure by China raises Chinese exports of the targeted product by 1% and reduces the respective imports (i.e. consumption substitution); also, subsidies to upstream industries are associated with higher final exports.[7] The effects on trade flows are estimated to be of a similar size in the case of subsidies by the US, whereas they are much larger in the case of EU subsidies, due to intra-EU trade. However, the impact of increased global trade restrictions appears to be asymmetric, as the Chinese economy is exposed to around half of the total restrictive measures adopted worldwide since 2009, compared with one third of the measures affecting the US economy.

A recent study by the World Trade Organization (WTO) shows that, since Russia's invasion of Ukraine in 2022, trade between blocs of countries that are not geopolitically aligned has grown 4% more slowly than intra-bloc trade.[8] Apart from the adverse implications for the macroeconomic outlook, the effects of trade fragmentation also extend to international financial transactions, including challenging the dominance of the US dollar in global trade.

Restrictions on trade in critical raw materials

Global fragmentation of trade in critical raw materials has intensified in the past couple of decades. Since 2009, export restrictions on critical raw materials have increased fivefold, with more than 10% of global trade in critical raw materials being subject to at least one export restriction measure during 2020-2022.[9] China, India, Argentina, Saudi Arabia and Vietnam were the top five countries in terms of the number of new export restrictions introduced in 2009-2022, together accounting for more than half of the measures adopted. Export taxes and licensing requirements were the most commonly used measures both before and after the pandemic. The use of quantitative restrictions on exports (e.g. quotas), although generally prohibited under WTO rules, has also been growing, particularly in recent years.

Increasing restrictions on trade in critical raw materials for the digital and green transitions pose high risks to global growth and inflation, as upstream value chain restrictions amplify the impact along the supply chain. Already before the pandemic, the growth rate of trade in a small number of critical raw materials,[10] which accounted for around 94% of the value of the corresponding global exports, had been higher than that of total trade in goods.[11] Demand for critical raw materials is projected to grow rapidly in the coming decades. For instance, global demand for lithium is expected to increase up to 89 times by 2050, while EU demand for gallium for semiconductor manufacturing is projected to grow 17-fold by 2050.[12]

At the same time, large quantities of critical raw materials are extracted and processed in countries that are geopolitically distant from the EU. For example, 73% of all cobalt is mined in the Democratic Republic of Congo, 69% of rare earth elements in China and 50% of the global nickel supply in Indonesia.[13] This geographical concentration of critical raw material (CRM) production should be taken into account in conjunction with the small

6 The "Made in China 2025" programme provides incentives to support domestic production of technology-intensive goods and reduce dependence on foreign technology. Similarly, the US Inflation Reduction Act provides tax and other incentives to increase investment in green technology and innovation, while the CHIPS and Science Act offers funding for the semiconductor sector.
7 The effects of China's subsidies are estimated using a dummy variable, which takes the value of 1 when China has at least one subsidy policy in place and the value of 0 otherwise. See Rotunno, L. and M. Ruta (2024), "Trade Implications of China's Subsidies", IMF Working Paper No. 24/180.
8 Blanga-Gubbay, M. and S. Rubínová (2024), "Is the global economy fragmenting?", World Trade Organization Staff Working Paper Research ERSD-2023-10.
9 *OECD Inventory of Export Restrictions on Industrial Raw Materials 2024*.
10 Iron and steel, gold, copper, aluminium, zinc, nickel, silver and platinum, lead and palladium.
11 OECD (2023), "Raw materials critical for the green transition. Production, international trade and export restrictions", *OECD Trade Policy Papers*, No. 269, April.
12 Proposal for a Regulation of the European Parliament and of the Council, establishing a framework for ensuring a secure and sustainable supply of critical raw materials, COM(2023), 160 final, 16.3.2023.
13 Faubert, V., N. Guessé and J. Le Roux (2024), "Capital in the twenty-first century: Who owns the capital of firms producing critical raw materials?", Banque de France Working Paper, July.

number of (multinational, state-controlled or state-owned) enterprises controlling a significant share of global production.[14] The location of these enterprises often masks ultimate ownership (e.g. a UK-based company that is actually under China's ultimate control), which could increase the underlying strategic dependencies, hence exposure to the risk of trade fragmentation. A recent study shows that non-European investors control a significant share of the capital of listed CRM mining companies.[15] China's leading position is especially notable in the extraction of rare earths, cobalt and lithium. By contrast, European investors hold limited stakes in CRM mining companies, while the EU's relatively high stake (18%) in the nickel sector partly reflects investments located in Cyprus representing Russian interests, which, if excluded, reduce this share to around 4%. Besides China, investors from the US also have significant holdings, especially in the lithium and copper sectors, which makes them more competitive compared with Europe.[16]

Overall, Europe's lack of strategic autonomy in CRM trade makes it more vulnerable to retaliatory measures by China. For example, in retaliation for US restrictions on microchip exports to China, in August 2023 China imposed export controls on two rare minerals, gallium and germanium, which are critical raw materials for the manufacture of microchips, fibre optics, electric vehicles, etc. It should be noted that the EU covers a significant share of its industry's needs for these raw materials by Chinese imports (70% and 45%, respectively, for gallium and germanium). Against this background, the EU adopted a Regulation (Critical Raw Materials Act[17]) in 2024, aimed at increasing the diversification of CRM imports from third countries and strengthening its autonomy. According to recent surveys, the exposure of European firms to critical inputs produced in China remains elevated, especially in Germany (about 35% of manufacturing firms), while it is also heterogeneous across firms, with the largest firms being almost twice as exposed as the smallest ones.[18] While a significant share of firms are implementing de-risking strategies, mainly by substituting Chinese suppliers with others located within the EU ("EU-shoring"), the largest share of firms has no strategy in place, as they are dealing with hard-to-substitute critical inputs, which amplifies risks in the event of future supply chain disruptions. Lastly, European companies expect their product prices to rise in the coming years due to diversification strategies, estimating that heightened geopolitical tensions and trade restrictions should have a negative impact on their production.

Impact on economic growth and inflation

The introduction of trade restrictions represents a supply-side shock, which can be more pronounced when the affected inputs are located upstream in the supply chain. Trade fragmentation is transmitted to the economy through varied and interconnected channels. A direct propagation mechanism is through traders' resulting cost of adaptation to the new trade conditions and the increased prices of imported intermediate and final goods, which have a consequent impact on the volume of global trade. Lengthening or restructuring of global supply chains; substitution of expensive imports with cheaper imports or domestic production; adoption of retaliatory measures; partial trade diversion; and increased administrative and compliance costs, inter alia, have negative effects on trade flows, allocative efficiency and, ultimately, economic growth. Technological decoupling of economies, i.e. reduced diffusion of innovation, is an additional factor that significantly increases losses from trade fragmentation,[19] as it hampers knowledge diffusion, productivity growth and the convergence of income levels across countries. Other channels that can work in combination and aggravate the impact of trade protectionism on the economy are changes in international labour and capital distribution, financial fragmentation, rising international commodity prices and uncertainty about the economic outlook and trade policies.

14 The top four mining companies control around 55% of global cobalt production, while the top five control 80% of the world's lithium production.
15 See footnote 13.
16 Faubert et al. (2024), op. cit.; and Leruth, L., A. Mazarei, P. Régibeau and L. Renneboog (2022), "Green energy depends on critical minerals. Who controls the supply chains?", Peterson Institute for International Economics, Working Paper 22-12.
17 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32024R1252
18 Balteanu, I., M. Bottone, A. Fernández-Cerezo, D. Ioannou, A. Kutten, M. Mancini and R. Morris (2024), "European firms facing geopolitical risk: Evidence from recent Eurosystem surveys", VoxEU, 18 May.
19 Góes, C. and E. Bekkers (2022), "The impact of geopolitical conflicts on trade, growth and innovation", WTO Staff Working Paper ERSD-2022-09; and Cerdeiro, D.A., R. Mano, J. Eugster, D.V. Muir and S.J. Peiris (2021), "Sizing Up the Effects of Technological Decoupling", IMF Working Paper No. 2021/069, March.

In the relevant literature, the economic implications of trade fragmentation are typically analysed by using structural general equilibrium models.[20] These models assume that the global economy decouples across a China-led East and a US-led West bloc. By way of illustration, three alternative scenarios are employed to quantify the effects of fragmentation, which differ in terms of the scope of trade restrictions.[21] In particular, the worst-case scenario assumes a complete disruption of trade (full decoupling) between competitive blocs due to steep trade barriers. The baseline scenario refers to a partial trade decoupling, i.e. a drop in trade between the two blocs, under which barriers restrict trade flows to the levels of the 1990s. Lastly, the best-case scenario, which is more in line with current developments in global trade, captures the implications of a selective trade decoupling through restrictions on specific categories of goods, such as critical raw materials and hi-tech goods. A direct consequence of the best case scenario is increased trade regionalisation and diversion through third countries for goods subject to restrictions. It should be noted that the size of the estimated impact of a trade disruption scenario depends mainly on three parameters: (i) the elasticity of substitution between inputs; (ii) the ease of reallocation of factors of production among sectors of the economy; and (iii) the flexibility to adjust nominal wages. A more flexible economy along these lines allows for milder effects of trade fragmentation.

Recent studies show that trade fragmentation leads to significant output losses. The empirical results vary depending on the model calibration and simulation assumptions. According to Attinasi et al. (2023),[22] under the baseline scenario where import costs of intermediate goods between the two competitive blocs sky-rocket due to non-tariff restrictions, global output drops by 2% in the long run. While all countries lose out on economic fragmentation, the smallest and most open economies are the most vulnerable. By contrast, output decreases less in large economies, such as the US and China, as they can more easily substitute imports with domestic production thanks to their large domestic markets. The euro area incurs more losses than the US and China (around 2%, compared with 1.5% and 1%, respectively), due to greater openness, but also owing to the less integrated single internal market. Two more interesting conclusions emerge from the study of Attinasi et al. (2023): (i) GDP losses from trade fragmentation are 50% higher when trade restrictions are imposed also within the same bloc of countries (see the US Inflation Reduction Act, which also affects the EU); and (ii) welfare losses in the short-run are five times higher compared to the long-run, due to sticky wages and a low substitutability across inputs and across factors of production. The above results are consistent with other studies in the literature (some of them additionally assuming tariff restrictions), under which the drop in global output ranges between 1.5% and 5% in the long term.[23]

The impact of trade fragmentation on inflation hinges, on the one hand, on the effects of costlier imported goods on consumer prices and, on the other hand, on the restructuring of production and, consequently, the adjustment of input demand and of wages. According to Attinasi et al. (2023), the increase in consumer prices for the global economy is estimated at 1.8% in the long term, while in the short term the low substitutability of inputs should raise production costs and, thus, consumer prices by 8.4%. Among major economies, inflationary pressures vary substantially and, as is the case with the global economy, the impact on prices is stronger in the short term than in the long term. In the euro area, consumer prices are estimated to increase by 1% over the long run, while in the US and China by around 3%, due to easier substitution of imports with domestic production in these countries, which should gradually push up labour demand, wages and domestic prices.[24]

---

20 The structural multi-country multi-sector model by Baqaee and Farhi is widely used in the literature. See Baqaee, D.R. and E. Farhi (2024), "Networks, Barriers, and Trade", *Econometrica*, 92(2), 505-541.

21 Many studies assume that restrictions concern non-tariff measures on trade in intermediate goods. See Attinasi, M-G., L. Boeckelmann, and B. Meunier (2023), "Friend-shoring global value chains: a model-based assessment", ECB, *Economic Bulletin*, Issue 2/2023, Box 3.

22 Attinasi, M.-G., L. Boeckelmann and B. Meunier (2023), "The economic costs of supply chain decoupling", ECB Working Paper No. 2839.

23 OECD (2020), *Shocks, risks and global value chains: Insights from the OECD METRO model*; Chepeliev, M., M. Maliszewska, I. Osorio-Rodarte, M.F. Seara e Pereira and D. van der Mensbrugghe (2022), "Pandemic, Climate Mitigation, and Reshoring: Impacts of a Changing Global Economy on Trade, Incomes, and Poverty", World Bank Policy Research Working Paper, No. 9955; Campos, R., D. Furceri, J. Estefania-Flores and J. Timini (2023), "Geopolitical fragmentation and trade", *Journal of Comparative Economics*, 51(4), 1289-1315; Góes and Bekkers (2022), op. cit.

24 By contrast, a disruption in global commodity trade (such as energy and critical raw materials) is expected to result in higher inflationary pressures in Europe compared with the US and China, due to structural constraints (e.g. lack of pipelines or other infrastructure) in oil and gas markets diverting trade within the same bloc of countries. See IMF, *World Economic Outlook*, October 2023, Chapter 3 "Fragmentation and Commodity Markets: Vulnerabilities and Risks".

Conclusions and policy recommendations

Despite the need to reduce the vulnerability of economies to disruptions in global supply chains and geopolitical risks, trade protectionism and subsidy competition among major economies may result in a barrage of barriers to international trade flows, which would be detrimental to global prosperity and would undermine price stability. Risks to global trade are likely to intensify further if the US changes its international trade policy for the worse by adopting new protectionist measures under President Trump. A key conclusion of empirical studies is that losses in terms of economic efficiency and growth due to trade fragmentation multiply as trade disruptions deepen, especially when they affect goods upstream in the supply chain, such as critical raw materials, at the same time delaying the green transition. The impact is further amplified as technological and financial transmission channels come into play, compounded by trade policy uncertainty. Trade fragmentation increases the risk of more frequent and more pronounced supply-side shocks; therefore, central banks should closely monitor the impact of changes in the relative prices of individual sectors on headline inflation. Overall, further efforts are needed to gain a deeper understanding of interdependencies in production networks, including direct and indirect foreign dependencies, in order to accurately assess related risks.

In an environment of increasing trade fragmentation, the adoption of targeted de-risking and uncertainty-reducing policies in international trade relations is considered strategically preferable and more sustainable in the long run over de-coupling and confrontational policies. Moreover, in the case of the EU, Single Market and financial market integration would improve Europe's productivity and international competitiveness, strengthening its negotiating position vis-à-vis its international trading partners.

Maintaining free, open and fair trade based on multilaterally agreed rules, on dialogue under the auspices of international organisations and on healthy competition practices remains the best possible framework for resolving trade disputes, as well as for striking a balance between national interests and the urgent need to jointly safeguard global public goods. Specifically, multilateral and multi-level economic and commercial cooperation in areas related to healthcare, climate change and key enabling technologies, such as artificial intelligence, is important in order to improve prospects for global economic growth and prosperity.

Box 2

INFLATIONARY PRESSURES AND WAGE RIGIDITIES

Following the COVID-19 pandemic, advanced economies witnessed a surge in inflationary pressures, primarily due to price shocks in energy and imported intermediate goods. Specifically, supply chain disruptions and rising energy prices had a significant contribution to the inflation surge across the euro area economies. Although euro area countries were exposed to largely common inflationary shocks, the magnitude and the persistence of inflation varied among countries. This suggests that, as shocks spill over into the economy, the factors driving inflation dynamics are predominantly domestic.[1] These factors include country-specific institutional and structural features, such as labour market institutions, firms' price-setting mechanisms, the level of competition in product markets and labour market flexibility. In particular, as highlighted by the relevant literature, wage rigi-

1 For more details on the origin of inflationary shocks in the euro area and the role of supply-side factors in the recent strong inflationary pressures, see Bańbura, M., E. Bobeica, and C. Martínez Hernández (2023), "What drives core inflation? The role of supply shocks", ECB Working Paper No. 2875; and Arce, Ó., M. Ciccarelli, A. Kornprobst, and C. Montes-Galdón (2024), "What caused the euro area post-pandemic inflation?", ECB Occasional Paper No. 343. For an analysis of differences in inflation developments across euro area countries, see Coutinho, L. and M. Licchetta (2023), "Inflation Differentials in the Euro Area at the Time of High Energy Prices", European Economy Discussion Paper No 197; and Buelens, C. (2023), "The great dispersion: euro area inflation differentials in the aftermath of the pandemic and the war", *Quarterly Report on the Euro Area (QREA)*, 22(2).

dities affect the channels through which exogenous shocks are transmitted into the economy, thereby affecting inflation dynamics.[2]

According to economic theory, the propagation mechanism following a shock that increases the prices of imported inputs is characterised by a dynamic process. Initially, higher import prices lead to an increase in firms' production costs. However, as nominal wages gradually adjust to higher inflation, firms are unable to absorb part of the increase in input costs by reducing real labour costs. The options they have are to pass on higher production costs to final prices and/or reduce production and labour demand and/or cut down profit margins. Over time, as firms adjust their prices, the shock spills over into the economy through second-round effects on wages and labour costs. Rising prices may lead to higher wage demands, thus further weighing on firms' production costs and prolonging inflation. This can give rise to a wage-price spiral, where higher prices cause higher wages and vice-versa, leading to persistently higher inflation. In this case, monetary policy has a key role to play in averting such a vicious circle.

The effects of this feedback between labour costs and prices are stronger in economies with wage-setting mechanisms characterised by delayed wage adjustment to exogenous shocks, as is the case with the majority of the euro area countries.[3] For example, the literature has shown that cost-push inflation leads to higher and more pronounced inflationary pressures in the euro area than in the United States, owing to variations in labour market institutions.[4]

Against this background, this box aims to investigate the channels through which price shocks to imported inputs spill over into the domestic economy and to study the effects of wage rigidities on inflationary pressures and economic activity. The analysis focuses on a typical, small, open euro area economy, allowing for a generalisation of results in terms of the effects of wage rigidity on the propagation mechanisms of an exogenous inflationary shock.

Methodology

The contribution of wage rigidities to inflation dynamics is analysed by simulating the Dynamic Stochastic General Equilibrium (DSGE) model of the Bank of Greece.[5] The model incorporates a number of real and nominal frictions, such as wage rigidities and monopoly distortions in product and labour markets. The real wage per hour worked in the private sector responds sluggishly to economic conditions, due to labour market frictions and imperfections.[6] Moreover, the model features two sectors of production, namely a tradable and a non-tradable goods (services) sector, as well as an import sector, where imported intermediate goods are used as inputs in the production of domestic final goods. Therefore, any changes in the prices of imported intermediate goods affect the production costs of domestically produced goods, as well as the prices set by firms.

---

2 Nominal or real wage rigidities refer to wages' slower adjustment to economic conditions. See inter alia Christiano, L., M. Eichenbaum, and C. Evans (2005), "Nominal rigidities and the dynamic effects of a shock to monetary policy", *Journal of Political Economy*, 113(1), 1-45; Galí, J. and M. Gertler (1999), "Inflation dynamics: A structural econometric analysis", *Journal of Monetary Economics*, 44(2), 195-222; and Blanchard, O. and J. Galí (2007), "Real wage rigidities and the New Keynesian model", *Journal of Money, Credit and Banking*, 39, 35-65.

3 See Beschin, A., K. Bodnár, P. Gomez-Salvador, E. Gonçalves, M. Tirpák, and M. Weißler (2024), "Recent inflation developments and wage pressures in the euro area and the United States", ECB, *Economic Bulletin*, Issue 3/2024. See also Branten, E., A. Lamo and T. Rõõm (2018), "Nominal wage rigidity in the EU countries before and after the Great Recession: evidence from the WDN surveys", ECB Working Paper No. 2159, which provides evidence on wage rigidity in the euro area countries.

4 See Peersman, G. and I. Van Robays (2009), "Oil and the euro area economy", *Economic Policy*, 24, 603-651; and Ball, L. and S. Mazumder (2020), "A Phillips curve for the euro area", ECB Working Paper No. 2354.

5 For a detailed description of the model see Papageorgiou, D. and E. Vourvachaki (2017), "Macroeconomic effects of structural reforms and fiscal consolidations: Trade-offs and complementarities", *European Journal of Political Economy*, 48, 54-73; and Papageorgiou, D. (2014), "BoGGEM: A dynamic stochastic general equilibrium model for policy simulations", Bank of Greece Working Paper No. 182.

6 The real hourly wage, w_t, is derived as follows: $w_t = (w_{t-1})^n (w_t^*)^{1-n}$, where $0 \leq n \leq 1$ indicates the degree of real wage rigidity and w_t^* is the optimal wage set as a constant markup over marginal labour productivity. The higher the value of n, the higher the degree of wage rigidity. When $n=0$, changes in wages are determined by changes in marginal labour productivity. For more information, see: Blanchard, O. and J. Galí (2007), op.cit.; and Papageorgiou, D. (2014), op.cit.

Impact of an increase in import prices and the role of wage rigidities

Source: Bank of Greece estimates.
Note: Percentage deviations from steady state; for profits as a percentage of GDP and for inflation, changes are expressed in percentage points. Inflation is annualised and measured by the GDP deflator.

The methodology used can be summarised as follows: first, the model economy is calibrated to represent a typical small open economy in the euro area.[7] As regards the degree of real wage rigidity, two scenarios are considered: one of relatively high real wage rigidity and one of low real wage rigidity, in which changes in real wages are mainly determined by changes in marginal labour productivity.[8] A temporary cost-push shock is then introduced, increasing the rate of change of the import price index by 1 percentage point in both scenarios. The calibration of the size and persistence of the shock is indicative, aiming to draw conclusions about the sensitivity of macroeconomic variables to changes in import prices and to compare the two model economies. Given that the shock is temporary, all macroeconomic variables will gradually converge back to their steady state levels.[9]

Results

The chart presents the dynamic effects generated by the model for selected variables. First, we analyse the channels of transmission of the shock into the economy and then we examine the role of wage rigidities by comparing the two economies of the model. Regarding the propagation mechanism of the shock on macroeconomic variables, the results suggest the following:

The first direct effect is an increase in the production costs of domestically produced consumer and investment goods. This prompts firms to increase domestic prices, thereby fuelling domestic inflation, and to reduce output and labour costs, in order to safeguard their profit margins. At the same time, the rise in prices creates a negative income effect for households, dampening consumer and investment demand and thus real GDP. Nevertheless, the negative impact on economic activity appears initially to be limited for the following reasons:

First, firms cannot immediately adjust their prices due to the presence of domestic price rigidities, which results in a gradual and incomplete pass-through of import prices to domestic final prices, thus mitigating the initial negative impact on the economy.[10] Second, there is an import substitution effect, which mitigates the impacts on output and inflation. In particular, imported intermediate goods are more expensive in the short term, leading firms and households to substitute them with domestically produced intermediate goods, thereby increasing demand for domestic consumption and investment goods, both tradables and non-tradables. The higher the elasticity of substitution between imported and domestically produced goods, the stronger the substitution effect and the more resilient the economy to changes in import prices. Third, there is an intertemporal substitution effect, as households anticipate lower income in the future and substitute future demand for consumption and investment with increased demand today. As shown in the chart, the net effect on real GDP on impact is marginally negative. Moreover, higher demand for domestically produced goods exerts upward pressures on the demand for labour

7 The selection of the parameters is based on representative values for the euro area countries. This allows the model to incorporate general characteristics of small, open economies in the euro area, ensuring the generalisation of the results. For the values of the key parameters, see Gomes, S., P. Jacquinot, and M. Pisani (2012), "The EAGLE. A model for policy analysis of macroeconomic interdependence in the euro area", *Economic Modelling*, 29(5), 1686-1714; and Papageorgiou, D. and E. Vourvachaki (2017), op.cit.

8 For an economy featuring high wage rigidity, the value of the n parameter selected equals 0.97, as estimated for euro area countries in Albonico, A., L. Calès, R. Cardani, O. Croitorov, F. Ferroni, M. Giovannini, S. Hohberger, B. Pataracchia, F. Pericoli, R. Raciborski, M. Ratto, W. Roeger, and L. Vogel (2019), "The Global Multi-Country Model (GM): An estimated DSGE model for the euro area countries", European Economy, Discussion Paper No. 102, July. For economies with a low degree of rigidity, the selected value of the parameter is 0.3.

9 The long-term steady-state value in the impact period is the same in both scenarios. Therefore, any differences in variable dynamics between the two scenarios are solely attributable to the different degree of wage rigidity.

10 Price rigidities are due to several factors, such as the cost and time required for identifying the optimal price that maximises the firm's profits following exogenous shocks. Strategic complementarity among firms also plays an important role in calculating optimal prices and strengthening price rigidities. In particular, a firm's decision to adjust its prices takes into consideration the expected response of competitors. Firms are less willing to be the first to change prices and risk losing market share. This complementarity delays price adjustments to external shocks. Lastly, certain factors such as repricing costs and long-term contracts with suppliers or customers also contribute to price rigidities (see e.g. Blanchard, O. and S. Fisher (1989), "Lecture on Macroeconomics", The MIT Press; Nakamura, E. and J. Steinsson (2008), "Five facts about prices: A re-evaluation of menu cost models", *The Quarterly Journal of Economics*, 123(4), 1415-1464; Wang, O. and I. Werning (2022), "Dynamic oligopoly and price stickiness", *American Economic Review*, 112(8), 2815-2849; and Alvarez, F. and F. Lippi (2023), "Price setting with strategic complementarities as a mean field game, *Econometrica*, 91(6), 2005-2039.

and, eventually, the wage rate. Thus, firms initially face a rise in labour costs and, in order to protect their profit margins, they pass on part of the import price increases to domestic prices, leading to higher profits as a percentage of GDP and to inflationary pressures.[11]

However, following the initial period of the shock and as firms adjust their prices, the import price pass-through to domestic final prices becomes stronger, thereby weakening substitution effects and amplifying the negative income effect. This reduces demand for consumption, investment and exports, with negative implications for economic activity. At the same time, as discussed below, wage rigidities limit the firm's ability to adjust wages in order to absorb part of higher production costs, thereby creating further inflationary pressures and reducing employment.

Regarding the role of the degree of wage rigidity, the main conclusion arising from the comparison between the two scenarios is as follows: a higher degree of real wage rigidity leads to stronger and more persistent inflationary pressures and a greater negative impact on economic activity. In particular, as shown in the chart, in an economy characterised by high wage rigidity, the labour market adjusts more slowly to economic shocks, which results in a smaller decline in real wages, higher inflation, but also stronger falls in employment and a larger fall in real GDP compared with a low-rigidity economy. This is so because firms are unable to adjust wages promptly in order to offset the increased production costs they face. Instead, they reduce labour demand and pass on increased production costs to domestic final prices, causing higher inflation and a larger fall in GDP.

Conclusions and policy recommendations

An analysis using the Dynamic Stochastic General Equilibrium (DSGE) model suggests that inflationary pressures arising from higher imported input prices are more pronounced in economies characterised by a high degree of real wage rigidity, which prevents firms from absorbing part of the increased import costs by reducing labour costs, while maintaining their profit margins constant. As a result, higher costs are passed on to final prices, creating strong inflationary pressures, with adverse effects on employment and output.

Based on the simulation results, labour market reforms that make wages more responsive to changing economic conditions and more aligned to labour productivity can help alleviate inflationary pressures and shield the economy against exogenous shocks that raise firms' production costs. In addition, reforms aimed at enhancing labour productivity and fostering innovation can mitigate the negative effects of wage rigidity on inflation dynamics by lowering unit production costs. Moreover, productivity growth can play a key role in preventing a wage-price spiral, as it enables a strengthening of workers' purchasing power without lowering firms' profit margins.

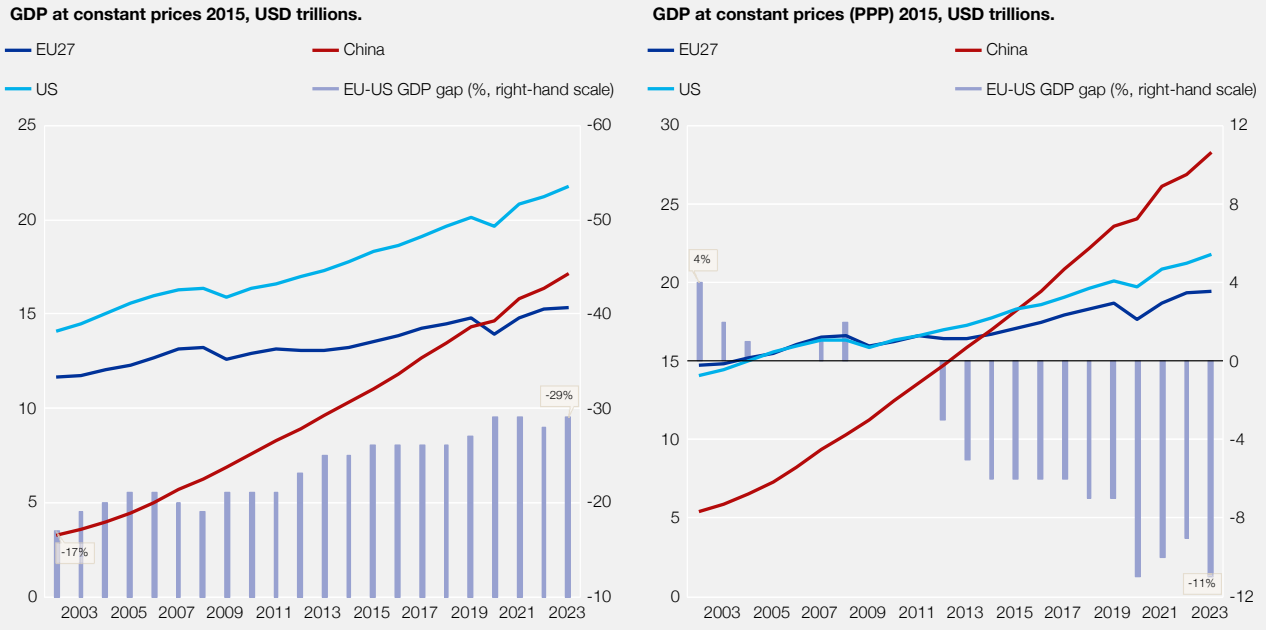
11 A short-term increase in profits stems from higher demand for tradables due to substitution effects, as well as from higher profits for firms that are importers of intermediate goods. See also Colonna, F., R. Torrini, and E. Viviano (2023), "The profit share and firm mark-up: how to interpret them?", Bank of Italy Occasional Paper No. 770, for an analysis suggesting that higher prices of imported inputs can increase business profits as a percentage of GDP, even if mark-ups remain constant.

Box 3

THE DRAGHI REPORT ON THE FUTURE OF EUROPEAN COMPETITIVENESS: FINDINGS AND PROPOSALS

Safeguarding and boosting the EU's competitiveness is placed increasingly higher on the European policy agenda. Since the beginning of this century, GDP growth in Europe has been lower than in the United States, mainly due to lower average productivity growth, largely on account of a technology investment gap. During this period, real disposable income per capita grew almost twice as much in the United States than in Europe (see Chart A). On the other hand, the same period also saw significant positive developments for EU member coun-

Chart A GDP evolution



Source: World Bank and OECD.
Note: The value of the gap in real GDP in any given year is only indicative. It should not be viewed as an exact estimate as price deflators and purchasing power adjustments are imperfect. GDP at constant prices offers insights into volume growth, while purchasing power adjustment allows a comparison from the consumer perspective.

tries. After the double-dip recession of 2008-2012, the unemployment rate gradually declined significantly, supporting social welfare and reducing inequality. At the same time, Europe has succeeded in increasing the share of its exports to major emerging markets especially in Asia, benefiting from the favourable conditions ensured by trade globalisation amid stable geopolitics and smooth multilateral cooperation.

However, in recent years, the international economic system has changed dramatically, in a way that poses new challenges to sovereigns, businesses and households. Global trade has slowed down, geopolitics has come back to the fore, causing frictions and fragmentation in international supply chains, while technological transformation is accelerating. Europe proves to be highly vulnerable to these changes, given its higher trade openness compared with the United States or China.[1] Moreover, it can no longer rely on the security umbrella provided by the United States for decades and needs to start spending significant amounts on its own defence and security. In addition, Europe has largely missed out on the income and productivity gains of the internet-led digital revolution, with the top new tech giants located outside Europe. Meanwhile, the until recently favourable interdependencies with Russia and China for cheaper energy and raw materials are no longer an advantage, but rather a source of risks to the prosperity and resilience of European economies.

The Draghi Report "The future of European competitiveness", presented in September 2024,[2] describes the new challenges that international economic relations imply for Europe and pinpoints the root causes of the EU's productivity gap vis-à-vis its major competitors, i.e. the United States and China. It analyses the EU's comparative structural weaknesses and strengths and proposes possible strategies to preserve or regain competitiveness in three critical areas: (i) research and innovation; (ii) energy transition; and (iii) defence and security. This box summarises the Report's main conclusions on how Europe currently stands and on possible policy responses to the challenges facing the European economy.

1 Bosone, C., E. Dautović, M. Fidora and G. Stamato (2024), "How geopolitics is changing trade", ECB *Economic Bulletin*, Issue 2/2024, Box 2.
2 Draghi, M. (2024), *The future of European competitiveness*.

The European Union comparatively more vulnerable to the new environment

The EU now appears to be more exposed to the new geo-economic environment in comparison with its main competitors. According to the Draghi Report, this is so because:

(a) it is more extrovert: its trade-to-GDP ratio is above 50%, compared with 37% in China and 27% in the US;

(b) it is highly dependent on a small number of suppliers for imports of critical raw materials and at the same time it imports more than 80% of digital technology;

(c) EU companies face electricity prices that are 2-3 times those in the United States or China;

(d) it has largely missed the benefits of the digital revolution led by the internet and artificial intelligence: only four of the world's 50 largest technology companies are European, and the EU's share of global technology revenues fell from 22% in 2013 to 18% in 2023;

(e) it is less prepared to cope with threats to its security, as only ten Member States currently spend 2% or more of their GDP on defence in line with NATO commitments.

The EU needs to design and implement as soon as possible a new industrial policy to enhance competitiveness, centred around three strategic objectives: closing the innovation gap; a joint decarbonisation and competitiveness plan; and increasing security and reducing dependencies.

In more detail, the current situation or "the starting point" in the EU and the relevant proposals for action in these three areas are described in the Draghi Report as follows:

Closing the innovation gap

The technological gap that has emerged in recent years between Europe and the United States is large and needs to be closed. The EU is generally stuck in a traditional manufacturing structure, where the top three investors in research and innovation (R&I) have been in the automotive industry for the past 20 years; in the US, this structure has changed, with the top three places now held by technology companies. Also, no EU company with a current market capitalisation over EUR 100 billion has been created from scratch in the last 50 years, whereas all six US companies with a current market capitalisation of between EUR 1 and EUR 3 trillion have been set up in the same period, all of them in the technology sector. In cloud computing services, the largest European provider accounts for just 2% of the EU market, while in quantum computing none of the top tech companies globally is based in Europe.

Despite the lack of economic dynamism in R&I within the EU, there are talents, scientists, research and entrepreneurship. The main obstacles to setting in motion a virtuous circle of empowerment for EU innovative start-ups are small size and market fragmentation, lack of synergies and economies of scale and failure to translate an innovative idea into a product and, in turn, into a commercial success. For example, only about one-third of the patented inventions registered by European universities and research centres are commercially exploited.

Innovative companies aspiring to scale up in Europe face many impediments, including regulatory fragmentation across Member States. Addressing this fragmentation would significantly help R&I start-ups. To this end, the Draghi Report recommends that innovative start-ups should be given the opportunity to adopt a new EU-wide legal statute (the "Innovative European Company"), providing them with a single digital identity valid throughout the EU and recognised by all Member States, and uniform legal treatment across the EU. Also, the report proposes to prioritise and selectively increase funding for those business plans that involve high technology, but also to encourage entry into research and production of artificial intelligence.

A joint decarbonisation and competitiveness plan

Policies to reduce greenhouse gas emissions and achieve Europe's ambitious climate targets, if uncoordinated, may remain costly and come at the expense of competitiveness and growth. Although they have declined,

energy prices are still comparatively high, weighing on competitiveness. Electricity costs for European companies remain 2-3 times higher than in the US, while gas costs are 4-5 times higher. This problem arises not only from Europe's lack of natural resources, but also from the way energy markets work. Cleaner forms of energy are burdened by high taxes and rents among traders in derivatives markets. In order to bring down the level of energy prices in the EU and limit their volatility, it is necessary to exploit all sources of cleaner energy (renewables, nuclear, hydrogen, biomass), by accelerating the licensing and increasing investment in clean power generation, as well as investment in the expansion of energy transmission networks and in energy storage technologies.

The green transition represents a major growth opportunity for the EU, but also an interesting policy challenge. The EU is a global leader in clean energy technologies, such as wind turbines, electrolysers for hydrogen production, etc. and is home to the development of more than one-fifth of clean and sustainable technologies worldwide. Rising competition from China, especially in the field of electric vehicles, jeopardises Europe's leading position. The interesting challenge for the EU is the trade-off it faces: If it wants a faster and cheaper energy transition, it should remain dependent on imports of cheaper clean technology from China, which to this end pursues an extensive industrial subsidy policy in these sectors. However, such dependence would affect Europe's productive clean tech and automotive industries.

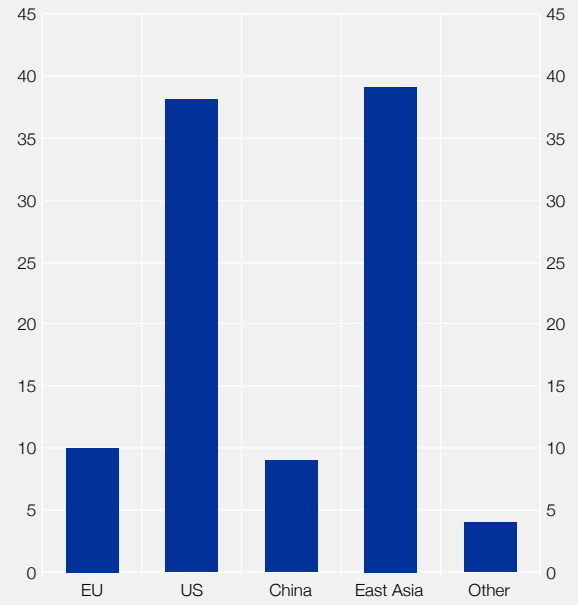
Increasing security and reducing dependencies

Security and peace are a prerequisite for sustainable economic growth. Growing geopolitical risks can add to uncertainty and weigh on fixed investment and international trade.

In critical raw materials (semiconductors, rare earths, etc.), the EU is overly dependent on imports from a small number of suppliers, mainly China. Europe's dependence on global semiconductor production chains, where the market is dominated by a few large companies, is particularly high. The United States specialises in the design of microprocessors, Korea, Taiwan and China in their manufacturing, while Japan and some EU Member States produce parts of their necessary production equipment. The EU's average reliance on imports of digital products, services and infrastructure is 90% overall (see Chart B), with this percentage ranging from 80-81% for digital intellectual property and equipment to 100% for memory. The impact of this dependence on global supply chains became apparent during the pandemic crisis.

Chart B Share in global semiconductor value chain by region

(% of global total in 2019)



Source: Draghi Report (2024).

Increasing Europe's strategic autonomy would however entail some costs, at least in the medium term. There is a need to diversify dependency risk by adding other key suppliers, not necessarily the cheapest. The EU needs to develop a genuine "foreign economic policy" geared towards securing critical resources, enabling it to coordinate preferential trade agreements status and direct investment with resource-rich countries and to increase the global market share of the European microprocessor industry.

Turning to defence, the EU's main disadvantage is the fragmentation of orders[3] and defence industry production, resulting both in higher procurement costs, even compared with the US where labour costs are higher than in

3 For example, twelve different types of battle tank types are operated in Europe, compared with only one in the US.

Europe, and in lower defence capabilities and preparedness.[4] Although the EU spends on defence and military equipment the second highest share of GDP worldwide, in 2022 only 20% of this expenditure went to European companies, while 63% went to the US; accordingly, the EU's defence and aerospace companies have lost dynamism and economies of scale. This points to a need for joint defence procurement planning and multi-annual orders, along with a commitment of resources to support investment in expanding defence industry infrastructure. Increasing the interoperability of weapon systems across individual European industries would be important in this regard, with a view to increasing economies of scale in production without harming competition within the EU.

Obstacles and funding

The Draghi Report summarises three types of key obstacles to Europe's competitiveness: (a) lack of focus, i.e. clear priorities and actions; (b) a waste of common resources; and (c) lack of policy coordination.

The Single Market has yet to be completed and so has the Capital Markets Union (CMU); unlike the US, investment financing in Europe relies excessively on bank lending, which is less well-suited to fund R&I. The fragmented administrative and regulatory framework is still cited by small and medium-sized enterprises as the main factor preventing them from scaling up in the EU. Available common European resources are wasted through the fragmentation of orders and procurements and are diverted out of Europe. Similarly, as far as R&I is concerned, while the EU compares favourably with the United States in terms of public sector R&I spending as a share of GDP (0.74% and 0.65% respectively in 2021), the private sector spends significantly less, as the EU's capital market is smaller and still unintegrated. The share of global venture capital funds raised in the EU is only 5%, compared with 40% for China and 52% for the US. Another disadvantage relates to the slow pace of regulatory and legislative processes in the EU, taking on average 19 months from the Commission's proposal to the signing of the relevant legal act, not to mention the time required for its transposition into the national law of individual Member States.

To meet the challenges identified by the Draghi Report, huge additional investment of an estimated EUR 750-800 billion per year will be needed, corresponding to 4.4-4.7% of EU27 GDP. The ratio of fixed capital formation to GDP will have to increase by around 5 percentage points to levels not seen since the 1960s and 1970s. This figure is unprecedented, considering that additional investment under the Marshall Plan, corresponded to 1-2% of EU GDP per year over the period 1948-51. Mobilising private resources of such size cannot be achieved without initial public sector support, whose contribution has historically been around 20% of all investment funding in Europe. Gradual productivity gains should progressively reduce the fiscal burden of such expenditure. It is estimated that a 2% increase in total factor productivity within ten years would cover up to one third of the required fiscal spending.

Conclusion

The challenges facing Europe are complex, and governments and EU institutions are therefore called to make difficult decisions. Inaction is not a viable option, as it has been shown to increase insecurity and uncertainty. In the current new environment of international economic relations, fragmentation and slowing globalisation, the EU must act swiftly and in a coordinated and effective manner to increase its resilience and safeguard the security and prosperity of its citizens. In order to achieve robust and sustainable growth and close the competitiveness gap that has emerged vis-à-vis the United States and China, a pan-European plan will be necessary, with a view to a massive increase in productive investment in innovation, energy transition and defence. This will require careful design, prioritisation of reforms, democratic legitimacy of decisions and, of course, policy coordination and cooperation among Member States.

4 The estimated cost of a 3rd generation Leopard 2A8 tank (Germany) is EUR 29 million, while an M1A2 Abrams tank (USA) costs EUR 17.5 million. See Mejino-Lopez, J. and G.B. Wolff (2024), "A European defence industrial strategy in a hostile world", Policy Brief, No. 29, 20 November, Bruegel.

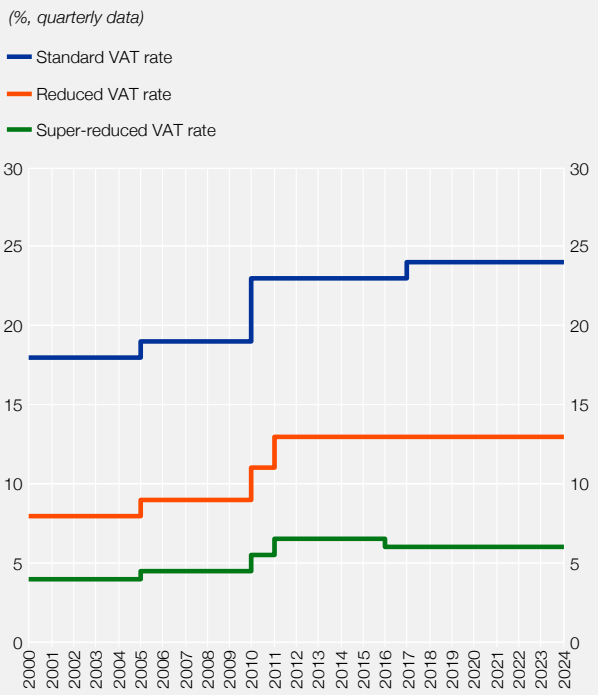
Box 4

EMPIRICAL INVESTIGATION OF THE EFFECT OF VAT RATE CUTS ON INFLATION AND THE OUTPUT OF THE GREEK ECONOMY

The proposal for a temporary and targeted reduction of the Value Added Tax (VAT) rate on certain categories of goods (such as basic foodstuffs and energy) has recently come to the fore in response to a surge in inflation, which, in turn, results from rising energy and commodity prices, as well as supply bottlenecks mainly due to the Russo-Ukrainian war.

In the European Union, Spain was the first country to adopt temporary VAT rate cuts on basic foodstuffs[1] and energy,[2] as part of a strategy to contain recent inflationary pressures (after the end of 2021). These temporary tax rate cuts were initially due to expire by the end of 2023, with the possibility of extension depending on inflation trends and the performance of the economy. Similar policies for both basic goods and energy were subsequently adopted by other euro area economies, such as Germany, France, Belgium, Italy and Portugal. In the case of Greece, since the end of the pandemic the authorities have made targeted interventions to address increased energy prices, but kept VAT rates mostly unchanged, at the elevated levels introduced during the economic adjustment period to achieve the required fiscal adjustment[3] (see Chart A).

Chart A Evolution of the VAT rate (%) in Greece



Sources: European Commission (DG Taxation and Customs Union), Taxes in Europe database and International Bureau of Fiscal Documentation (IBFD).

Literature and theoretical influences

As evidenced by relevant literature, the effectiveness of a VAT reduction in containing inflation remains controversial, as it depends on several factors. According to Blundell (2009),[4] who analyses the 2009 temporary VAT rate cuts in the UK, the impact on inflation is limited, as these cuts boost real incomes and demand, which, in turn, fuel inflation. At the same time, a number of studies[5] assess the impact of VAT cuts on specific goods and

1 VAT was cut from 4% to 0% for certain products such as bread, milk, cheese, fruit, vegetables and cereals, and from 10% to 5% for meat and fish.

2 For example, VAT on electricity was reduced from 21% to 5% to mitigate the impact of high energy prices on households and businesses.

3 It should be noted that, during the pandemic, Greece introduced a number of income support measures and benefits, as well as temporary tax exemptions, which aimed at sustaining consumers' purchasing power. In this context, Greece reduced VAT on electricity and natural gas from 13% to 6%, and on the catering sector from 24% to 13% (for a detailed description of relevant fiscal measures, see previous Bank of Greece Annual Reports, Section "Institutional framework and fiscal reforms"). The country's limited interventions in the period following the outbreak of the Russo-Ukrainian war included VAT rate cuts for inputs used in livestock production and agriculture (feed, fertilisers, etc.), and an extension of the exemptions in force (in the form of a reduced VAT rate) for specific sectors (such as non-alcoholic beverages, transport and gyms, real estate).

4 Blundell, R. (2009), "Assessing the temporary VAT cut policy in the UK", *Fiscal Studies*, 30(1), 31-38.

5 Depending on the data format and the structure of the markets under examination, alternative empirical methods of analysis mainly involve the use of structural vector autoregression, as well as the use of panel data models. Markets where the effects of VAT rate cuts have been studied include: (i) hairdressing (Kosonen, T. (2015), "More and Cheaper Haircuts after VAT Cut? On the Efficiency and Incidence of Service Sector Consumption Taxes", *Journal of Public Economics*, 131, 87-100.); (ii) film (Arce, I. and M. Gómez-Antonio (2020); "Una evaluación sobre los efectos de una reducción del tipo de

services markets. These studies indicate that estimates for the pass-through of VAT rate cuts to retail prices vary and depend on market structure (e.g. based on the size of businesses), the level of competition,[6] businesses' cost strategies, the penetration of e-commerce and e-shopping in households' purchases, and the degree of product diversification.

Ceteris paribus, the short-term effect of a temporary VAT rate cut on inflation is a reduction of price levels. Turning to second-round effects, however, this initial decline is partly cancelled out, as the implementation of this measure strengthens consumers' purchasing power, shifting the corresponding aggregate demand curve to the right, which in turn results in output growth driven by consumption as well as higher inflation. Under perfect competition, generalised VAT rate cuts – if also affecting the cost of production inputs – are expected to reduce production costs, improving the productive capacities of economic sectors. In turn, this would increase production and decrease prices (shifting the supply curve to the right). On the contrary, under imperfect competition[7] (oligopolistic or monopolistic market structures), a fall in production costs, along with cuts in consumer prices (due to VAT rate cuts), may translate into higher profit margins for businesses and lower production levels. In such cases, the pass-through of VAT rate cuts to retail prices becomes limited and inflation persists, eventually reducing the effectiveness of this policy measure.[8]

Empirical investigation

Through an empirical autoregression model for the Greek economy,[9] it is possible to estimate the impact on inflation and output of an unexpected and temporary reduction of the standard VAT rate by 1 percentage point (from 24% currently to 23%). As shown in Chart B, it may be estimated that temporary VAT rate cuts limit in-

gravamen del IVA para los bienes y servicios culturales", Instituto de Estudios Fiscales); (iii) catering (Harju, J. and T. Kosonen (2014), "The inefficiency of reduced VAT rates: Evidence from restaurant industry", Government Institute for Economic Research); and (iv) food and beverages (Benzarti, Y., S. Garriga, and D. Tortarolo (2024), "Can VAT Cuts and Anti-Profiteering Measures Dampen the Effects of Food Price Inflation?", National Bureau of Economic Research, Working Paper No. 32241, De Amores Hernandes, A., S. Barrios, R. Speitmann, and D. Stoehlker (2023), "Price Effects of Temporary VAT Rate Cuts: Evidence from Spanish Supermarkets", European Commission, JRC132542, and Fuest, C., F. Neumeier and D. Stöhlker (2024), "The pass-through of temporary VAT rate cuts: Evidence from German supermarket retail", *International Tax and Public Finance*, p. 1-47). In addition, recently artificial intelligence technologies have been used to exploit electronic transaction data in real time (see Forteza, N., E. Prades, and M. Roca (2024), "Analysing the VAT cut pass-through in Spain using web-scraped supermarket data and machine learning", Banco de España, *Documentos de Trabajo*, No. 2417).

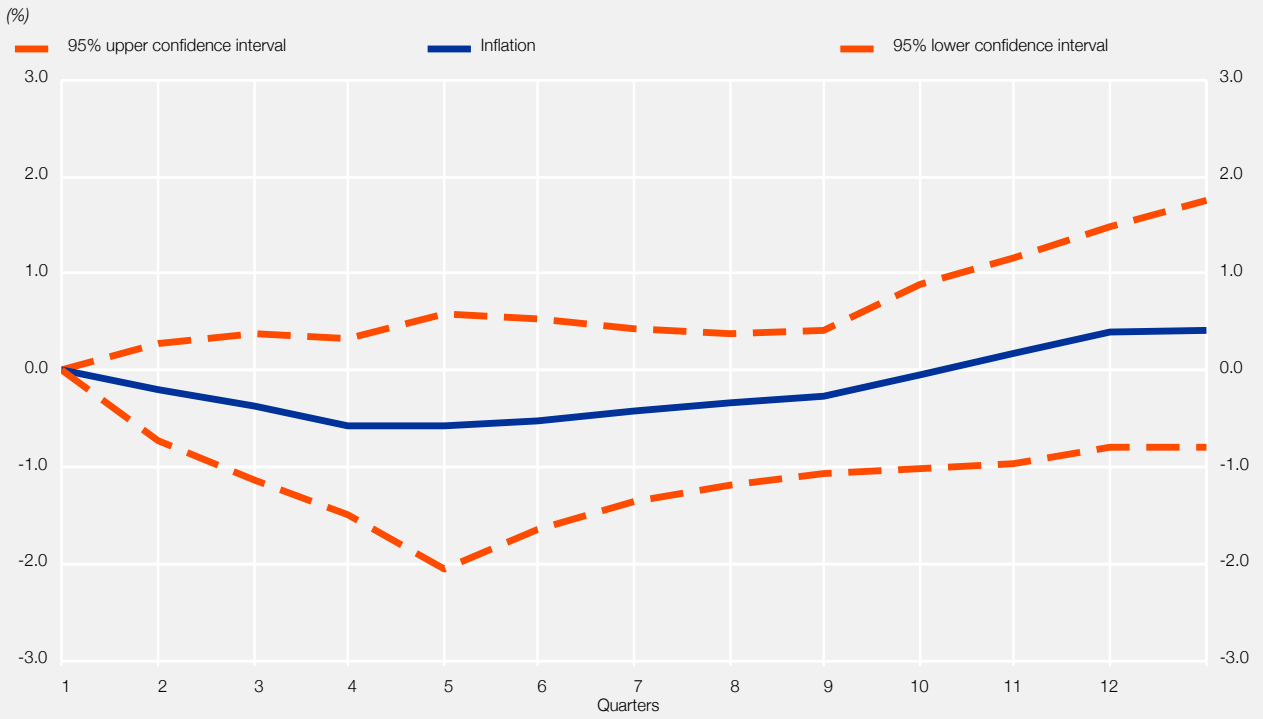
6 For example, see Hindriks, J. and V. Serse (2019), "Heterogeneity in the tax pass-through to spirit retail prices: Evidence from Belgium", *Journal of Public Economics*, 176, 142-160, and Copestake A. and M. Bellon (2022), "Supply and Demand Determinants of Heterogeneous VAT Pass-Through", SSRN 4207882.

7 Under conditions of monopolistic competition, undertakings determine the level of production and – given the aggregate demand – the price, whereas under oligopolistic competition, they determine the production level, while prices are linked to the strategies of the other firms in the oligopoly sector.

8 In the case of Spain, the effectiveness of this measure remains controversial. A recent study by the Bank of Spain concludes that it is indeed effective with regard to supermarket prices, as VAT rate cuts are well passed through to consumer prices, reducing inflation. On the other hand, the Spanish consumer association (Facua-Consumidores en Acción) considers this measure to be inadequate; according to their price survey, 44.7% of the surveyed goods saw price increases compared to December 2023. Similar conclusions can be drawn from surveys in 2023, the year when VAT rate cuts were introduced in Spain (for more details, see https://facua.org/en/noticias/4-out-of-10-food-items-affected-by-the-vat-reduction-became-more-expensive-during-the-first-half-of-the-year/ and https://euroweeklynews.com/2023/10/30/facua-reveals-52-per-cent-food-products-reduced-vat-expensive-than-january-2023/).

9 The autoregression model incorporates variables with a quarterly frequency as follows: Endogenous variables include the annualised growth rate and the harmonised inflation rate (HICP), whereas exogenous variables include the standard or statutory VAT rate (%) along with its four lags, as well as the three-month Euribor. Quarterly data from ELSTAT, the European Commission and the ECB refer to the period from Q1 2000 to Q1 2024. Four time lags are adopted in the model. Results from the impulse response functions, presented in Charts B and C, compare two scenarios. In the first, the standard VAT rate is temporarily reduced from 24% to 23% starting in Q2 2024 (last quarter of the sample period), for a period of 8 quarters, and then reverts to 24%. The second is a baseline scenario where the VAT rate remains stable after the end of the sample period. The estimated effects on inflation and output are derived from the system of inferred relationships of the above autoregression model. In order to optimise the model's in-sample/out-of-sample fitness, stochastic simulations that generate confidence intervals of 95% are applied.

Chart B Inflation response to a temporary (8-quarter) reduction in the standard VAT rate from 24% to 23%



Source: Bank of Greece calculations.

flation in the short term, but the impact is statistically not significant,[10] suggesting that, ceteris paribus, this reduction should not be expected to pass through to retail prices.[11,12] Similarly, over the medium term, the estimated rise in inflation, while consistent with theoretical projections of higher demand, is also statistically not significant. Lastly, the same holds true for the effects of temporary VAT rate cuts on real GDP growth (Chart C), which are not estimated to be statistically significant in the short term. This finding is consistent with the forecasts in the relevant literature indicating that VAT does not affect growth, as it does not introduce distortions and disincentives in the production process.[13]

Conclusion

In light of the above, VAT rate cuts are not expected to make a significant contribution to the fight against inflation in the Greek economy. These findings suggest that such a measure can only be effective if goods and services markets are properly structured and functioning. Under imperfect competition (e.g. monopolistic or oligopolistic market conditions), producers develop pricing strategies that lead to an imperfect pass-through of tax cuts and other cost reductions. The adoption of measures to strengthen competition at market

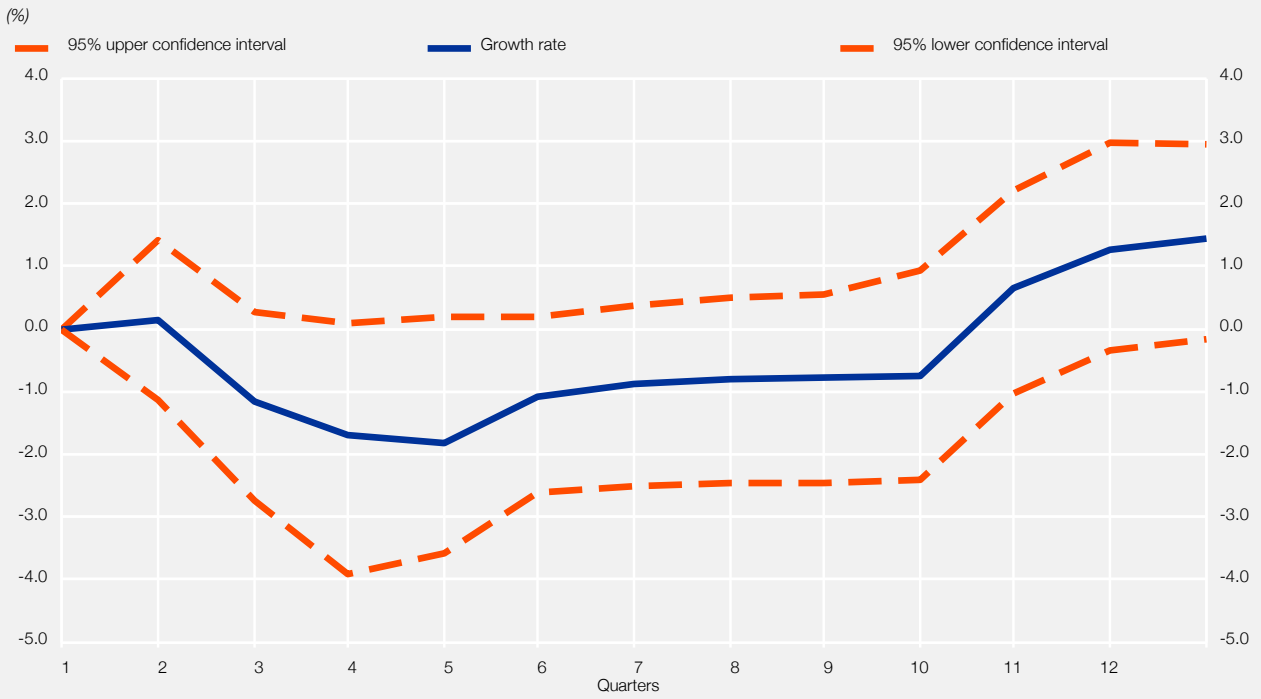
10 VAT rate cuts proved statistically not significant, as evidenced by the fact that, on a quarterly basis, the confidence intervals lie on either side of zero (x-axis).

11 It should be noted that the above analysis refers to the aggregate level of goods and services as recorded in the HICP and does not reflect the impact of the VAT rate cuts on individual markets (at the disaggregate level).

12 Similar findings are generated by empirical analysis using an alternative model of local projections. See Jordà, Ò. (2005), "Estimation and Inference of Impulse Responses by Local Projections", *American Economic Review*, 95(1), 161-182.

13 According to Kneller, R., M.F. Bleaney and N. Gemmell (1999), "Fiscal policy and growth: evidence from OECD countries", *Journal of Public Economics*, 74, 171-190, as well as Rapanos, V.Th. and G. Kaplanoglou (2014), "Taxation and economic growth. The case of Greece", in Masourakis, C. and C.V. Gortsos (eds.), *Competitiveness for Growth: Policy proposals*, Hellenic Bank Association, 609-638, the change in VAT rates does not by itself affect the factors of the production function through substitution effects, and does not affect saving and investment decisions or businesses' competitiveness through exports.

Chart C Growth response to a temporary (8-quarter) reduction in the standard VAT rate from 24% to 23%



Source: Bank of Greece calculations.

level,[14] as well as the expansion of e-commerce, are expected to contribute to a fuller pass-through of VAT rate cuts to end consumers for broader categories of goods and services, leading to a decline in inflation. Finally, it should be noted that deciding on any VAT rate cut should also take into account potential budgetary implications, in line with the commitments stemming from the new Stability and Growth Pact.

14 According to Benzarti, Y. et. al. (2024), op. cit., such measures have been adopted in the past in Argentina and included policies to combat price gouging followed by the effective monitoring of price developments, etc.

Box 5

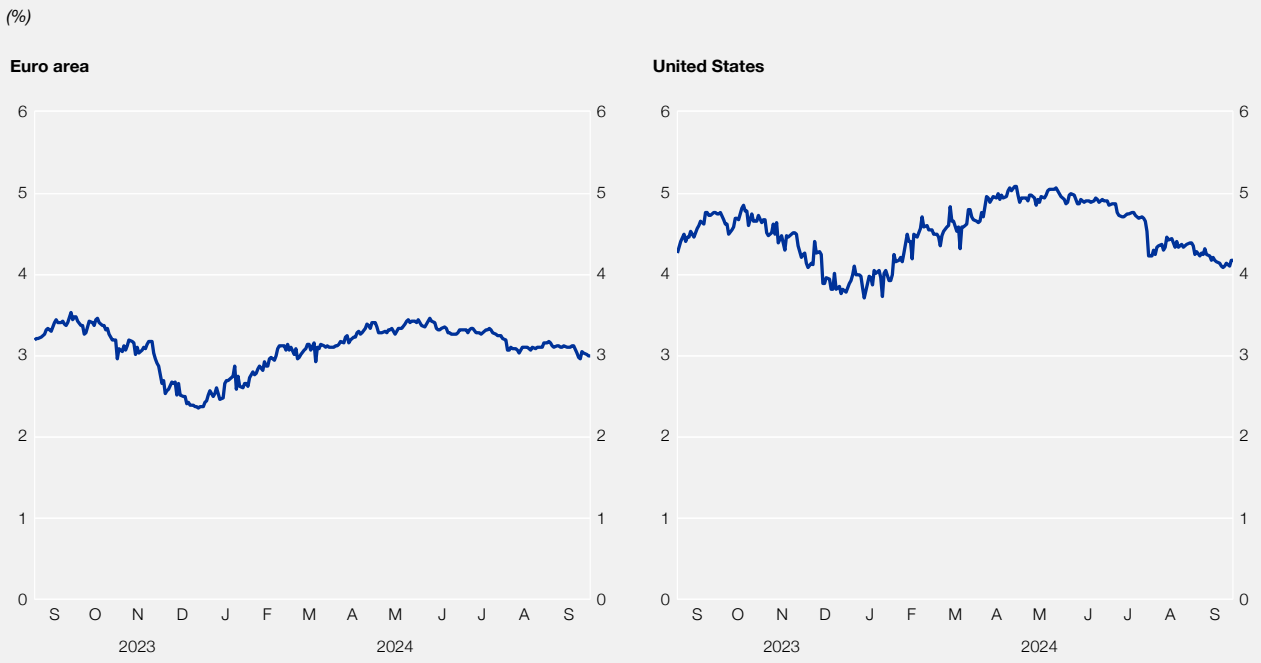
INVESTOR EXPECTATIONS FOR INTEREST RATES AND ECONOMIC ACTIVITY, AND VOLATILITY IN INTERNATIONAL CAPITAL MARKETS

With US and euro area inflation rates trending downwards, investor focus has shifted to forward-looking indicators of economic activity. Thus, up until August this year, signals of stronger-than-expected economic activity, especially in the United States, prompted a series of upward revisions to interest rate expectations for the end of the year. At the same time, stock markets priced in higher future profitability. In August, however, releases of softer-than-expected US economic data led to a reduction in interest rate expectations and drove up stock market volatility. This box discusses developments in the macroeconomic and financial environments over the course of 2024.

Macroeconomic developments and interest rates

Investor expectations about the path of US and euro area policy rates have been adjusted several times since early 2024. Specifically, as illustrated in Chart A, between end-2023 and end-January 2024, for each of these regions, forward rates were pricing in around 150 basis points of cumulative interest rate cuts for 2024 by year-end. Subsequently, as a result of stronger-than-expected economic activity in the United States and a higher

Chart A Expected euro area and US policy rates for end-2024



Source: LSEG Refinitiv.
Note: The deposit facility rate is shown for the euro area and the federal funds rate for the United States.

persistence[1] of key inflation components in both regions, these expectations were downscaled, reaching around 75 basis points for the euro area and around 50 basis points for the United States at the end of June (see Chart A).

By mid-August, investors' policy rate expectations changed again to reflect more cuts, leading to lower policy rates by the end of the year, especially in the US. The reason was that investors perceived US manufacturing new orders and labour market data released at the turn of July as underwhelming.[2] In particular, the US unemployment data release was interpreted as signalling an unanticipated weakening in the US economy. That was based on the so-called Sahm rule. According to this rule, a recession is signalled when the unemployment rate exceeds a threshold of 0.5% defined relative to its past growth, just like it did then.[3] As a result, the release, on 2 August 2024, of an unemployment rate of 4.3% for July (see Chart B, left-hand panel) triggered concerns among investors that the US economy might be heading for a largely unanticipated recession, forcing them to cut their expectations about the path of US interest rates.

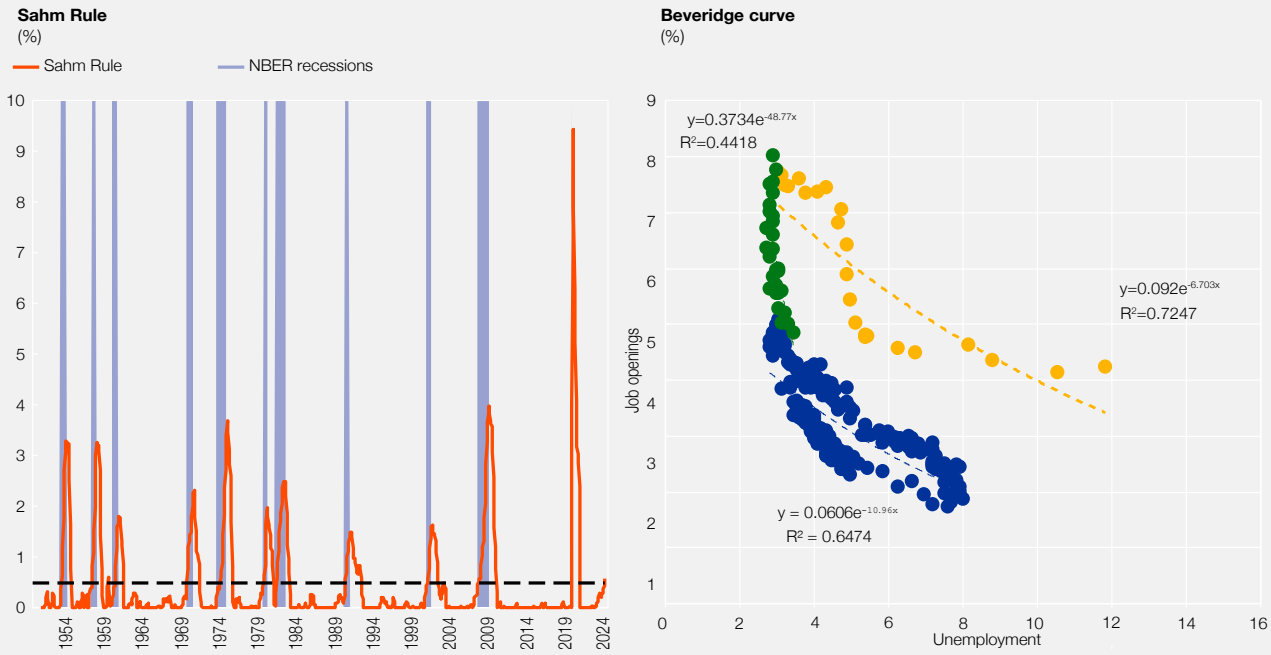
The Sahm rule is certainly a good indicator of past US recessions. However, as shown in the right-hand panel of Chart B, initial US labour market conditions are currently different than they were in earlier periods, both before and during the COVID-19 pandemic. In particular, the Beveridge curve, which can provide signals about labour market tightness (and thus the existence of supply-side inflationary pressures), shows that, in contrast to past

1 E.g. according to Personal Consumption Expenditure (PCE) Price Index data released on 26 January 2024, the headline price index showed a year-on-year change of 2.7% in December 2023, 0.1 percentage point more than expected. The headline and core PCE growth figures released at the end of February were again 0.2 percentage points and 0.3 percentage points higher than expected, reaching 2.6% and 3.1%, respectively.

2 In greater detail, the 46.8 ISM manufacturing PMI new orders index reading released on 1 August 2024 was not only lower than expectations of 48.8, but also below the threshold of 50 (an index value over 50 indicates manufacturing expansion). Subsequently, on 2 August 2024, employment gains of 89 thousand, along with an unemployment rate of 4.3%, were released. Both numbers disappointed investors, who had expected 175 thousand and 4.1%, respectively.

3 See Sahm, C. (2019), "Direct Stimulus Payments to Individuals", in H. Boushey, R. Nunn, and J. Shambaugh (eds.), *Recession Ready: Fiscal Policies to Stabilize the American Economy*, Washington, DC: The Hamilton Project and the Washington Center on Equitable Growth.

Chart B US labour market indicators



Source: Bank of Greece calculations based on data from the FRED (Federal Reserve Bank of Saint Louis) database.
Note: In the left-hand panel, the orange line represents the Sahm Rule and is calculated as the three-month moving average of the US unemployment rate minus its minimum value over the previous 12 months. Shaded areas indicate US recessions, as designated by the National Bureau of Economic Research (NBER). The black dashed line represents 0.5%. In the right-hand panel, the Beveridge curve shows the relationship between, on the x-axis, the unemployment rate and, on the y-axis, the job openings rate, the number of job openings expressed as a proportion of the labour force. Three periods are identified: from 2000 to March 2020 (blue); from March 2020 to the start of the Fed's interest rate hikes in March 2022 (orange); and from March 2022 to July 2024 (green).

economic cycles, the labour market is loosening today mainly as a result of fewer job openings rather than a rise in the unemployment rate. However, the fast decline in net job openings suggests that US economic growth may be slowing.[4]

The cumulative net change in employment is strongly correlated with NBER recessions.[5] In greater detail, as illustrated in Chart C, the downward trend in cumulative job openings observed since the start of the interest rate hiking cycle is consistent with a US slowdown.[6] Yet, while, according to the press release of 2 August 2024, the 12-month net change in employment fell in July, it did not move into negative territory, as it had in previous recession episodes.

Thus, even though US employment gains are slowing, this is from an extremely tight labour market, as Fed officials argue,[7] and the current 12-month cumulative level of job openings is inconsistent with recessionary conditions. Besides, last September's Fed's monetary policy statement indicated that the US economy had continued to expand at a solid pace.[8] Therefore, it appears that, in cutting its rates by 50 basis points at the FOMC meeting on 17-18 September, the Fed acted proactively rather than reacting to an already occurred economic deterioration event.

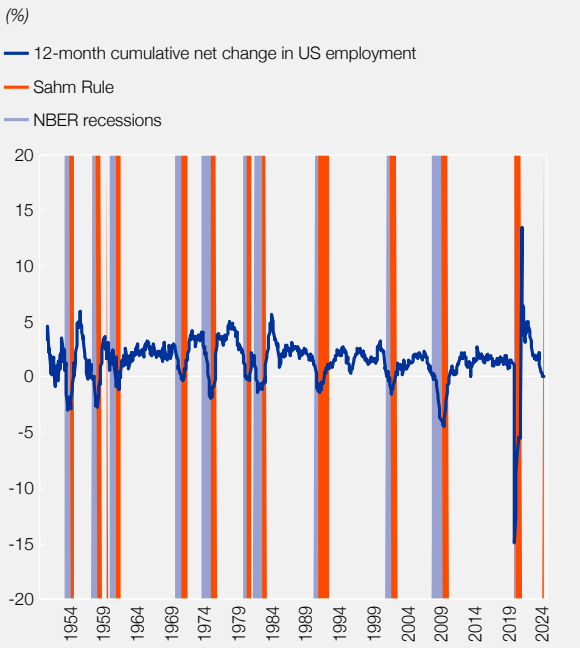
4 E.g. analysts expect annual US GDP growth to come in at around 2% in 2025. This projection compares unfavourably with the 2.7% expected for 2024.
5 Indicatively, NBER's report "*Determination of the December 2007 Peak in Economic Activity*" (March 2010) notes that the payroll employment measure is the most reliable estimate of employment. Employment and domestic production are the two main criteria for assessing whether or not a period of time qualifies as a recession.
6 US real GDP slowed in the first quarter of 2024, growing by 1.4% year-on-year (see p. 22 in Federal Reserve Board, Monetary Policy Report, July 2024, while for the full years 2024 and 2025 real GDP growth is projected at 2.8% and 2.2%, respectively, down from 2.9% in 2023 (see IMF World Economic Outlook, October 2024). For more details, see Chapter II of this Report.
7 See https://www.federalreserve.gov/newsevents/speech/bowman20240924a.htm.
8 See https://www.federalreserve.gov/monetarypolicy/files/monetary20240918a1.pdf.

Stock market developments

US labour market data releases in early August were followed by a massive spike in global capital market volatility, with indices of implied stock and bond market volatility exceeding 90% or 80% of historical observations, respectively.[9] This surge in international capital market volatility was accompanied by risk repricing and a plunge in share prices.[10]

Share prices have rebounded since, but this recovery has taken place in an environment of low risk aversion, as evidenced by the low, by historical standards, levels of implied stock market volatility.[11] Also, as stressed in numerous reports by international organisations, in several markets share valuations are high relative to fundamentals.[12] Such stretched valuations and low risk aversion leave shares and, by extension, international financial conditions vulnerable to negative surprises, e.g. in interest rate or geopolitical and economic developments.

Chart C US employment net change and recessions



Source: Bank of Greece calculations based on data from the FRED (Federal Reserve Bank of Saint Louis) database.
Note: The chart shows the relationship between the 12-month cumulative net change in employment (blue line), NBER recessions (grey-shaded areas) and the Sahm rule (>0.5%; orange-shaded areas).

Conclusion

In August this year, international financial markets experienced a massive spike in volatility and a drop in prices, especially for shares, following macroeconomic releases showing a weakening US economy. Even so, the recession concerns that triggered this stock market turmoil in the first place do not seem to have been confirmed, all the more since the Fed has started cutting rates. It can be concluded, therefore, that despite their considerable recovery, stock market valuations remain vulnerable to adverse economic and geopolitical developments.

9 Specifically, on 5 August 2024, the S&P 500 implied volatility index (VIX) closed at 38.57 points, higher than 95% of the historical observations, and its European equivalent VSTOXX index finished at 31.17 points, near the 90th percentile of the implied volatility distribution. Even the MOVE index, a measure of implied volatility in the US Treasury market, soared to 121 points, exceeding 80% of the historical observations.

10 At the close of 5 August 2024, the S&P 500 and Eurostoxx, respectively, finished 6% and 6.2% lower compared with the close of 31 July 2024. The Athex composite share price index also plunged by 9.3% relative to the same date.

11 E.g. VIX's, VDAX's and VSTOXT's median values for the period 1 November to 12 December 2024, as compared with their respective historical counterparts, were: 14.8 (against 17.5), 15.6 (against 19.9) and 17.2 (against 21.4).

12 See (a) Box A "Markets increasing response to labour market conditions in the US", Chapter "Carry off, carry on" in *BIS Quarterly Review*, Bank for International Settlements, 13 September 2024; (b) the Record of the Bank of England Financial Policy Committee meeting on 19 September 2024; and (c) the press release following the ESRB General Board meeting on 26 September 2024.

Box 6

GREEK BANKS' CREDIT RATING UPGRADES

Greek banks' credit rating has improved significantly in recent years, mainly driven by the sovereign's credit rating upgrades and the strengthening of banks' fundamentals. As a result, the rating gap between Greek banks

and the Greek sovereign has narrowed to around 1.5 notches. This positive development is reflected in lower credit risk levels for Greek bank bonds, as yields at issuance have moved closer to the yields of euro area investment grade bank bonds, contributing to banks' efforts to meet their regulatory capital requirements (MREL).

This box summarises the evolution of Greek banks' aggregate credit rating and its constituents since the recovery of the Greek sovereign rating. The purpose of this study is to highlight the contribution of the credit rating parameters to banks' upgrades and reflect on their importance for the reduction in bank funding costs.

Greek banks' credit ratings

Rating agencies apply a robust credit rating framework for assessing banks, which rests on both quantitative and qualitative parameters, similar to the ones they use for sovereign credit ratings.[1] Through this framework, they assess banks' credit profiles as corporate entities, as well as their ability to meet their contractual obligations against their creditors (e.g. depositors, bondholders),[2] taking into account a large number of parameters that reflect on the current level and prospects of their credit risk. The rating process typically starts with a quantitative assessment (stand-alone rating), consisting of an assessment of the operating environment and bank fundamentals, such as their asset quality and capital adequacy. The final credit rating is assigned by the Rating Committee, after taking other factors into account as well, be they systemic or idiosyncratic, exercising analytical judgment, that could alter the overall score resulting from the stand-alone rating.

The downgrades in the Greek sovereign credit rating and the debt crisis of the past decade brought about a sharp deterioration in the financial metrics of Greek banks. The fundamentals of the banking system deteriorated due to, inter alia, the economic and financial recession and the negative consequences from the loss of investor confidence in the prospects of the Greek economy, as well as the restricted access to the international money and capital markets. As a result, the rating agencies downgraded the rating of banks by several notches within a short period of time; these downgrades closely tracked the downgrades of the Greek sovereign. Subsequently, as shown in the left-hand panel of Chart A, from 2013 to 2014, Greek banks' credit ratings, as well as that of the sovereign, started to recover, but this development was fully reversed due to the imposition of capital outflow controls and a bank holiday; as a result, new sovereign and bank credit rating downgrades followed in 2015.[3]

The period following the start of the recovery of the Greek sovereign credit rating, around 2016, was not however accompanied by immediate rating upgrades for Greek banks. The rating score for the Greek banking system remained subdued for about 3.5 years, despite a gradual improvement in bank fundamentals and the upgrades of the Greek sovereign, mainly due to the drag from the large stock of non-performing loans. As a result, the rating gap between Greek banks and the Greek sovereign widened to five notches, thus leaving the assessment of banks' operating environment much room for improvement, which is also used as an input for determining banks' overall rating.

The lifting of capital controls in October 2018, coupled with the gradual improvement in the fundamentals of the Greek economy, triggered an upward trend for the ratings of Greek banks towards investment grade, which is still in process today. In particular, the recovery was initially supported by an elimination of the gap between the

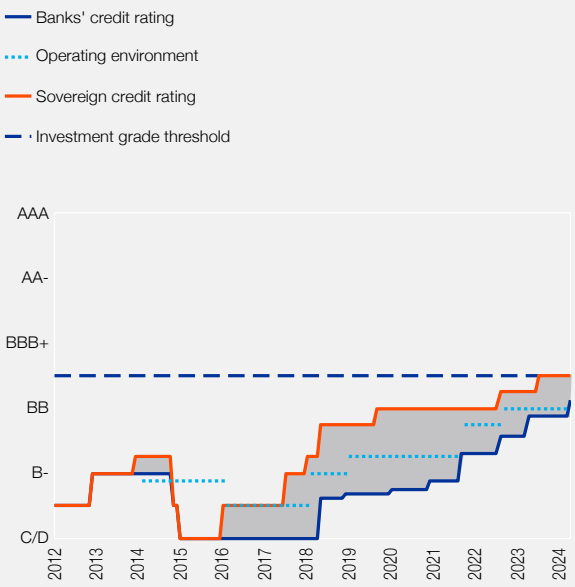
1 See Box 5, "The drivers of Greece's sovereign credit rating upgrades", Bank of Greece, *Monetary Policy – Interim Report 2023*, Executive Summary and Boxes, December 2023, and Malliaropulos, D. and P. Migiakis (2020), "Sovereign credit ratings and the fundamentals of the Greek economy", Bank of Greece, *Economic Bulletin*, No. 51, 43-72.

2 Rating agencies assess banks' credit risk at issuer level, over a long-term and a short-term horizon, but also at instrument level, including bank deposits and bank bonds. Individual ratings may differ for the same issuer, as agencies may take into account different factors (e.g. State guarantees). In this box, credit ratings refer to the four systemic banks' long-term issuer ratings assigned by the "Big Three" (S&P, Moody's and Fitch, which together hold almost 93% of the market) and, where mentioned, to their bond ratings.

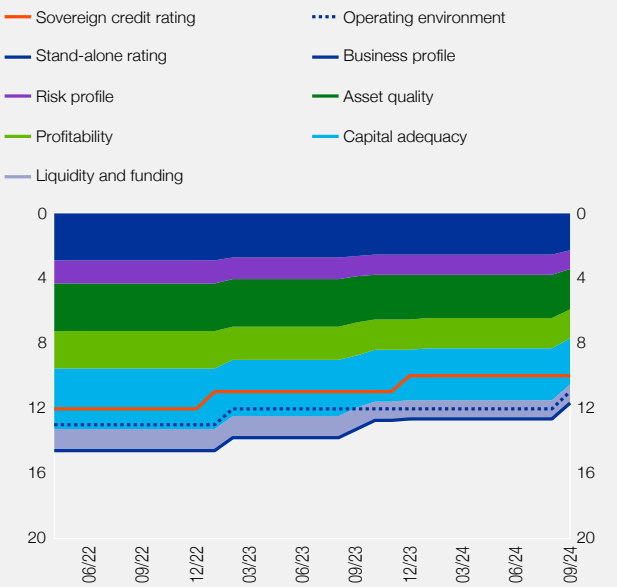
3 The relationship between bank credit ratings and the corresponding sovereign ratings is documented by relevant studies: see, inter alia, Adelino, M. and M.A. Ferreira (2016), "Bank ratings and lending supply: Evidence from sovereign downgrades", *The Review of Financial Studies*, 29(7), 1709-1746, and Drago, D. and R. Gallo (2017), "The impact of sovereign rating changes on the activity of European banks", *Journal of Banking and Finance*, 85, 99-112. As regards the components of the credit ratings, see Caporale, G.M., R. Matousek and C. Stewart (2012), "Ratings assignments: Lessons from international banks", *Journal of International Money and Finance*, 31(6), 1593-1606.

Chart A Greek banks' credit rating

1. Greek banks' credit rating and Greek sovereign credit rating



2. Banks' credit rating components



Sources: Rating agencies and Bank of Greece calculations.
Note: The chart shows the evolution of Greek banks' aggregate credit rating over time. The stand-alone rating includes an assessment of the operating environment. The sovereing rating refers to the long-term foreign currency credit rating. In panel 1, the banks' credit rating is the average long-term rating of the four systemic banks. In panel 2, the banks' credit rating derives from the cumulative assessment of the rating parameters.

overall score and the stand-alone rating score (three notches), as the drag of the analytical judgment was reduced, while the improved operating environment parameter – already reflecting the better prospects of the Greek economy – also contributed positively.

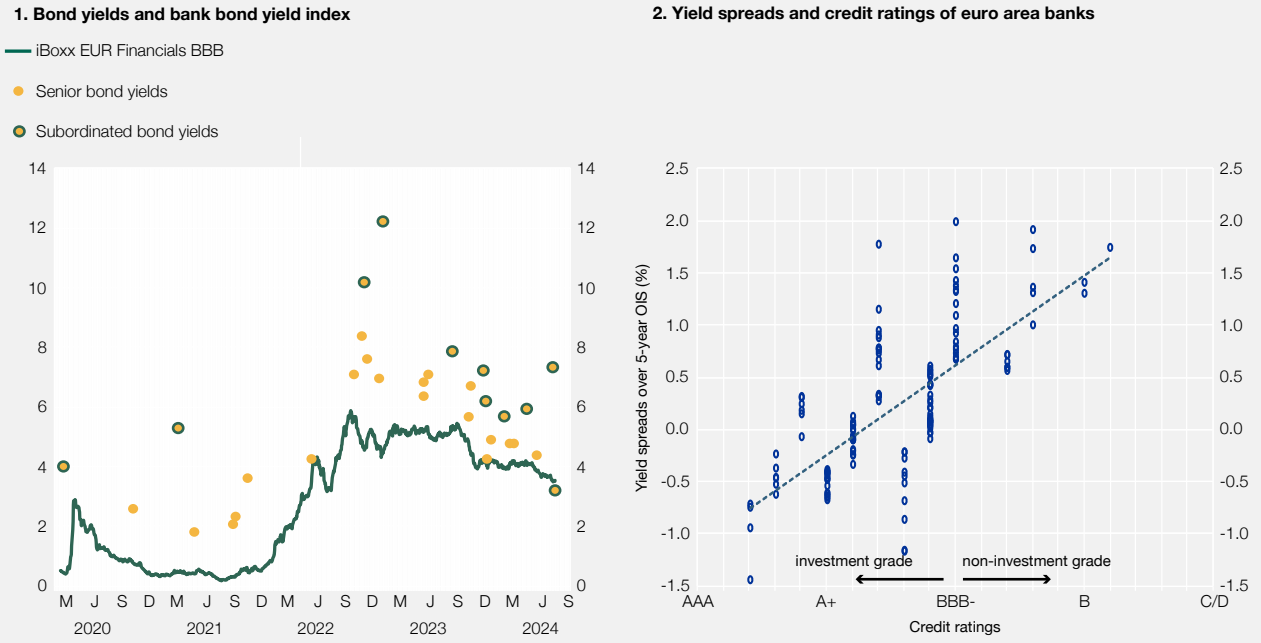
However, the operating environment score remained below that of the sovereign credit rating. This shortfall can be attributed to the fact that rating agencies also include in the quantitative component variables related to institutional parameters (e.g. governance and investor protection indicators) and systemic factors (e.g. degree of concentration in the banking system, geographical diversification of bank operations). It should be noted that there is a two-way interaction between the rating of the banking system and that of the sovereign, as the improvement in bank fundamentals also had a positive contribution to the improvement in the Greek sovereign credit rating.

In the period that followed, the successive upgrades of Greek banks also relied on improvements in their financial metrics. Greek banks entered the economic recovery period with a large stock of legacy loans, which weighed heavily on their capital positions and their financing capacity. At the same time, they posted negative profitability owing to high loan-loss provisions, while liquidity and funding positions remained weak, albeit showing signs of recovery. The improvement in the stand-alone rating was initially triggered by positive developments in bank asset quality and capital ratios, as a result of banks' active policies to clean up their balance sheets from non-performing loans. Higher liquidity and funding scores also contributed positively, supported by increased confidence in the domestic banking system, favourable liquidity conditions due to the Eurosystem monetary policies and bank bond issuance costs closer to the euro area average. More recently, bank ratings were supported by improvements in the profitability and capital adequacy ratios amid a high-interest rate environment.

The credit rating of Greek banks now stands about 1.5 notches, on average, below investment grade, with rating agencies assigning a positive outlook.[4] The rating upgrade of banks to investment grade primarily hinges on fur-

4 The credit ratings of banks as bond issuers remain below investment grade. It should be noted, however, that Moody's assigns ratings in investment grade to senior bonds issued by Greek banks.

Chart B Greek banks' bond yields



Sources: LSEG and Bank of Greece calculations.
Note: Panel 1 shows Greek bank bond yields at issuance in 2020-2024 against the BBB euro area bank bonds yield index (iBoxx EUR Financials BBB index) in the same period. Issues refer to senior bonds and subordinated bonds. Panel 2 shows the relationship between credit ratings and yields at issuance for euro area bank bonds. Bank bonds are bail-inable bonds issued in euro during the 2020-2024 period with a 5-10-year horizon. The y-axis reflects bank bond yield spreads over the corresponding benchmark bonds (OIS 5-year rates). The credit rating refers to the best of the Big Three's long-term issuer ratings. The upper and lower bound of each rating category is the half of the standard deviation above and below the median rating category yield, respectively.

ther improvements in their fundamentals. Greek banks should also continue their efforts to clean up their assets and improve their capital ratios, converging further towards the euro area average, albeit having started from a higher NPL ratio.

Impact of the rating upgrades on Greek banks' funding costs

Since 2018, Greek banks have increased their issuance activity in the primary bank bond market, raising a total of EUR 20.7 billion in senior and subordinated bonds. Successive improvements in banks' credit ratings have supported the credit quality of their bonds, often with the same number of notch upgrades. As a result, Greek bank senior bonds have a rating that is roughly the same as that of their issuers, while subordinated bonds are assigned lower ratings.

In turn, the upgrades of the bank bonds have brought about a reduced cost of issuance in the primary market, to the benefit of banks' financial results. Yields at issuance, especially of senior bonds, have gradually moved closer to the yields of euro area investment grade bank bonds, despite the upward pressures from the tightening of global monetary and financial conditions (see Chart B, left-hand panel).

The convergence towards the yields of euro area investment grade bank bonds, as was the case with the yields of Greek government bonds,[5] reflects a strengthening of investor confidence in the prospects of the Greek banking system. In particular, it is estimated that a rating upgrade by one notch from the current level would result in a permanent decrease of around 110 basis points in Greek banks' bond issuance costs (see Chart B, right-hand panel).

5 See Box 6, "Empirical investigation of the impact of upgrades to investment grade status", Bank of Greece, *Monetary Policy – Interim Report 2023, Executive Summary and Boxes*, December 2023.

ISSN: 2732 - 9593 (online)