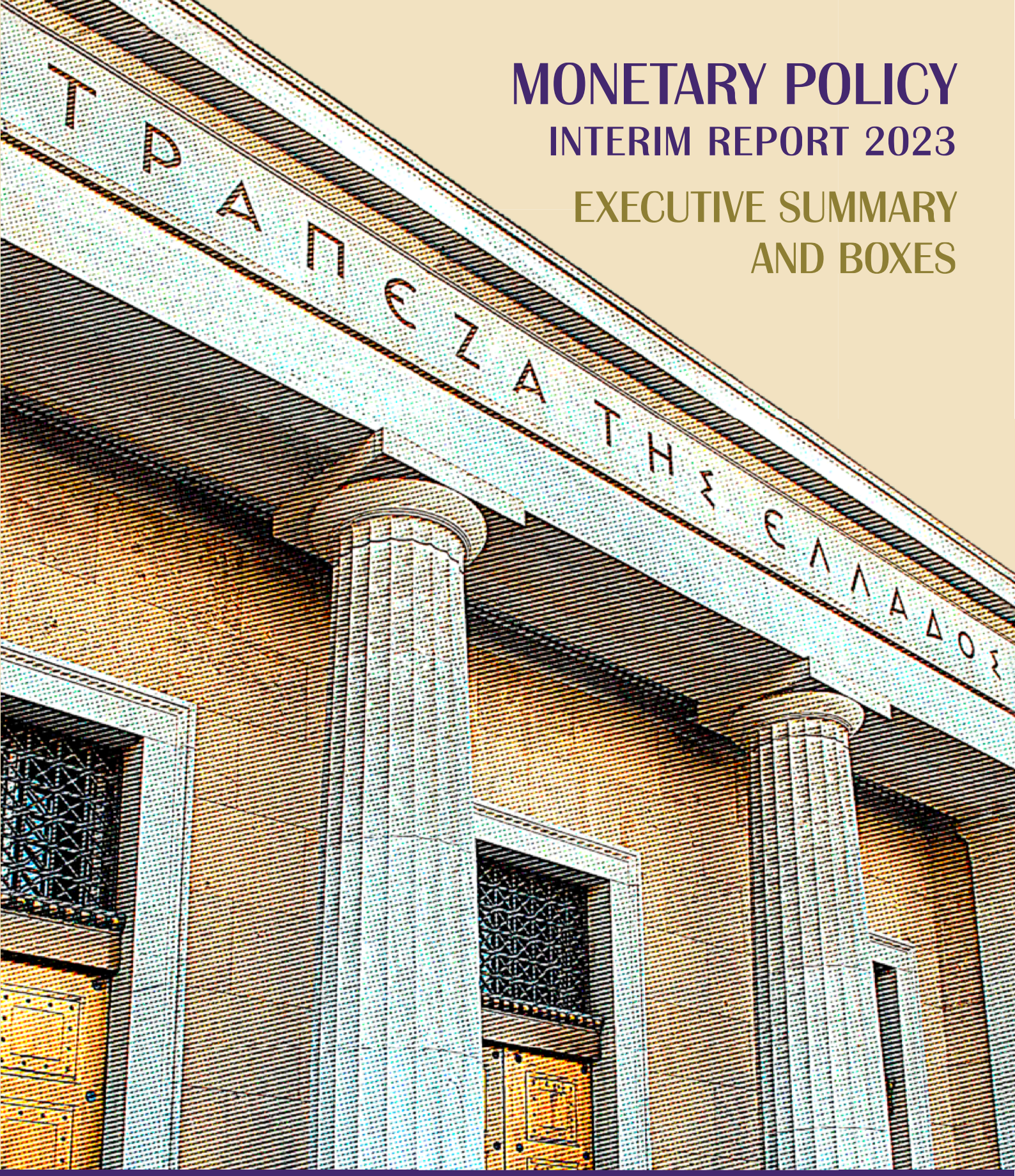
MONETARY POLICY
INTERIM REPORT 2023
EXECUTIVE SUMMARY AND BOXES



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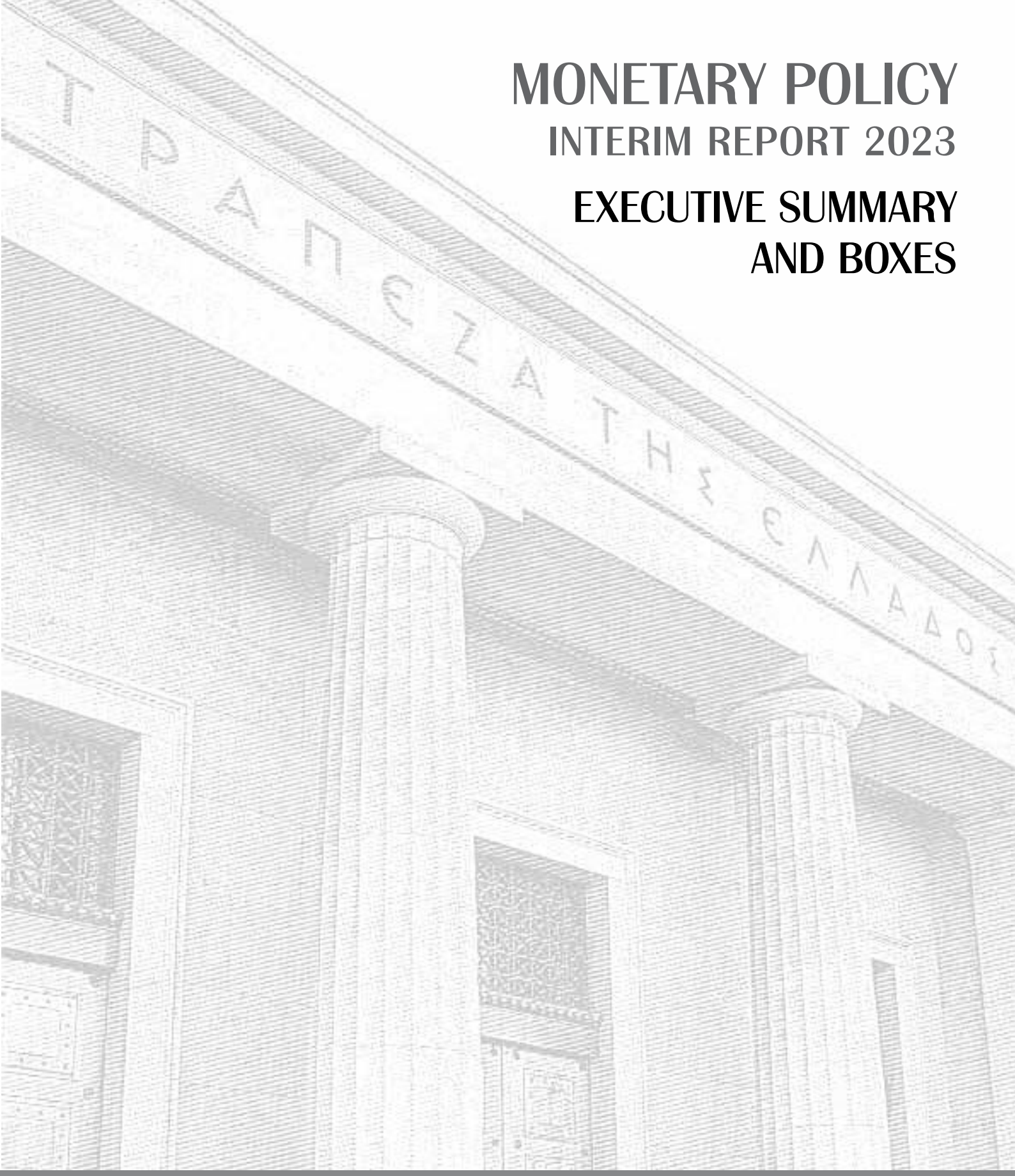

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Economic Analysis and Research Department

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EXECUTIVE SUMMARY

RETURN TO INVESTMENT GRADE RATING PROVIDES AN OPPORTUNITY NOT TO BE MISSED FOR THE GREEK ECONOMY TO FURTHER IMPROVE ITS PERFORMANCE

1 INTRODUCTION

The global economy slowed down in 2023. However, it has proved more resilient than had been expected in the beginning of the year, although economic developments have been considerably uneven across countries. Economic activity is weakening in advanced economies and especially in the euro area, whereas developing and emerging market economies are only witnessing a marginal deceleration. The tightening of monetary policy, the phasing-out of fiscal support, persistently high –albeit declining– inflation, high debt, the fallout from the war in Ukraine, geoeconomic fragmentation and a new surge of uncertainty since October, triggered by geopolitical tensions in the Middle East, are all having adverse effects on economic activity and expectations. Global inflation, although continuing to decline as a result of policy rate hikes and falling commodity prices, remains elevated, and second-round effects seem to become gradually entrenched in its core. Risks to the global growth outlook remain significant. More specifically, heightened geopolitical uncertainties, the erosion of real incomes by inflation and high debt servicing costs could continue to weigh on economic activity in 2024.

In Greece, the economy continued to expand at a satisfactory yet slower pace in 2023, outperforming the euro area average. Headline inflation declined sharply, chiefly as a result of falling energy prices. However, upward pressures on the prices of processed food, non-energy industrial goods and services kept core inflation at high levels.

The steadily improving fiscal performance and commitment to the timely implementation of an ambitious investment and reform programme played a crucial role in the upgrade of the Greek sovereign to investment grade. Greece's upgrade as well as the subsequent upgrades of Greek banks are very important developments, cushioning the impact of interest rate increases on the borrowing costs of the public and private sectors, with favourable effects on the real economy. At the same time, progress in cleaning up bank balance sheets, an improvement in banks' key profitability and liquidity ratios and the ongoing divestment of the Hellenic Financial Stability Fund's stakes in Greek banks suggest that the financial system is now in a much better position than in the past to withstand potential future shocks.

The upgrade of Greece's credit rating to investment grade amid heightened global uncertainty, related to geopolitical developments and increased financial risks, undoubtedly marks a milestone in the course of the Greek economy. Nevertheless, this should not lead to complacency, as the Greek sovereign's rating is well below the average credit rating of euro area countries. Therefore, adherence to a fiscal path in line with the EU rules must continue, so as to further support fiscal sustainability in the long term. Reforms should also be sustained and the utilisation of resources under the EU recovery instrument NextGenerationEU (NGEU) should be accelerated, with the aim of raising productivity and growth in the Greek economy. In particular, NGEU resources should be channelled to investment in export-oriented and high-tech sectors, as well as in infrastructures underpinning the development of such sectors.

2 THE GREEK ECONOMY: DEVELOPMENTS AND PROSPECTS

2.1 Real economy: Satisfactory yet slower increase in economic activity

Economic activity: Over the January-September 2023 period, economic activity in Greece slowed year-on-year, but remained resilient (+2.2%), even more so compared with the euro area. Private consumption, exports of goods and services, and gross fixed capital formation remained the key drivers of growth, despite the adverse effects from the slowdown in global trade and high inflation on these GDP components. On the other hand, higher imports, largely due to rising private consumption and investment, had a negative contribution to GDP growth. Lastly, improved labour market conditions, with a drop in the unemployment rate, robust employment growth and an increase in nominal wages, supported household incomes.

Economic activity indicators paint a mixed picture. Most indicators, such as manufacturing, construction and car sales, continued to suggest positive –albeit decelerating– year-on-year growth rates. Other indicators, such as industrial production and retail sales, point to deceleration or decline. Furthermore, business and consumer confidence indicators have shown fluctuations, probably affected by mounting uncertainty over developments in the Middle East. Still, the Purchasing Managers' Index (PMI), though standing at the lowest levels seen in several months, continues to suggest a marginally upward trend in Greek manufacturing and is higher than the euro area PMI.

Inflation: Headline inflation, as measured by the Harmonised Index of Consumer Prices (HICP), declined sharply in 2023, from 7.3% in January to 2.9% in November, mainly on account of large falls in energy prices. Nevertheless, HICP excluding energy recorded high rates of increase, reflecting upward pressures on food prices, as well as on the prices of non-energy industrial goods and services. Food inflation, after its peak in December 2022 (12.9%), has been on a downward path, which however remains fragile because of the ongoing war in Ukraine and the new crisis in the Middle East.

Headline HICP inflation is set to decline further in the coming year, as all its components except energy are expected to trend downwards. Yet, the international environment and geopolitical developments in particular give rise to uncertainty, with strong upside risks to the inflation outlook.

Real estate market: The Greek real estate market continued to attract investor interest in 2023, with property prices rising further, especially in the case of prime properties in short supply relative to increased demand, both foreign and domestic. However, a number of leading indicators of the domestic real estate market, as well as European and global property price developments point to some moderation in real estate prices in the following quarters, especially for lower-demand properties.

Labour market: The Greek labour market kept improving in the first nine months of 2023, albeit at a slower pace. Total employment increased by 1.3% and the unemployment rate dropped to 11.3%, down by 1.3 percentage points year-on-year. According to Labour Force Survey data, the seasonally adjusted unemployment rate fell to 9.6% in October 2023 from 11.8% in October 2022. Private sector employment, based on dependent employment flows data from the ERGANI information system, returned to pre-pandemic levels; on the other hand, employment prospects, although still positive, worsened in the third quarter of 2023 compared with the high levels seen in the second quarter. Nevertheless, the labour market continues to be tighter than in the recent past, as businesses find it difficult to hire workers matching their needs, despite a considerable increase in wages during 2023.

Competitiveness: After a visible improvement over the past few years, the international competitiveness of the Greek economy is showing signs of stagnancy and/or slight deterioration in

2023. The effective exchange rate indices based on relative prices and on relative unit labour costs rose in the first three quarters of 2023, implying a worsening in international competitiveness, mainly due to the strong impact of the euro appreciation in nominal effective terms observed since the last quarter of 2022.

Meanwhile, the available composite structural competitiveness indicators show that the marked improvement seen in the previous three years has now stalled. Yet, foreign direct investment (FDI) in 2023 is projected to remain at roughly its 2019-21 average, supported by the improved economic sentiment in Greece. FDI inflows to Greece over the January-September 2023 period amounted to EUR 3.9 billion (2.3% of GDP) and are mostly channelled to the sectors of real estate (management and private purchases/sales of real estate), manufacturing, wholesale and retail trade, telecommunications, accommodation and food services.

Current account balance: Following a deterioration in 2022, the current account balance improved markedly over the first nine months of 2023. In January-September 2023, the current account deficit decreased by EUR 4.6 billion year-on-year to EUR 7.3 billion. This development is attributable to improvements, primarily, in the balance of goods and, to a lesser extent, in the services balance and the secondary income account, which were partly offset by a deterioration in the primary income account. More specifically, the goods balance deficit shrank, as the decline in imports outpaced that in exports. The improvement of the services balance mainly reflects higher travel and, to a lesser extent, other services receipts, despite a lower surplus in the sea transport balance. It should be noted that in January-September 2023 tourist arrivals and receipts continued to rise, yet at a slower pace relative to 2022, by 17.3% and 15.2% respectively, while average expenditure per trip decreased by 2.5%. The secondary income account also improved, chiefly on the back of net receipts (against net payments in the respective period of 2022) in the general government sector. The above favourable developments were partly offset by a higher deficit in the primary income account, due to increased interest, dividend and profit payments.

2.2 Fiscal developments: Improvement of the primary balance and considerable reduction of the debt-to-GDP ratio mainly on account of higher nominal GDP

According to the second EDP notification of fiscal data for 2019-22 by the Hellenic Statistical Authority (ELSTAT) in October 2023, the general government primary balance for 2022 was confirmed a surplus of 0.1% of GDP, while general government debt reached 172.6% of GDP. Fiscal data for 2022 show a marked decline in both the primary deficit and the debt ratio relative to 2021. The improvements achieved by Greece, 4.6 percentage points of GDP for the primary balance and 22.4 percentage points of GDP for public debt, were the largest among all euro area countries. The biggest contribution (21.2 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.

Between July and October 2023, interventions in response to the energy crisis were maintained in various forms, while additional fiscal measures were adopted to support incomes, consistent with the government’s pre-election promises, and to cushion the economic fallout from the natural disasters that hit Greece. In this context, two supplementary budgets were adopted, totalling EUR 1.3 billion. At the same time, tax revenue considerably overshot the period target in the Stability Programme.

According to the Introductory Report on the 2024 Budget, the general government primary balance (based on ESA) is estimated at a surplus of 1.1% of GDP in 2023, against 0.1% of GDP in 2022. The higher primary surplus in 2023 relative to 2022 is due to increased revenue from taxes and social security contributions, reflecting stronger economic activity and the impact of inflation, as well as to an increase in electronic transactions and tax audits that improved tax collection. General government debt is projected to decline by 12.3 percentage points of GDP

to 160.3% of GDP compared with 2022, mainly owing to the debt-reducing contribution of the interest rate-growth differential ("snowball effect"). The projections of the Bank of Greece foresee a primary surplus of 1.1% of GDP and a debt ratio of 162.2% of GDP in 2023.

2.3 Financial developments: The upgrade of Greece's sovereign credit rating to investment grade mitigates the impact of monetary policy tightening on bond yields

Interest rate hikes by central banks have helped contain medium-to-long-term inflation expectations, but, on the other hand, have led to increases in yields on government bonds, as well as bank and corporate bonds. Meanwhile, investor expectations about interest rates were revised upwards, as major economies around the globe, and the US economy in particular, appear to be more resilient than initially anticipated. As interest rates are thus expected to remain higher for longer, they should continue to tighten global financial conditions.

These developments are exerting upward pressures on the yields of Greek government bonds, as well as of bonds issued by Greek banks and corporations. However, the upward pressures on Greek government bond yields during the second half of 2023 were offset by positive developments in Greece's sovereign credit rating. Specifically, Scope Ratings in August, DBRS in early September, S&P in October and Fitch in early December 2023 upgraded the Greek sovereign to investment grade.

As a result, Greek government bond yields, as well as their spreads vis-à-vis other euro area government bonds, are now considerably lower compared with early 2023. In particular, the spread between the Greek ten-year government bond and its German counterpart narrowed by 84 basis points between January and December 2023 to 119 basis points.

Accordingly, the volatility of Greek corporate bond yields has been moderate since the beginning of the year, as the positive impact of the sovereign credit rating upgrades has largely offset the upward pressures on yields in the bond market. Furthermore, these yields moved along a similar path as those on BBB-rated bonds, decoupling from high-risk bonds. Bank bond yields on the secondary market declined, after increasing in March amid the US banking sector woes. Greece's upgrade and the expected improvement of Greek banks' credit ratings, which will narrow their distance from investment grade territory, are set to mitigate the impact of higher interest rates on banks' funding costs in bond markets, with positive effects across the economy.

Since the beginning of 2023, global stock market prices have risen markedly, on the back of better-than-expected performance of major economies and expectations of a pause in interest rate hikes. Both in the United States and in the euro area, the high-tech index has outperformed the general index. Against this backdrop, share prices in the Athens Exchange (ATHEX) rose sharply between the beginning of 2023 and end-November, faring much better than their US and euro area counterparts. The banking index performed better than the ATHEX composite index, supported by the Greek sovereign's upgrade to investment grade, banks' profitability and credit rating upgrades, as well as the resilience of the Greek economy.

2.4 Banking sector: Higher interest rates, slowing credit growth, stabilisation of deposits

During the January-October 2023 period, bank interest rates continued to rise, in response to the tightening of the single monetary policy stance. However, deposit rates have lagged behind Eurosystem key policy rates and euro area money market rates. Specifically, the weighted average interest rate on time deposits by households and non-financial corporations (NFCs) stood at 1.5% on average between January and October 2023, up by 140 basis points year-on-year, while that on overnight deposits remained almost unchanged. As interest rate increases in Greece were more limited relative to the euro area, interest rates on time deposits in Greece have been hovering below the euro area average since mid-2022.

As a consequence, NFCs and households are increasingly shifting funds to time deposits, owing to the higher remuneration they offer in the context of the ECB's monetary policy tightening, especially for deposits with a maturity of over one year. Still, the bulk of banks' deposit base continues to consist of liquid assets held in overnight accounts (75% of private sector deposits).

In the year to October, total bank deposits by the domestic private sector only showed a small increase of EUR 0.3 billion (January-October 2022: EUR 3.6 billion), as the growth in household deposits was largely offset by a decline in business deposits. Household deposits grew by EUR 2.1 billion during the period under review (January-October 2022: EUR 2.6 billion). This year-on-year slowdown was due to a moderation in real disposable income growth and households' relatively higher consumer spending due to high inflation. Business deposits, which had increased by EUR 0.8 billion one year earlier, shrank by EUR 1.7 billion in January-October 2023, reflecting slower growth in loans to NFCs over the reviewed period.

Bank lending rates to NFCs rose considerably in January-October 2023 year-on-year, as they are mostly variable, linked to a benchmark rate. The composite interest rate on loans to NFCs averaged 5.8% in the first ten months of 2023, up from an average of 3.2% one year earlier. In bank loans to households, where variable rates are less common, interest rate increases were smaller: the composite interest rate on household loans rose by 1 percentage point year-on-year to an average of 6.1% in January-October 2023. The upward adjustment of interest rates was broadly based across housing and consumer credit.

The rise in nominal bank lending rates in Greece during 2023 has been milder compared with the euro area average for either sector (NFCs and households). As a result, the differential in the weighted average cost of bank borrowing between Greece and the euro area over the January-October 2023 period narrowed to 125 basis points for business loans (January-October 2022: 151 basis points) and to just 47 basis points for housing loans to households (January-October 2022: 111 basis points).

The annual growth rate of bank credit to NFCs weakened in the first ten months of 2023, which is associated with higher lending rates and slower GDP growth. In the January-October 2023 period, the average monthly net flow of bank credit to NFCs amounted to EUR 79 million, compared with EUR 450 million year-on-year, dragged further down by sizeable loan repayments, mostly by large firms. Bank lending to businesses continued to be supported in 2023 by the programmes of the European Investment Bank (EIB) Group and the Hellenic Development Bank (HDB), as well as by the Recovery and Resilience Facility (RRF). Business loan disbursements under the EIB and HDB schemes came to EUR 1.6 billion in January-October (2022: EUR 4.2 billion), representing 11% of new loans with a defined maturity to NFCs (2022: 18%). In addition, business loan disbursements under the RRF amounted to around EUR 1.1 billion over the same period and to a cumulative of EUR 1.4 billion since the start of disbursements in July 2022.

Compared with NFCs, loans to households declined at a stronger pace during the January-October 2023 period. However, the average annual growth rate of consumer credit rose to 1.9% (January-October 2022: 0.6%), while that of housing loans became more strongly negative (-3.7%; January-October 2022: -3.0%). Developments in consumer loans are consistent with the uptrend in private consumption.

Looking ahead, the high level of bank lending rates will likely continue to dampen the annual growth of bank credit to NFCs, also given the lagged response of loans to interest rate changes. Even if Eurosystem policy rates are kept at their current levels, their past increases should continue for some time to be passed through to financing conditions, pushing up bank borrowing costs. The shift away from overnight deposits to higher-remunerated time deposits also works in the same direction.

On the other hand, Greece's recent upgrade to investment grade improves the liquidity conditions of Greek banks, by squeezing down their funding costs on capital and bond markets. Moreover, the ongoing favourable developments in the labour market, with a positive impact on the creditworthiness of prospective borrowers, and in the real estate market, implying higher collateral value, pave the way for lower bank lending rates. Meanwhile, the projected rise in GDP and the expected increase in loan disbursements under the RRF as the approved investment projects are implemented are set to offset the negative impact of high interest rates and help maintain bank credit to businesses at growth rates similar to those seen in 2023. The new co-funding and guarantee programmes of the HDB and the EIB Group, which will be made available under the Multiannual Financial Framework (MFF) 2021-2027, should continue to play a supportive role.

Banking system: Positive outlook on the back of the Greek sovereign's credit rating upgrade to investment grade

The most important development in the first nine months of 2023, which has a positive effect on the outlook for Greek banks, is the Greek sovereign's upgrade to investment grade. In particular, the upgrade is expected to lead to further upgrades of Greek banks' credit ratings, thereby helping to contain their increased funding costs in international bond markets amid tighter monetary and financial conditions globally. The direct benefits of the upgrade include an improvement in the quality of banks' securities portfolios, partly consisting of Greek government bonds; an increase in bank liquidity (as these bonds can now be used as collateral in Eurosystem refinancing operations without the need for a waiver of the eligibility requirements); and lower market risk for banks, by reducing the sensitivity of Greek securities to international market fluctuations. Furthermore, access to international capital markets and the interbank market should become easier for Greek banks; in fact, the upgrade has already had a dampening effect on banks' funding costs from capital markets. Lastly, significant favourable effects on domestic economic activity are expected in the long run as bank profitability increases, credit risk is reduced and the quality of banks' loan portfolio improves. It should be noted that the upgrade and its drivers, such as improved bank profitability and the resilience of the Greek economy, have been supportive to the divestment of the Hellenic Financial Stability Fund's stakes in Greek banks.

In the January-September 2023 period, the profitability of Greek banks increased, due to significantly higher net interest income and lower loan-loss provisions. Profitability was adversely affected by lower net income from financial operations, which had benefited from non-recurring income in the past year, and to a lesser extent by higher operating expenses.

Between December 2022 and September 2023, capital adequacy ratios on a consolidated basis showed marginal changes, remaining lower than the respective euro area average. It should be noted that the ECB/EBA stress test assessed that the fully loaded CET1 ratio of the four stress-tested Greek banks would increase more (fall less) in the baseline (adverse) scenario than the European average.

The non-performing loan (NPL) ratio on a solo basis fell in September 2023 compared with December 2022, although it is still higher than the euro area average. Nevertheless, it should be pointed out that the first nine months of the year saw a net inflow of new NPLs across all loan portfolios. In the light of the above, close monitoring of banks' loan portfolio quality is warranted, as the high interest rate environment coupled with a possible slowdown in economic activity may push up the NPL ratio.

With regard to bank liquidity, the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) rose in September 2023 relative to December 2022, both remaining higher than the respective euro area averages.

2.5 Projections: Continued growth momentum, lower inflation, improved fiscal aggregates

According to the current projections of the Bank of Greece, the growth rate of the Greek economy is expected to turn out at 2.4% in 2023, picking up somewhat to 2.5% in 2024 and 2025 and moderating slightly to 2.3% in 2026. Thus, the Greek economy is set to grow faster than the euro area economy.

The growth rate for 2024 has been revised downwards from the June projection (3.0%), reflecting the downward revision of euro area growth and the expected higher-for-longer interest rate environment. In the years ahead, the economy will continue to be driven by private consumption, investment and exports, while net trade should have a marginally negative contribution. Monetary policy is expected to keep having a restrictive effect on economic activity, while a positive contribution to growth is expected from investment, backed by RRF funds.

Unemployment is estimated to stand at 11.1% in 2023, before gradually declining to 8.2% in 2026, reflecting the ongoing economic recovery. According to the Bank of Greece projections on labour costs, in the following years, for total economy, nominal compensation per employee should keep rising at an annual growth rate of around 5%, on the back of a tight labour market. By contrast, labour productivity for total economy is expected to grow at a weaker pace. These trends will exert upward pressures on labour costs and downward pressures on firms' profit margins.

HICP inflation is projected to continue its downward path. In 2023, it is expected to turn out at 4.1%, down from 9.3% in 2022, on the back of a large fall in energy prices. By the end of the projection horizon, headline inflation should converge towards the 2% target of the ECB. All its components are expected to contribute to the declining path of inflation. Core inflation is projected to stand at 5.3% in 2023, before dropping sharply in 2024, and to decline steadily thereafter.

The current account deficit is expected to decrease further in 2024, among other things due to a faster implementation of the MFF 2021-2027 programme and the disbursement of two tranches by the RRF, which will improve the primary and secondary income accounts. Furthermore, capital transfers, which are recorded under the capital account, will reduce total financing needs of the Greek economy. However, the recovery in domestic investment will lead to higher imports of investment goods, while the oil deficit is not projected to decrease further in 2024, as international energy prices are expected to stop falling.

Turning to fiscal aggregates, according to the Introductory Report on the 2024 Budget, the general government primary surplus is projected to increase further to 2.1% of GDP in 2024, due to an anticipated rise in revenue from taxes and social security contributions amid solid economic growth. Moreover, public debt is projected to decline further, by 8 percentage points of GDP, to 152.3% of GDP in 2024, primarily thanks to the dampening contribution of the "snowball effect" by 4.3 percentage points of GDP and secondarily thanks to the primary surplus. These forecasts are in line with the rules of the current Stability and Growth Pact that will be reactivated in 2024.

The projections of the Bank of Greece foresee a primary surplus of 2.1% of GDP and a debt ratio of 152.4% of GDP in 2024.

In spite of interest rate increases during 2023, risks to public debt sustainability are contained in the medium term, as a result of the favourable repayment profile of official sector debt, provided that the fiscal measures in response to the pandemic and the energy crisis are temporary and that European resources are efficiently used. The capitalisation of deferred interest on part of EFSF loans, which is expected to add to the stock of debt in 2033, and its scheduled repayment should not pose any significant risks to public debt sustainability. Despite a temporary reversal

in the downward path of the debt-to-GDP ratio, which should be expected at that point, gross financing needs will not be greatly affected (in fact, they may remain below the threshold of 15% of GDP), insofar as the stock of debt is repaid over a long time horizon. But this requires not only a responsible fiscal policy and compliance with the EU fiscal rules, but also the achievement of cyclically adjusted primary surpluses of 2% of GDP, which help build sufficient fiscal buffers.

2.6 Risks and uncertainties: Heightened risks and uncertainty related to geopolitical tensions

Risks to the growth forecasts of the Bank of Greece are tilted to the downside. In more detail, downside risks to the outlook for the Greek economy include: (i) an aggravation of the geopolitical crisis in Ukraine and the Middle East and the ensuing implications for the global economic environment; (ii) a lower-than-expected rate of absorption and utilisation of RRF funds; (iii) delays in the implementation of reforms, which would hold back the process of improving the economy's productivity and the competitiveness of businesses; and (iv) extreme weather events (floods and wildfires, as was the case in 2023). Upside risks are associated with stronger-than-expected positive effects from Greece's credit rating upgrade or, once again, higher-than-expected tourism receipts.

With regard to the debt-to-GDP ratio, there is increased uncertainty in the long term, as the gradual refinancing of accumulated official sector debt on market terms will increase the exposure of Greek government debt to interest rate risk. An additional source of uncertainty is the climate crisis, which is expected to exert upward pressures on the debt ratio.

3 THE EXTERNAL ENVIRONMENT OF THE GREEK ECONOMY

3.1 Developments and prospects outside the euro area: A soft landing for the world economy

The world economy is going through a soft landing, exhibiting high resilience in the face of the triple (pandemic, energy and cost-of-living) crisis, while the risk of stagflation has receded following the decisive economic policy response. According to the IMF, world GDP growth is forecast to slow from 3.5% in 2022 to 3.0% in 2023 and 2.9% in 2024, with important divergences among major economies. The post-pandemic full recovery in services, the tightening of global monetary conditions to prevent inflationary pressures from becoming entrenched and the consequences of last year's unprecedented energy price shock have heavily weighed on global economic activity. The IMF expects that real GDP growth in advanced economies will slow from 2.6% in 2022 to 1.5% in 2023 and 1.4% in 2024, while for emerging market and developing economies a modest decline is projected, from 4.1% in 2022 to 4.0% in both 2023 and 2024.

During 2023, the escalation of geopolitical uncertainty, the slowdown in global economic activity and the boost to services demand relative to goods have dampened global trade. At the same time, the strong appreciation of the US dollar in 2022 contributed to a further weakening in international trade flows. Despite the normalisation of global supply chains, world trade was further constrained compared with the pre-pandemic period, with its growth rate remaining at historically low levels. According to IMF projections, world trade in volume terms (goods and services combined) will grow by a mere 0.9% in 2023, compared with 5.1% in 2022, and by 3.5% in 2024.

Global headline inflation has halved from its peak of 11.6% in the second quarter of 2022 to 5.3% in the second quarter of 2023. The slower-than-expected decline in headline inflation was driven by a fall in energy prices and, to a lesser extent, in food prices. Global core inflation has also declined, albeit more gradually than headline inflation, from a peak of 8.5% in the second quarter of 2022 to 4.9% in the second quarter of 2023. The drivers of high core inflation differ markedly across economies, but they mainly arise from both the demand side (labour market

tightness, pandemic-related emergency fiscal support, etc.) and the supply side, due to pass-through effects from increased costs of raw materials and intermediate goods. Corporate profits have increased robustly over the past two years, with final prices having risen faster than wages. But since 2023 labour costs have been rising at a quicker pace, particularly in the United States.

According to the IMF, global headline inflation is expected to decline from 8.7% in 2022 to 6.9% in 2023 and 5.8% in 2024, benefiting from monetary policy tightening and falling commodity prices, with the pace of disinflation being more pronounced in advanced economies than in emerging market and developing economies.

3.2 Euro area developments and prospects: Slowdown in economic activity – Easing of inflationary pressures

The recovery of the euro area economy has slowed considerably in 2023. Euro area GDP in the third quarter of 2023 declined by 0.1% quarter-on-quarter, reflecting a negative contribution from destocking. On the other hand, the contribution of domestic demand was positive, while that of net exports was negligible.

According to the baseline scenario of the Eurosystem staff macroeconomic projections (December 2023), real GDP is projected to grow by 0.6% in 2023, compared with 3.4% in 2022, mainly on account of tighter financial conditions and subdued consumer confidence. For 2024 real GDP is expected to partly recover and grow by 0.8% as disposable income rises, supported by declining inflation and robust wage growth, and foreign demand gradually recovers. By contrast, the impact of past monetary policy tightening and the withdrawal of fiscal policy support are set to dent the growth momentum.

Lower energy and commodity prices relative to 2022, the unwinding of disruptions in global supply chains and weaker domestic demand, partly as a result of the ECB's monetary policy tightening, contributed to an easing of inflationary pressures. At the same time, the effective appreciation of the euro has moderated import price growth. In November 2023, euro area inflation declined once again to 2.4%, from 2.9% in the previous month and from 10.1% in November 2022.

According to the Eurosystem staff projections (December 2023), HICP inflation in the euro area is expected to stand at 5.4% in 2023, compared with 8.4% in 2022, and to decrease further to 2.7% in 2024, mainly reflecting declines in food inflation, while a temporary rebound is expected in energy inflation owing to the reversal of fiscal support measures. Yet, inflation is projected to remain above the ECB's target of 2%, as increases in labour costs will keep HICP inflation excluding energy and food at high levels, i.e. 5.0% in 2023 and 2.7% in 2024, against 3.9% in 2022.

3.3 Risks and uncertainties: Risks to the global growth outlook still persist

The risks to the growth outlook for the global and the euro area economy remain elevated. An intensification of geopolitical uncertainty in the Middle East and in Ukraine, increased volatility in commodity prices and a further weakening in world trade would exacerbate the twin problems of slower economic growth and rising inflation, adding to the risk of higher inflation expectations and higher-for-longer key interest rates. The slowdown in the Chinese economy is becoming entrenched and a possible aggravation of China's property sector crisis poses risks to global economic activity. A further tightening of global financial conditions would affect global demand, public finances and financial stability. Several economies have run out of fiscal space to respond to a crisis, while public debt and its increased servicing costs necessitate a tight fiscal policy, so as to prevent a loss of confidence. At the same time, in a macroeconomic environment where core inflation remains high, higher-than-expected increases in nominal wages and a smaller compression of firms' profit margins would lead to more persistent inflation, stronger monetary policy response and lower growth rates.

4 THE SINGLE MONETARY POLICY

Keeping interest rates at levels that drive down inflation

The Governing Council of the ECB raised its key interest rates in June, July and September 2023, by 25 basis points each time, but kept them unchanged in October and December 2023. It should also be noted that at its July 2023 meeting the Governing Council decided to set the remuneration of minimum reserves at 0%, effective as of late September 2023. Up until then, minimum reserves had been remunerated at the ECB's deposit facility rate, which, as already known, has turned positive since several months. This decision preserves the effectiveness of monetary policy by ensuring the full pass-through of the interest rate decisions to money market rates. At the same time, it improves the efficiency of monetary policy by reducing the overall amount of interest that needs to be paid on reserves in order to implement the appropriate stance.

The Governing Council noted that the past policy rate increases have dampened aggregate demand as financing conditions have tightened and credit growth has slowed, which helps to bring inflation back to its medium-term target of 2%.

Against this backdrop, in the second half of 2023 headline and core inflation decreased, owing to improved supply conditions, the recent declines in energy prices, an easing of pressures on wholesale prices and lower aggregate demand. Yet, food inflation and, to a lesser extent, services inflation still remain high. Labour market conditions continued to be favourable, with unemployment falling to historic lows and employment rising, while wage growth, albeit slightly lower, still outpaces productivity growth and is now an important source of inflationary pressures. Most measures of long-term inflation expectations hovered around 2%, but some measures posted a rise that calls for close monitoring.

The tightening of the single monetary policy led to an increase in banks' funding costs, translating into higher interest rates on business and housing loans. As a result, growth in bank loans to both firms and households decelerated. In line with this deceleration and with the downsizing of the Eurosystem's asset portfolio, the growth rate of the broad monetary aggregate M3 declined significantly and entered negative territory.

The degree and the duration of monetary policy tightening in the euro area are determined by the Governing Council of the ECB, based on its assessment of the inflation outlook in the light of incoming economic, financial and monetary data, as well as its assessments regarding the dynamics of inflation and the strength of the single monetary policy transmission to the real economy. The Governing Council stands ready to adjust all of its monetary policy instruments within its mandate to ensure that inflation returns to its target over the medium term and to preserve the smooth functioning of the monetary policy transmission mechanism.

In September 2023, the Governing Council of the ECB stressed that key interest rates were in a range of levels that, if maintained for a sufficiently long duration, would make a substantial contribution to the timely return of inflation to its target. In October, at the Athens meeting, and in December the Governing Council kept the key policy rates unchanged, as its previous assessment of the medium-term inflation outlook was broadly confirmed, while it was verified that the past interest rate increases continue to push down inflation, given the decline in headline and core inflation.

5 CHALLENGES

Inflation: For as long as the ECB's monetary policy tightening is necessary in order to bring down inflation to the 2% target over the medium term, the fiscal policy stance must be restrictive,

so as to prevent excess demand that could further add to the current inflationary pressures and thus inflation expectations. It is crucial that national policies contribute to containing inflation expectations, with a view to averting an upward price spiral, which would necessitate more drastic and protracted monetary policy tightening.

High public debt-to-GDP ratio: Despite interest rate increases during 2023, risks to public debt sustainability are contained in the medium term. In the longer term, however, there is increased uncertainty, as the gradual refinancing of accumulated official sector debt on market terms will increase the exposure of Greek government debt to interest rate risk.

Non-performing loans and private debt overhang: The NPL ratio, despite its marked decline, remains above the euro area average and, in a higher-for-longer interest rate environment, its further reduction is necessary. At the same time, private debt as a percentage of GDP continues to be very high, acting as a drag on growth.

Chronic weaknesses in the labour market: Despite a visible fall in unemployment thanks to the reforms implemented over the past few years, several distortions persist, with female and youth unemployment rates remaining well above the EU averages. The desirable further reduction of unemployment also depends on how easily firms can hire suitable workers to meet their needs. Job mismatches are holding back a faster fall in unemployment and, coupled with the low labour force participation of women, are dampening potential growth.

Low structural competitiveness: Greece's ranking in terms of structural competitiveness has not improved or has even worsened in 2023, after the substantial progress seen in 2020-22. On the basis of the IMD's composite competitiveness index (June 2023), Greece ranks 49th of 64 countries in 2023, down from 47th place. The worsening is due to a marginal decline in the efficiency of the private sector, high inflation, a large current account deficit and population ageing. Some comparative disadvantages of the Greek economy, according to the IMD, are lack of a competitive tax framework, an ineffective legal framework and poor corporate governance. Additional examples of inherent weaknesses include tax evasion, red tape and persisting inefficiencies in property transfers, land-use planning, the completion of the national cadastre and the digitalisation of public administration. Special mention should be made to the low effectiveness of the judicial system. As suggested by European Commission data (2023 EU Justice Scoreboard), the time required for the resolution of civil disputes at first-instance courts increased further, to 728 days in 2021 from 637 days in 2019.

6 POLICY RECOMMENDATIONS

In an environment of high inflation, slower economic growth, high interest rates and heightened uncertainty because of the successive crises, with increased geopolitical risks and the impacts of climate change becoming more and more evident and affecting broader parts of population, a credible medium-term economic policy planning is of crucial importance. Against this background and with a view to improving economic resilience and addressing the medium-to-long-term challenges as well as the chronic weaknesses of the Greek economy, economic policy should place emphasis on the following areas:

1. Sustainable deceleration of inflation. Businesses should limit, where possible, their markups, so as to avert the so-called "profit inflation". In the short term, more intense controls by the relevant authorities and the Hellenic Competition Commission are required in order to curb profiteering and oligopolistic practices. In the medium-to-long term, competition in product markets must be enhanced, by removing all kinds of regulatory barriers to competition and market entry. At the same time, wage increases should be such as to recoup losses in workers' purchasing power, without inducing a wage-price spiral that would also harm competitiveness.

Furthermore, support measures in response to the pandemic and the energy crisis should be withdrawn as the impact of the crises gradually wanes. In the event of a resurgence of the energy crisis, spurred by the recent developments in the Middle East, and if the adoption of new support measures is deemed necessary, such measures should be temporary and targeted to vulnerable social groups.

2. Faster absorption and effective use of funds under the EU recovery instrument NGEU and the Multiannual Financial Framework 2021-2027. These funds should be channelled to economically viable and environmentally sustainable high-tech sectors, which are export-oriented, as well as to the improvement of infrastructures. This would enable closing the investment gap and boosting investment related, among other things, to green and digital transitions.

3. Pressing ahead with and strengthening reforms, especially in areas with chronic dysfunctions, such as the delivery of justice. It should be noted that an efficient judicial system that assists in the resolution of disputes and the protection of property rights is a key driver of investment and growth. This can be explained by the fact that investors are more willing to invest in an economy where their contractual and property rights are protected and where they can seek and receive justice promptly should these rights be violated. Besides, an efficient judicial system is crucial for addressing business malpractices and monopolistic structures, thus contributing to increased competition, which in turn leads to higher productivity and fosters economic growth. Moreover, a well-functioning justice system provides an effective contract enforcement mechanism, thereby ensuring the expansion of money markets, improved financing conditions in the economy and faster growth rates. Actions (some of which are included in the "Greece 2.0" plan) are therefore required, aimed at modernising and speeding up the delivery of justice, through an upskilling of judges as well as through the digitisation of court archives and judicial processes, adopting legislation for monitoring and improving the performance of judicial staff, and revising the judicial map for administrative, civil and criminal courts.

4. Improving the business environment, with a view to boosting investment and labour productivity. Actions in this direction include cutting red tape and digitalising public administration, as well as improving tax administration and streamlining the tax system, which could strengthen legal certainty for investors and help address the investment gap. At the same time, there is a need to remove the remaining, and excessive by EU standards, regulatory barriers to entry in certain professional services, to increase business R&D spending, which lags behind the European average, and to improve the digitalisation of the Greek economy.

5. Curbing tax evasion. This would create additional fiscal space, enabling a broader reform of the tax system towards greater tax fairness. Measures to this end include: (i) an increase in electronic transactions by expanding the use of POS terminals in a growing number of economic activities; (ii) incentives for debit card or bank payments; (iii) incentives in the form of tax exemptions for the disclosure of transactions in sectors with high tax evasion rates; (iv) continued upgrading of the electronic tools of the Independent Authority for Public Revenue, which expands the scope for managing and utilising information collected via electronic transactions, ensuring more frequent and more effective audits as well as the successful imposition of sanctions; and (v) efforts to nurture tax compliance and forge a tax culture. In this manner, tax policy can be growth-oriented, while allocating the tax burden more fairly and proportionally.

6. Reducing the government debt-to-GDP ratio. The return to a primary surplus in 2022, as well as the projected primary surpluses of 1.1% of GDP in 2023, despite the compensation for the victims of natural disasters that was deemed necessary, and of 2.1% of GDP in 2024, are undeniable signs of fiscal responsibility. However, these developments should not lead to complacency, as the cyclically adjusted primary surplus still falls short of 2% of GDP, which means that the required fiscal buffer has not been built up. Although higher interest rates do not pose immediate risks to public debt, thanks to its favourable characteristics, it should be stressed

that such characteristics are not permanent. They merely provide a unique window of opportunity for public debt to remain sustainable going forward, as the concession loans under the MoUs gradually mature and are replaced by new borrowing on market terms. In order to take advantage of this window of opportunity, two things are needed. First, fiscal credibility must be maintained. This requires the building of fiscal buffers in good times, which prevents the need for fiscal tightening in bad times to maintain fiscal sustainability. Second, given the heightened uncertainty, the medium-term planning of fiscal policy should place great emphasis on risk assessment and on the accumulation of fiscal buffers over time, capable of shielding the economy in times of crisis.

7. Tackling the challenges of natural disasters related to climate change. The recent experience with the devastating effects of climate change, especially in Southern Europe, has demonstrated the need for a "rainy day" fund to finance climate change adaptation and emergency relief, in addition to the necessary investments to mitigate the impacts of climate change over the medium-to-long term. The increased cost of addressing natural disasters must be covered either from European funds or from additional national income sources, without undermining fiscal stability. At the same time, the promotion of private property insurance is warranted for tackling climate change risks, as the public sector alone cannot bear the entire cost of compensation and infrastructure restoration.

8. Addressing the problem of job mismatches and raising the labour force participation of women. In order to address labour supply and demand mismatches, it is necessary, among other things, to sustain and upgrade technical education, to reskill long-term unemployed persons and to ensure the continuous development and use of skills throughout workers' careers. Furthermore, investment in high-tech sectors should be incentivised, either through co-financing schemes or through improvements in the tax framework, with a view to retaining high-skilled workers in the country and averting a brain drain. Appropriate mechanisms for matching labour force skills with labour market needs must also be put in place. Besides, interventions are still needed to improve the work-life balance and to encourage the inactive population, women in particular, to participate and remain in the labour market, which will support economic growth and preserve social cohesion.

9. Further increasing the resilience of the banking sector. The quality of Greek banks' prudential own funds remains low, as deferred tax credits (DTCs) account for a large part of total prudential own funds. Further ahead, Greek banks are faced by a number of challenges, such as a possible increase in their funding costs (among other things, due to the impact from the issuance of MREL-eligible bonds) and the need to further reduce the NPL ratio towards the European average, in a higher-for-longer interest rate environment. In this context, banks need to further strengthen their capital buffers, taking advantage of their increased profitability, which creates favourable conditions for internal capital generation. Lastly, the interlinkages between climate change risks and the financial system must be further explored.

10. Addressing private debt held by non-banks. This can be achieved through sustainable workout solutions for viable borrowers and through collateral liquidation in all other cases. In this respect, the role of credit servicing firms is of paramount importance. The transposition of Directive 2021/2167 into Greek law, setting out the new legislative framework for credit servicers, is expected to provide assistance, among other things, in corporate governance matters and in borrowers' fair treatment. Improvements in the out-of-court settlement mechanism and the operation of the Sale and Lease Back Organisation in particular are expected to help address this problem.

11. Attracting foreign investment, which will help to further close the investment gap (according to European Commission estimates, the investment gap has narrowed from 11.5% of GDP in 2019 to 8.7% of GDP in 2022). This requires improving the business environment, so as to en-

courage FDI inflows. At the same time, Greek businesses should seek to attract foreign portfolio investment inflows (debt and/or equity financing). Diversifying their financing sources, by tapping the capital markets and using venture capital (investing in new high-tech firms) and private equity (investing in non-listed companies), or through alternative sources such as crowdfunding, business angels and startup accelerators, is essential for speeding up the implementation of new private investment projects, especially in the high-tech sector. However, this would also require improvements in firms' financial reporting and overall corporate governance practices, in order to overcome information asymmetries that discourage potential international investors.

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The restoration of international investors' confidence in the prospects of the Greek economy was affirmed by the upgrade of Greece's sovereign credit rating to investment grade. The upgrade is a very important development, cushioning the impact of interest rate increases on the borrowing costs of the public and private sectors, with favourable effects on the real economy. This development was driven by the steadily improving fiscal position of the country, on the back of a substantial reduction in the public debt-to-GDP ratio, the consolidation of the banking system and the implementation of reforms and investments under the National Recovery and Resilience Plan, which translated into robust growth rates for 2023.

Despite the multiple international crises and heightened uncertainty related to geopolitical tensions, the Greek economy is projected to grow at a faster pace relative to the euro area this and the next years, accelerating the convergence of real per capita GDP towards the euro area average. Nevertheless, the positive prospects should not lead to complacency, as the current credit rating of the Greek sovereign is still well below its 2009 level, as well as today's euro area average rating. This calls for responsibility and sustained effort to maintain foreign investors' confidence in the economic policy pursued, paving the way to further upgrades of Greece's sovereign credit rating.

Key pillars of this effort should be continued fiscal prudence, efficient use of the available EU resources in strategic sectors of the economy and the implementation of the necessary reforms. Prudent fiscal management accompanied by primary surpluses will lead to a rapid decline in the public debt-to-GDP ratio, even when inflation has dropped to the ECB's medium-term target. The absorption and efficient use of the available EU funds are expected to boost investment, which in turn will promote the green and digital transitions of the Greek economy. The implementation of the necessary reforms, which will help reduce further the stock of NPLs, combat pervasive tax evasion, speed up the delivery of justice, eliminate persistent distortions in the goods and services markets, leading to oligopolistic structures in several sectors of the Greek economy, and increase the labour force participation of women, is set to enhance productivity and structural competitiveness and, coupled with a rise in investment, will ensure a higher potential growth rate and stronger social cohesion.

Box 1

THE POTENTIAL EFFECTS OF GREECE'S RATING UPGRADE TO INVESTMENT GRADE

With the exception of the pandemic downturn, the Greek economy has been growing at a fast pace in recent years, recording increases in investment, industrial production, employment and exports, as well as a decline in the public debt-to-GDP ratio. This marked progress has been reflected in declining sovereign spreads and a steadily improving Greek sovereign credit rating, which culminated in its recent upgrade to investment grade by DBRS, S&P and Scope Ratings, for the first time since its downgrade at the onset of the sovereign debt crisis in the early 2010s.

This box investigates the potential impact of such an upgrade on the real and financial sectors of the Greek economy. To this end, a dynamic stochastic general equilibrium model (DSGE) is employed. The main objective is to identify and understand the channels through which this positive shock is transmitted to the real economy and the banking sector and to quantify its potential effects. In addition, it examines whether the upgrade to investment grade increases the Greek economy's resilience to negative exogenous shocks. The results suggest that an upgrade leads to a permanent improvement in key real and financial variables and has a stabilising effect on both the banking sector and the real economy.

Dynamic effects of a credit rating upgrade to investment grade

The channels through which a credit rating upgrade affects the economy are investigated using the theoretical model of Clerc et al. (2015), calibrated for the Greek economy.[1] This is a DSGE model with a rich financial sector, suitable for studying the transmission of alternative shocks from the real economy to the financial sector, and vice versa.

The positive shock caused by an upgrade to investment grade can be identified from different alternative perspectives, as it brings forth multiple anticipated benefits such as an enhanced investment sentiment, a reduction in uncertainty, etc. However, on the basis of existing literature, the first and foremost effect is a decrease in sovereign spreads and, as a direct consequence, a reduction in the funding cost of the financial sector that is also transmitted to the overall economy (see Box 6). In line with the findings in Box 6, we model a credit rating upgrade to investment grade as a permanent positive shock that reduces bank funding costs by 100 basis points and examine the dynamic effects on key real and financial variables. The dynamic effects produced by the model are illustrated in Chart A.

The results suggest that a reduction in bank funding costs enables banks to lower the interest rates they charge on housing and corporate loans and increase credit to the real economy (bank funding cost channel). In turn, households increase their consumption and housing investment expenditure, while firms increase their capital investment expenditure, thereby prompting a rise in the value of housing and physical capital. Given that, in the model, these assets constitute collateral against which loans have been pledged, this increase in asset prices leads to reduced rates of default for both mortgages and business loans. As a result, bank equity also increases, and, thus, so does the supply of loans, boosting economic activity (bank capital channel). At the same time, the improvement in the quality of bank loan portfolios drives up banks' solvency, thus enhancing overall financial stability and mitigating risks to the banking system. Accordingly, the interest rate that depositors demand in order to trust their savings to banks falls, further pushing lending rates downwards. This induces a second-round increase in asset prices, which drives down the default rates of borrowers and further boosts credit supply to the real economy, ultimately leading to stronger economic activity. It is worth mentioning that lending rates fall by less than the initial decline in banks' funding costs, resulting in higher bank profitability and net worth.[2]

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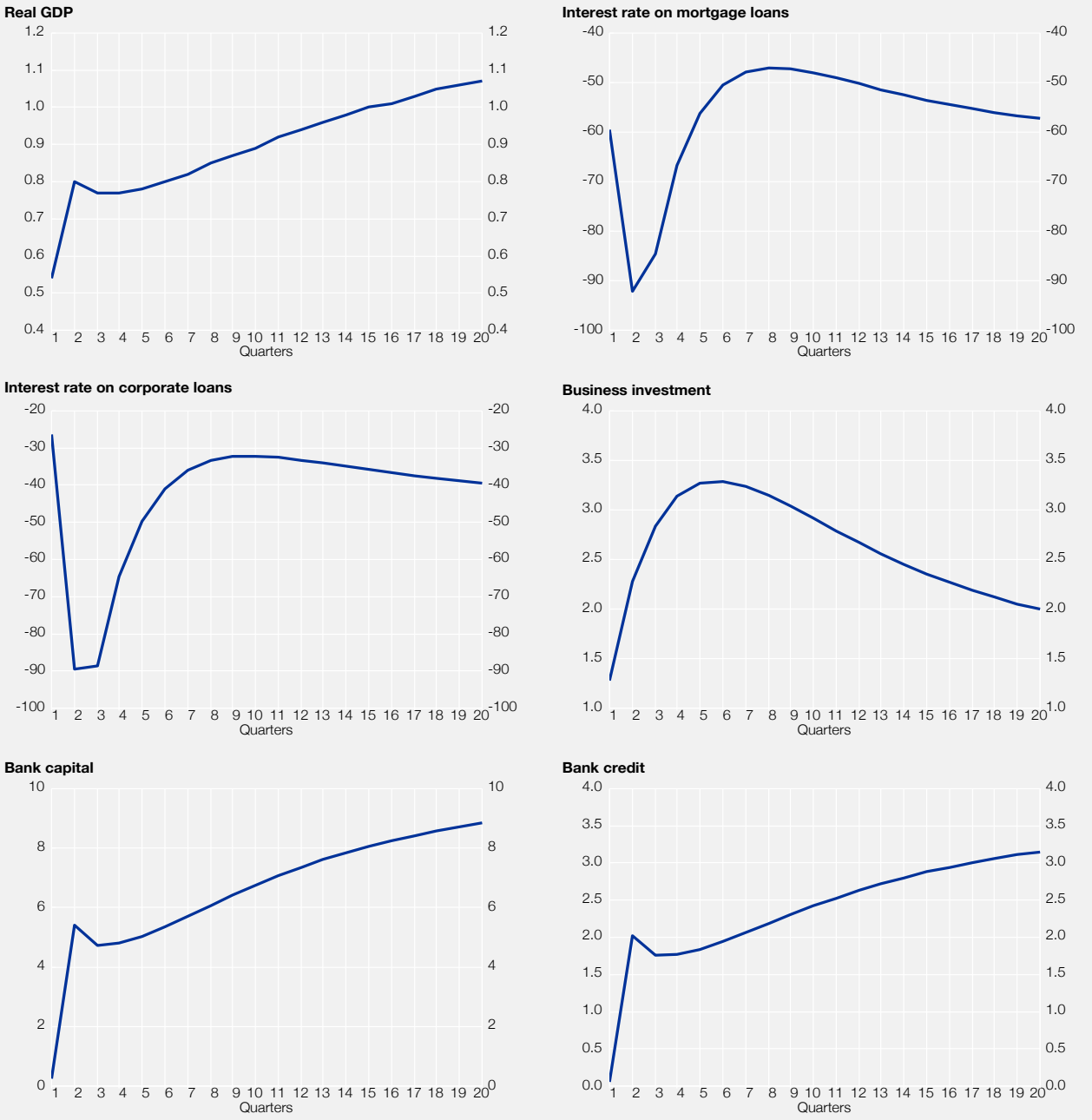
1 Clerc, L., A. Derviz, C. Mendicino, S. Moyen, K. Nikolov, L. Stracca, J. Suarez and A.P. Vardoulakis (2015), "Capital Regulation in a Macroeconomic Model with Three Layers of Default", *International Journal of Central Banking*, 11(3), 9-63. For details on the model's calibration for the Greek economy, see Balfoussia, H. and D. Papageorgiou (2016), "Insights on the Greek economy from the 3D macro model", Bank of Greece Working Paper No. 218; and Balfoussia, H., H. Dellas and D. Papageorgiou (2019), "Fiscal distress and banking performance: The role of macroprudential regulation", CEPR Working Paper No. 14003.

2 This is so because the banks have an incentive to contain demand for new loans in the medium term in order to rein in NPL growth.

Chart A Dynamic effects of an upgrade to investment grade



Source: Bank of Greece estimates.
Note: All variables are expressed as percentage deviations from the steady state before the shock, save for interest rates (annualised) which are expressed as percentage point changes from the initial steady state.

As reported in the table, the level of real GDP increases by 0.9% after twelve quarters (3 years) following the upgrade shock. Business investment and housing investment increase by 2.7% and 3.4%, respectively, over the same period, and total credit and bank equity by 2.6% and 7.4%, respectively.

As the positive shock of an investment-grade upgrade is assumed to be permanent, it causes the economy to gradually converge to a new long-run equilibrium. As shown in the table, in the long run, the levels of real GDP, business investment and housing investment rise by 1.3%, 1.6% and 3.2%, respectively, and total credit and bank capital by 4.2% and 11.7%, respectively.

Effects of a rating upgrade to investment grade

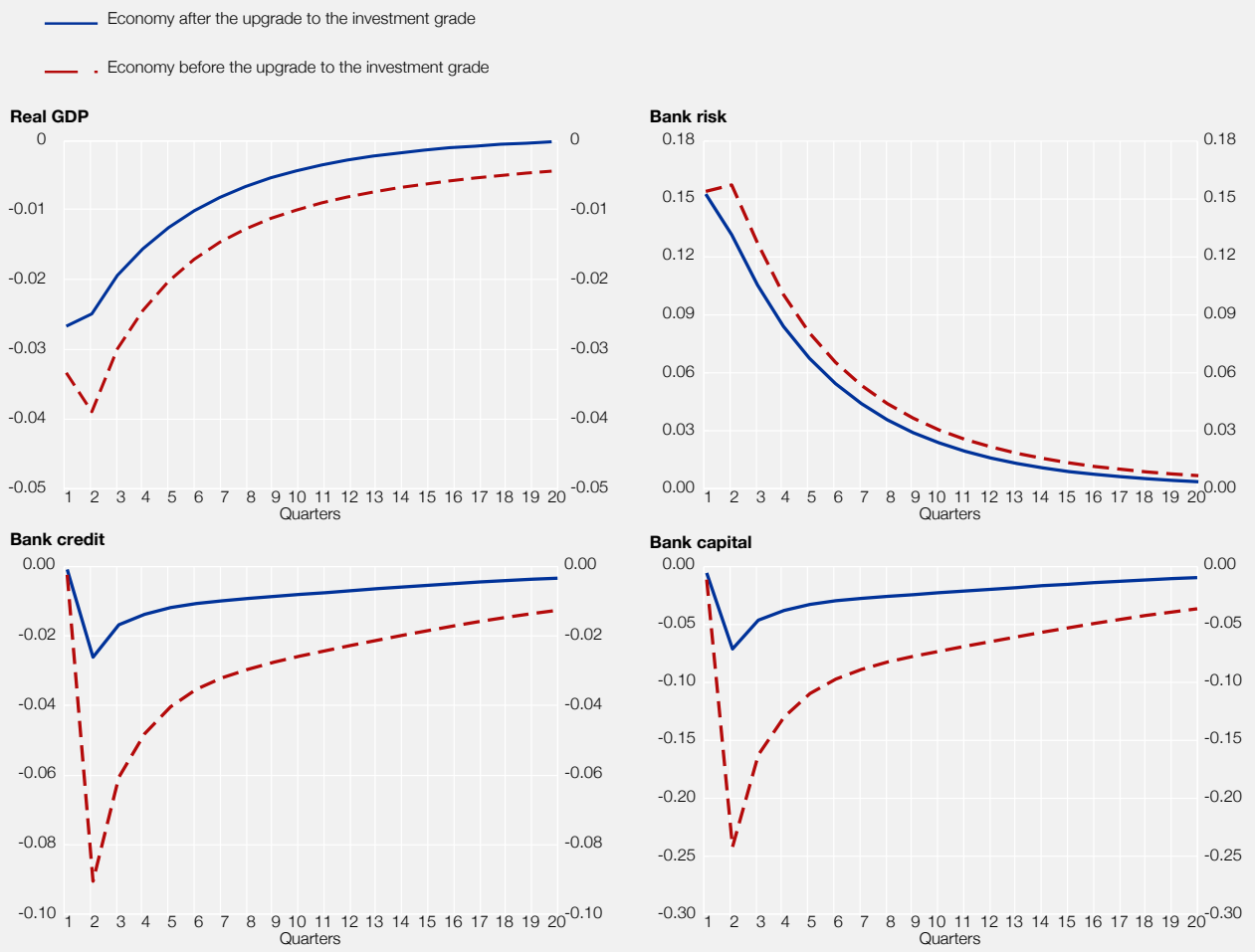
Quarters	1	4	8	12	20	Long-run
Real GDP	0.5	0.8	0.8	0.9	1.1	1.3
Business investment	1.3	3.1	3.1	2.7	2.0	1.6
Housing investment	0.7	1.8	2.6	3.4	4.3	3.2
Bank capital	0.2	4.8	6.1	7.4	9.0	11.7
Total credit	0.1	1.8	2.2	2.6	3.2	4.2

Source: Bank of Greece.
Note: All variables are expressed as percentage deviations from the steady state before the shock.

Impact of a credit rating upgrade on the economy's resilience

This section investigates whether an upgrade to investment grade would make the Greek economy more resilient to exogenous shocks. Specifically, we introduce a temporary shock that negatively affects the performance of banks' loan portfolios and examine whether an upgrade to investment grade would reduce volatility in the real and financial sectors of the economy. To this end, we compare the dynamic effects of the above-mentioned exogenous shock on the pre-upgrade economy with those on a post-upgrade economy, where the banking sector enjoys lower funding costs. Chart B shows the evolution of selected key variables under these two scenarios. It

Chart B Effects of a shock on the performance of the bank loan portfolio



Source: Bank of Greece estimates.
Note: All variables are expressed as percentage deviations from the steady state before the shock, save for bank risk which is expressed as percentage point changes from the initial steady state.

can be seen that, in the post-upgrade scenario, the contraction of output due to the temporary increase in the banking sector's financial risk is relatively milder and more short-lived. This can be attributed to the weaker impact of the negative shock on banks' capital and creditworthiness, resulting in a smaller reduction in bank credit supply. Similar conclusions can be drawn from the examination of alternative exogenous shocks. The analysis therefore suggests that an upgrade increases the resilience of the real and financial sectors of the economy by limiting the volatility resulting from exogenous shocks.

Conclusions

To sum up, a simulation of an upgrade of Greece's sovereign credit rating to investment grade in the context of a DSGE model leads to a permanent increase in the level of key real and financial variables. In the long run, real GDP rises by 1.3% and bank capital and bank credit also increase. In addition, the upgrade appears to have a stabilising effect on the economy when facing exogenous shocks. Given that the upgrade is expected to affect the economy also through additional channels not explored in this analysis, such as by reducing uncertainty and attracting foreign investment, the overall positive effect on the Greek economy may be larger.[3] This highlights the need to preserve fiscal stability and step up the reform effort, with a view to ensuring further improvements in Greece's creditworthiness, as potential further credit rating upgrades of the Greek sovereign are expected to bring about additional gains in terms of growth and economic stability.

3 For an empirical analysis of the impact of credit rating upgrades on economic activity, see Box 6.

Box 2

OPPORTUNITIES AND CHALLENGES IN THE MINERAL RAW MATERIALS MARKET: THE POSITION OF GREECE

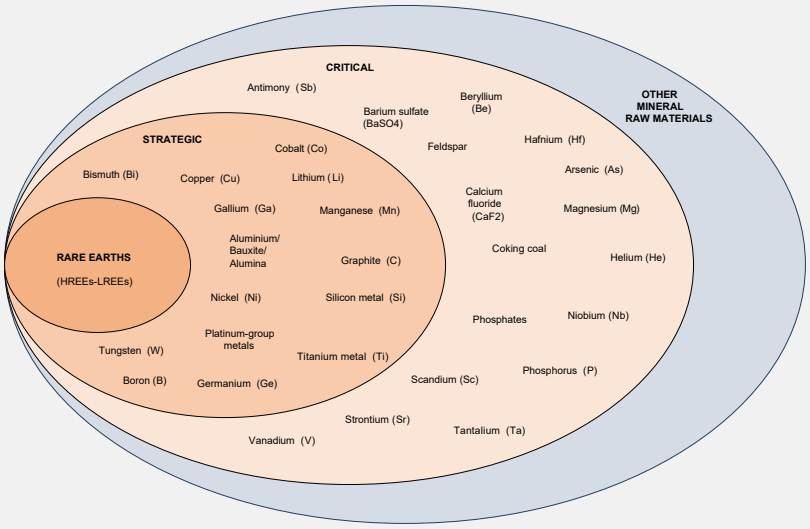
Mineral raw materials are a significant input to the production of intermediate and final goods. Until today, EU countries have been highly dependent on imports from a limited number of non-EU countries. As a result, geo-political developments increase the risk of a potential disruption of raw materials supply in global value chains. Given that Europe is highly dependent on energy goods from Russia, Russia's invasion of Ukraine revealed weaknesses in its supply chain. The subsequent supply disruptions prompted the EU to take action with the aim to prevent such situations in other goods markets in the future. This box seeks to present key concepts concerning mineral raw materials, the reasons behind the EU's actions to strengthen its resilience, as well as Greece's production of mineral raw materials and export potential in the years to come.

Mineral raw materials: definitions and drivers of demand

Mineral raw materials can be classified into different categories, such as deposits (mining, energy, industrial), marbles, slates, aggregates, etc. The classification of raw materials as "critical" does not refer to the total, but to a part thereof. More specifically, raw materials classified as critical[1] by the EU are the most likely to disrupt the supply chain in the event of an interruption in their smooth supply (see Chart A). A subset of all raw materials that have been classified as critical is considered to be of strategic importance, as their demand is expected to increase exponentially in the coming years due to their required use in the production process, while the risk of insufficient supply is also considered to be increased. Strategic raw materials include rare earths.[2] The size of the market for critical mineral raw materials needed for the energy transition[3] is estimated at EUR 320 billion.[4]

1 The list of critical raw materials included in the provisionally agreed upon proposal for a Regulation COM(2023) 160 shall be updated every three years.
2 Critical raw materials are distinguished into heavy and light, consist of a group of 17 metals (yttrium, scandium and 15 lanthanoids), are commonly found together and have specific uses.
3 In addition to the energy transition, there is a great number of other uses for critical mineral raw materials in manufacturing.
4 International Energy Agency (IEA) (2023), Critical Minerals Market Review.

Chart A Classification of critical and strategic mineral raw materials (2023)



Source: European Commission (2023), Annex COM (2023) 160.

By 2040, demand for lithium is expected to increase by 42%, for cobalt by 21%, for nickel by 19%, for graphite by 25% and for rare earths by 7%.[5] Current production and processing of critical raw materials is concentrated in China, as well as in the United States, Australia, Saudi Arabia, India and Russia. Verified stocks of mineral raw materials globally are concentrated in many developing countries, including countries where the prevailing political instability does not favour investment in extraction and exploitation. Overall, Asia's share in the production of mineral raw materials stands at 60.4%, compared with 6.8% for Europe,[6] whose share in total global demand for critical mineral raw materials is estimated at 20%.[7]

Manufacturing sectoral needs for raw materials are changing with the integration of technology and innovation, while the requirements for increasingly diversified and highly specialised raw materials are rising. Increased production of renewable energy and storage capacity are also a prerequisite for the energy transition.[8] For example, critical raw materials are used in the manufacture of parts for photovoltaic panels and wind turbines. At the same time, the transition to e-mobility requires the extensive use of critical mineral raw materials, such as lithium, which is used in battery production. The consequent increase in demand for critical raw materials will lead to a potentially steep price hike in the sector, unless supply increases. This price hike, in turn, will affect the cost of production of other goods as well, giving rise to inflationary pressures.

World stocks/production of raw materials and the degree of EU dependence on imports

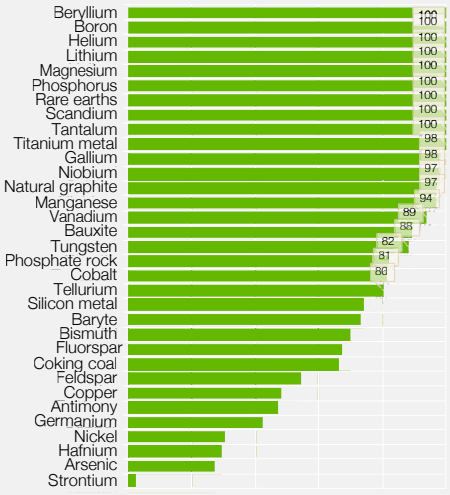
Given that the production of most critical raw materials within the EU is not sufficient (see Chart Bb), the EU's current dependence on imports of critical raw materials is, as the case may be, either total or at such levels that a supply chain disruption, paired with an increase in demand, would result in a squeeze in the European market (see Chart Ba). Indicatively, EU critical raw materials imports in 2022 amounted to EUR 85 billion (see Chart C). According to geological studies,[9] there are verified mineral raw material deposits of significant size located in Europe, namely Greenland, Sweden, Finland, Norway, as well as Greece. However, carrying out the necessary geological studies on deposits does not automatically lead to extraction, processing and exploitation.

5 IEA, op. cit.
6 International Organising Committee for the World Mining Congresses (2023), World Mining Data.
7 European Commission (2023), Supply chain analysis and material demand forecast in strategic technologies and sectors in the EU − A foresight study.
8 World Bank (2023), Minerals for climate action: the mineral intensity of the clean energy transition.
9 US Geological Survey (2023), Mineral Commodity Summaries.

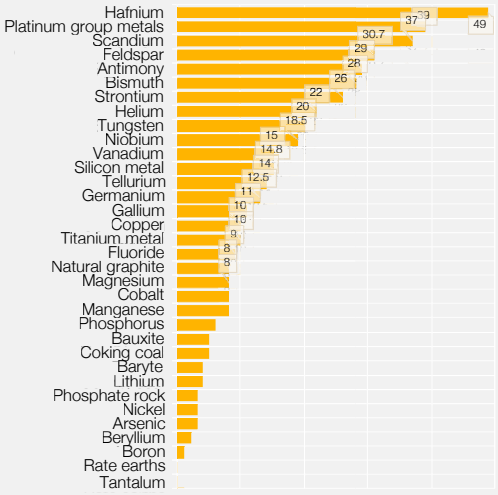
Chart B EU import dependence and share of total world production for each critical mineral raw material

(average for 2016-2020)

a) EU import dependence
(%)



b) EU share in world production
(%)



Source: Solutions for Critical Raw Materials - a European Expert Network (SCRREEN2).

EU regulations and strategic partnerships

In November 2023, the European Parliament and the Council reached a provisional agreement on a proposal for a Regulation to gradually achieve strategic autonomy in critical raw materials.[10,11] Aiming to address the vulnerability of the European economy, new rules have been established, envisaging that by 2030: (a) at least 10% of annual EU consumption will originate from extraction within the EU; (b) at least 40% of annual EU consumption will be processed within the EU; (c) at least 25% of annual EU consumption will originate from recycling; and, finally, (d) up to 65% of annual consumption regarding each strategic raw material, at any processing stage, will be sourced from a single third country.[12] With a view to ensuring adequate supply at competitive prices, the EU concluded strategic agreements regarding the joint negotiation and supply of raw materials,[13,14] where self-sufficiency at the EU level is not possible. In line with the objectives of the European Global Gateway strategy[15] to develop reliable economic and investment relations with EU partner countries, transnational agreements can be further expanded.

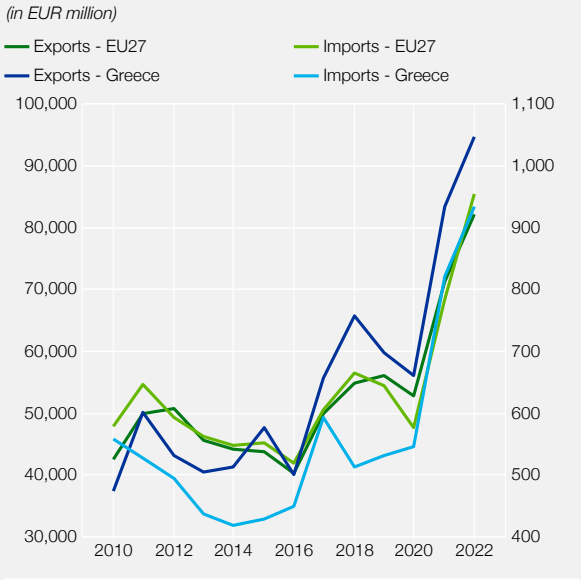
Production, stocks, national framework and the position of Greece

The potential for the exploitation of critical raw materials deposits in Greece is significant,[16] which could reinforce the country's exports and geopolitical role. With respect to mineral raw materials, bauxite, nickel, cobalt, mag-

10 European Commission, Proposal for a regulation establishing a framework for ensuring a secure and sustainable supply of critical raw materials, COM(2023) 160 final, 16.3.2023.
11 European Commission, Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability, COM(2020) 474 final, 3.9.2020.
12 European Commission (2023), "Critical Raw Materials: ensuring secure and sustainable supply chains for EU's green and digital future", Press release, 16.3.23.
13 Council of the European Union, "Trade with the United States: Council authorises negotiations on EU-US Critical Minerals Agreement", Press Release, 20.7.2023.
14 European Commission (2023), "Global Gateway: EU signs strategic partnerships on critical raw materials value chains with the Democratic Republic of Congo and Zambia and advances cooperation with US and other key partners to develop the 'Lobito Corridor'", Press release, 26.10.2023.
15 European Commission (2021), Joint Communication to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank "The Global Gateway", JOIN(2021) 30 final, 1.12.2021.
16 Ministry of the Environment and Energy (2023), Hellenic Geological and Mineral Research Authority, Geodata portal, "Metallogenic Map".

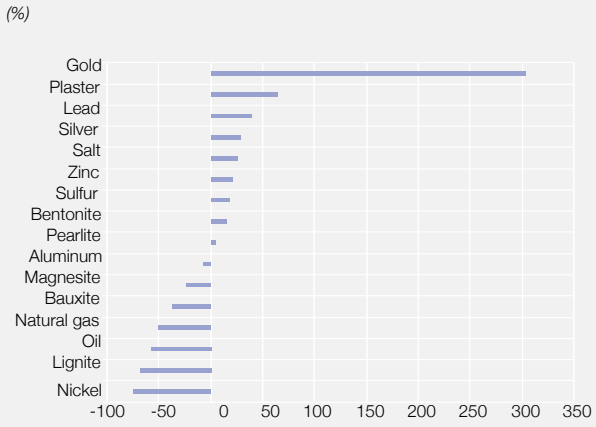
nesite, quartz and copper are already being extracted. An increase in gold and plaster production and a decrease in lignite and nickel production are observed, in compliance with EU directives (see Chart D). Greece's highest global rankings in 2021 in terms of production concern pearlite (2nd place), bentonite (5th place) and magnesite (10th place), while domestic bauxite production stood at the 14th place globally. In recent years, Greece recorded a 68% drop in lignite production (between 2017 and 2021), while the largest increase has been seen in gold production (also linked to the relevant investment in the Scourges mine). This is followed by plaster, which marked a 64.5% production hike. Nickel production also declined by 74.5%. Greek mineral raw materials exports in 2022 amounted to EUR 1 billion, compared with EUR 933 million in 2021, mainly relating to aluminium and copper, both included in the list of critical raw materials (see Chart C). However, verified and documented deposits also comprise cobalt, lithium, graphite, as well as rare earths. The exploitation of these deposits, along with technological and environmental requirements regarding raw materials, can lead to a rise in exports. Domestic productive investment that will help diversify the current production model could also be strengthened as a result. National policy[17] on the use of mineral raw materials requires modifications on land use, spatial planning, quarrying legislation and environmental permitting procedures. Delays in implementing investment projects for deposits exploitation are chiefly due to the permitting process, which has been slow so far. Significant time periods are required to launch an investment in the mining and quarrying sector, which are prolonged by research permitting, rental procedures and the requirements pertaining to environmental restoration guarantees.[18] Legislative changes are underway to reduce the currently long permitting period to 2-3 years. The action plan to exploit domestic raw materials deposits should be far-sighted and comprehensively justified, as these deposits constitute strategic national wealth. Certain stocks are located in coastal or underwater areas and their exploitation is complicated by the problem of continental shelf delimitation in the Aegean Sea, which has yet to be resolved. To date, 1,699 research drillings have taken place, mainly involving sulphide and copper ores (28%), chromite ores (22%), alluvial gold ores (16%), industrial minerals and phosphorate rock (14%) and manganese ores (9%). Research and chemical analyses are necessary not only to substantiate that a deposit exists, but also to categorise it according to its degree of purity or admixture with other substances. Post-drilling chemical analyses are also needed to verify indications. It should be noted that certain areas are excluded from drilling for reasons of public interest. Moreover, some stocks are not exploited as they are radioactive or contain heavy metals.

Chart C Evolution of imports and exports of all critical mineral raw materials for Greece and the EU27 (2010-2022)



Source: Eurostat.
Note: Greece: right-hand scale, EU: left-hand scale.

Chart D Changes in the production of mineral raw materials in Greece (2022 compared to 2017)



Source: International Organizing Committee for the World Mining Congresses (2022), World mining data.

17 Ministry of the Environment and Energy (2012), Greek National Policy for the exploitation of Mineral Resources.
18 Ministry of the Environment and Energy (2023), Mining and Quarrying Activity in Greece, 2021 Annual Report.

Summary
The market for mineral raw materials production and exports has a strong potential for growth; however, there are interlinkages with environmental protection policies, energy transition, as well as the need to preserve the quality of the country's tourism product. Even though there are documented stocks of critical raw materials across EU Member States, the Union's production has been limited to date, resulting in high import dependence. Nevertheless, it is important to make optimal strategic choices to obtain the maximum benefits from exploiting critical raw materials with the aim to strengthen the EU's strategic autonomy. At the same time, efforts to change Greece's production model will also be reinforced thanks to the expansion of the manufacturing sector that will arise from strategic decisions to exploit the available deposits in the country. This will be achieved both by exploiting innovation to diversify the raw materials required and their supply sources and by increasing Greece's exports and participation in global value chains, which will in turn contribute to employment growth and welfare.

Box 3

PUBLIC FINANCE MANAGEMENT REFORM: THE RECENT EXPERIENCE OF GREECE

The multiple crises (economic, health, geopolitical and climate) that Greece has faced in recent years have highlighted the need for institutional reforms to enable the emergence of a modern framework for public administration and government financial management, characterised by medium-term planning, target setting, transparency, prioritisation and scenario evaluation. This box, first, provides an overview of institutional reforms in public finance management implemented in Greece over the last decade;[1] second, from a long-term perspective, it outlines the main thrust of the further and demanding reforms still required; and third, it sets out possible steps towards more efficient and fairer fiscal management. These reforms are essential to deliver improved governance, helping to boost investment and economic growth.[2]

Improved fiscal management contributes to fiscal stability by ensuring better control over the execution of the public budget and more effective monitoring of expenditure efficiency and tax compliance. In particular, changes in the management of public finances could lead to a shift of public expenditure towards more productive uses, an increase in spending efficiency, as well as a broader reform of the tax system to alleviate and more fairly allocate the tax burden.

Fiscal reforms in Greece: a brief account

The need to manage the debt crisis of 2010 prompted Greece to introduce major structural changes in the areas of fiscal consolidation, discipline, transparency and accountability.[3,4] These institutional changes were geared towards more efficient budgeting procedures and medium-term planning. They included the introduction of new, up-to-date tools, laying the foundations for a modern approach to public finance management. The main purpose was to prevent

1 For a more detailed discussion, see Spanou, C. (ed.), *Reforms in Public Administration under the crisis: Overview, Description, Evaluation*, ELIAMEP/Crisis Observatory and The A.G. Leventis Foundation (2018) [in Greek]; and Anastasatou, M. and P. Tsakloglou (2019), "Structural changes in fiscal policy during the crisis: Institutional framework and economic outcomes", ELIAMEP/Crisis Observatory and The A.G. Leventis Foundation, Papazisis Publishers, Athens [in Greek]. For an indicator-based quantitative analysis, see IMF (2023), The IMF's structural reform database.

2 See Adamopoulou, E., P. Kapopoulos and A. Rizos (2023), "Reforms to stimulate business investment in Greece: Assessing the impact of judicial efficiency, governance quality and tax wedge reduction", *Insights – Alpha Bank Economic Research*, Alpha Bank, September; and Cugat, G. and C. Pizzinelli (2023), "Marker Reforms Can Stabilize Debt and Foster Growth in Developing Countries", IMFblog, 12 September.

3 See Law 3871/2010 "Fiscal Management and Responsibility"; Law 4270/2014 "Principles of fiscal management and supervision (transposition of Directive 2011/85/EU) – public accounting and other provisions"; and Law 4389/2016 "Urgent provisions concerning the implementation of the fiscal goals and structural reforms agreement, and other provisions". See also OECD (2019), "Budgeting in Greece", *OECD Journal on Budgeting*, 2019/2.

4 OECD (2020), "Budget review for Greece", *OECD Journal on Budgeting*, 19(3).

budgetary slippages and to enable the timely correction of any temporary deviations, with the aim of ensuring, to the extent possible, the correct execution of the budget and the achievement of the agreed budgetary targets.

In greater detail, (i) the institutional framework for fiscal management and supervision was revised and modernised by establishing the necessary fiscal rules, supervisory practices and control mechanisms to ensure fiscal consolidation; (ii) public accounting legislation was updated to bring the national budgetary framework into line with EU best practices and increase transparency in government statistics; and (iii) the concept of fiscal responsibility and discipline became key to policymaking.

The institutional interventions undertaken in this context concerned: division of roles and responsibilities among different fiscal management bodies; a requirement to draw up a medium-term plan with binding expenditure limits and cost assessment of envisaged policy measures; establishment of the Hellenic Fiscal Council (HFC) as an independent authority; enshrining the legal status and independence of the Parliamentary Budget Office; establishment of an (operationally, administratively and financially) independent Authority for Public Revenue (AADE); introduction of mechanisms for monitoring general government entities and public enterprises; establishment of a national Observatory of Local Finances to ensure the financial autonomy of local governments and a clear view of their operations; publication of general government budget execution bulletins; and integration of all general government accounts into a unified System of Treasury Accounts at the Bank of Greece.

Challenges ahead

Going forward, reform efforts should focus on the adoption of a new, comprehensive and more effective strategic model of fiscal policy, which, beyond the current considerations of fiscal management, will also promote the necessary productive transformation of the economy in view of today's challenges related to the climate, geopolitical, energy and demographic crises.

The main elements of such a comprehensive framework for fiscal policy implementation would be the following:

(i) the establishment of Programme and Performance Budgeting, whereby state budget presentation is broken down into distinct, entity-specific programmes based on performance, as assessed against a set of strategic and clearly defined policy objectives, both short-term (one-year) and long-term (three-year), and organised according to a three-level classification into functional areas (sectors, programmes and actions), using specific key performance indicators (KPIs). This will facilitate the systematic monitoring of budget execution, while clarity as to which ministry or other public entity is responsible for which sector, programme or action will ensure more efficient management of public resources, greater transparency and more rational and informed decision-making in all spending entities.[5]

(ii) Continued comprehensive and structured spending reviews and programme evaluations across the general government sector to save costs and free up resources that could be re-allocated to more efficient uses.

(iii) Further integration of green budgeting into the standard budget process. "Green budgeting" is an umbrella term for a range of budgetary policymaking tools intended to support the achievement of environmental goals. It refers to a continuous assessment of the state budget against the climate and environmental goals and priorities of the country, thereby incorporating environmental consciousness into all policy areas. Emphasis should be placed on "green spending reviews", both horizontal and sectoral, with a view to improving the energy footprint of policy actions and supporting the achievement of environmental goals with the necessary interventions. Combined with the use of appropriate indicators to assess the environmental impact of programme-related policies, this would also facilitate the effective implementation of the "green budgeting" reform.[6]

5 2021 saw the first pilot introduction of performance budgeting. Under conventional budgeting procedures, budget outlays are determined relative to the previous year, subject only to a legality audit and a regularity audit (based on supporting documentation). The necessity or performance of budget allocations is not examined.

6 For a road map, see Pojar, S. (2023), "How Green Budgeting is Embedded in National Budget Processes", European Commission, European Economy Discussion Paper 196.

(iv) Completion of the public accounting reform through the effective implementation of the new Accounting Framework for General Government.[7] Greece would thus join a group of advanced countries applying the accruals principle to public sector accounting as a basis for informed decision-making, performance evaluation, public property management and accountability. The most important benefits of such reforms are:

- lower operating costs across public administration and general government;
- more rational allocation and/or freeing-up of public resources;
- lower cost of public goods and services;
- greater transparency and accountability through full disclosure of general government financial transactions;
- better quality and reliability of government accounts; and
- recording of fiscal data in accordance with European System of Accounts (ESA) and Government Finance Statistics (GFS) standards.

(v) Effective tackling of widespread tax evasion to increase tax revenue. This will create additional fiscal space, facilitating a broader reform of the tax system towards more fairness and enabling the financing of emergency support measures in the event of macroeconomic shocks, without jeopardising fiscal sustainability. In the area of fiscal management, the upgrading of AADE's electronic tools should continue, expanding the scope for managing and exploiting data collected from electronic transactions.

Conclusions

The multiple crises of recent years have revealed the chronic weaknesses and rigidities of the Greek public administration and financial management. They have clearly shown that the economy's resilience to future crises will depend on its ability to maintain fiscal stability, entailing, among other things, the completion of fiscal management reform. This reform should be seen as a tool for reorganising and redesigning operational processes, with the aim of achieving measurable improvements in monitoring the execution of the public budget, as well as a transparent and credible framework for medium-term fiscal policy planning, so as to safeguard fiscal sustainability and create fiscal space.

7 Adoption of International Public Sector Accounting Standards (IPSAS) (see Presidential Decree 54/2018).

Box 4

MONETARY POLICY TRANSMISSION TO HOUSEHOLD DEPOSIT RATES

Household deposits make up the bulk of bank deposits and, more generally, of bank liabilities; accordingly, interest rates on deposits have a significant impact on banks' overall funding costs, hence on loan supply, as well as on bank profitability. This box examines the pass-through of ECB policy rate increases to the interest rates on household deposits in Greece. The results confirm the relative stickiness of deposit rates to policy rates, while factors such as the supply of deposits to banks, competition in the banking system and the negative interest rate environment that prevailed until mid-2022 appear to be affecting the pass-through of these increases to deposit rates.

Recent developments

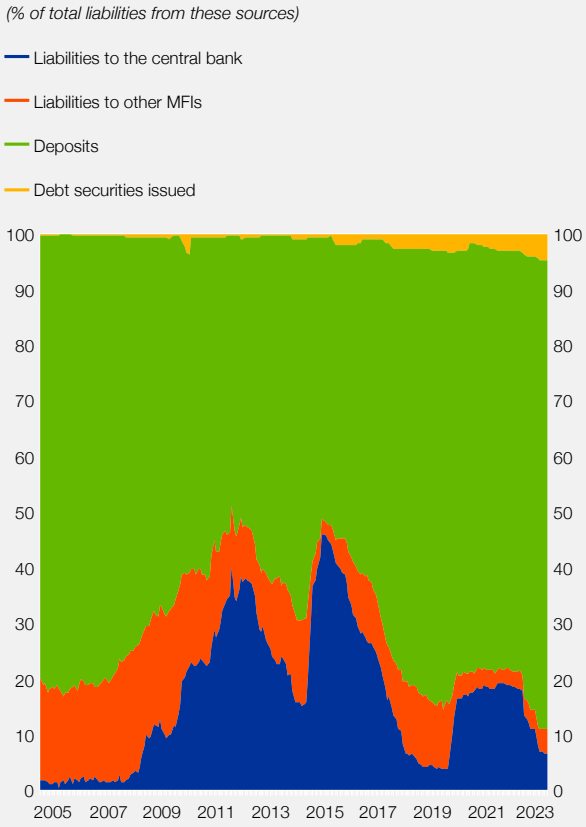
From July 2022, when the previous cycle of increases in key ECB interest rates started, up to October 2023, the average interest rate on household deposits increased by 34 basis points (bps), the interest rate on household

time deposits with an agreed maturity of up to 1 year rose by 164 bps, while that on household overnight deposits showed a zero change. Such increases are limited in comparison with the corresponding change in the policy rate over the same period. In September 2023, the spread between the policy rate – the main refinancing rate (MRO rate) or the deposit facility rate (DFR) – and the average household deposit rate stood at 413 bps (relative to the MRO rate) or 363 basis points (relative to the DFR). This spread is indicative of the opportunity cost of holding deposits relative to other low-risk saving options, such as Treasury bills, mutual fund shares or deposits abroad, whose remuneration can adjust more promptly to policy rate changes. It should be noted, however, that, although deposit rates in the euro area have risen more markedly than in Greece, there is no evidence of deposit outflows to other euro area countries.

Availability of bank deposits

The pass-through of the ECB interest rate increases to deposit rates is closely linked to the supply of deposits to credit institutions, as deposits are the most stable source of liquidity for banks. The relative weight of deposits in Greek credit institutions' total liabilities from the various alternative sources of funding (central bank, interbank market, deposits and bank bonds issued) has increased markedly over the past eight years (see Chart A). The share of deposits in such liabilities increased from 51% in mid-2015 to 81% in early 2020 (before the pandemic) and to 84% in September 2023, a historic high since Greece's entry to the euro area.

Chart A Funding structure of Greek banks
(January 2005-October 2023)



Source: Bank of Greece.

The availability of deposits is also reflected in the ratio of loans to deposits. If the availability of bank deposits is high, the ratio is low and banks have little incentive to raise interest rates with a view to attracting new deposits. This is also the case if the liquidity provided by the central bank to commercial banks is ample. Thus, the pass-through of changes in policy rates depends to a large extent on banks' need to raise funds via deposits or other sources. Chart B shows that the ratio of domestic private sector loans to deposits declined continuously in 2015-21, owing to deleveraging in the banking sector and a gradual strengthening of deposits. This downward trend continued during the pandemic, due to extensive government transfers to the private sector and, more generally, to the accumulation of deposits.[1] However, from late 2021 onwards, this ratio appears to have stabilised at relatively low levels, reflecting strong credit expansion to firms in 2022 and a slowdown in private sector deposit growth over this period.

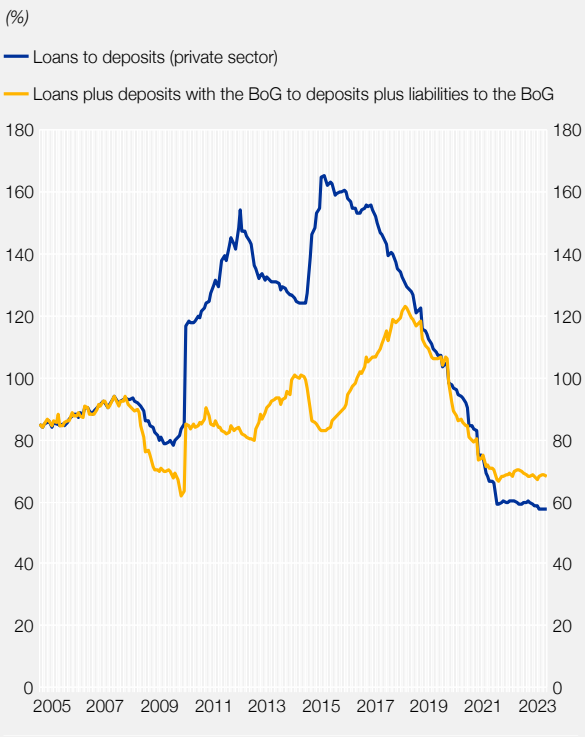
On the other hand, it should be noted that the repayment of TLTROs III by commercial banks in 2023 has significantly reduced the liquidity available through the central bank. However, net borrowing from the central bank (i.e. the difference between credit institutions' outstanding liabilities to the Bank of Greece and their deposit claims on the Bank of Greece) remains negative, suggesting that banks rely on customer deposits to fund their lending.

1 Following the imposition of capital controls in 2015, and later during the pandemic, households became increasingly familiar with the use of deposits as an electronic means of payments. This use implies maintaining higher balances of overnight deposits than in the past for payment purposes, thus making the supply of deposits by firms and households less elastic to interest rate changes.

Empirical analysis of the pass-through of policy rate increases to household deposit rates in Greece

Chart C shows the ratio between the cumulative change in the interest rates on time and overnight deposits held by households and the corresponding change in the policy rate during the current tightening cycle,[2] as well as during the previous one that started in December 2005 and lasted until July 2008. Based on this ratio, it appears that, in the previous cycle, the ECB's successive increases were more closely integrated into household time deposit rates in Greece, with the pass-through gradually rising from 40% in the first month after the start of policy rate increases to 90% (implying an almost full pass-through) at the onset of the global financial crisis in late 2007. By contrast, in the current cycle, the resulting rise in household deposit rates has been considerably smaller and slower, despite the fast and sharp increase in the policy rate by the ECB. As regards overnight deposit rates, the ratio stood at close to 20% shortly after the start of increases in December 2005, remaining broadly unchanged thereafter, while currently the pass-through of higher policy rates to overnight deposit rates is zero.

Chart B Loan-to-deposit ratio of Greek banks (January 2005-October 2023)



Sources: Bank of Greece (BoG) and ECB.

We will now empirically examine the degree of pass-through of changes in monetary policy to the interest rates on household deposits by estimating the following equation[3]:

$$\Delta r_t^d = \Delta r_{t-1}^d + \Sigma_{j=0}^{k} \beta^j \Delta r_t^{ECB} + \Gamma X_t + Z LD_t + E Conc_t + e_t$$

where Δr_t^d is the change in the household deposit rate considered each time (average interest rate, overnight deposit rate and inteerst rate on time deposits with an agreed maturity of up to 1 year) in month t and Δr_t^{ECB} is the change in the ECB's deposit facility rate with k lags. The X_t vector includes control variables to account for changes in demand for deposits (based on the changes in industrial production and in the HICP at time t and with some lags). A dummy variable for the June 2014-June 2022 period is also used to reflect the period of negative interest rates in the euro area.[4] The variable LD_t refers to the availability of deposits based on the loan-to-deposit ratio as discussed above. The variable $Conc_t$ stands for the degree of concentration in the banking system, as measured by the share of assets of the five largest Greek banks in total bank assets, and is expected to be negatively correlated with the degree of monetary policy transmission.[5] The data used are monthly, covering the period from September 2002 to July 2023.

2 For this measure, see (a) Messer, T. and F. Niepmann (2023), "What determines passthrough of policy rates to deposit rates in the euro area?", *FEDS Notes*; and (b) Kang-Landsberg, A., S. Luck and M. Plosser (2023), "Deposit betas: Up, Up and Away?", Federal Reserve Bank of New York, *Liberty Street Economics*.

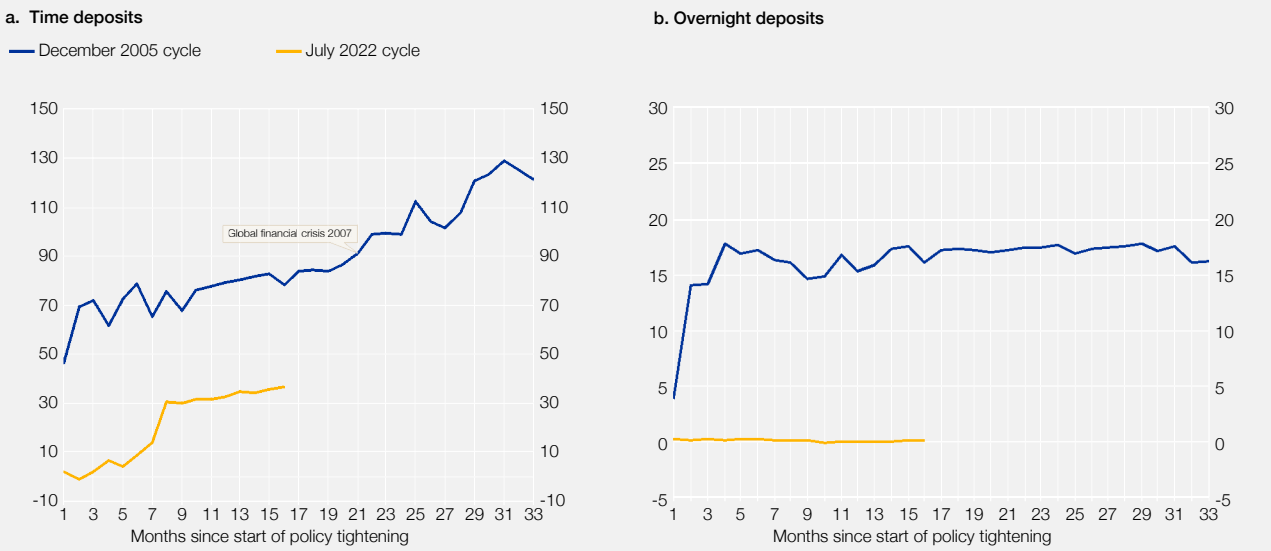
3 For example, see Messer and Niepmann, op. cit.

4 The slower adjustment of deposit rates in the current hiking cycle may be due to the fact that, during the preceding exceptional period of negative interest rates, nominal deposit rates in Greece remained at slightly positive or zero levels.

5 It should be noted that this measure hovered around 70-75% until June 2012 and rose sharply to 93% by the end of 2013, following the completion of several mergers and acquisitions in the domestic banking system during 2012-13, including the absorption of the healthy part of the Agricultural Bank of Greece by Piraeus Bank and of Emporiki Bank by Alpha Bank; since 2015, it has been about 96-97%. According to the literature, banking market structure and competition may affect banks' interest rate margins, while the competitive pressure faced by banks could also be linked to the availability of non-bank financing and non-bank saving options in the economy.

Chart C Changes in household deposit rates and the policy rate

(ratio of cumulative changes in the two rates, %)



Sources: Bank of Greece and ECB.

The table below reports the results of alternative exercises of the model for the three categories of deposit rates.

In summary, the results suggest the following:

– The interest rate on household overnight deposits is much less responsive to policy rate changes than that on time deposits. Any adjustment in the overnight deposit rate is relatively immediate and then ceases to be statistically significant. The adjustment of the time deposit rate follows with a greater lag, as it is estimated to be statistically significant in the second and third months following the ECB policy rate change.

– High concentration in the domestic banking system is a structural factor limiting the pass-through of changes in ECB interest rates to household deposit rates. The high availability of deposits in recent years relative to lending to the economy has so far enabled banks to keep overnight deposit rates unchanged at levels close to zero during the current tightening cycle. The increasing use of overnight deposits as a means of payment over the past eight years is likely to have contributed in the same direction.

– In the period of negative inerest rates (from June 2014 to June 2022), household deposit rates remained slightly positive or zero. However, the low interest rate environment is over and banks could face increasing competition from alternative higher-remunerated saving products. Moreover, the ongoing contraction of the ECB's balance sheet is likely to increase the impor-

Estimated pass-through of changes in the policy rate to household deposit rates

	Average deposit rate	Overnight deposit rate	Time deposit rate (up to 1 year)
Δr^{d}_{t-1}	0.37 *** (0.08)	0.20 * (0.16)	0.27 *** (0.11)
Δr^{ECB}_{t}	0.07 (0.05)	0.06 * (0.03)	0.08 (0.07)
Δr^{ECB}_{t-1}	0.07 (0.07)	0.03 ** (0.01)	0.15 (0.12)
Δr^{ECB}_{t-2}	0.14 ** (0.06)	0.06 ** (0.03)	0.20 *** (0.07)
Δr^{ECB}_{t-3}	0.07 ** (0.04)		0.28 *** (0.10)
LD_t	0.02 (0.02)	0.02 *** (0.01)	0.00 (0.46)
$Conc_t$	-0.21 *** (0.05)	-0.06 *** (0.02)	-0.34 *** (0.09)
Negative interest rate period	0.05 *** (0.02)	0.02 *** (0.01)	0.08 *** (0.03)
Long-run pass-through	0.34	0.18	0.66
N	242	242	242
Adj.R^2	0.55	0.36	0.54

Note: Newey-West standard errors are indicated in brackets.
* p-value<0.1, ** p-value<0.05, *** p-value<0.01.

tance of deposits as a source of liquidity for banks in the coming months, accelerating the pass-through of policy rate increases to deposit rates.

– On a cumulative basis, the pass-through of policy rates is estimated to be higher (66%) for household time deposits, particularly low (18%) for overnight deposits, while it stands at 34% for the average deposit rate, confirming the relative stickiness of household deposit rates to monetary policy changes.

Box 5

THE DRIVERS OF GREECE'S SOVEREIGN CREDIT RATING UPGRADES

Greece's sovereign credit rating has improved significantly over the past few years, rising continuously since 2017, while the recent upgrades by DBRS, S&P, Scope Ratings and Fitch brought it back to Investment Grade[1] after 12 years. The importance of this development is underlined by the fact that (i) it signals the convergence of the credit risk level of Greek bonds to that of the other euro area bonds; and (b) it allows a large and diversified pool of international investors to invest in the financial assets of the Greek economy.[2]

This box examines the evolution of credit ratings over the period 2009-23 and their determinants.[3] First, developments are reviewed and the contributions of the different categories of macroeconomic, fiscal, external and structural factors to the upgrades of the Greek economy's creditworthiness are assessed. Then, the box focuses on those factors which have significant room for further improvement so that the upward course of credit ratings continues.

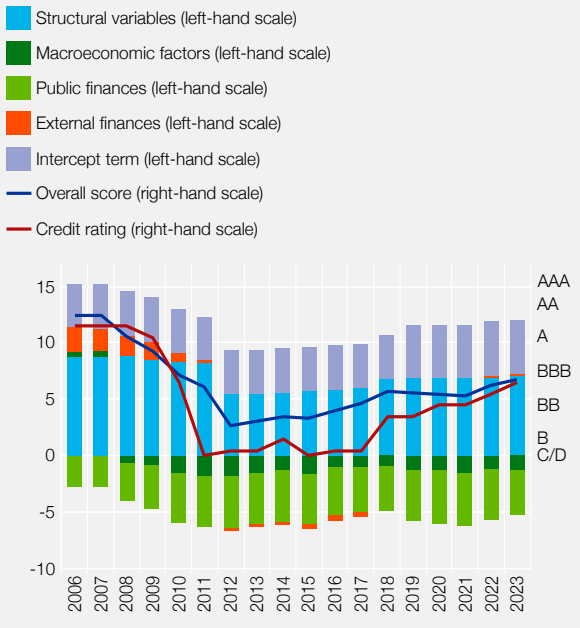
Developments in credit ratings in 2009-2023

The downgrades of Greece's sovereign credit rating to below Investment Grade in 2010-11 marked the worsening of the sovereign debt crisis for the Greek economy.[4] These downgrades were accompanied by a sharp increase in Greek government bond spreads and a general loss of investor confidence in the Greek economy, with broader consequences, such as the drying-up of credit flows to the Greek economy and the loss of Greek banks' access to international money and capital markets. The financing constraints of the Greek banking system and, consequently, of the Greek economy were partly mitigated by the waiver of the Eurosystem's collateral eligibility rules for Greek government bonds.

The adverse rating downgrades, as shown in Chart A, reflected a deterioration in the fundamentals of the Greek economy (mainly public finances) in 2009 and 2010, as well as expectations of a further intensification of the debt crisis in Greece, despite the financial support provided in the context of the economic adjustment programmes. In particular, it appears that in 2009 and 2010 the deterioration in the public finances parameter of ratings led to a decrease of 1.1 notches in their quantitative component. Similarly, the worsening of external finances (current account balance and international investment position of the country) explains a further one-notch decline, while the recession and ensuing deterioration of the real economy and GDP variables account for an additional downgrade of around 1 notch. Subsequently, until 2012, other structural variables, such as governance indicators,

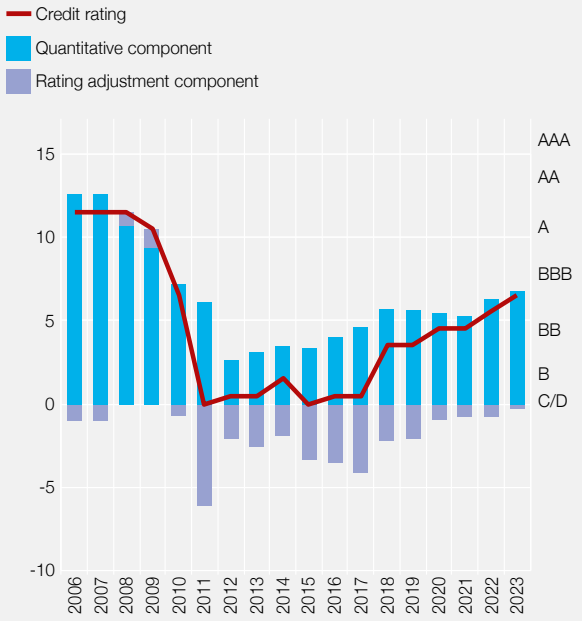
1 Investment Grade includes all rating categories and notches above the one used as threshold (i.e. BBB-/Baa3/BBB-low).
2 See in this regard Baghai, R.P., B. Becker and S. Pitschner (2023), "The Use of Credit Ratings in the Delegated Management of Fixed Income Assets", *Management Science*.
3 For the purposes of this box, the credit ratings of the four agencies accepted by the Eurosystem as external credit assessment institutions (ECAIs), namely DBRS, Fitch, Moody's and Standard and Poor's, as well as the Bank of Greece model are employed (see 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). The Bank of Greece model replicates the parameters used by these agencies for the quantitative component of their ratings.
4 S&P first downgraded Greece's sovereign credit rating to BB+ on 27 April 2010. This was followed by downgrades by Moody's to Ba1 on 14 June 2010 and by Fitch to BB+ on 14 January 2011.

Chart A Input variables in Greek sovereign credit ratings



Sources: Credit rating agencies and the Bank of Greece (econometric estimates).
Note: The vertical bars show the overall score of each input variable in the quantity component of ratings. The blue line indicates the level of the overall score for Greece according to the fundamentals and the red one the best final credit rating between DBRS, Fitch, Moody's and Standard and Poor's.

Chart B Credit ratings and their components



Sources: Credit rating agencies and Bank of Greece (econometric estimates).

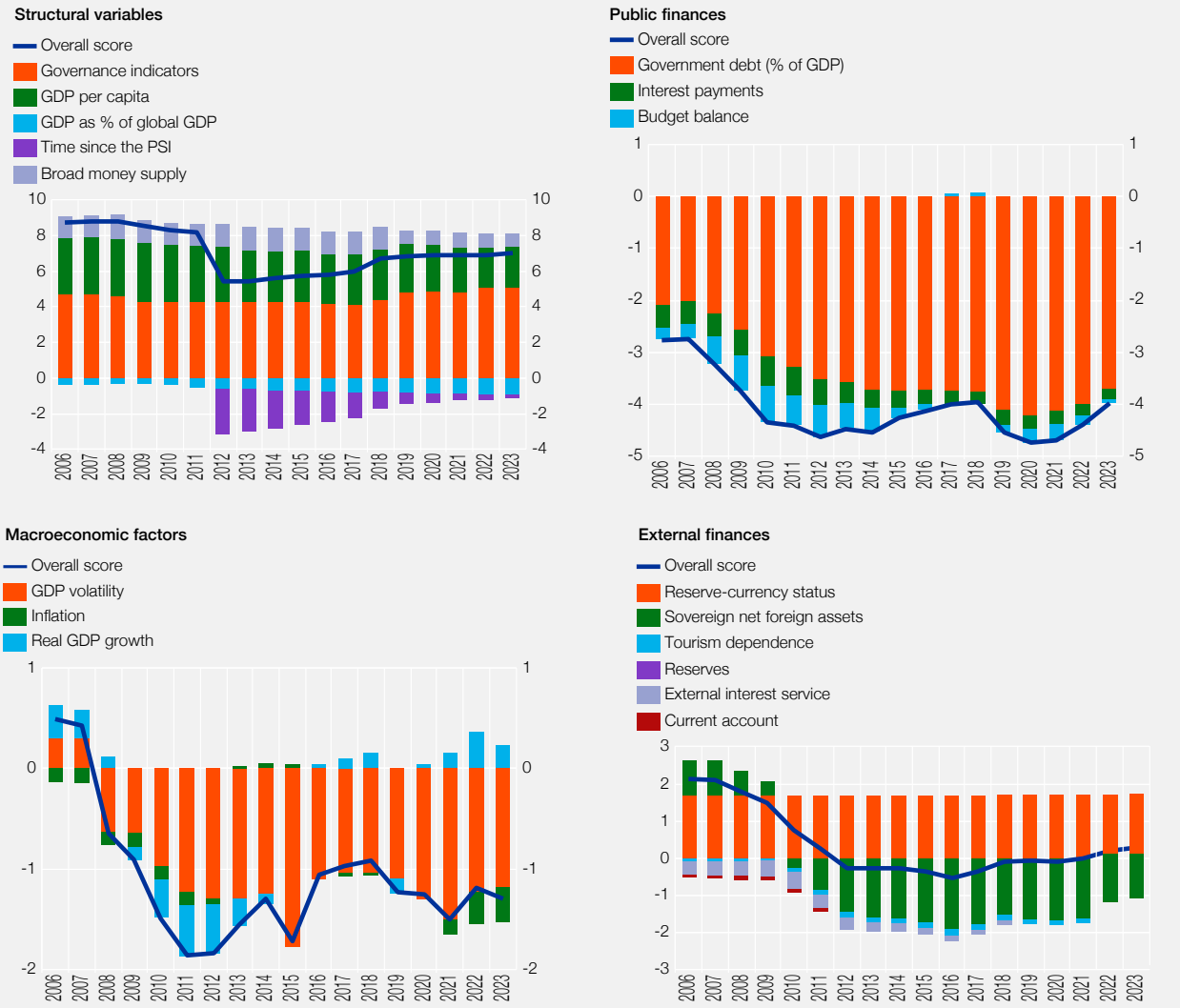
declined significantly. Thus, Greece's sovereign credit rating reached its lowest level during the public debt restructuring (PSI) period, which is mainly accounted for by the structural variables, as these include debt restructuring, which had a significant negative impact on the overall rating.

Nevertheless, the quantitative component of the credit rating had not fallen below single-B rating levels, as illustrated in Chart A. The qualitative component of the rating (i.e. the adjustment following an assessment based on rating analysts' expectations) therefore made a significant negative contribution to rating downgrades. Thus, the "adjustment component", i.e. the difference between the scores derived from fundamentals and the final credit rating, was very large (over 4 notches) until 2017. As can be seen in Chart B, the adjustment phase in 2017 deducted around 4 notches from the rating derived from the fundamentals of the Greek economy. The reasons for this very significant downward adjustment were reported by credit rating agencies and mainly concerned the large (at the time) stock of non-performing loans, weak financing of the economy and uncertainties about the consistency of economic policy.

Since then, there has been a continuous increase of input variables' score (see Chart C) and, consequently, an improvement of the final credit ratings. In this development, the improvement in structural variables, notably the time since the restructuring of public debt, has added 1.25 notches, while the improvement in macroeconomic factors and public finances has added about 1 additional notch to the rating. Finally, the significant mitigation of the initially very negative sovereign net foreign assets and the gradual repayment of official sector debt (mainly the IMF and Greek Loan Facility loans) have reduced the negative contribution of external finances by about 1 notch.

Overall, these developments in the rating parameters explain the upgrades of over 3 notches observed between 2017 and 2023. Thus, the quantitative component increased from a rating of B+ in 2015 to a rating of BBB- in

Chart C Contribution of individual variables to the quantitative part of the assessments of the Greek economy



Sources: Credit rating agencies and Bank of Greece econometric estimates.

2023, as expected according to analysis conducted by the Bank of Greece.[5] In this period, credit rating analysts' expectations about the Greek economy improved significantly, leading to a gradual decrease in the "adjustment gap", as shown in Chart B. Thus, given the performance in public finances and economic activity, which exceeded both initial expectations and similar developments in comparable economies, credit rating agencies decided to upgrade Greece's credit rating to levels within the Investment Grade territory, despite uncertainties in the international environment and the slowdown in global economic activity.

Prospects for further rating upgrades

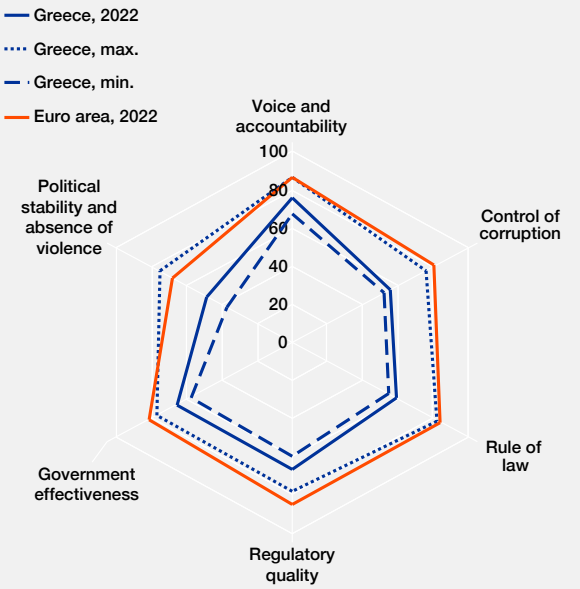
Continued prudent fiscal policy and stronger economic growth in Greece will help to reduce the public debt-to-GDP ratio. By way of illustration, a debt reduction of 30 percentage points of GDP (i.e. from 159% of GDP expected at the end of 2023, based on the Introductory Report on the 2024 Budget, to 129% of GDP) would result in an improvement of about 1 notch in the public finances score in the quantitative component of the credit ratings

5 See Box VI.1 "The prospects for upgrades of Greece's credit ratings", Bank of Greece, *Monetary Policy – Interim Report*, December 2019 [in Greek], and Box IX.2 "The drivers of an upgrade in Greece's sovereign credit rating", Bank of Greece, *Annual Report 2022*.

process. Of course, the timing of such a reduction in the public debt-to-GDP ratio depends both on the overall macroeconomic environment and on economic policy.[6]

A reduction in GDP volatility would also result in an upgrade of around 1.5 notches. As regards the resilience variable in particular, the contribution of financing flows through the Recovery and Resilience Facility (RRF) is considered very important.[7] Therefore, if the public debt-to-GDP ratio fell and the resilience of the economy was enhanced, Greece's sovereign credit rating would stand at around BBB+, provided that the difference between final ratings and scores, i.e. the "adjustment gap", remained at current levels.

Chart D Greece's ranking in governance indicators



Source: World Bank.

However, on the one hand, the process of economic adjustment is long and, on the other hand, these macroeconomic and fiscal improvements do not increase the quantitative component enough for the Greek economy to obtain a credit rating close to the euro area economies' average (A+). Additional improvements are therefore needed in the structural variables of credit ratings, which make a very significant contribution to credit ratings both directly and indirectly due to the diffusion of benefits to economic activity. In particular, among the structural variables, the ranking of the economy in the World Bank's Worldwide Governance Indicators is the most important. These indicators carry a very high weight in the quantitative component of credit ratings, as high as 20%. At the same time, as can be seen in Chart D, there is ample room for improvement for the Greek economy as regards these indicators, based on historical performance.

In particular, the average ranking of the Greek economy in the governance indicators that credit rating agencies take into account had declined over the decade of the crisis from levels very close to those of the euro area average to levels close to those of developing economies. Any convergence in the ranking of these indicators towards the average ranking of the euro area economies would add a further 1.5 notches to the quantitative part of the credit ratings of the Greek economy. As can be seen from Chart D, there is ample scope for improvement in the indicators of "political stability and absence of violence", "rule of law" and "control of corruption". Thus, successful interventions in the fields of justice and public administration, together with maintaining political stability, pursuing prudent fiscal policy and strengthening the resilience of the Greek economy, could drive Greece's sovereign credit rating above grade A levels.

Conclusion

The upgrades of the Greek economy to levels within Investment Grade have come after a long path of prudent fiscal policy and economic recovery. At the same time, the better-than-expected macroeconomic and fiscal performance, which helped close the adjustment gap between Greece's final sovereign credit rating and its quantitative component, has contributed significantly in the same direction. In order for Greece's sovereign

6 S&P's recent report states that the use of the State cash buffer (which is around 17% of GDP) to reduce nominal government debt, combined with the expected reduction in government debt by other factors, but mainly due to the interest rate-growth differential, will bring the public debt-to-GDP ratio down to around 125% by the end of 2026.

7 On the economic effects of the Recovery and Resilience Facility, see Malliaropulos, D., D. Papageorgiou, M. Vasardani and E. Vourvachaki (2021), "The impact of the Recovery and Resilience Facility on the Greek economy", Bank of Greece, *Economic Bulletin*, No. 53, 7-28.

credit rating to be further upgraded, the expected macroeconomic and fiscal performance should materialise, in particular with regard to reducing public debt and enhancing the resilience of the Greek economy.

However, if the policy goals aim for the sovereign credit rating of Greece to converge with the average rating of the euro area economies (i.e. A+), in addition to fiscal and macroeconomic developments, the structural variables of the Greek economy should also converge towards the average level of the respective euro area indicators. To this end, it will be very important to step up efforts to promote relevant public policy reforms, e.g. in justice and public administration.

Box 6

EMPIRICAL INVESTIGATION OF THE IMPACT OF UPGRADES TO INVESTMENT GRADE STATUS

The upgrades of recent years led in 2023 to the Greek sovereign credit rating regaining Investment Grade status. The Investment Grade threshold is a very important criterion for institutional investors' portfolio decisions.[1] It is also important for banks, as it constitutes a collateral eligibility and valuation criterion in the Eurosystem's monetary policy framework, while it is taken into account in the risk parameter calibration under the capital adequacy framework. It is therefore evident that the Investment Grade threshold is instrumental in satisfactory bond demand and valuation and, by extension, low borrowing costs for new issues.

This raises the question of *how and to what extent an upgrade to Investment Grade affects bond yields and economic activity*. In order to investigate this question, data have been gathered on the basis of past experiences of economies whose ratings were upgraded to notches within the Investment Grade territory (i.e. from an initial rating of BB+/Ba1 and/or lower to BBB-/Baa3).[2] For the purposes of this analysis, historical credit ratings were collected from the three major agencies (Fitch, Moody's and S&P)[3] for a large set of both advanced and developing economies.[4]

The table below presents past cases of economies whose credit ratings were upgraded in the period 2000-2022 above the Investment Grade threshold. It appears from this table that it is common practice, prior to a significant upgrade such as that above the Investment Grade threshold, to announce a change in the credit rating outlook to a positive one. On average, the announcement of the change in outlook is followed by an upgrade above the Investment Grade threshold eight months later.

An upgrade to Investment Grade is presumed to have a dampening effect on government bond yields. In particular, the relevant literature has documented a strong link between the level of government bond yields and so-

1 Indicatively, studies have shown that around 90% of US investment funds' mandates and 60% of European investment funds' mandates refer to the Investment Grade threshold; as a result, 90% of their portfolios consists of Investment Grade bonds. See Baghai, R., B. Becker and S. Pitschner (2023), "The Use of Credit Ratings in the Delegated Management of Fixed Income Assets", *Management Science*. Indeed, in recent years, the importance of non-bank financial intermediaries (i.e. mainly investment funds) has increased for bond issuers. In particular, open-end regulated funds manage portfolios worth USD 63 trillion, of which around USD 28.5 trillion is invested in bonds (see International Investment Funds Association, "Worldwide regulated open-end fund assets and flows, first quarter 2023"). Thus, given that (a) according to data from the International Capital Markets Association, outstanding corporate and government bonds worldwide amount to USD 128 trillion; (b) central banks hold around USD 18 trillion in bonds; and (c) the vast majority of banks' bond portfolios are in held-to-maturity accounts, the great importance of investment funds in shaping bond valuations globally becomes evident.

2 The Investment Grade threshold is the BBB-/Baa3 rating. Investment Grade comprises the BBB, A, AA and AAA ratings, including the intermediate ratings (notches).

3 According to data from the European Securities and Markets Authority (ESMA), in 2022 the so-called "big three" credit rating agencies held market shares that cumulatively exceeded 90% in Europe. In particular, S&P had a market share of more than 50%, Moody's around 33% and Fitch 10%, with all the others having a maximum share of 1%.

4 In total, the analysis is based on a sample of 85 world economies, under review from January 2000 to December 2022.

vereign ratings.[5] Furthermore, a non-linear rise in bond yields and risk premia following a downgrade below this threshold has also been documented.[6]

However, as the relevant studies mainly concern downgrades below this threshold, the question remains whether the upgrades above the Investment Grade threshold lead to corresponding non-linearities, i.e. whether they have a downward impact on yields higher than that expected due to a typical upgrade. In order to investigate this question, a relevant econometric model was constructed in which dependent variables, i.e. ten-year government bond yields and their spreads against a benchmark bond,[7] are considered as a function of (a) sovereign credit ratings;[8] (b) a variable that identifies the impacts of the upgrade to Investment Grade;[9] (c) international monetary conditions;[10] and (d) changes in exchange rates.[11] The model results are illustrated in the chart below.[12]

As shown in the chart, upgrades to a higher credit rating (e.g. from BB- to BB or from A to A+) reduce the credit risk premium embedded in government bond yields. Moreover, the left-hand panel shows that, while the tightening of international monetary conditions has the same impact for all economies irrespective of their credit rating, the impact of exchange rates is more significant for low-rated economies. However, in addition to these factors, it appears that, within the six-month period (3 months before and 3 months after) during which the impact of an upgrade to Investment Grade is considered,

Cases of upgrades to Investment Grade (2000-2022)

Economy	Upgrade date	Outlook change date	Credit rating agency
Croatia	22.3.2019	21.9.2018	S&P
Cyprus	14.9.2018	15.9.2017	S&P
Hungary	20.5.2016	22.5.2015	Fitch
Philippines	27.3.2013	-	Fitch
Türkiye	5.11.2012	-	Fitch
Uruguay	3.4.2012	-	S&P
Indonesia	15.12.2011	-	Fitch
Panama	23.3.2010	29.1.2008	Fitch
Brazil	30.4.2008	16.5.2007	S&P
Romania	6.10.2006	7.6.2006	Moody's
India	22.6.2004	16.10.2003	Fitch
Bulgaria	4.6.2004	24.7.2003	S&P
Russia	18.10.2003	28.7.2003	Moody's
Slovakia	30.10.2001	9.11.2000	S&P
Mexico	3.7.2000	2.2.2000	Moody's

Source: Refinitiv.
Notes: The date of the upgrade, 2nd column, corresponds to the date when the first of the three major rating agencies (Fitch, Moody's and S&P) announced the upgrade of the sovereign credit rating of the economy indicated in the 1st column above the Investment Grade threshold, while previously all three agencies rated it below this threshold. The name of the agency that upgraded first is indicated in the last column. Finally, if that agency had previously changed its credit rating outlook into positive, the date on which this change was announced is indicated in the 3rd column.

5 See, among others, El-Shagi, M. and G. von Schweinitz (2018), "The joint dynamics of sovereign ratings and government bond yields", *Journal of Banking and Finance*, 97, 198-218; and Malliaropulos, D. and P. Migiakis (2018), "The re-pricing of sovereign risks following the Global Financial Crisis", *Journal of Empirical Finance*, 49, 39-56.

6 See, among others, Acharya, V. and S. Steffen (2020), "The risk of being a fallen angel and the corporate dash for cash in the midst of COVID", *The Review of Corporate Finance Studies*, 9(3), 430-471; Cantor, R. and F. Packer (1996), "Determinants and impact of sovereign credit ratings", *FRBNY Economic Policy Review* (October 1996), 37-54; and Jaramillo, L. and C.M. Tejada (2011), "Sovereign credit ratings and spreads in emerging markets: Does investment grade matter?" International Monetary Fund Working Paper No. 2011/044.

7 The benchmark bonds are the 10-year German Bund for the euro area economies and the corresponding 10-year US federal bond for the other economies in the sample.

8 This variable captures the credit risk premium demanded by investors. The lower the credit rating of each economy, the higher the credit risk premium.

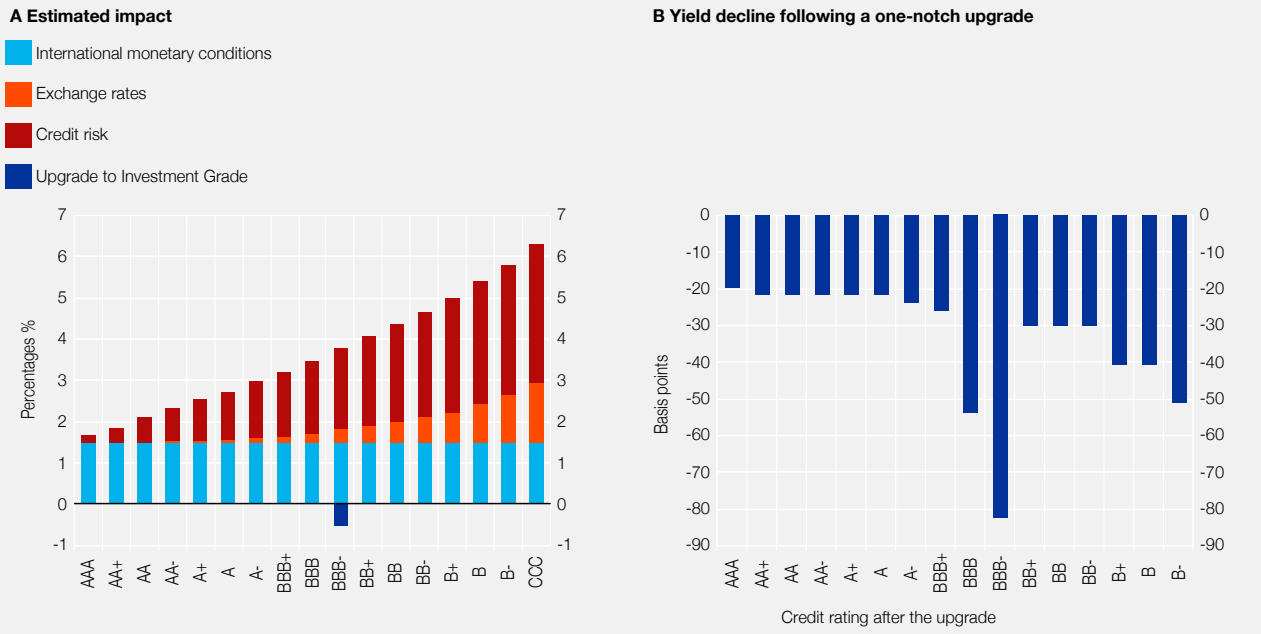
9 This variable captures effects that are not explained by the other variables in the model, for a period of 3 months before up to 3 months after the first upgrade to Investment Grade. For the selection of this definition, several alternatives were considered for the length of time (e.g. a period of 6 months before to 6 months after the upgrade), but also for the timing of the upgrades (upgrades by two agencies or upgrades by all three agencies to Investment Grade).

10 The variable used is the effective fed funds rate, while the "shadow rate", which takes into account the contribution of non-interest rate monetary policy tools as well, was considered as an alternative (see Wu, J.C. and F.D. Xia (2016), "Measuring the macroeconomic impact of monetary policy at the zero lower bound", *Journal of Money, Credit and Banking*, 48(2-3), 253-291).

11 According to international monetary theory, exchange rates reflect interest rate differentials between two currency areas.

12 Regarding the effects on government bond yields, as the data used were of daily frequency, 77 out of 85 economies had sufficient data for the period from 1.1.2000 to 31.12.2022.

Estimated impact of an upgrade to Investment Grade on government bond yields



Note: The left-hand panel captures the estimated government bond yields, per credit rating category, based on the estimations of a cointegration model (see Malliaropulos, D. and P. Migiakis (2023), "A global monetary policy factor in sovereign bond yields", *Journal of Empirical Finance*, 70, 445-465). The contribution of reference rates is calculated on the basis of their current values and the contribution of exchange rates is calculated on the basis of the average fluctuation per credit rating category. The right-hand panel captures the estimated changes, per credit rating category, following an upgrade by one notch.

government bond yields fall by around 50 basis points on top of the downward impact of a one-notch upgrade. Overall, therefore, this upgrade is expected to knock off around 75-80 basis points of the level explained by international and domestic monetary conditions, as well as by economic fundamentals, which are reflected in credit ratings.

In the case of Greece, the impact of an upgrade was largely priced in between 21 April 2023, when S&P announced the change in Greece's credit rating outlook to positive, and the end of October, when Greece's rating was upgraded to Investment Grade. Thus, while government bond yields in the euro area, during the period from the announcement of the change in Greece's sovereign credit rating outlook until the actual upgrade, increased significantly (change in 10-year bond yields between 21.4.2023 and 27.10.2023: Germany: +36 bps, France: +47 bps, Italy: +48 bps, Spain: +42 bps, Portugal: +22 bps), mainly as a result of the interest rate hikes, Greek government bond yields during the same period declined across all maturities (change in GGB yields over the same period: 10-year: -14 bps, 5-year: -20 bps, 2-year: -5 bps). Since then, the decline in GGB yields continued and exceeded by far that of the other euro area government bonds (aggregate change in Greek government bond yields from 21.4.2023 until 15.12.2023: 10-year: -112 bps, 5-year: -115 bps, 2-year: -91 bps). Consequently, these observations are in line with the findings of the econometric estimation, as both the observations of the Greek government bond yields and the model estimates indicate that the tightening of monetary conditions, notably through interest rate hikes, had an upward effect on euro area government bond yields, but these effects on Greek government bonds were offset by expectations of an upgrade to Investment Grade.

At the same time, bank bond yields have declined significantly (indicatively, change in the median yields on senior bonds between 21.4.2023 and 15.12.2023: -251 bps). This observation is in line with the literature, as government bond yields are a benchmark for the pricing of both bank and corporate bonds. Therefore, it is expected that the yield reduction effects of an upgrade to Investment Grade also pass through to the borrowing costs of banks and businesses. By extension, it is also expected to have significant effects on economic activity, at least through the cost-of-investment channel.

The effect of rating upgrades on economic activity has already been studied, with findings pointing to a significant upward impact on foreign direct investment and portfolio investment.[13] However, the literature has not examined the non-linear effects that an upgrade above the Investment Grade threshold may have. To this end, the impact of such an upgrade on real GDP growth and on GDP volatility was examined, on the basis of the aforementioned very large sample of economies.[14] The estimation of this relationship is based on a dynamic panel data model (Arellano Bond GMM), with instrumental variables, such as the budget balance, the current account balance, the ranking of the economy in the World Bank's governance indicators, etc.

The results imply a significant upward impact on GDP and a dampening impact on GDP volatility from an upgrade to Investment Grade. Specifically, real GDP grows by 2.5% in the long run, while GDP volatility decreases by 0.4 percentage point after the upgrade. According to the literature, upgrade effects are transmitted to the economy through three channels: lower financing costs, increased flows of external financing and improved economic climate. Thus, the GDP growth rate of 2.5% reflects the overall impact through all three channels.[15]

Conclusions

A credit rating upgrade to Investment Grade, as shown in previous cases of such upgrades, has a reduction effect on government bond yields and thus on borrowing costs for the public and private sectors of the economy. At the same time, findings of an econometric estimation suggest that such an upgrade also entails significant benefits for the real economy, as it has a long-term add-on effect on GDP and strengthens the economy's resilience. By extension, a permanent upgrade to Investment Grade may have significant, positive and permanent fiscal and macroeconomic effects.

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13 See Cai, P., Q. Gan and S. Kim (2018), "Do sovereign credit ratings matter for foreign direct investments?", *Journal of International Financial Markets, Institutions and Money*, 55, 50-64; Chen, S., H. Chen, C. Chang and S. Yang (2013), "How do sovereign credit rating changes affect private investment?", *Journal of Banking and Finance*, 37(12), 4820-4833; and Chen, S., H. Chen, C. Chang and S. Yang (2016), "The relation between sovereign credit rating revisions and economic growth", *Journal of Banking and Finance*, 64, 90-100.

14 The analysis of the effects of an upgrade on economic activity used anuual data for all 85 sampled economies over the period 2000-22.

15 For the impact of an upgrade on the Greek economy through lower financing costs, see Box 1.

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