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FINANCIAL STABILITY: MAIN VULNERABILITIES AND RISKS

Since the last *Financial Stability Report* (FSR) was published, there has, on balance, been some containment of the risks identified and the vulnerabilities have eased. That said, a potential escalation of the geopolitical tensions, associated in particular with the war in Ukraine and the conflict in the Middle East, remains the main risk to economic activity and the stability of the Spanish financial system.

Despite these tensions and the tight monetary policy stance, the global growth outlook for 2024 has been revised upwards slightly since last autumn thanks to some positive surprises, which have affected the United States in particular. However, the euro area has performed relatively weakly and its growth outlook has worsened.

Meanwhile, the drop in headline and underlying inflation in the advanced economies, not least in the euro area, has led financial markets to bring forward and heighten expectations of monetary policy easing, with the consequent reduction in expected interest rates in both the short and long term. However, these interest rate expectations have partially corrected upwards since the start of 2024, reflecting uncertainty over the disinflationary process. The monetary authorities of the main developed economies have been signalling that the first interest rate cut could be near, while emphasising that their decisions will remain data dependent.

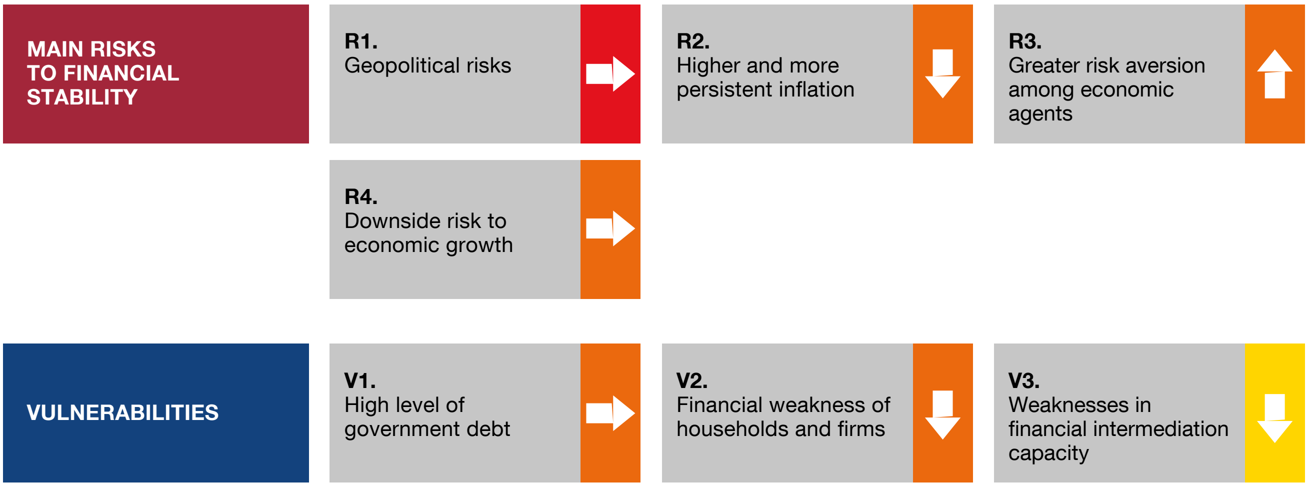
Since the last FSR, risk premia have held at low levels by historical standards (especially considering the climate of macroeconomic uncertainty) and have declined in some asset classes. Against this background, greater risk aversion among agents, prompted by a shift in the perceived level of uncertainty, could lead to an abrupt and deep correction of risky asset prices.

Meanwhile, positive income developments and deleveraging in Spain's private non-financial sector have helped to improve its financial position. However, the country's high government debt remains a significant vulnerability.

Turning to financial intermediation capacity, the Spanish banking industry reported very positive profitability developments in 2023, driven by net interest income growth. The cumulative increase in policy rates since 2022 has gradually driven up the average return on assets while being passed through to the cost of liabilities more slowly. At the same time, the sector has maintained comfortable liquidity and funding positions.

The recent easing of money market rates has led to the tapering off of interest rate increases on new loans. Conversely, the shift from sight deposits to term deposits persists and the average remuneration of the latter, while remaining low, has continued to improve. Against this background, the supply of credit appeared more buoyant in the final stretch of 2023. Meanwhile,

Figure 1
Financial stability: main risks and vulnerabilities (a) (b)


MAIN RISKS TO FINANCIAL STABILITY
R1. Geopolitical risks ➡
R2. Higher and more persistent inflation ⬇
R3. Greater risk aversion among economic agents ⬆
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V1. High level of government debt ➡
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SOURCE: Banco de España.

a In this report, the **vulnerabilities** are defined as economic and financial conditions that increase the impact or probability of materialisation of **risks to financial stability,** which in turn are identified as adverse changes in economic and financial conditions, or in the physical or geopolitical environment, with an uncertain probability of occurrence, which hamper or impede financial intermediation, with negative consequences for real economic activity.

b The risks and vulnerabilities shown here are measured using three colours: yellow (low level), orange (medium level) and red (high level). The arrows denote the change in the risks and vulnerabilities since the last FSR.

credit quality in Spain, specifically in the households segment, performed less favourably in 2023, although the deterioration has been very limited.

The growth in bank profitability has not yielded a significant strengthening of banking sector solvency: unlike in other European countries, the CET1 ratio in Spain improved only very moderately in 2023. In consequence, the gap between the Spanish and European banking systems has widened. On the whole, banks would remain well advised to use their current positive earnings to strengthen their capacity to absorb potential macro-financial shocks in the future, particularly in light of the persisting downside risks to economic growth.

The main risks[1] to the stability of the Spanish financial system are discussed in greater detail below.

R1. Geopolitical risks

The military conflicts in Ukraine and the Middle East continue to be geopolitical flashpoints and, despite remaining contained in scale, constitute sources of uncertainty that are hard to quantify.

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[1] Risks to financial stability are defined as adverse changes in economic and financial conditions, or in the physical or geopolitical environment, with an uncertain probability of occurrence, which hamper or impede financial intermediation, with negative consequences for real economic activity.

Chart 1
GDP response to uncertainty shock (a)

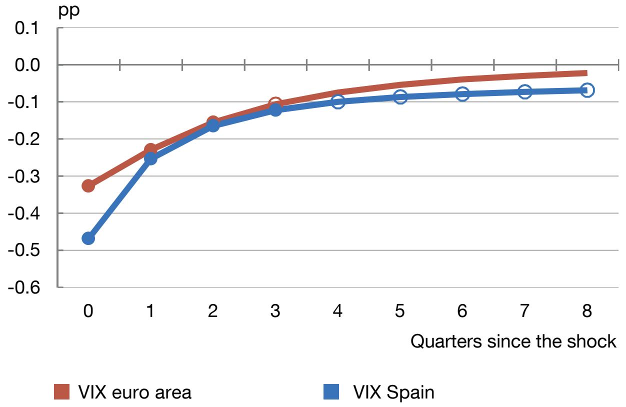
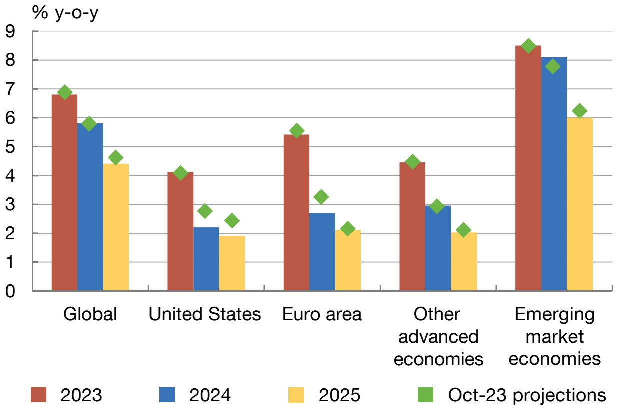


Chart 2
IMF inflation projections (b)



SOURCES: Chicago Board Options Exchange, Factiva DJ, IMF and Banco de España.

- a The chart shows the response to a positive one standard deviation shock in the VIX. The solid (hollow) circles indicate statistical significance at 5% (10%); the unbroken line indicates no statistical significance. The VAR model for Spain includes the following variables: the EPU index, the spread over German 10-year sovereign bonds, year-on-year GDP growth and inflation; the VIX is included as an exogenous variable in the first position, forcing its equation to depend only on its own past values and not on the other lagged variables. For the euro area, the same model is estimated, but considering the spread between German and US bonds as a proxy for the European spread.
- b The bars denote the latest projections (IMF World Economic Outlook Update, January 2024). The diamonds denote the previous projections (IMF World Economic Outlook, October 2023).

In the Middle East, there have been some instances of the tensions spreading across the region. This has notably affected shipping traffic in the Red Sea and caused trade routes to lengthen, primarily those between the Asia-Pacific region and Europe. All this has resulted in longer delivery times for some products and a broad-based increase in shipping costs. The economic impact of these incidents has, for the time being, been limited. However, an escalation of the conflict, particularly one that affects traffic through the Strait of Hormuz, could ultimately disrupt the global economy more severely.

Therefore, the potential remains for the geopolitical tensions to adversely impact trade in energy and other commodities, and freight traffic more generally, and to trigger sharp falls in the prices of risky financial assets. As Box 1.1 discusses in more detail, these tensions, insofar as they translate into greater economic uncertainty, could have a significant impact on activity (see Chart 1). However, for the time being there have been no signs of a significant materialisation of these risks.

In particular, natural gas prices have fallen considerably since October 2023, while oil prices are at relatively contained levels, despite rising since early December 2023. Gas prices stand well below the levels observed before the Russian invasion of Ukraine began, while oil prices stand at somewhat higher levels. Developments in global energy demand, increased fracking and greater oil production in non-OPEC+ countries appear to have contributed to this price containment.

In addition, a full analysis of the geopolitical risks requires continued close monitoring of the tensions between China and the United States, which have very significant ramifications for the entire Asia-Pacific region and for global trade in technological goods. Several important elections are set to take place around the world in 2024, adding a further layer of uncertainty to the geopolitical context.

The possibility of an intensification of cyber attacks globally also remains a specific risk. This FSR includes a special feature on the bank-level and systemic implications of cyber risk, and the European and global regulatory and supervisory initiatives to protect the financial system against them.

R2. Higher and more persistent inflation

Euro area inflation eased markedly in the last 12 months, recording a year-on-year rate[2] of 2.4% in March 2024, down from 6.9% in March 2023. This decline, which was sharper than anticipated last autumn, can be attributed not only to the decrease in energy prices, but also to lower underlying inflation[3] (2.9% in March 2024 compared with 5.7% a year earlier), largely reflecting the monetary policy tightening and the easing of supply chain tensions. Services sector inflation has shown more downward stickiness than that of non-energy industrial goods, just as it displayed greater upward stickiness during the period of inflationary pressures.

In line with the previous FSR, central banks' forecasts continue to point to a gradual easing of inflation to around 2% in the medium term, both in the euro area as a whole and in Spain. However, this target would now be reached in 2025, while in 2024 the disinflation process would be somewhat slower due to (i) the disappearance of the benign energy-related base effects and some of the temporary fiscal measures introduced to soften the impact of surging energy and food prices on the shopping basket, and (ii) the greater historical persistence of services inflation.

For these projections, geopolitical factors remain a significant source of upside inflation risk, mainly due to their potential impact on energy prices, but also on other commodities such as food. They could also have a bearing on freight costs and trade and financial fragmentation. However, as noted above, energy prices have not yet been strained despite the adverse political and military developments in the Middle East.

Labour markets in the euro area remain very buoyant, with a low level of slack, and wages continue to see robust growth, enabling workers to gradually recover the purchasing power they lost in previous years. This dynamic is expected to continue over the coming years. A larger wage increase than expected on the basis of current trends continues to be a source of upside risk to inflation.

Conversely, the materialisation of downside risks to growth, amid persistent signs of weak global demand, or a potentially greater monetary policy impact could lead to inflation being lower than projected. Overall, the risks to inflation appear balanced.

Since the last FSR, the Governing Council of the European Central Bank (ECB) has kept the key interest rates unchanged, albeit stressing in its statements the sound developments in headline

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[2] Growth in the Harmonised Index of Consumer Prices.

[3] Excluding the energy, food, alcohol and tobacco components.

Chart 3
Expectations about short and long-term interest rates (a) (b)

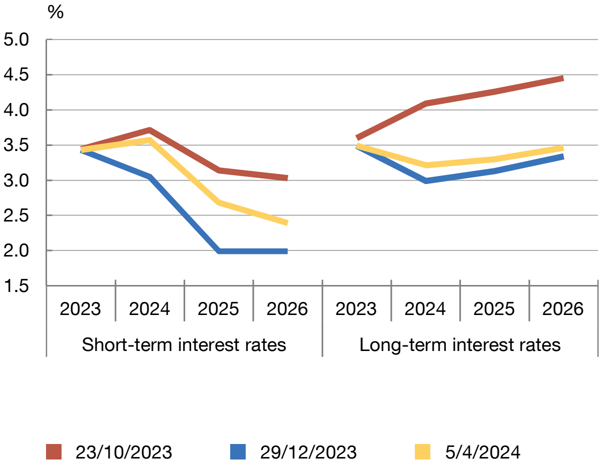
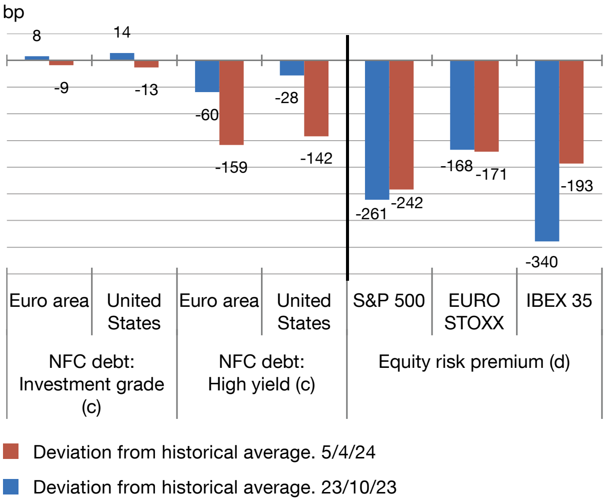


Chart 4
Risk premia (b)



SOURCES: ECB, Refinitiv Datastream and Banco de España.

a For the projection period, the figures are technical assumptions, prepared following the Eurosystem's methodology. These assumptions are based on futures market prices or on proxies thereof and should not be interpreted as a Eurosystem prediction as to the path of these variables.
b The date 23/10/23 refers to the cut-off date for the last FSR.
c Spreads against the swap curve of the ICE Bank of America Merrill Lynch indices. The historical average refers to the period 1998-2024, and is 78 basis points (bp) for euro area investment-grade bonds, 131 bp for US investment-grade bonds, 452 bp for euro area high-yield bonds and 444 bp for US high-yield bonds
d The equity risk premium is calculated using a two-step dividend discount model (Russell J. Fuller and Chi-Cheng Hsia. (1984). "A simplified common stock valuation model". *Financial Analysts Journal,* 40(5), pp. 49-56). The historical average refers to the period 2006-2024, and is 494 bp for the S&P 500, 658 bp for the EURO STOXX and 781 bp for the IBEX 35.

and underlying inflation and the strength of monetary policy transmission. The markets anticipate a cut in euro area interest rates in June and three or four over the course of 2024.

This scenario of falling inflation is being witnessed in economies across the world (see Chart 2). Specifically, inflation expectations for the United States are already around 2% for 2024, in turn strengthening expectations of a cut to its current monetary policy rates. Given this country's key position in the global financial system, such a shift in its monetary policy would be conducive to some easing of global financial conditions. However, the United States continues to post stronger GDP growth than other advanced economies, driven by its expansionary fiscal policy, and the latest inflation data contain some upward surprises, against a backdrop in which the unemployment rate remains at very low levels. Thus, there are still some risks to inflation in the United States.

Meanwhile, weaker growth in China, linked to some extent to difficulties in its property market, could help lower inflation in other economies through various financial and trade channels. Specifically, a sharper slowdown in this country's economy would dampen global demand for commodities and ease pressure on their prices.

Financial market expectations of the future paths of interest rates have adjusted downwards since the last FSR (see Chart 3), which is consistent with the receding inflation pressures. However, more recent developments show expectations of interest rate cuts reversing partially (see Chart 3).

R3. Greater risk aversion among economic agents

Equity and corporate risk premia are at historically low levels and have even declined for some asset classes since the last FSR was published (see Chart 4). Risk aversion is at very reduced levels in the financial markets,[4] despite elevated geopolitical uncertainty and expectations of low global economic growth.

Thus, the continuing misalignment of risky-asset valuations and the macroeconomic fundamentals also increases the likelihood of agents becoming more risk averse. This could amplify any further tightening of financing costs and incentivise agents to postpone or cut back their consumption and investment plans. Higher risk premia would not only affect traded financial instruments, but could also impinge on the supply of bank credit.

The main trigger for such a risk materialising would be a potential shift towards a more negative perception of the future course of growth and inflation among agents. As discussed in the last FSR, the existence of high asset valuations in the current uncertain environment could render these perceptions more fragile to shocks of different magnitudes, and lead to sharper and larger corrections if they turn more pessimistic. Although there are clearer signs of high valuations in the United States than in the other advanced economies, any potential price correction in its financial markets would foreseeably affect other economies owing to the high degree of global interconnectedness.

In these more adverse scenarios, the possibility of fire sales by some financial intermediaries, such as international open-ended investment funds, with illiquid or highly leveraged positions could prompt larger falls in prices for some assets.

R4. Downside risk to economic growth

Since the last FSR was published, growth in global economic activity has been more buoyant than expected, with the upward surprises concentrated in the United States, China and some emerging economies. In 2024 Q1 the outlook for manufacturing activity improved worldwide, except in the euro area, while the services sector also saw a slight recovery in the main economic areas (see Chart 5).

Economic activity in the euro area remained weak in 2023 H2. A gradual recovery is expected in 2024, albeit one slower than envisaged last autumn, with growth projected to remain at low levels in the medium term. Some of the main euro area economies contracted or posted low growth in 2023 (-0.3% in Germany and 0.9% in France), and are not expected to see any marked acceleration in economic activity in 2024.

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[4] For the purposes of this analysis, the term “risk aversion” is used in its broad sense, i.e. as the reduced willingness of agents to assume risk, owing to a more pessimistic assessment of the future probability of adverse macro-financial scenarios or a lower preference for (or a higher cost of) decisions that may generate losses. A strict definition referring exclusively to agents’ preferences has not been applied.

Chart 5
Economic activity (a)

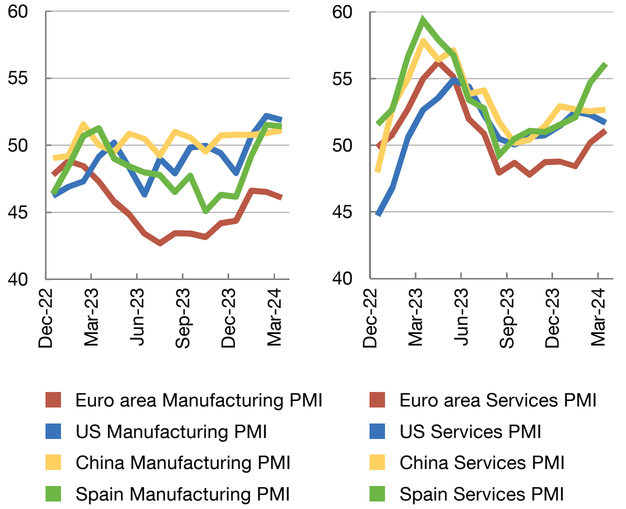
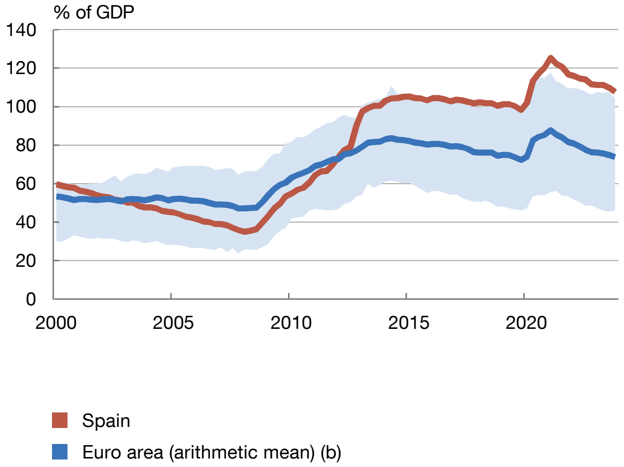


Chart 6
Spanish government debt in the European context



SOURCES: National statistics, IGAE, S&P Global and Banco de España.

a The purchasing managers' index (PMI) is a survey-based qualitative indicator that captures the change in economic activity with respect to the previous month, indicating an increase (decrease) when the value is above (below) 50.
b The blue shaded area represents the interquartile range of the distribution of government debt ratios in the euro area.

Spain posted GDP growth of 2.5% in 2023, a significantly higher rate than the euro area average of 0.4% and outstripping expectations. The factors underpinning this growth include the favourable developments in external demand and household income, with the latter linked to job creation (which has been a major factor in the strong increase observed in immigration) and the recovery in real wages. The latest information points to a slight moderation in 2024 Q1, amid weak economic activity among Spain's main trading partners. Nevertheless, growth is expected to hold above its potential in 2024-2026.

As with the global economy, the risks to GDP growth in Spain remain on the downside. The main source of uncertainty continues to be a potential heightening of the global geopolitical tensions outlined above.

In addition, the downturn in China's real estate market remains a global concern. An abrupt slowdown in this economy could reduce growth in the other main economies, particularly through the trade channel, and increase uncertainty about international economic developments, which could affect the global financial markets.

In this context, the main vulnerabilities[5] of the Spanish economy and financial system include:

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[5] In this report, vulnerabilities are defined as economic and financial conditions that increase the impact or probability of materialisation of risks to financial stability.

V1. High level of government debt

The budget deficit in Spain stood at 3.6% of GDP in 2023, 1.1 percentage points (pp) less than in 2022. The government debt ratio declined by nearly 4 pp, to 107.7% of GDP, underpinned by strong nominal GDP growth. This level of government debt is significantly below the peak reached after the pandemic began (125.3% in March 2021), but remains above its pre-pandemic level (98.2% in December 2019) and is high compared with other euro area countries (see Chart 6).

The average cost of new debt issuance in 2023 was 3.4%, up 2.1 pp on its 2022 level, with the increase being particularly concentrated in shorter-term instruments. However, the average cost of more recent issuances (3.3% in February 2024) remains below the peak of 2023 (3.9% in October), reflecting expectations of a reduction in monetary policy rates.

The higher cost of new issuance is only passing through gradually to the average cost of Spanish government debt for two reasons: (i) its long average term to maturity (close to eight years) and (ii) the debt currently maturing was issued a decade ago at much higher rates than the current ones. The lower interest accrued on inflation-linked bonds also partly offset the impact of the costlier new issuance last year. Specifically, since 2021 the average cost of outstanding Spanish government debt has increased by only 0.4 pp, to 2.3%.

In the absence of the consolidation measures required to comply with the new European fiscal rules, the Banco de España's projections continue to envisage a moderately upward path for the average cost and level of government debt over the coming years. Thus, the average cost would rise by approximately 0.3 pp over the next three years, to 2.6% in 2026. In addition to the higher debt burden, there will be other upward pressures on government spending, driven by factors such as population ageing, climate change-related investment needs, digitalisation and defence spending. The government debt ratio would therefore increase by 0.7 pp, to stand at 108.4% of GDP in 2026.

On the basis of these expectations, government debt remains a significant vulnerability for the Spanish economy. The limited fiscal space may make it difficult to absorb fresh shocks – whether real or financial – to the Spanish economy. High government debt may also render issuance costs more sensitive to changes in the policy interest rate expectations and risk perception of the financial markets.

In light of the foregoing, and also taking into account the cyclical position of the Spanish economy, a fiscal consolidation process must get under way in 2024 and be designed to boost the economy's potential growth as much as possible. In this respect, strict compliance with the new EU fiscal rules is a sound foundation upon which to base such process.

V2. Financial weakness of households and non-financial corporations

Following growth in earlier quarters, non-financial corporations' (NFCs) earnings stabilised in 2023 H2. Higher turnover and increased profit margins contributed to the growth in earnings in 2023.

With regard to profit margins, higher wage growth was offset by a moderation of other production costs (energy, other commodities, etc.). Earnings growth was broad-based across sectors.

Spanish firms also continued the strong deleveraging process in 2023, reducing their total financing (loans plus debt securities and including external financing) by slightly more than 1% year-on-year in February 2024. This was partially driven by the repayment of outstanding loans, such as those obtained during the pandemic under the Spanish Government's public guarantee scheme. Deleveraging and income growth reduced NFCs' debt ratio to 65% of GDP in December 2023, down 6.4 pp from its end-2022 level. This is the lowest level observed for this ratio in Spain since 2002 and is almost 3 pp below the euro area average (see the left-hand panel of Chart 7).

Despite the positive performance of corporate earnings and the deleveraging, higher interest rates continue to exert upward pressure on the average cost of debt and debt burden of NFCs. Specifically, in December 2023 the debt service ratio (interest expenses as a percentage of gross operating surplus) stood at 16.3%, up 7.3 pp and 9.8 pp from its December 2022 and December 2021 levels, respectively (see the right-hand panel of Chart 7). Meanwhile, the percentage of firms under high financial pressure, i.e. that were unable to cover their interest payments with their gross operating profit, increased moderately in 2023 according to the simulations performed by the Banco de España.[6]

The decline in reference interest rates since end-2023 and the expectations of further reductions in 2024 could lead to downward revisions to the interest rates on floating-rate business loans, which account for around 70% of total lending to the sector. Nevertheless, in 2024 interest rates would remain at considerably higher levels than those prevailing before the monetary tightening cycle, meaning that financial pressure will not be eased entirely.

Turning to households, growth in employment and wages in 2023 H2 continued to underpin the increase in their income. In 2023 as a whole, average real household gross disposable income (GDI) grew by around 5.5%, although it remained 1.1% below its pre-pandemic level. This increase, together with the sector's deleveraging, reduced households' debt ratio to 47% of GDP in December 2023, some 5.5 pp below its 2022 Q4 level. This is the lowest level observed for this ratio since 2002 (see the left-hand panel of Chart 7) and is also 4 pp below the European average.

Despite these favourable developments in households' indebtedness, those with floating-rate debt continued to see their interest expenses rise to end-2023. Such expenses were, however, largely offset by income growth, resulting in households' aggregate debt burden ratio only increasing by 1.1 pp in 2023, to stand at 3.2% in December 2023 (see the right-hand panel of Chart 7).

Income growth also curbed the increase in the proportion of households with a high gross debt burden (over 40% of household income). According to the simulations conducted by the Banco

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[6] See Chapter 1 of this report and Banco de España. (2024). "Box 2. The impact of interest rate hikes on firms' financial pressure". *Report on the Financial Situation of Households and Firms - Banco de España,* second half of 2023.

Chart 7
Debt ratio and interest expenses of households and NFCs

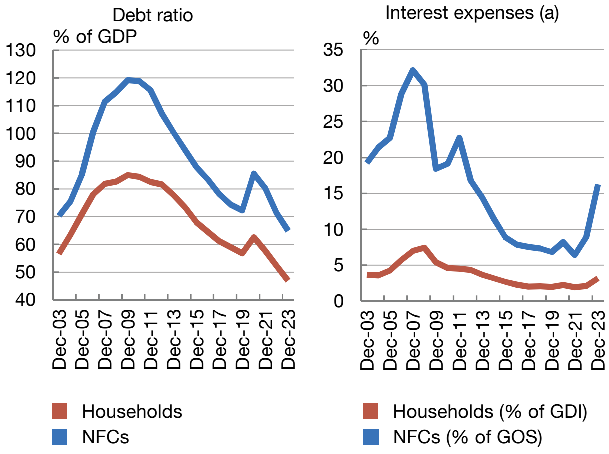
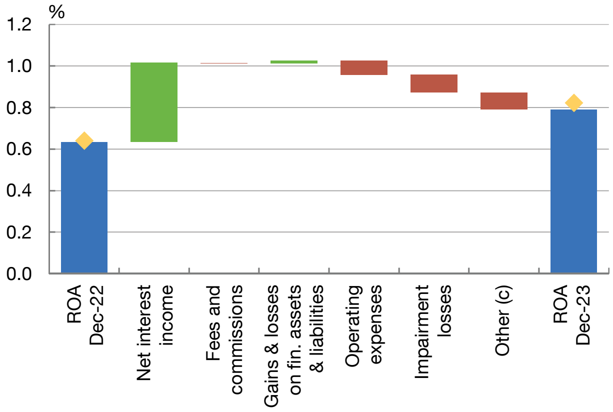


Chart 8
Breakdown of the change in bank profit.
Consolidated net profit as a percentage of ATAs (b)



SOURCE: Banco de España.

a Interest expenses are quarterly and are neither seasonally adjusted or adjusted for the allocation of financial intermediation services indirectly measured (FISIM). GDI and gross operating surplus (GOS) are quarterly and seasonally adjusted.

b The red (green) colour of the bars denotes a negative (positive) contribution of the corresponding item to the change in consolidated profit in December 2023 compared with December 2022. The yellow diamonds denote the ROA excluding the extraordinary losses in 2022 from the purchase of offices by a bank (-€0.2 billion) and the impact of the temporary levy on the banking sector in 2023 (-€1.3 billion).

c Includes, among other items, the extraordinary losses and the temporary levy on the banking sector mentioned in the previous note.

de España,[7] the percentage of indebted households in a vulnerable financial position only rose by 0.7 pp between 2020 and 2023 Q3, to 11.2%. The effect of inflation on consumer staples – food and energy – exerted further pressure on households' ability to cover their interest payments.

As with NFCs, the policy interest rate hikes had passed through virtually in full to the average cost of Spanish households' outstanding loans at end-2023. Similarly, the decline in the reference interest rates since October and the further decrease expected by the markets will bring down the related interest costs in 2024, particularly for floating-rate mortgages.[8] In any event, in 2024 reference interest rates will foreseeably be significantly higher than before the monetary tightening cycle, which will keep the cost of new credit and of rollovers at a relatively high level for households.

Lastly, households' use of Codes of Good Practice[9] remains limited, which is consistent with their financial resilience described above.

V3. Weaknesses in the financial sector's intermediation capacity

Spanish banking sector profits grew significantly in 2023, confirming the positive performance observed in the first half of the year. Overall, return on assets (ROA) and return on equity (ROE) stood at 0.8% and 12.4%, 15 bp and 230 bp, respectively, higher than at end-2022.

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[7] Based on the granular data from the Spanish Survey of Household Finances, whose latest wave refers to 2020. The simulation is based on aggregate interest rate and GDI developments, applied to these granular data.

[8] Floating-rate mortgages accounted for approximately 65% of mortgage lending to households at end-2023.

[9] See the Special Feature on the Codes of Good Practice in the Spring 2023 FSR.

The main driver of banking profits is rooted in the growth of net interest income (see Chart 8), which rose by 22.4% in 2023, fundamentally underpinned by wider net interest margins. Banks' cost of liabilities increased in 2023 by 1.4 pp (only 0.3 pp of which correspond to 2023 H2) and stood around 2.6% at the consolidated level. However, monetary policy tightening has continued to be passed through to lending rates more forcefully than to deposit rates, thereby buoying growth in net interest margins.

As things stand in the current interest rate hiking cycle, further growth in net interest income via the pass-through of policy rate rises is unlikely. Indeed, the latest data show a flattening in interest rate increases on new loans in Spain, with slight falls in some segments. In addition, both US and European banks have seen a levelling off in the contribution of net interest income to ROA.

However, some headroom appears to still exist for Spanish banks' deposit rates since, although there are expectations of a moderation in the reference rates for 2024, they will likely remain above the average deposit rate. Given this situation, the replacement of sight deposits with term deposits may continue, as may the shift away from bank deposits to investment funds and public debt, as investor seek higher returns.

In any event, deposits from the private non-financial sector grew by close to 1.5% at the consolidated level in 2023 and by 0.3% for business in Spain. Spanish banks also maintained a comfortable liquidity position at the end of 2023, with a liquidity coverage ratio of 186.3%, almost 8 pp higher than at end-2022.

Bank fees and commissions grew much more moderately than net interest income, at an annual rate of 2.2%, while there was a downturn in other income statement headings in 2023, as foreseen on the basis of data from 2023 H1. Operating costs have risen in the current inflationary environment, as have impairment losses. The effect of the levy on banks' operations in Spain (which amounted to 3.9% of consolidated net profit) was one of the factors that weighed on consolidated net profit.

Impairment losses rose by 22.9% year-on-year at consolidated level, and also grew, albeit to a lesser extent, in business in Spain. Here, the increase in impairment losses was not observed until 2023 H2, which is consistent with the worse performance of credit quality in Spain.

Specifically, the non-performing loan (NPL) ratio for lending to households in Spain increased slightly (by 14 bp) in 2023 to 2.9%, and the ratio of Stage 2 loans rose from 5.5% to 6.1% (see Chart 9). Improvements in credit quality in the non-financial corporate sector meant that the NPL ratio of the resident private sector in Spain remained essentially stable in 2023, at 3.4%.

Despite strong profits in 2023, the banking sector has not seen a significant increase in its solvency: the CET1 capital ratio held steady over the last year, standing at 13.2% in December

2023, 17 bp above its 2022 level. However, the gap between that of the Spanish banking system and the EU average has widened to 3.3 pp.

The most recent stress tests carried out on the Spanish banking sector show a high aggregate loss-absorbing capacity.[10] However, in an environment where uncertainty remains high, banks are still recommended to use some of the current improvement in profitability to buttress their capacity to absorb future losses via provisioning and capital policies.

Lastly, as noted above, some concerns remain internationally about the vulnerabilities of some non-bank financial intermediaries (NBFIs) (e.g. open-ended investment funds) regarding their tight liquidity positions and high degree of leverage. The NBFI sector's growth means that it is increasingly important for financial stability monitoring purposes.

Real estate market developments

The acceleration in housing prices seen during the first three quarters of 2023 slowed somewhat towards the end of the year. As a result, house prices rose by 4.2% year-on-year in Q4, 0.6 pp above the average of the first two quarters of the year, but 0.3 pp below the figure seen three months earlier. The average of house price imbalance indicators increased slightly in 2023 H2, remaining positive, but near neutral levels.

House sales rallied somewhat in late 2023, with seasonally adjusted quarter-on-quarter growth slightly above 3% in Q4, breaking with the previously observed downward trend. For 2023 as a whole, their cumulative decline from 2022 reached 11%, although they were still 12% above pre-pandemic levels. The flow of new lending followed a pattern comparable to that of housing sales, with marked declines over the year, but a slowdown in the declines in 2023 Q4. If this improvement in activity indicators continues, house prices could show similar behaviour in the coming quarters.

The commercial real estate sector remains relatively sluggish, both in terms of prices and sales, although no sudden corrections were seen in 2023.

Despite the levelling out of the contractionary trend observed in the housing market in 2023 H1, it is necessary to increase monitoring of the banking sector's real estate exposures in order to better detect the potential build-up of risks and better measure the impact of their potential materialisation. This FSR analyses construction and real estate activities firms' ability to pay their bank debt and the impact on banks' solvency of the materialisation of risks in the wider real estate sector. The gradual reduction of Spanish banks' real estate exposures since the global financial crisis limits the estimated impact of real estate shocks

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[10] The latest stress tests reveal the adequate aggregate resilience of the Spanish banking sector, but they also show a reduction in its CET1 solvency ratio of more than 2 pp in adverse scenarios. See Chapter 2 and Box 2.1 of the Autumn 2023 FSR of the Banco de España for a summary of the results for Spanish banks in the Forward Looking Exercise on Spanish Banks and in the European Banking Authority's 2023 tests.

Chart 9
Share of lending classified as non-performing and in Stage 2. December of each year. Business in Spain. ID

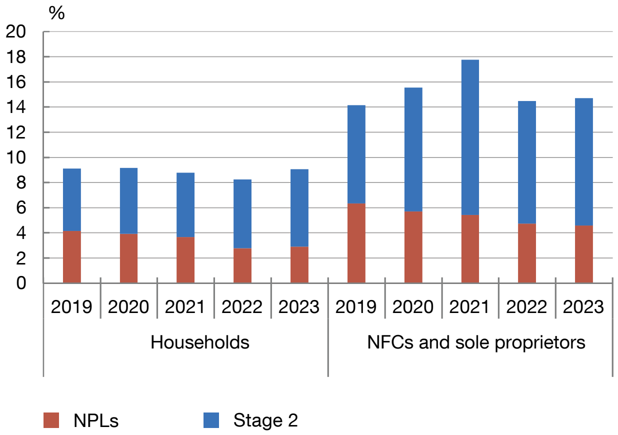
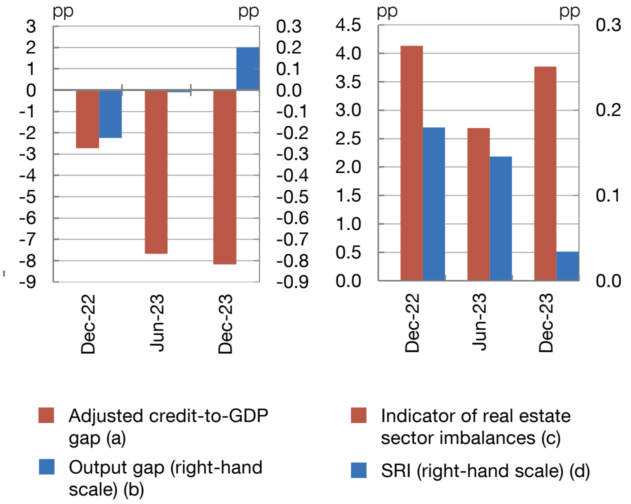


Chart 10
Macroprudential indicators



SOURCE: Banco de España.

a The credit-to-GDP gap is calculated as the percentage point difference between the observed ratio and its long-term trend calculated by applying a one-sided statistical Hodrick-Prescott filter with a smoothing parameter of 25,000. This parameter is calibrated to the financial cycles historically observed in Spain. See Jorge E. Galán. (2019). "Measuring credit-to-GDP gaps. The Hodrick-Prescott filter revisited". Documentos Ocasionales, 1906, Banco de España.

b The output gap represents the percentage difference between observed GDP and its quarterly potential level. Values calculated at constant 2010 prices. See Pilar Cuadrado and Enrique Moral-Benito. (2016). "Potential growth of the Spanish economy". Documentos Ocasionales, 1603, Banco de España.

c The indicator of real estate sector imbalances represents the average value of four indicators of house price imbalances: (i) the real house price gap; (ii) the house price-to-household disposable income ratio gap; (iii) the ordinary least squares (OLS) model that estimates house prices based on long-term trends in household disposable income and mortgage rates; and (iv) the error correction model that estimates house prices based on household disposable income, mortgage rates and fiscal effects. The long-term trends for indicators (i) to (iii) are calculated using a statistical one-sided Hodrick-Prescott filter with a smoothing parameter equal to 400,000. All four indicators have an equilibrium value of zero.

d The systemic risk indicator (SRI) aggregates 12 individual stress indicators (including volatilities, interest rate spreads and maximum historical losses) from four segments of the Spanish financial system. The effect of cross-correlations is taken into account to calculate the SRI, such that it registers higher values when the correlation between the four markets is high and lower values when the correlation is low or negative. For a detailed explanation of this indicator, see Box 1.1 of the May 2013 FSR.

on them, but it remains a significant channel to be analysed as part of the supervisory function.

In view of the above, and also taking into account the absence of signs of easing lending standards for mortgages, the real estate sector remains absent from the list of vulnerabilities, but it is essential that a potential accumulation of risk in this market is carefully monitored.

Macroprudential policy stance

The decline of the credit-to-GDP gap has slowed, as the continuing deleveraging of the banking sector results in lower estimates of its long-term trend. This gap fell in 2023 H2, albeit less so than in early 2023 and is still significantly below zero, against the backdrop of a further contraction in lending and rising nominal output. The output gap remained at a neutral level and the contemporaneous financial market indicators show no signs of stress.

Overall, since the publication of the last FSR, developments in the various macro-financial indicators have tended to be still contractionary in the case of lending, neutral in the case of output, and somewhat more expansionary in the real estate or wholesale financial markets (see Chart 10).

Consequently, the countercyclical capital buffer currently remains at 0% and no other macroprudential measures have been activated.

1

RISKS LINKED TO THE MACRO-FINANCIAL ENVIRONMENT

1 RISKS LINKED TO THE MACRO-FINANCIAL ENVIRONMENT

Despite the geopolitical tensions and tight monetary policy stance, the global growth outlook for 2024 has been revised upwards somewhat since last autumn, owing mainly to the impact of certain positive surprises in the United States. In any event, a moderate slowdown compared with last year is expected. In addition, some regions, the euro area in particular, have shown greater weakness and their outlook has deteriorated.

The main pockets of uncertainty relate to the course of geopolitical tensions, the correction in China's real estate market and the country's general economic performance, and developments in US financial conditions amid a still robust labour market. In emerging markets, the main risks to financial stability stem from the external environment, with persisting vulnerabilities in some of the economies to which the Spanish banking system is significantly exposed.

The Spanish economy showed robust growth in 2023, which prompted an upward revision to the outlook for 2024, although a gradual slowdown is expected. In any event, the projections continue to be surrounded by high levels of uncertainty, with downside risks to activity related to global economic developments and the aforementioned geopolitical tensions.

Over the last six months, financial market expectations of changes in the direction of monetary policy in the advanced economies have led to a drop in short-term and long-term interest rates, helping to drive up financial asset prices. Risk premia have also decreased in some asset classes and, broadly speaking, are holding at historically low levels. In any event, interest rate expectations have been revised upwards since the beginning of the year, especially in the United States, where the markets expect somewhat smaller policy rate cuts than anticipated six months ago.

Prices in the Spanish residential real estate market slowed somewhat towards the end of last year, but demand-side pressures persist due to a higher number of households, the entry of foreign buyers and a recovery in tourism. Commercial real estate prices have remained stable, except in prime areas where prices have fallen.

Both households and non-financial corporations (NFCs) have continued to bear rising interest expenses, but resilient employment and the improvement in incomes and profits continue to mitigate the materialisation of financial risks. Marked deleveraging continues in both segments.

The economy's nominal growth has also helped reduce the budget deficit and external imbalances. However, government indebtedness remains high, as does the structural budget deficit, which constitutes a source of vulnerability amid mounting pressures on government spending, not only as a result of the higher interest rate environment, but also due to structural phenomena such as population ageing, climate change and higher defence spending prompted by geopolitical tensions.

1.1 Macroeconomic environment

1.1.1 Systemic and material countries

Global economic activity grew more robustly than expected in the final stretch of 2023 and early 2024. In this period, the positive surprises were concentrated in the United States, China and some emerging economies (see Chart 1.1.a). This improvement in activity is largely attributable to the gradual unwinding of global production chain bottlenecks and falling energy commodity prices. These developments, together with strong employment, a recovery in household purchasing power, continued fiscal support measures and, in some cases, use of the savings buffer built up during the pandemic, explain the robust private consumption seen globally. The growth outlook for 2024 has been revised upwards somewhat in recent months, but still points to a moderate slowdown compared with last year.

In the euro area, recent developments in activity indicators suggest that the weakness observed in 2023 H2 persists. During that period, activity was weighed down by the lagged effects of high energy prices and the tightening of financial conditions, which affected the manufacturing sector in particular. The economic outlook for the euro area points to a slow and gradual recovery, driven by a progressive improvement in agents' confidence and in real disposable income. All told, growth will foreseeably remain very subdued in both the short and medium term.

Global inflation has been on a declining path in the recent period. The fall in headline inflation rates, against a backdrop of tight monetary policy, has been accentuated by falling energy prices in recent months, while underlying inflation, which has proven more persistent, shows clear signs of containment (see Chart 1.1.b). Inflation expectations remain anchored thanks to the absence of significant second-round effects. Looking ahead, the recent trends are expected to continue over the coming quarters. However, the ongoing disinflation process is not without risks, in particular those related to a potential deterioration in the geopolitical situation that might prompt commodity price spikes or the re-emergence of bottlenecks.

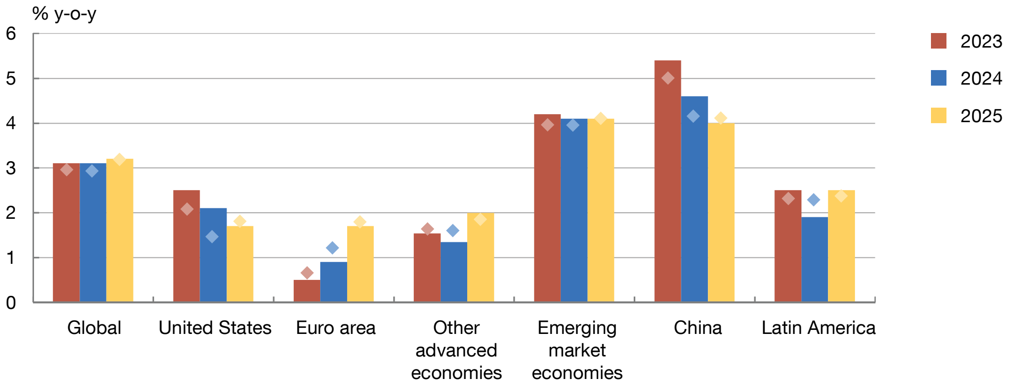
The risks to global economic activity now appear more balanced, but factors tilting them to the downside persist. These risks again include those stemming from geopolitical tensions, which have heightened in recent months due to the conflict in the Middle East and the attacks in the Red Sea, whose duration and scope remain uncertain. The materialisation of these risks could lead to higher commodity prices and transport costs, more bottlenecks and greater trade and financial fragmentation, which would adversely affect global activity and inflation. Several important elections are also set to take place in 2024, adding an extra layer of difficulty in predicting the course of this geopolitical context. Box 1.1 analyses more closely developments in the uncertainty indicators and their potential economic impact.

The risks associated with the sharp contraction in the Chinese real estate market remain significant. A case in point is the liquidation in late January of the property development company Evergrande, although no significant spillover to other property developers has been

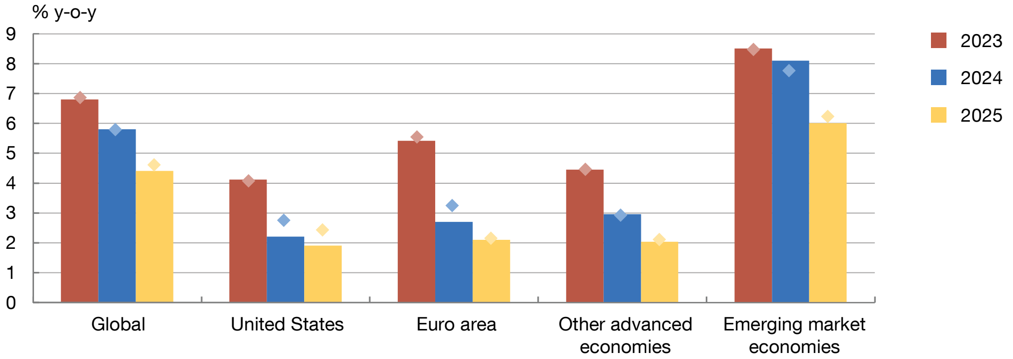
Chart 1.1

Forecasts for the global economy envisage growth stabilising against a backdrop of global disinflation

1.1.a GDP growth forecasts (a)



1.1.b Inflation forecasts (a)



SOURCE: IMF.

a The bars denote the latest forecasts (IMF World Economic Outlook Update, January 2024). The diamonds denote the previous projections (IMF World Economic Outlook, October 2023).

recorded for the time being. An abrupt slowdown in China would pose a downside risk to growth in the main world economies – which would be affected via the trade channel and through heightened uncertainty, with potential effects on global financial markets – but also a downside risk to inflation due to lower demand for commodities and industrial goods.[1] Several agencies have lowered their ratings outlook, underscoring the current concerns over developments in the Chinese economy.

Global financial conditions could also be tightened owing to rising long-term interest rates. In particular, this could stem from the deteriorating fiscal outlook in some systemic economies, such as the United States, or increased risk in the commercial real estate sectors of some advanced economies.

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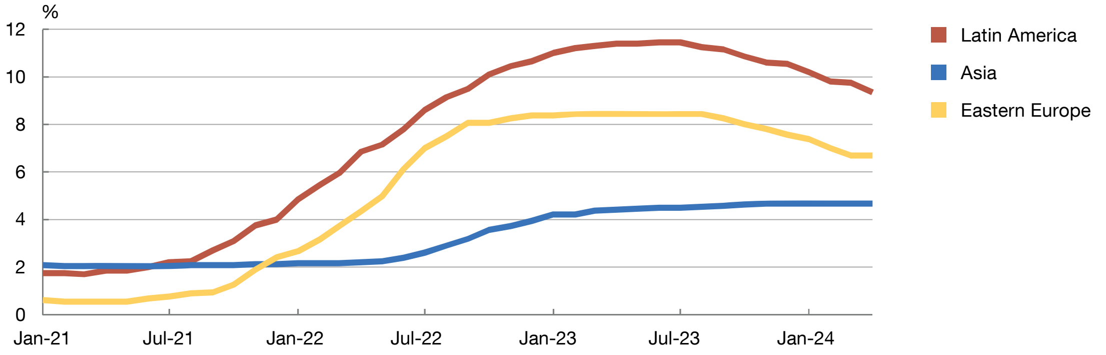
[1] Irma Alonso, Daniel Santabárbara and Marta Suárez-Varela. (2023). "The potential global effects and transmission channels of a slowdown in Chinese growth". *Economic Bulletin* - Banco de España, 2023/Q4, 06.

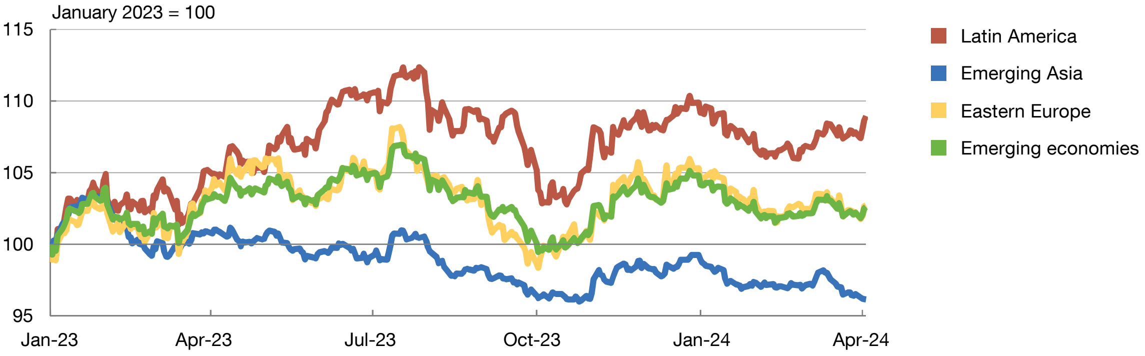
Chart 1.2

The start of the monetary easing cycle in some emerging market economies has not, as yet, prompted a marked depreciation of their currencies

1.2.a Policy rates in emerging market economies (a)



1.2.b Exchange rates against the dollar (a) (b)



SOURCES: Refinitiv and national statistics.

a “Latin America” is the average of Brazil, Mexico, Chile, Colombia and Peru. “Emerging Asia” is the average of India, Indonesia, South Korea, Thailand, the Philippines and Malaysia. “Eastern Europe” is the average of the Czech Republic, Hungary, Poland and Romania (in Chart 1.2.a) and also Bulgaria (in Chart 1.2.b). The “Emerging economies” aggregate is the average of the regions shown.

b An increase denotes appreciation against the dollar. Average of the three regions shown.

Broadly speaking, emerging economies have proven more resilient than expected. Inflation has eased towards rates more in line with central banks’ targets, allowing the monetary easing cycle to get under way in most emerging countries (see Chart 1.2.a). This pattern is expected to continue over the coming quarters and to spread to other central banks, with notable exceptions such as Türkiye and Argentina, which still face significant inflationary pressures.

Emerging financial markets also performed relatively well over the last six months. In general terms, Latin American markets again outperformed those of other emerging regions (see Chart 1.2.b), thanks to the higher profitability of carry trades[2] and their greater distance from today’s global geopolitical conflicts.

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[2] Where an investor borrows in a currency with lower interest rates and invests in a financial asset denominated in a higher-interest currency, in this case a Latin American one. This strategy entails exchange rate risk, among others.

The main risks to financial stability in emerging economies stem from the external environment. For instance, tighter than expected monetary policy in the United States could lead to capital outflows, exchange rate depreciation and higher risk premia. Similarly, lower than expected growth in China would reduce its external demand, which would lead to lower commodity prices for commodity-exporting economies.

On the domestic front, the main risks for these economies relate to more persistent inflation and fiscal vulnerabilities in some countries. Some of the countries still face idiosyncratic risks arising from domestic political tensions and economic policy uncertainty, with multiple elections set to take place in 2024. Below is a brief overview of the main vulnerabilities of the three emerging market economies to which the Spanish banking system is most exposed.

In Mexico, underlying inflation remains high. The economy showed signs of a slowdown in 2023 Q4, but the output gap is expected to remain in clearly positive territory.[3] This appears consistent with the Mexican central bank's cautious approach to starting the monetary easing process, doing so later (with its first policy rate cut, of 25 basis points (bp), coming at its March meeting) than other inflation-targeting central banks in the region. Meanwhile, bank lending has continued to accelerate, in particular consumer lending, although the country's banks maintain adequate levels of capital and liquidity.

In Brazil, activity slowed markedly in the second half of the year as a result of weak investment. Inflation is holding above the Brazilian central bank's target, but some price containment factors were observed in certain services (education and health) and energy. The central bank has continued to cut its policy rate, although monetary policy remains in restrictive territory, contributing to a slowdown in bank lending. The country's public debt is very high, standing just below 90% of GDP in 2023 according to International Monetary Fund (IMF) estimates. Reducing this debt would require strict adherence to the new fiscal rules that were recently approved.[4]

In Türkiye, there have been some signs of stabilisation since mid-2023. The Central Bank of the Republic of Türkiye has raised policy rates on nine consecutive occasions, for a cumulative increase of 41.5 percentage points (pp). The most recent increase came in March, when the rate was lifted from 45% to 50%, above previous market expectations. It has also widened the interest corridor and indicated that it would raise rates further if necessary. The outlook for inflation has been declining, although in that same month the year-on-year rate climbed to 68.5%. Moreover, the central bank is providing for a steady and gradual adjustment in the lira exchange rate, while it has made progress towards regulatory simplification and introduced measures to control credit growth. For its part, the Government has raised taxes in order to reduce the budget deficit. The gradual headway towards correcting its macroeconomic imbalances, reflecting a shift in economic policy priorities, has seen Türkiye's country risk indicators (for instance, sovereign spreads and 5-year sovereign CDS spreads) improve significantly since the last FSR was published.

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[3] See page 6 of the *Report on the Latin American economy,* Second half of 2023, Banco de España.

[4] See pages 22 to 25 of the *Report on the Latin American economy,* Second half of 2023, Banco de España.

1.1.2 Spain

The Spanish economy grew at a more moderate pace in early 2024, following the positive surprise in late 2023. Spanish GDP grew by 0.6% in 2023 Q4, up by 0.2 pp on Q3 and slightly more than the 0.3%[5] forecast in the Banco de España's December projection exercise. The most recent data point to activity growth of 0.4% in 2024 Q1, down slightly on three months earlier.[6]

Spain's favourable activity performance in 2023 was underpinned by various factors, notably including the resilience of private consumption. The latter grew despite the cumulative tightening of financing conditions, since the adverse impact of the latter was partly mitigated by improvements in households' real income, driven by the easing of inflation over the course of the year, robust employment and wage growth. Exports also improved, fuelled by the services component, despite global uncertainty and weak demand in several of Spain's main trading partners.[7] Conversely, investment showed a negative performance, especially investment by private agents. The fiscal policy stance appeared slightly contractionary in 2023, amid marked growth in both government consumption[8] and government revenue.

Looking beyond the first quarter, GDP growth rates are expected to hold relatively stable and higher than in the euro area. These will converge over the projection horizon towards rates consistent with the Spanish economy's growth potential. In annual average terms, GDP growth will slow from 2.5% in 2023 to 1.9% in 2024 and 2025, before declining slightly to 1.7% in 2026 (see Chart 1.3.a).

GDP growth will be underpinned by a number of factors over the coming quarters. These include the gradual fading of the adverse impact of monetary policy tightening on activity, the projected population growth, the gradual recovery of the European and global economy and the larger roll-out of NGEU funds.

However, some of the factors underlying the Spanish economy's relative strength during 2023 are expected to lose steam over the course of 2024. For instance, some of

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[5] In addition, between the publication of the Banco de España's December macroeconomic projections and the publication on 26 March of the National Statistics Institute's (INE) revised Quarterly National Accounts (QNA) data for 2023, GDP growth in both the second and third quarter of 2023 was revised upwards by 0.1 pp, more than offsetting the slight downward revision in Q1. In 2023 overall, GDP grew by 2.5% (5.8% in 2022).

[6] For more details, see "Macroeconomic projections for the Spanish economy (2024-2026)". In "Quarterly report and macroeconomic projections for the Spanish economy. March 2024" (in *Economic Bulletin* - Banco de España, 2024/Q1, pp 29-42). These projections were published on 12 March, before the revision of the 2023 QNA series published by the INE on 26 March. That revision entailed no notable changes to the GDP series available at the time of preparing those projections.

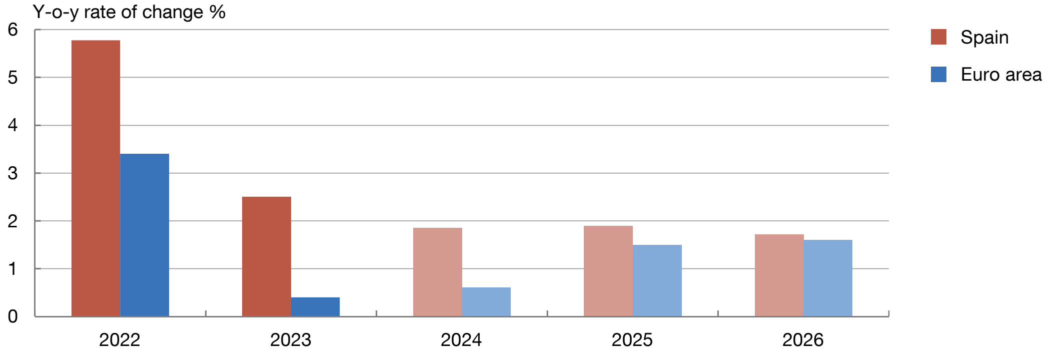
[7] See pages 10 and 13 of the "Quarterly report on the Spanish economy". 2024/Q1.

[8] See page 23 of the "Quarterly report on the Spanish economy". 2024/Q1.

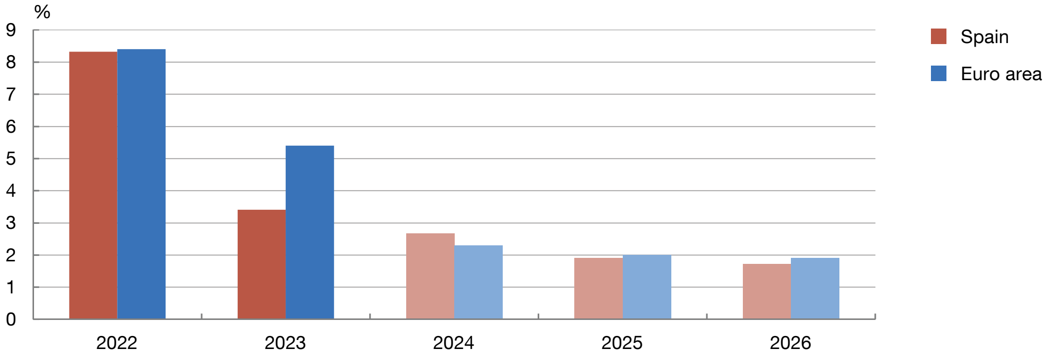
Chart 1.3

Forecasts point to Spanish economic growth moderating in 2024 (albeit holding above the euro area level) and inflation continuing its gradual decline

1.3.a Real GDP. Spain and the euro area (a)



1.3.b Inflation. Spain and the euro area (a)



SOURCES: ECB, Banco de España and INE.

a The faded bars denote the Banco de España and ECB's March 2024 macroeconomic projections for the period 2024-2026. The annual average change in the harmonised index of consumer prices (HICP).

the recent growth tailwinds (such as significant pent-up demand for certain goods and services and the sharp correction of some negative supply shocks that impinged on activity in 2021 and 2022) are expected to peter out. In addition, the persistence of considerable geopolitical tensions may weigh on the pace of activity growth going forward.

The projections envisage a continuation of the disinflationary trend in Spain. Following a slight increase in March, partly due to the partial reversal of the measures aimed at alleviating the effects of the crisis, in the coming months inflation is expected to return to a downward path (see Chart 1.3.b), reflecting a gradual moderation in food and underlying inflation, which will more than offset the increased contribution of the energy component.

The outlook for the Spanish economy under the baseline scenario remains highly uncertain, with risks to activity predominantly on the downside. The risks to inflation are more balanced, with the main downside risk being a stronger than expected slowdown in activity. The primary downside risks to activity stem from the external environment. As discussed in Section 1.1.1, an escalation of various global geopolitical conflicts could bear down on activity and generate greater inflationary pressures, undermining agents' confidence and economic expectations. On the domestic front, the return of the EU-wide fiscal rules (which had been suspended since the onset of the pandemic) is significant. Compliance with these rules will require the implementation of a medium-term fiscal consolidation plan (as discussed in Box 1.2), paving the way for a more pronounced reduction of the structural budget deficit than envisaged in these projections. This would probably mean weaker activity in the short term. In any event, the economic impact will depend on how the consolidation measures are designed.

1.2 Financial markets and the real estate sector

1.2.1 Financial markets[9]

The interbank market

Interbank market rates declined during the last six months amid expectations of policy rate cuts. Over this period, the central banks of the main developed economies have been ending policy rate hikes and holding rates at restrictive levels. In the final stretch of 2023 the markets sharply revised down the expected future path of policy rates, both in the United States and in the euro area. However, those expectations have been revised upwards in the early months of 2024, given the tone of central bank communications and positive surprises in some economic data. Following this back and forth, at the cut-off date for this report markets expect somewhat smaller policy rate cuts in 2024 than anticipated six months ago in the United States and slightly larger cuts in the euro area. Compared with the cut-off date for the previous FSR, the 12-month EURIBOR has decreased by 49 bp to stand at 3.7% in early April (see Chart 1.4.a).

Sovereign and corporate debt

Long-term yields on higher-rated sovereign debt have also declined, marking a shift from the performance observed last autumn. However, these declines were followed by an upward correction in the early months of 2024, in line with the expected path of policy rates. Over the last six months as a whole, the drop in long-term interest rates appears to reflect both the revised monetary policy expectations and a lower term premium. At the cut-off date for this report, yields on ten-year US and German sovereign bonds stood at 4.4% and 2.4%, respectively, down by 47 bp and 46 bp on the cut-off date for the last FSR.

Likewise, sovereign spreads in the main euro area economies have contracted. The drop in long-term risk-free rates, which has a positive bearing on debt sustainability, appears to

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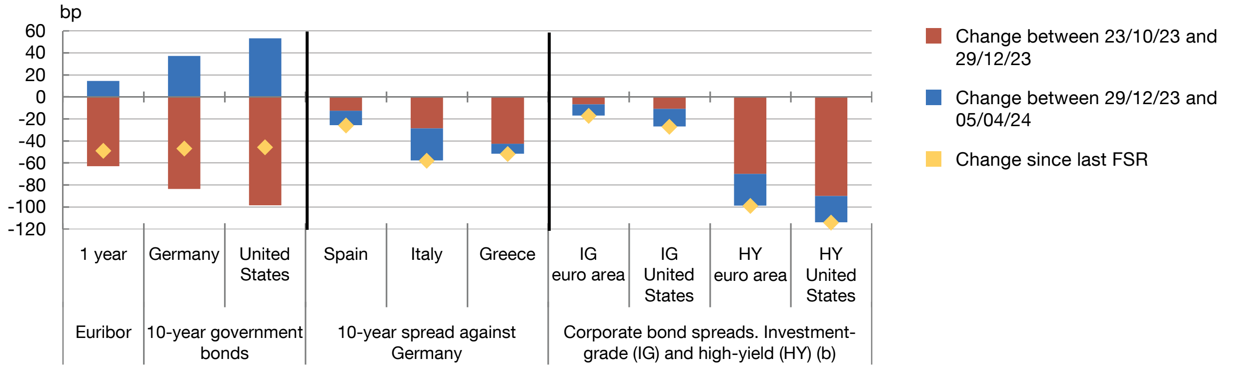
[9] Data cut-off date: 5 April 2024.

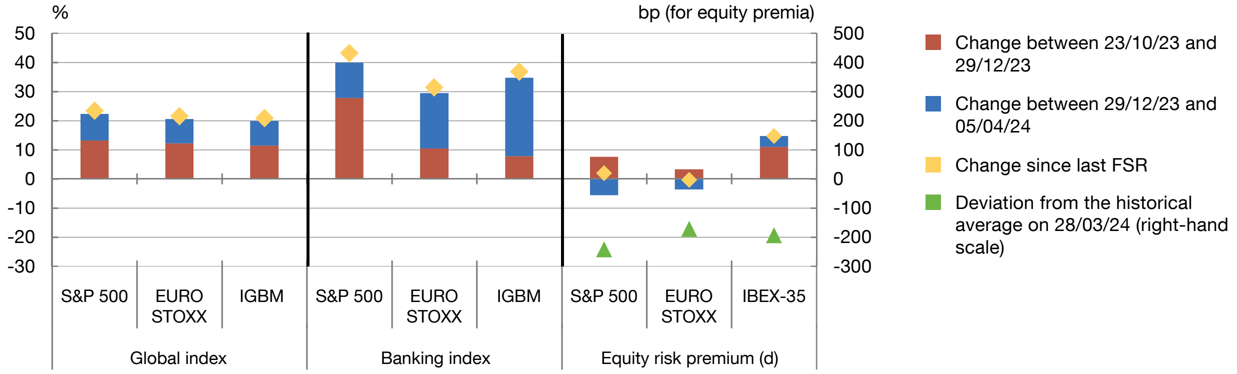
Chart 1.4

Yields on debt assets have declined while stock market prices have risen, amid expectations of lower policy rates, although these expectations partially corrected upwards since the start of 2024

1.4.a Euribor and debt yields (a)



1.4.b Stock market indices and equity premia (a) (c)



SOURCES: Refinitiv Datastream and Banco de España.

a The date 23/10/23 relates to the cut-off date for the last FSR. The cut-off date for this FSR is 05/04/24.
b Spreads over the swap curve of the ICE Bank of America Merrill Lynch indices.
c The change in the equity risk premium is shown on the right-hand scale and uses weekly data.
d The equity risk premium is calculated based on a two-stage dividend discount model (see Russell J. Fuller and Chi-Cheng Hsia. (1984). "A simplified common stock valuation model". Financial Analysts Journal, 40(5), pp. 49-56). The historical average, which refers to the period 2006-2024, is 496 bp for the S&P 500, 658 bp for the EURO STOXX and 781 bp for the IBEX-35.

have fuelled the narrowing of euro area sovereign spreads against the German benchmark, especially for those countries with higher government debt. For instance, the declines in sovereign risk premia were particularly marked in Italy and Greece, with cumulative falls of 58 bp and 52 bp, respectively, since the cut-off date for the previous FSR. The drop was likely also supported by the sovereign credit rating upgrades for these countries,[10] along with specific factors related to the German bond.[11] Spain's yield spread against Germany decreased by 26 bp over the same period, bringing it below 84 bp.

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[10] In early December Fitch upgraded Greece's sovereign debt rating to investment grade, while on 17 November Moody's raised Italy's rating outlook from "negative" to "stable".

[11] The German ten-year sovereign bond yield has declined since the last FSR, albeit less than risk-free rates, proxied by the overnight index swap (OIS) rates. This apparently owes to such bonds becoming less scarce for use as collateral assets, reflected in a less negative risk premium relative to these OIS rates.

The credit risk premia on bonds issued by NFCs have also declined, while there has been a recovery in such fundraising. Corporate spreads relative to the swap curve have narrowed since end-October in both the euro area and the United States, in line with the drop in long-term risk-free rates. The fall has been particularly marked in the high-yield segment in both jurisdictions. Issuance in these markets was higher in 2023 than in 2022, both in the investment-grade and high-yield segments, and has remained robust in 2024 so far.

Equities and exchange rates

The main stock market indices have risen sharply since the cut-off date for the last FSR. This was driven by lower long-term interest rates, strong corporate earnings (especially in the United States) along with positive macroeconomic data. Thus, since the cut-off date for the previous FSR, the S&P 500 index has risen by 23.4% and the EURO STOXX by 21.5%, with both standing close to record highs (see Chart 1.4.b). The Chinese stock market has performed less robustly, conditioned by signs of economic weakness in the country. By sector, the gains have been broad-based, although cyclical stocks (those most closely linked to the consumption environment and, in particular, the technology sector, along with those related to artificial intelligence) have performed particularly well. The stock markets also made notable gains in 2023 as a whole. For instance, in the case of Spain, the IBEX 35 gained 22.8% value in the period.

Bank stock prices have also performed very favourably. As a result, the US banking index and the EURO STOXX Banks index exceeded levels seen prior to the turbulence of March 2023. In any event, despite also making gains, US regional bank stock prices remain below their March 2023 levels and there have even been sporadic stress episodes associated with specific banks in recent months. The Spanish banking sector has also made notable gains, with the IBEX 35 banking index rising 27.8% in 2023 as a whole and a further 27% in 2024 thus far.

In the foreign exchange market, the US dollar has depreciated against the euro and the pound sterling in the period. These developments were initially driven by the shift in the US monetary policy outlook and greater risk appetite among investors. However, since early 2024 the depreciation of the dollar has partially corrected, supported, in part, by a more resilient US economy than expected.

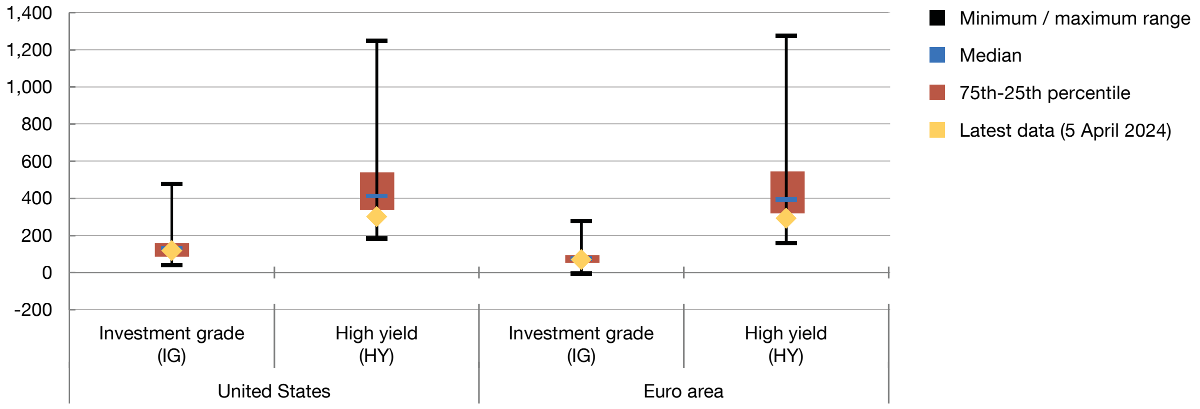
Risks to financial stability

The materialisation of certain risks could trigger corrections in financial asset prices, particularly for higher risk assets. A scenario of more persistent than expected inflation could drive up expectations regarding the future level of policy rates, increase long-term yields and adversely affect the prices of risky assets, such as shares and corporate bonds. Risky asset prices could also decline should global economic growth be weaker than expected, due to the adverse impact this would have on firms' expected earnings and the increase in risk premia.

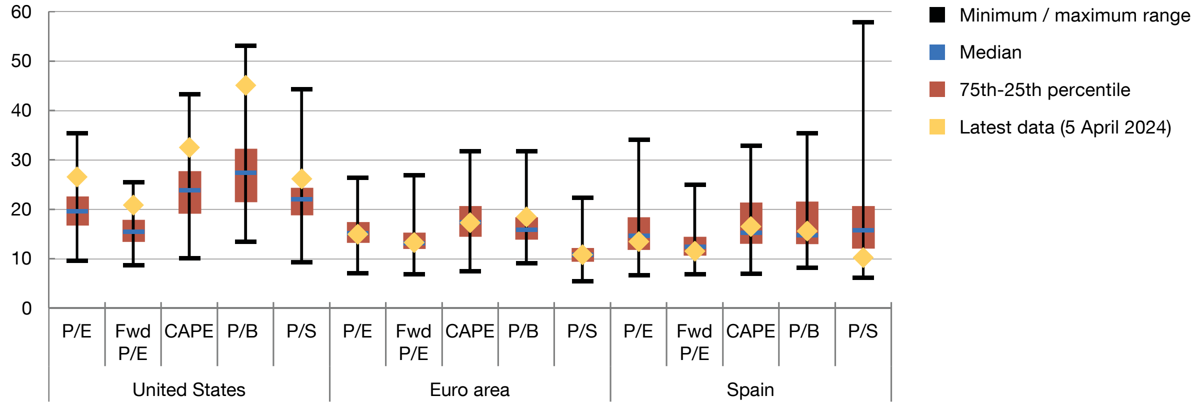
Chart 1.5

High-yield corporate bond risk premia stand at low levels and US stock valuation ratios are high by historical standards

1.5.a Corproate bond spreads (a)



1.5.b Stock market valuation ratios (b)



SOURCES: Refinitiv Datastream and Banco de España.

a Corporate spreads over the swap curve of the ICE Bank of America Merrill Lynch indices. Monthly series data since 1998.

b Drawing on monthly data of the stock market index series constructed by Datastream since 1985 for the euro area and the United States and since 1987 for Spain. The sample is somewhat smaller for Spain's CAPE ratio and the euro area Fwd P/E ratio. Ratios provided by Datastream, except the CAPE (cyclically adjusted price/earnings ratio) which is calculated as the value of the stock index in real terms (adjusted for CPI) divided by the 10-year moving average of the index firms' earnings in real terms. The price/earnings (P/E) ratio and 1-year forward P/E (Fwd P/E) ratio capture the relationship between the stock price and earnings per share (observed or expected). The price/book (P/B) and price/sales (P/S) ratios capture the stock market capitalisation of the firms divided by their book value (P/B) or sales (P/S) and have been multiplied by 10 for representation in this chart.

The current high prices of some risky assets entail a greater probability of corrections. Despite the elevated geopolitical tensions and the subdued outlook for global economic growth, stock price volatility is very low by historical standards. Moreover, high-yield corporate bond spreads have declined significantly since the cut-off date for the last FSR (see Chart 1.4.a), to stand at low levels compared with their historical median both in the euro area and in the United States (see Chart 1.5.a). In the equity markets, valuation ratios (stock prices relative to some of their underlying fundamentals) stand above the 75th percentile of the historical distribution in the United States, compared with ratios closer to their median in the euro area and Spain (see Chart 1.5.b). Equity premia, calculated using a dividend discount model, are well below the historical average in all three geographical areas (see Chart 1.4.b).

Such price corrections could be magnified if they materialise amid liquidity tensions. The possibility of fire sales by some intermediaries, such as international open-ended investment funds, with illiquid or highly leveraged positions, could trigger abrupt price movements for some assets.

1.2.2 The Spanish real estate market

House price growth moderated in the last quarter of 2023, while remaining above 4% year-on-year. According to the INE, the year-on-year house price growth moderated to 4.2% in 2023 Q4, down from 4.5% three months earlier (see Chart 1.6.a). New house prices rose by 7.5% year-on-year, less than the increase of 11% recorded in the previous quarter (the highest growth since 2007). By contrast, growth in second-hand house prices accelerated to 3.6% year-on-year, 0.4 pp higher than in the previous quarter. For both overall housing and the second-hand segment, the price increases observed in 2023 were significantly lower than in 2022, while price growth in new construction remained unchanged.

Upward pressure on house prices comes against a background of robust demand and relatively rigid supply.[12] The higher housing demand is linked to the number of households, in a setting of strong migration flows. Notable here is the increase in demand for rental housing, particularly in large urban areas. In the more popular tourist areas, housing demand has been boosted by the momentum of house purchases by non-residents. The pick-up in tourist rentals may also be having an impact on rental prices and, consequently, on house prices. In addition, the strong past increases in construction material costs could continue to feed through to the price of new housing, although this factor is likely to lose strength during 2024, insofar as these costs have tended to stabilise since mid-2022.[13] All this in a setting in which the supply of both new and second-hand housing is characterised by insufficient growth to meet the strong demand.[14, 15]

House sales have rebounded since late 2023, reversing part of the contraction recorded since 2022 H2. Despite the cumulative tightening of financing conditions, transactions signed before a notary increased, in seasonally adjusted terms, by 3% in 2023 Q4, with this positive trend continuing into early 2024 (see Chart 1.7.a). For 2023 as a whole, sales prices fell by 11% from the high levels reached in 2022, but were 12% above the figures recorded in 2019. The percentage of purchases by foreign citizens was slightly above 19% in 2023, higher than that observed in 2019 (nearly 17%) and close to the highest

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[12] Andrés Lajer, David López and Lucio San Juan. (2024). “El mercado de la vivienda residencial en España en perspectiva: hechos estilizados y evolución reciente”. Documentos Ocasionales, Banco de España. Forthcoming.

[13] Changes in construction costs tend to be passed through to new house prices with a lag of almost two years, which is approximately the time it takes to build the houses.

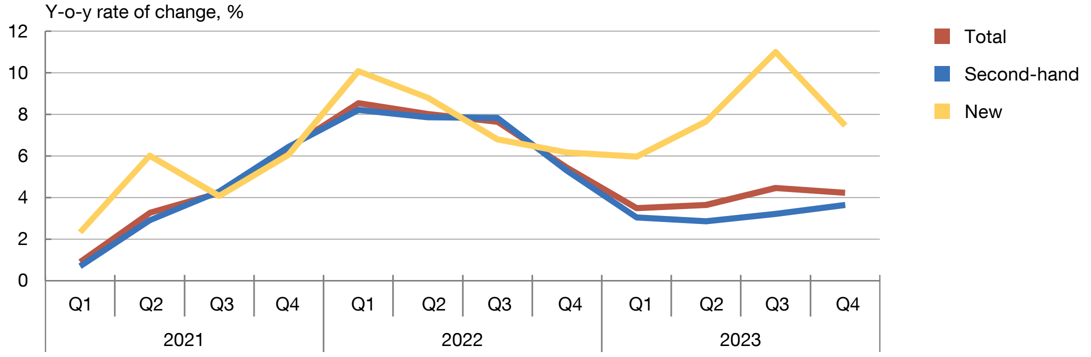
[14] The supply of new housing, measured as the number of finished dwellings, stood at around 90,000 units in 2023, significantly below both its historical annual average since 1980 (270,000) and net household formation in 2023 (close to 270,000 units). In turn, the supply of second-hand housing, proxied by the number of listings on the leading real estate portals, stood at 700,000 units at end-2023, 3% lower than that observed a year earlier and 14% below the peak level reached in the final stretch of 2019.

[15] For further details on housing supply and demand in Spain, and on the possible role public policies might play in the current juncture, see Chapter 4 of the Annual Report 2023 of the Banco de España, forthcoming.

Chart 1.6

Slight slowdown in house prices in the final stretch of 2023, although with sound year-on-year growth

1.6.a House prices

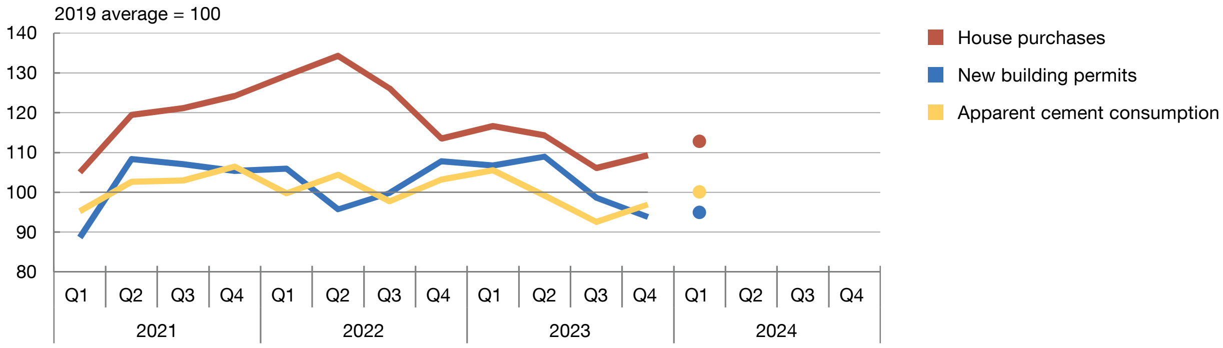


SOURCE: INE.

Chart 1.7

House purchases show notable resilience, while supply indicators lost momentum in 2023 H2

1.7.a Indicators of activity in the residential real estate sector (a)



SOURCES: Banco de España, INE, Ministerio de Transportes y Movilidad Sostenible and Ministerio de Economia, Comercio y Empresa.

a Seasonally adjusted series. For 2024 Q1, an average of the last three months up to the latest one available is used (January for house purchases and building permits, and February for apparent cement consumption), as there are no data for the entire quarter.

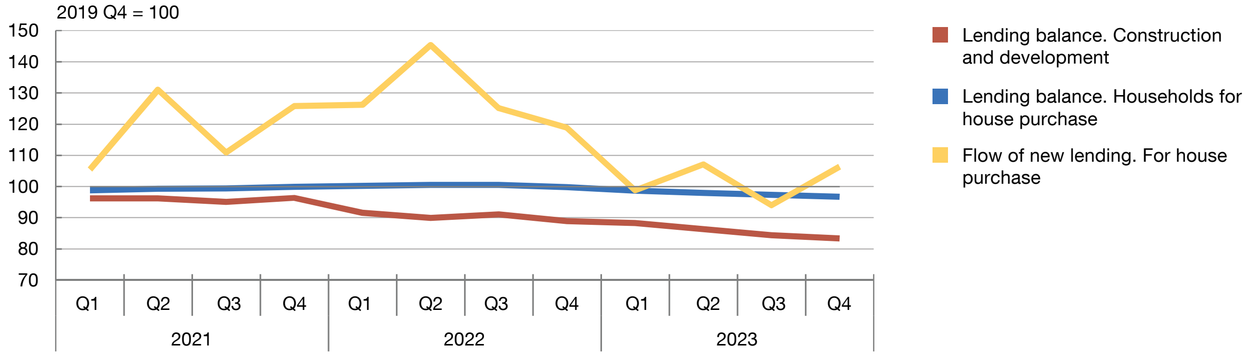
percentage on record. This factor would also partly explain the gradual decline in the weight of house purchases financed by mortgage loans, since some foreign citizens would have other sources of financing available.

The flow of new residential mortgage lending also slowed its decline in 2023 H2. This flow declined by 10.5% year-on-year in 2023 Q4, far less than the declines in excess of 20% recorded in the first three quarters of the year. Despite the contraction in 2023 (see Chart 1.8.a), the annual volume of new residential mortgages is 16% above its pre-pandemic level in 2019.

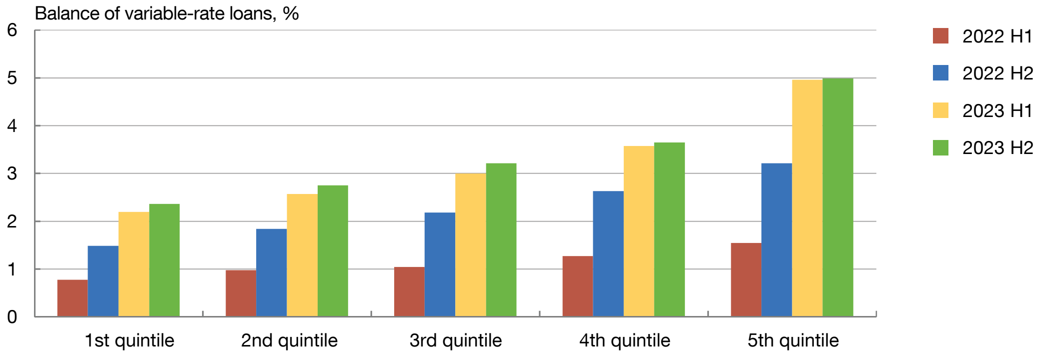
Chart 1.8

The high volume of mortgage repayments seems to have contributed to a notable slowdown in lending in the real estate market compared with 2022

1.8.a Indicators of real estate sector financing (a)



1.8.b Early repayment of variable-rate mortgages by income quintile (b)



SOURCES: CIRBE and Banco de España.

a Lending for construction and development includes real estate activities.

b Mortgages for house purchase. Household income is not observed and is imputed based on information on the distribution of income at postcode level provided by the INE. Specifically, the number of mortgages is the same and stable over time for each quintile.

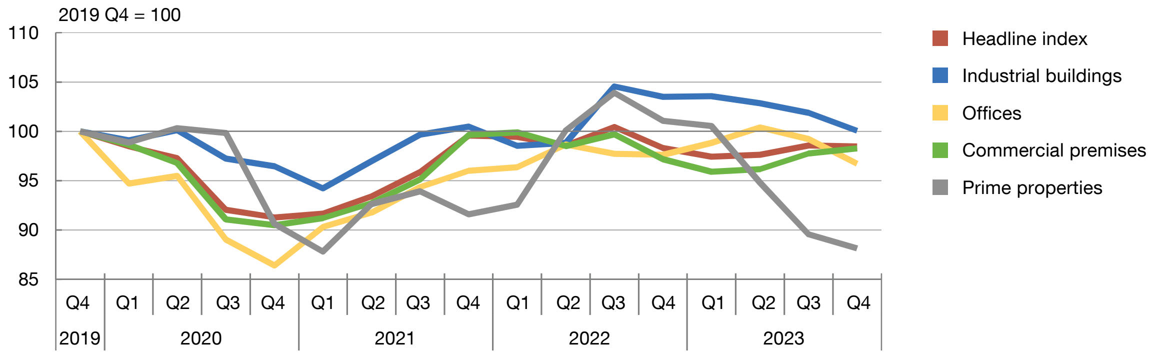
The reduction in the stock of residential mortgage loans intensified in the second half of the year. Thus, the stock of such loans fell by 3.1% year-on-year in December 2023, compared with 2.6% in June 2023 (see Chart 1.8.a). In addition to the reduction in the flow of new credit, the high volume of mortgage repayments, particularly in the higher-income segments and in variable-rate mortgages, appears to have also contributed to this year-on-year decline (see Chart 1.8.b).

On the construction side, in 2023 H2 inputs in the construction sector and, especially, building permits, decreased (see Chart 1.7.a). Developments over the course of 2023 could have been partly influenced by uncertainty and, in the case of inputs, also by the adverse weather in the last stretch of the year. In the first few months of 2024 both figures are expected to remain somewhat subdued, based on recent developments in the orders component of the sector's confidence indicator.

Chart 1.9

The prices of commercial real estate assets have held steady, except in the prime segment, where they have fallen significantly

1.9.a Commercial real estate sector price indices (a)



SOURCES: Registrars Association and Banco de España.

a Based on estimates using a hedonic regression model for each stratum. The aggregate index is the average weighted by the relative share of transactions carried out in each segment (4% for offices, 78% for commercial premises and 18% for industrial buildings). In 2022 properties in prime locations, i.e. those located in central areas of the main large cities (Barcelona, Bilbao, Madrid, Malaga, Palma and Valencia), represented 4% of transactions conducted in the commercial real estate segment as a whole. For further details, see Matías Lamas and Sara Romaniega (2022), "Designing a price index for the Spanish commercial real estate market", Documentos Ocasionales, 2203, Banco de España.

The contraction in the stock of loans for development and construction intensified in 2023 H2. The year-on-year decline reached 6.2% in December and the cumulative fall since the start of the COVID-19 crisis is 17%, deepening the correction of 76% observed in the period 2008-2019 (see Chart 1.8.a).

In the commercial real estate segment, prices experienced minor changes in 2023 Q4, with the exception of properties in prime areas, whose prices have declined. The overall commercial property index remained relatively stable in 2023 Q4, standing 0.2% above its level a year ago (see Chart 1.9.a). By segment, the significant correction in the prices of properties located in prime areas, which recorded a fall of close to 13% year-on-year in 2023, stood out. The headline index and the other components (excluding the prime segment) remained close to, albeit generally somewhat lower than, their pre-pandemic levels, and their performance has been relatively stable since early 2022.

The stock market value of Spanish listed real estate investment companies (SOCIMIs, by their Spanish acronym) has partially recovered recently. The share prices of these companies have increased by 6% since the start of 2023 Q4, in line with developments in other European markets. However, the sector's stock market value remains close to 30% below pre-pandemic levels.

1.3 Non-financial sectors

1.3.1 Non-financial corporations and households

Non-financial corporations

Corporate earnings increased in 2023, but these increases moderated from Q2 onwards. In 2023 corporate earnings were driven by growth in turnover and profit margins. The acceleration in wage costs was cushioned by the fall or slowdown in other production costs (commodities and energy, among others). Thus, according to the Spanish tax revenue service (AEAT), firms' gross operating profit (GOP) is estimated to have increased in 2023 by 7% in nominal terms (compared with 30% the previous year), with a substantial slowdown from Q2 onwards (see Chart 1.10.a). The breakdown by sector shows heterogeneity, with a notable improvement in the construction and real estate activities sector and a less marked slowdown in the wholesale and retail trade and hospitality sector.

The balance of corporate debt continued to decline sharply. The balance of financing granted to firms contracted by over 1% year-on-year in February. This, together with income growth, led to a notable decline in the corporate debt ratio. Specifically, the aggregate debt-to-GDP ratio stood at 65% of GDP at end-2023, a level not seen since 2002 and almost 3 pp lower than the euro area average. The sample of firms in the Banco de España's Central Balance Sheet Data Office Quarterly Survey (CBQ) also reflected a decline in the debt-to-earnings ratio for this sample as a whole, as well as for the different debt percentiles. Also, the percentage of CBQ firms with high indebtedness[16] decreased to 18.2% in 2023 Q4, down from 20% in 2022 Q4.

Despite positive developments in activity and lower indebtedness, rising interest rates have pushed up the debt burden of firms. In particular, according to the National Accounts, interest payments by NFCs stood at more than 16% of gross operating surplus (GOS) in 2023 Q4, nearly doubling the figure for the same quarter in 2022 (see Chart 1.10.b).

The pass-through of tighter monetary policy to interest payments on variable-rate loans seems to have been completed by end-2023. Given the decline in interbank rates since October 2023, and with the market expecting this process to continue, an increasing share of variable-rate loans[17] is likely to undergo interest rate reductions in 2024.[18] In any event, market expectations point to interest rates remaining at levels considerably higher than in 2021, before the monetary tightening cycle. As a result, although interest rates on new loans have already started to decline, part of the fixed-rate loans that will have to be rolled over at

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[16] Firms are understood to be highly indebted when their ratio of net financial debt to (GOP + financial revenue) is higher than 10, or they have positive net financial debt and zero or negative earnings.

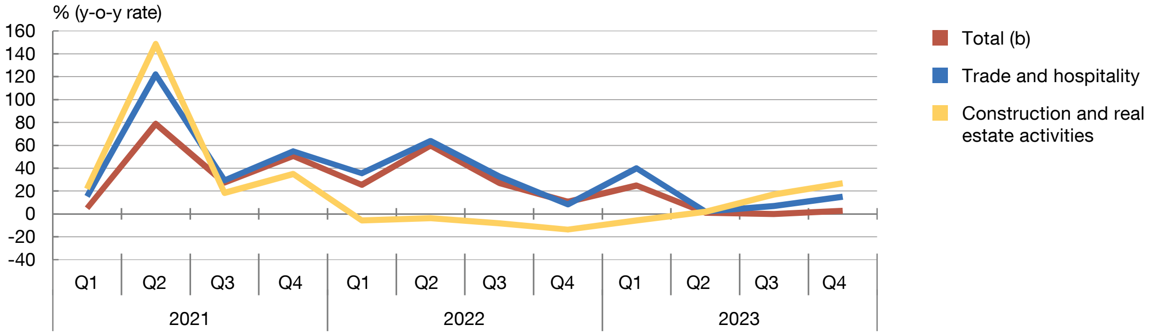
[17] Variable-rate loans account for around 70% of firms' bank lending.

[18] See "Box 1. Monetary policy transmission to interest payments on the bank debt of households and firms". In Banco de España, *Report on the financial situation of households and firms,* Second half of 2023, pp 25-28.

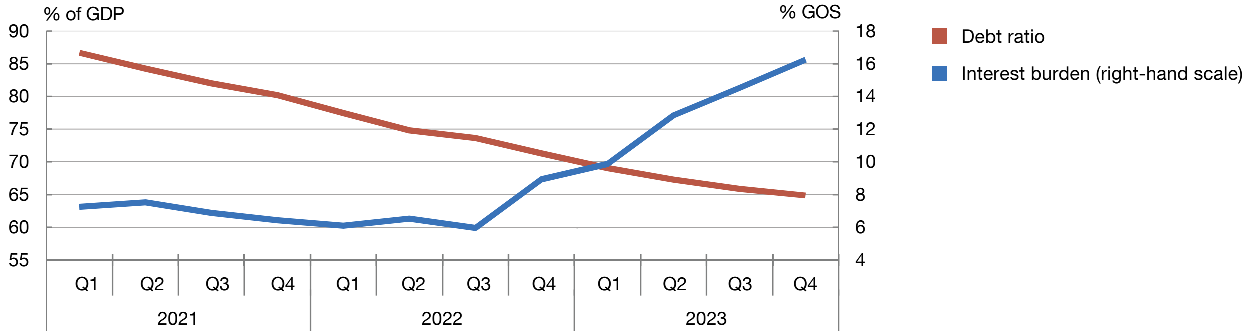
Chart 1.10

Corporate earnings have slowed. The interest burden has grown, despite the decline in indebtedness, and the percentage of firms under financial pressure appears to have increased moderately

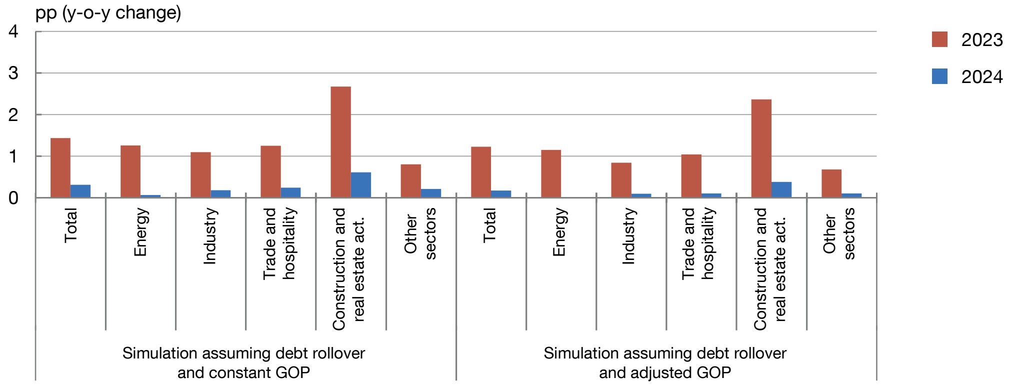
1.10.a GOP of Spanish NFCs. AEAT (a)



1.10.b Debt ratio and interest burden (c)



1.10.c Expected change in the percentage of firms under high financial pressure (d)



SOURCES: AEAT and Banco de España.

a GOP is obtained by subtracting intermediate consumption and personnel costs from output. Seasonally adjusted data.

b The following sectors are not included: education, health, public administration, recreation, financial and insurance institutions and other services.

c Interest payments are quarterly, before allocation of financial intermediation services indirectly measured (FISIM) and are not seasonally adjusted. Gross operating surplus (GOS) is quarterly and seasonally adjusted.

d A firm is considered to be under high financial pressure when its (GOP + financial revenue) / financial costs ratio is lower than 1. The financial costs of each firm for 2023 and 2024 are proxied based on the balance of interest-bearing debt and the expected path of interest rates. 2023 data are observed data for CBQ firms. For other firms, under the updated GOP scenario, profits increase by 6.4% in 2023 (growth observed in AEAT data) and by 3.7% in 2024, in line with the growth in underlying GOS in the Banco de España's latest macroeconomic projections. Holding companies, head offices and dormant firms are excluded. For more details on the methodology, see "Box 2. The impact of interest rate hikes on firms' financial pressure". In Banco de España, *Report on the financial situation of households and firms,* Second half of 2023, pp. 29-31.

maturity are expected to increase in cost, as they were granted prior to the last monetary tightening cycle.

Financial vulnerability indicators associated with the higher interest burden point to some deterioration, although there is heterogeneity across sectors. According to the simulations carried out by the Banco de España, the percentage of firms that were unable to cover their debt interest payments out of ordinary earnings[19] (firms under high financial pressure) increased moderately in 2023.[20] This increase is somewhat sharper in the construction and real estate sectors, assuming that firms rolled over the entirety of their debts in 2023 (see Chart 1.10.c). See Box 3.1 for a deeper analysis of the bank debt burden of firms in this sector. Taking into account market expectations as at January 2024 for interest rate developments, the share of debt held by firms under high financial pressure would practically stabilise by 2024. However, a more pronounced economic slowdown than that underlying this simulation exercise, and than envisaged in the baseline economic projections, could increase the number of vulnerable firms, especially if interest rates fall less than envisaged in the assumption underlying this exercise.

Households

Employment growth, wage growth and public sector support continued to sustain household income growth in the second half of 2023. Thus, year-on-year employment growth averaged 3.5% in 2023 H2, while compensation per employee increased by 5.1%. Adjusted for inflation and the number of households,[21] gross disposable income (GDI) grew on average by 5.5% year-on-year in H2 (slightly below the 5.9% change recorded in H1). Despite these developments, in 2023 real GDI per household still stood slightly short of pre-pandemic levels (1.1% lower). Meanwhile, households' perceptions of their future economic situation deteriorated slightly in late 2023, followed by a correction in 2024 Q1, to stand at levels very similar to those seen in mid-2023 across all income brackets. (see Chart 1.11.a).

The financial position of households has continued to strengthen. The debt-to-GDP ratio stood at 47% of GDP in 2023 Q4 (see Chart 1.11.b), the lowest level since 2001 and 4 pp below the euro area average. This decline has been supported by both lower outstanding debt balances and by inflation and higher real income. Gross household wealth grew by 4.7% year-on-year at end-2023, driven by rising house and financial asset prices.[22]

Despite the decline in the indebtedness of the sector as a whole, interest payments continued to increase until end-2023. Income growth has mitigated the increase in the debt

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[19] For the purposes of this indicator, ordinary earnings are calculated excluding financial costs, as the sum of GOP and financial revenue.

[20] See "Box 2. The impact of interest rate hikes on firms' financial pressure". In Banco de España, *Report on the financial situation of households and firms,* Second half of 2023, pp. 29-31.

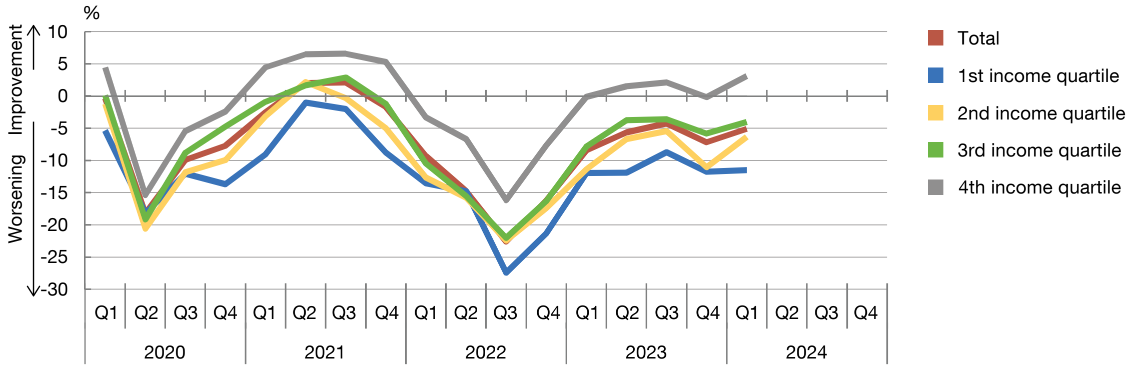
[21] The consumer price index (CPI) has been used as an income deflator. In 2023 the number of households grew by 1.5%.

[22] According to the ECB's experimental statistics on the distribution of household wealth (for 2024 Q3), deleveraging has been widespread, but was more intense for households in the bottom 50% of the net wealth distribution. Gross wealth also increased across the board, although more moderately for households whose net wealth is in the top deciles.

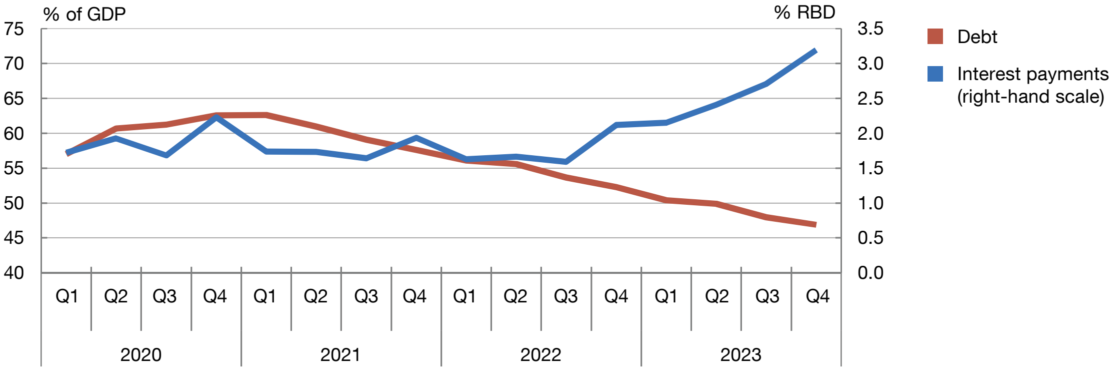
Chart 1.11

Households' economic outlook remains stable. Despite a reduction in debt, the interest burden has grown, albeit with only a limited rise in the share of households with a high interest burden

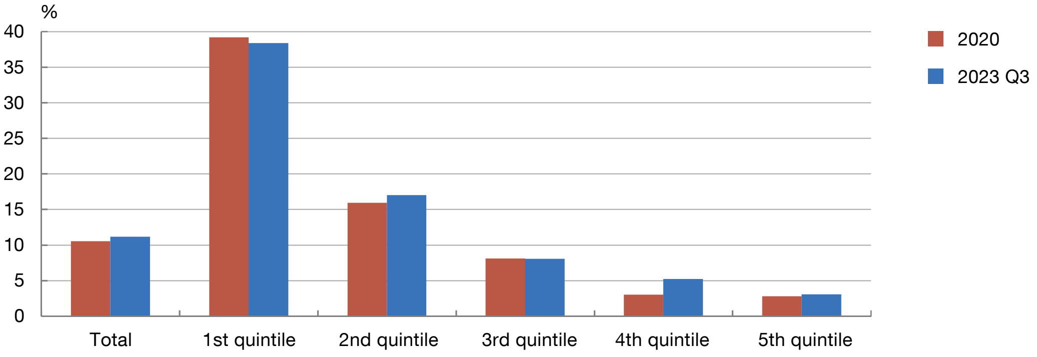
1.11.a Households' expectations for their own financial situation over the next 12 months (a)



1.11.b Debt and interest payments (b)



1.11.c Simulation of the percentage of indebted households with a high interest burden, by income quintile (c)



SOURCES: European Commission, INE and Banco de España.

a Consumer Confidence Survey. Indicator = percentage of households expecting their economic situation to improve significantly over the next 12 months × 1 + percentage expecting their economic situation to improve somewhat × 1/2 - percentage of households expecting their economic situation to worsen somewhat × 1/2 - percentage expecting their economic situation to worsen significantly × 1.

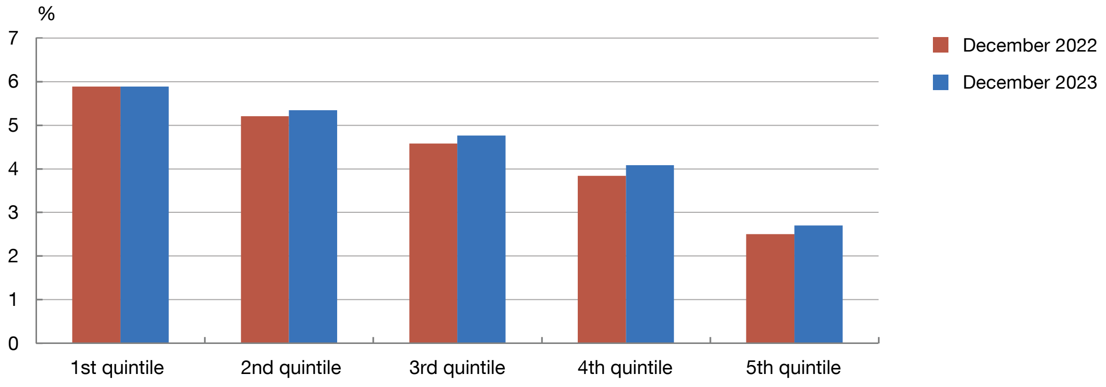
b Interest payments are quarterly and are neither adjusted for the allocation of financial intermediation services indirectly measured (FISIM) nor seasonally adjusted. GDI is quarterly and seasonally adjusted.

c Drawing on the 2020 Spanish Survey of Household Finances. Interest burden is considered high when debt service costs exceed 40% of household income. 2023 figures estimated under a scenario of a cumulative interest rate rise from 2020 of 466 bp and a 15.6% increase in household income.

Chart 1.12

The increase in the non-performing loan ratio has been highly contained across all income quintiles

1.12.a Non-performing ratio for residential mortgage loans. By income quintile (a)



SOURCES: INE and Banco de España.

a For each date and income quintile, the non-performing loan ratio is defined as the outstanding balance of non-performing credit (including due to arrears and for subjective reasons) as a proportion of total credit. The distribution by income quintiles is approximated by assigning to each borrower the gross household income by postcode provided by the INE. The upper limit of the first income quintile is lower than €28,000 and the lower limit of the highest quintile is more than €41,000. The income levels are for 2021 (latest data available).

burden (see Chart 1.11.b). According to the simulations carried out by the Banco de España for a scenario involving an increase in interest rates of 466 bp,[23] and adjusting for the average increase in income, the percentage of indebted households with a high gross debt burden (more than 40% of household income) rose by only 0.7 pp between 2020 and 2023 Q3, to 11.2% (see Chart 1.11.c).[24] By income level, the percentage of indebted households with a high debt burden in the first quintile decreased, while the most affected quintiles were the second and fourth (with increases of 1.1 pp and 2.2 pp). This reflects both differences in debt levels and in the percentage of households with variable-rate debt.[25] In any event, the results of this simulation should be interpreted with caution, as households also have to face the rising costs of other essential expenditures. In addition, the simulation exercise assumes a similar increase in income between 2020 and 2023 for all households and equal to that observed in the sector's aggregate data, which could also lead to some measurement error.

Against this backdrop, the non-performing ratio for residential mortgage loans has seen very moderate increases in 2023 for most income quintiles. Note, in any case, that this ratio is uneven across income levels, and has an inverse relationship with income. Thus, as at

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[23] This figure represents the peak increase in the twelve-month EURIBOR (the key reference rate for mortgages) during the recent monetary tightening cycle.

[24] The difference in the magnitude of these results compared with the ones presented in the Spring 2023 Financial Stability Report is due to the inclusion in the new simulations of an income assumption, while the previous simulations focused purely on interest rate sensitivity.

[25] According to the Spanish Survey of Household Finances 2020, the percentage of indebted households with some form of variable-rate debt is approximately 30% for the first income quintile, 40% for the second income quintile and 47%, 60% and 66% thereafter.

December 2023, the non-performing loan ratio for residential mortgage loans ranged between 5.9% for the first quintile and 2.7% for the fifth income quintile (see Chart 1.12.a). The systemic importance of the higher non-performance in the lower quintiles is limited by the fact that the two top income quintiles account for around 75% of mortgage lending.

The pass-through of higher policy rates to the cost of outstanding mortgages appears to have been virtually completed by end-2023. Given recent developments and market expectations for interbank rates, the cost of outstanding mortgages should start to fall in 2024.[26] In any event, expectations suggest that interest rates will not return in the coming years to the levels observed in 2021, before the monetary tightening cycle.

1.3.2 General government in Spain

The budget deficit declined further in 2023. For the year as a whole, the deficit stood at 3.6% of GDP, below the government's target of 3.9% and 1.1 pp lower than that recorded in 2022 (see Chart 1.13.a). Government revenue continued to grow at a brisk pace in 2023 (9%), driven by higher wages and employment, and by the entry into force of new taxes[27] and higher social security contributions.[28] Government expenditure also grew substantially, spurred by pension revaluation and the maintenance of some expenditures that had been introduced on a temporary basis in the early stages of the COVID-19 pandemic. Overall, it is estimated that the structural component of the deficit decreased by 0.5 pp, to 3.7% of GDP.

The government debt-to-GDP ratio decreased by around 4 pp to 107.7% of GDP. This decline reflects the growth of nominal GDP. The level is 13 pp below the 2020 peak, but 9 pp above that observed before the pandemic (see Chart 1.13.b) and 17 pp (34 pp) above the weighted (arithmetic) mean in the euro area.[29]

The average cost of general government debt has increased slightly from its 2022 level. The higher cost of new issuance was largely offset by lower interest rates on inflation-linked bonds. The latter were very high in 2022, when the standard benchmark inflation rate – the euro area Harmonised Index of Consumer Prices (HICP) excluding tobacco – exceeded 10%, compared with 2.8% in 2023.[30] By contrast, the cost of non-indexed new issuances increased significantly, to 3.4% for Treasury securities (2.1 pp more than in 2022 and 3.5 pp more than

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[26] See "Box 1. Monetary policy transmission to interest payments on the bank debt of households and firms". In Banco de España, *Report on the financial situation of households and firms,* Second half of 2023, pp 25-28.

[27] Extraordinary taxes on financial corporations and energy utilities, the wealth tax, taxes on plastic containers and on landfill waste, as well as corporate income tax changes (a minimum rate of 15% and a limit to deductions for offsetting losses at subsidiaries).

[28] As a result of the pension reform.

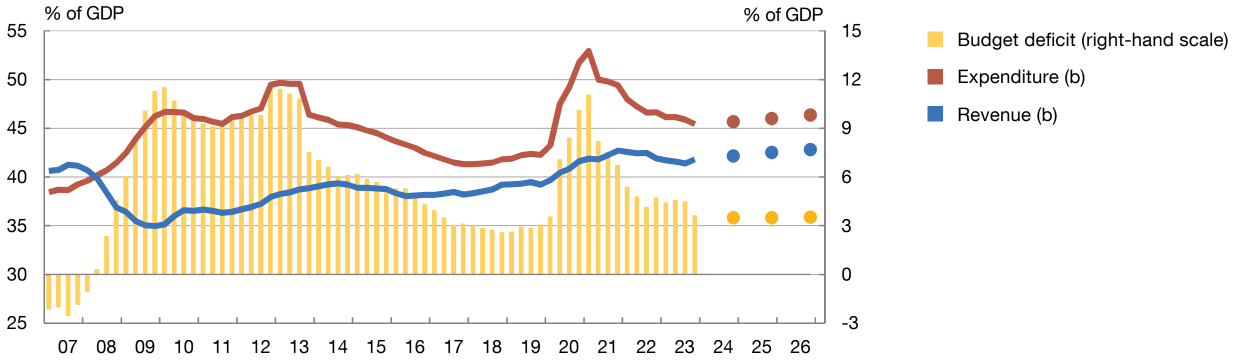
[29] The latest European Commission forecasts, published in November 2023, are used for the euro area.

[30] At the end of 2022, inflation-linked bonds accounted for 5% of total general government debt. However, in terms of interest accrued in that year, they accounted for around 25% of the total. This discrepancy is explained by the fact that inflation affects not only coupons, but also the principal that will have to be repaid in the future, and in the National Accounts the increase in principal is considered accrued interest for the year in which the change in the principal occurs.

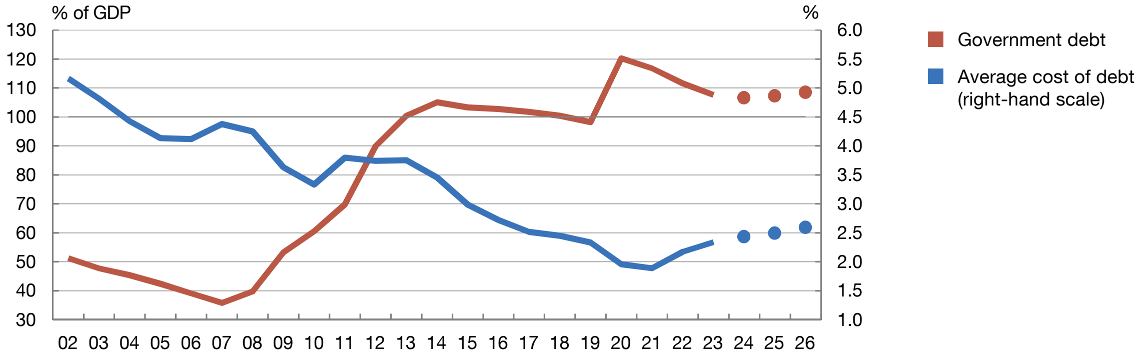
Chart 1.13

Growing spending demands and the rising cost of debt warrant a fiscal consolidation process in Spain

1.13.a Budget balance in Spain (a)



1.13.b Government debt in Spain and its average cost (a)



SOURCES: IGAE and Banco de España.

a The circles denote the Banco de España's March 2024 macroeconomic projections, which were prepared before the publication of the final data for 2023. These entailed an upside surprise in government revenue (and the budget balance) of 0.2 pp of GDP and minor changes in government expenditure and debt. The average cost of debt in 2023 stood at 0.1 pp above the figure forecast in March.

b Excluding estimated NGEU funds, which temporarily increase revenue and expenditure, but have no effect on the deficit.

in 2021). However, since the average life of public debt is close to eight years (and thus the volume of new issuances has a limited weight in the total) and maturing debt was generally issued at higher interest rates than the current ones, the sharp increase in issuance costs in the last two years has only resulted in an increase of 0.4 pp in the average interest rate on debt, to 2.3%.

Over the next few years, the average cost of debt will continue to rise. While issuance rates could fall from the 2023 levels, they will likely remain high relative to the levels observed over the past ten years. According to the Banco de España projections – based on interest rate expectations in the financial markets – this average cost is set to increase by around 0.3 pp over the next three years, to 2.6% in 2026.[31]

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[31] However, a hypothetical 100 bp increase in market rates, in both the short and long term, would raise this increase to 0.8 pp, bringing the public debt interest burden to 3.1% of GDP in 2026, 1 pp more than in 2021.

In addition to the higher debt burden, there will be other upward pressures on public spending. These pressures will contribute to the rising path projected for the government expenditure-to-GDP ratio (see Chart 1.13.a). The pressure on public spending will remain high in the coming years, as a result of various structural phenomena, such as the impact of demographic ageing, investment needs related to climate change, digitalisation and the defence commitments undertaken in the face of geopolitical tensions.

Overall, public debt in Spain will likely be on a rising path in the medium and long term if a fiscal consolidation process spanning several years is not implemented (see Chart 1.13.b). The consolidation process required must take into account pressures on the spending side, and prioritise revenue and spending measures that will foster economic growth.

The fiscal consolidation process must comply with the EU's new fiscal rules (see Box 1.2). The current cyclical position of the Spanish economy and the vulnerability of the country's public finances justify initiating the fiscal consolidation process this year.

1.3.3 Financial flows vis-à-vis the rest of the world and the international investment position

In the second half of 2023 the Spanish economy continued to show significant net lending capacity, while placements of debt on international markets increased. In particular, foreign investment by residents was concentrated on repo transactions by resident monetary financial institutions. By contrast, investment by non-residents in Spain mainly took the form of purchases of long-term debt issued by monetary financial institutions and general government. This net lending position, together with the net inflow of funds into sectors other than the Banco de España, was reflected in a 20% decrease in the central bank's net external liabilities.

As a result, Spain's negative net international investment position (IIP) continued to decline. As a percentage of GDP, the IIP decreased by 3.7 pp in H2, to 52.8% in December, underpinned by net transactions and nominal GDP growth. By contrast, changes in the value of financial instruments offset this decline, mainly owing to the appreciation of the euro in 2023 Q4 (see Chart 1.14.a). This is the lowest level since the start of 2004, but remains well above the threshold set in the macroeconomic imbalances procedure (35%) and far from those of the main euro area economies.[32]

Likewise, Spain's gross external debt ratio continued its downward path in the second half of the year, reaching 165.5% of GDP (see Chart 1.14.b). This reduction reflected the increase in nominal GDP, as the outstanding amount of debt increased (by €45 billion), as a result of the increase in the stock of debt issued by general government and monetary financial institutions, due to both new investments and increases in market value. In any event, the high

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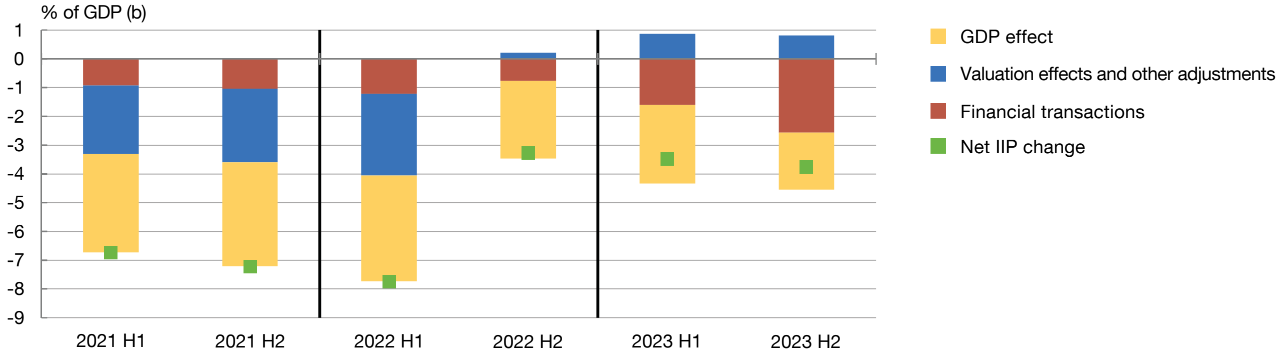
[32] Germany and Italy have a positive net IIP and France has a negative net IIP of 28% of GDP.

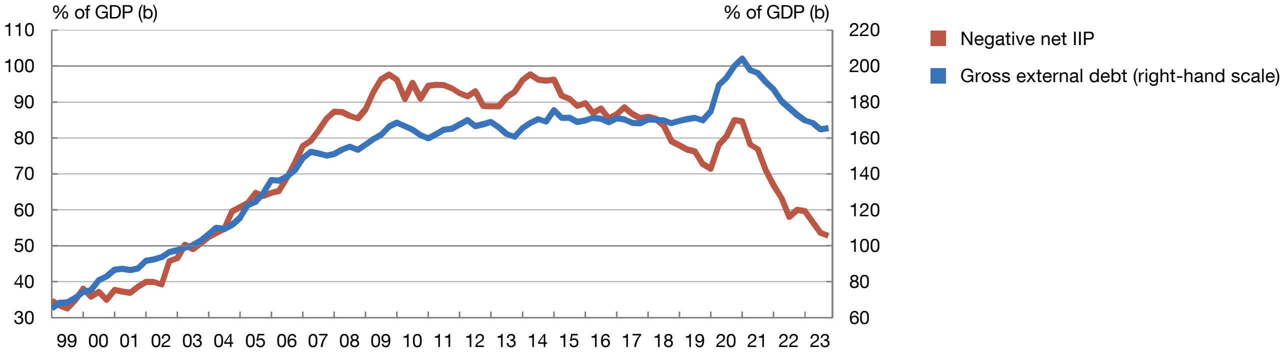
Chart 1.14

Foreign imbalances continue to correct, underpinned by the Spanish economy's net lending and nominal economic growth

1.14.a Change in the negative net international investment position (IIP) and determinants (a)



1.14.b Negative net IIP and gross external debt (a) (c)



SOURCES: IGAE and Banco de España.

a Negative net IIP is the difference between the value of national liabilities vis-à-vis the rest of the world and resident sectors' foreign assets.
b Four-quarter cumulative.
c Gross external debt comprises all liabilities included in the international investment position except equity and financial derivatives.

volume of external debt (€2,419 billion) of the Spanish economy continues to be an element of vulnerability, particularly given that potential refinancing will be carried out in a setting of higher interest rates. However, the composition of these liabilities (with long average repayment terms) and the fact that 27% are general government debt and 22% are liabilities of the Banco de España (which do not have an explicit maturity) continue to mitigate part of this risk.

Box 1.1

THE IMPACT OF UNCERTAINTY ON ECONOMIC ACTIVITY

In recent quarters, the backdrop to global economic activity developments has been marked by heightened uncertainty, largely associated with geopolitical events, such as tensions in the Middle East and the ongoing war in Ukraine.

The activity of economic agents always involves elements of risk and uncertainty. Households, firms and governments – when making their decisions on consumption, saving, investment, hiring, or, in the case of financial institutions, credit conditions – need to make assumptions about the future course of certain variables (e.g. the cost of energy or the demand for a specific good or service). This involves the assignment of (subjective or objective) probabilities to the potential values of these variables. And in this decision-making process, agents are aware that both domestic and global factors influence future scenarios and their probabilities of occurring.

However, when uncertainty increases very sharply, agents' decisions are distorted. Indeed, a broad set of studies shows that these spikes in uncertainty may adversely affect agents, inhibiting or reducing their purchases or investments, thus having a negative impact on economic activity as a whole.[1]

Since it is not an observable variable, economists attempt to measure uncertainty using various alternative empirical measures. For example, some standard measures of economic uncertainty use observed stock market volatility,[2] the VIX index,[3] the dispersion of professional or business forecasts,[4] the common variability of unforecastable components in econometric models,[5] or forecast errors computed on the basis of real-time statistical models.[6]

There are also geopolitical risk indicators based on the frequency with which terms relating to geopolitical events appear in the press.[7] Other authors measure uncertainty linked to the future course of economic policy by means of textual analysis (see the Economic Policy Uncertainty (EPU) Index),[8] which has also been adapted to the case of Spain.[9] Finally, other studies use the subjective responses of economic agents to questions regarding how they perceive uncertainty to approximate this concept.[10]

With regard to the latest evidence on global uncertainty developments, the signals emerging from these indicators are mixed. Increases in perceived uncertainty are concentrated in geopolitical risk. The Geopolitical Risk (GPR) Index (widely used in the scientific literature)[11] has increased considerably since tensions began to rise in the Middle East: since 7 October 2023, when the first attack by Hamas on Israel took place, this index has increased to twice its average value in 2023 (see Chart 1), although it remains well below the levels recorded in 2022 as a result of the Russia-Ukraine war. However, this increase does not appear to have translated into an

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[1] The literature on the impact of uncertainty shocks on economic activity is very extensive. See, for example, Corinna Ghirelli, Maria Gil, Javier J. Pérez and Alberto Urtasun. (2021). "Measuring economic and economic policy uncertainty and their macroeconomic effects: the case of Spain", *Empirical Economics,* 60, pp. 869-892.

[2] Nicholas Bloom. (2009). "The impact of uncertainty shocks", *Econometrica,* 77(3), pp. 623-685.

[3] The VIX index is a measure of the constant 30-day expected volatility in the US stock market, derived from the real-time prices of S&P 500 index put and call options. This is one of the most globally recognised volatility measures, widely reported by financial media and closely monitored on a daily basis by a variety of financial market participants.

[4] Rüdiger Bachmann, Steffen Elstner and Eric R. Sims. (2013). "Uncertainty and economic activity: evidence from business survey data", *American Economics Journal: Macroeconomics,* 5(2), pp. 217-249.

[5] Kyle Jurado, Sydney C. Ludvigson and Serena Ng. (2015). "Measuring uncertainty", *American Economic Review,* 105(3), pp. 1177-1216.

[6] Chiara Scotti. (2016). "Surprise and uncertainty indexes: Real-time aggregation of real-activity macro-surprises", *Journal of Monetary Economics,* 82, pp. 1-19.

[7] Dario Caldara and Matteo Iacoviello. (2022). "Measuring Geopolitical Risk", *American Economic Review,* 112(4), pp. 1194-1225.

[8] The EPU index is a textual indicator of uncertainty regarding economic policies based on the press, first constructed for the United States by Scott Baker, Nicholas Bloom and Steven Davis. (2016) "Measuring economic policy uncertainty", *Quarterly Journal of Economics,* 131(4), pp. 1593-1636. The indicator is calculated on the basis of the number of articles containing at least one keyword relating to each of the categories" uncertainty", "economy" and "policy". Subsequently, these authors have applied the same methodology to construct EPU indicators for other countries. Data available online.

[9] The EPU indicator for Spain is constructed by the Banco de España on the basis of the Spanish press. It considers the main national newspapers from January 1997 to the present (El País, El Mundo, La Vanguardia, ABC, Expansión, Cinco Días and El Economista). See Corinna Ghirelli, Javier J. Pérez and Alberto Urtasun. (2019). "A new economic policy uncertainty index for Spain", *Economic Letters,* 182, pp. 64-67.

[10] Alejandro Fernández Cerezo and Mario Izquierdo. (2024). "The Banco de España Business Activity Survey: 2024 Q1", *Economic Bulletin* - Banco de España, 2024/Q1, 08.

[11] The GPR index is a textual indicator developed and published by US Federal Reserve economists. Dario Caldara, and Matteo Iacoviello. (2022). "Measuring Geopolitical Risk", *American Economic Review,* 112(4), pp. 1194-1225. Data available online.

Box 1.1

THE IMPACT OF UNCERTAINTY ON ECONOMIC ACTIVITY (cont'd)

Chart 1
Geopolitical risk index (a)

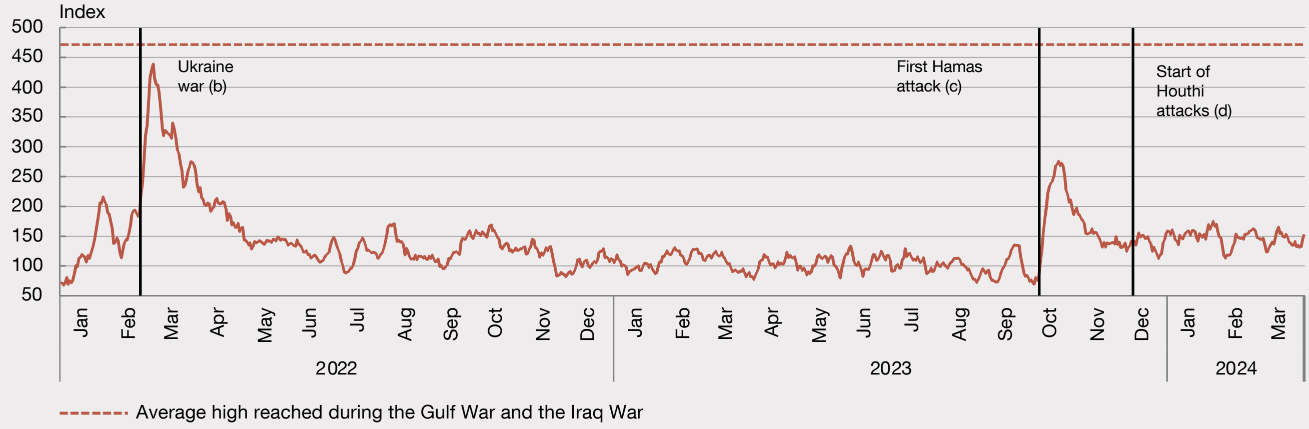


Chart 2
Global uncertainty. VIX (e)

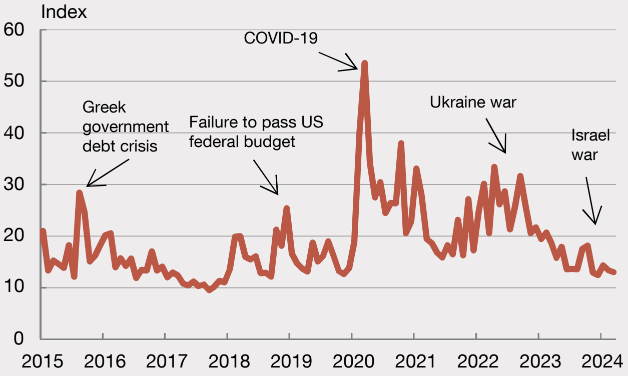
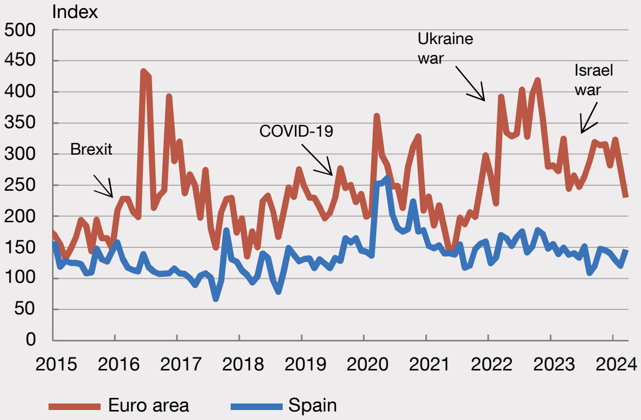


Chart 3
Economic policy uncertainty (EPU) (f)



SOURCES: Chicago Board Options Exchange (CBOE), Factiva DJ and Banco de España calculations.

a The geopolitical risk (GPR) index is a textual indicator of geopolitical risk constructed by US Federal Reserve economists, available online. Seven-day moving average, 1985-2019 = 100.

b On 24 February 2022 the war in Ukraine broke out with the Russian invasion.

c On 7 October 2023 an attack by Palestine militant group Hamas took place against the south of Israel, considered to be the worst attack suffered by the country since its creation.

d On 10 December 2022 the Houthis launched various drones and missiles against vessels in the Red Sea.

e The VIX index is a measure of the constant 30-day expected volatility in the US stock market, derived from the real-time prices of S&P 500 index put and call options. High values indicate market stress, and values above 30 indicate elevated uncertainty.

f The EPU index is a textual indicator of economic policy uncertainty and is expressed as the deviation from its historic average level of 100. The EPU index for Spain is constructed by the Banco de España, while the EPU index for the euro area is constructed by Scott Baker, Nicholas Bloom and Steven Davis. (2016). "Measuring economic policy uncertainty", *The Quarterly Journal of Economics.* Data available online.

increase in global economic uncertainty, if we consider, for example, the VIX, one of the indicators most commonly used to measure global financial uncertainty (see Chart 2).

At the domestic level, the indicator of uncertainty about the future course of economic policies does not appear to have been affected by these or domestic events (see Chart 3). However, in 2024 Q1, for the second quarter in a row, the Banco de España Business Activity Survey identified uncertainty as the main factor constraining activity, adversely affecting around 60% of companies. In the euro area as a whole, there appears to have been an increase in the economic policy uncertainty indicator since the start of the war between Israel and Hamas.

Box 1.1

THE IMPACT OF UNCERTAINTY ON ECONOMIC ACTIVITY (cont'd)

Chart 4
Impact of uncertainty shock on GDP: Spain (a)

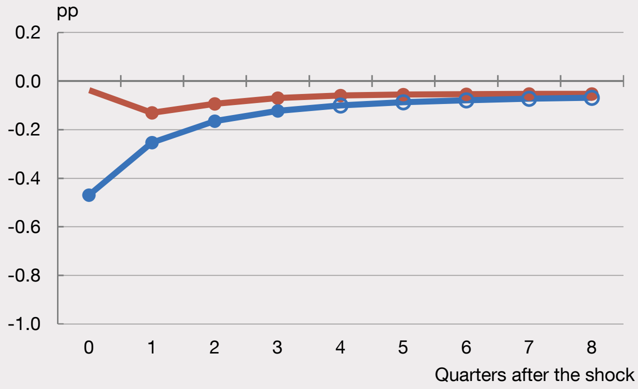
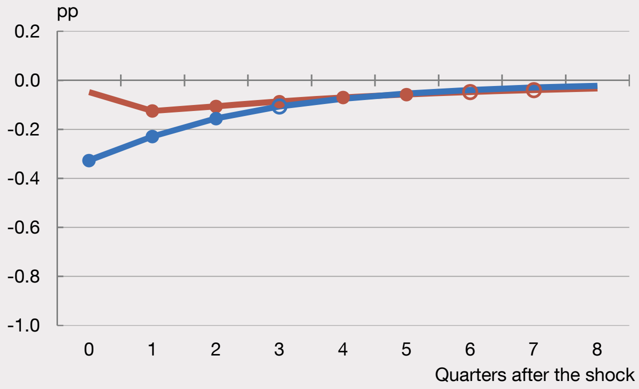


Chart 5
Impact of uncertainty shock on GDP: euro area (a)



SOURCES: Chicago Board Options Exchange (CBOE), Factiva DJ and Banco de España calculations.

a Both charts show responses to a positive shock of one standard deviation in the EPU index (red line) and in the VIX (blue line). The solid (empty) circles indicate statistical significance at the 5 (10)% level; solid line, not statistically significant. The VAR model for Spain includes the following variables: the EPU index, the spread over German 10-year sovereign bonds, quarter-on-quarter GDP growth and inflation; the VIX is included as an exogenous variable in first position, subject to the condition that its equation does not depend on the other lagged variables, but only on its own past values. In the case of the euro area, the same model is estimated, except that the spread between German and US bonds is considered as a proxy for the European spread.

These indicators are contemporaneous, since they capture agents' perceptions at a given point in time. Given its very nature, uncertainty cannot be perfectly quantified at all times, and may vary over time as agents receive a flow of imperfect and complex information to interpret.

These considerations highlight the importance of analysing the sensitivity of economic activity to possible larger increases in agents' perceived uncertainty. In this box, we use an estimation method based on vector autoregressive (VAR) models incorporating the uncertainty indicators mentioned above to do so.[12]

Chart 4 contains the responses of Spain's GDP to unexpected increases in both global and domestic uncertainty.[13] Uncertainty shocks are seen to cause material reductions in GDP. These impacts differ depending on whether the shock is of external or domestic origin.

An external financial shock has a larger negative impact on GDP (0.4 pp in the contemporaneous quarter), but also of shorter duration (as it remains statistically significant at the 5% level only during the first four quarters after the shock). By contrast, a domestic, economic policy-related uncertainty shock has a minor impact on GDP, the maximum impact being 0.1 pp after one quarter, but it is more persistent, remaining statistically significant at the 5% level even after two years (see Chart 4). In the literature, a financial shock of global origin tends to have a greater

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[12] The sovereign debt spread (in the model for Spain, this spread is defined as the spread between Spanish and German sovereign debt, while in the model for the euro area it is defined as the spread between German and US debt) and a price index are also included as additional control variables, to take into account the possible effects of the financial and nominal variables on the various indicators of uncertainty. The analysis also takes into account the effect of uncertainty stemming from the external environment, in particular the European Union, which allows the effects of country-specific shocks to be isolated. Specifically, the VAR model for Spain includes the following variables: the EPU index, the spread over German 10-year sovereign bonds, quarter-on-quarter GDP growth and inflation; the VIX is included as an exogenous variable in first position, subject to the condition that its equation does not depend on the other lagged variables, but only on its own past values. In the case of the euro area, the same model is estimated, except that the spread between German and US bonds is considered as a proxy for the European spread.

[13] The size of the shock corresponds to one standard deviation of the structural shock estimated in the model. For the Spanish EPU index, this corresponds roughly to the rise associated with the general elections in November 2011 or to half of the rise related to the 2008 financial crisis. For the VIX, the structural shock considered corresponds to the increase related to the stock market collapse in China in August 2015.

Box 1.1

THE IMPACT OF UNCERTAINTY ON ECONOMIC ACTIVITY (cont'd)

impact on the economy. However, the persistence of local shocks shows that they are relevant for identifying medium-term growth risks for Spain.

In the euro area, in comparison, the response of GDP to a local EPU shock is similar to that in Spain, with a maximum impact of 0.13 pp that falls over time. However, the impact continues for up to eight quarters after the shock. As in the case of Spain, the impact of a global uncertainty shock on GDP is greater, reaching 0.3 pp, and the effect remains negative and significant for four quarters (see Chart 5). In comparison with Spain, the global shock has a somewhat smaller and less persistent impact on the euro area as a whole, where it causes less destabilisation. These results suggest that, in the current context of economic uncertainty, it will be very important to continue to monitor developments in these indicators, since increases could pose risks to growth. It should also be borne in mind that spikes in uncertainty can affect financial stability through multiple channels in addition to growth, such as risk premia, which are addressed in the main text of this report.

Box 1.2

THE VULNERABILITY OF HIGH PUBLIC DEBT IN THE CONTEXT OF THE REFORM OF THE EU ECONOMIC GOVERNANCE FRAMEWORK

Following the agreement between the European Council and the European Parliament, the proposed reform of the EU economic governance framework, which will affect the fiscal rules in particular, is set to be ratified in the coming weeks.[1] Its design is especially important for ensuring the sustainability of EU countries' public finances,[2] thus averting risks to financial stability. This is all the truer given that, following the activation of the escape clause, several EU countries (including Spain) have built up large structural deficits (euro area average of 3.1% in 2023, according to European Commission forecasts, and 3.7% in Spain, according to the Banco de España's projections) and high levels of government indebtedness (more than 100% of GDP in some cases, including Spain).

The new framework is intended to normalise the euro area's fiscal position by adopting a differentiated approach to national consolidation plans, taking into account each country's debt levels and fiscal risks. To this end, each Member State will draw up a medium-term fiscal-structural plan that will include commitments in terms of expenditure paths, structural reforms and public investment plans.

For the most indebted countries, the expenditure path must ensure that the public debt-to-GDP ratio is on a plausible downward path towards the reference value of 60%, on the condition that the budget deficit remains below 3% of GDP over the medium term. The fiscal adjustment period to reach these targets is four years, although that period can be extended to seven years if the Member State implements structural reforms and investments that benefit potential growth and fiscal sustainability over the medium term.

The fiscal stabilisation targets are expressed by means of a single instrument: the multi-year net primary expenditure path,[3] which is set based on a reference trajectory prepared by the European Commission and country-specific debt sustainability analysis. The new framework also includes additional requirements (safeguards) to ensure that the expenditure path delivers ex ante minimum deficit and/or debt adjustments to guarantee the predictability of the framework and that fiscal buffers are built up.

In the case of Spain, public debt stands at very high levels, above those in most euro area countries (see Chart 1). Indeed, at end-2023 the country's public debt-to-GDP ratio of 107.7% was more than 30 percentage points (pp) (17 pp) higher than the euro area simple (weighted) average, and slightly above the 75th percentile of the euro area distribution.

Against this background, identifying the risks to fiscal sustainability linked to this level of indebtedness – one of the cornerstones of the multi-annual adjustment plans under the new EU economic governance framework – is all the more important. At present, there are both medium and long-term sources of vulnerability for public debt dynamics going forward.

One centrepiece of these dynamics is the differential between the cost of government financing and a country's economic growth.

The differential between the implied interest rate on the total stock of debt and the nominal economic growth rate (the interest rate-growth rate differential) has improved since 2019 and in 2023 stood at negative levels (around -6.2 pp in the case of Spain, according to the latest data, and -5.8 pp in the euro area, according to European Commission forecasts). However, the outlook for the coming years points to a significant trend reversal. Based on the Banco de España and European Commission's latest forecasts, that differential could correct by nearly 5 pp in Spain over the next two years and by more than 3 pp in the euro area, albeit still holding in negative values (see Chart 2).

From a longer-term standpoint, gradual population ageing will exert increasing pressure on public spending (e.g. pension-related and health-related costs). In the case of

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[1] See European Council press release.

[2] Mario Alloza, Javier Andrés, Pablo Burriel, Iván Kataryniuk, Javier J. Pérez and Juan Luis Vega. (2021). "The reform of the fiscal governance framework of the European Union in a new macroeconomic environment". Documentos Ocasionales, 2121, Banco de España.

[3] The concept of net primary expenditure referred to in the new economic governance framework excludes (in addition to interest expenditure) EU-funded expenditure and national expenditure on co-financing of programmes funded by the EU, cyclical unemployment expenditure, one-off or temporary measures and discretionary revenue measures.

[4] See Independent Authority for Fiscal Responsibility. (2023). "Opinion on the long-term sustainability of public administrations: The impact of demographics", which includes the changes stemming from the recent pension reform in Spain, and European Commission (2021). "The 2021 Ageing Report. Economic and Budgetary Projections for the EU Member States (2019-2070)", respectively.

Box 1.2

THE VULNERABILITY OF HIGH PUBLIC DEBT IN THE CONTEXT OF THE REFORM OF THE EU ECONOMIC GOVERNANCE FRAMEWORK (cont'd)

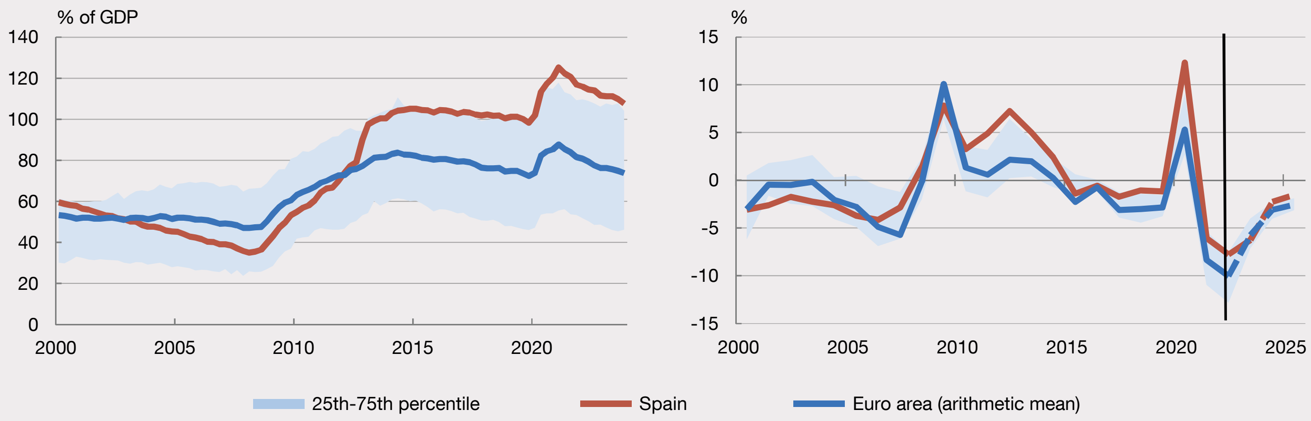


Chart 1
Spanish public debt in the European context (a)

Chart 2
Interest rate - nominal growth rate differential (b)

SOURCES: Eurostat, European Commission and Banco de España.

a European Commission November 2023 estimates for 2023 Q4 (except for Spain).
b Differential calculated using the implied interest rate on public debt and the nominal GDP growth rate. The implied interest rate is calculated as the ratio between the interest burden and the stock of public debt in the previous period.

Spain, it is estimated that pension expenditure could increase by more than 2 pp of GDP over the next two decades (and by almost 1 pp in the euro area),[4] in the absence of significant reforms. In addition to these demographic trends, countries face other long-term challenges such as higher defence spending[5] and the public investment required for the green transition.[6]

A more formal analysis of the medium and long-term implications of these developments for the sustainability of public finances can be conducted using Debt Sustainability Analysis (DSA) tools. These are stylised models that, taking into account the interplay between economic activity, financial conditions and fiscal policy, can project different debt dynamics to identify fiscal sustainability vulnerabilities. In particular, these models relate public debt developments to the expected paths of their determinants using equations that describe the course of real GDP, inflation and interest rates.[7]

To achieve a more complete characterisation of these dynamics in the case of Spain, a model that explicitly captures the uncertainty stemming from developments in the macro-financial environment is considered. Thus, taking recent empirical evidence, this model can be used to project numerous debt paths that illustrate the vulnerabilities related to the macro-financial environment and how these change over time and under different fiscal adjustment assumptions.[8]

Thus, Chart 3 shows the expected changes in Spain's public debt ratio up to 2040 under the assumption of unchanged fiscal and budgetary policies (which would entail non-compliance with the new fiscal rules). This would foreseeably take government debt to levels close to 108% of GDP in 2026 and around 120% in 2040.

Moreover, considering the uncertainty stemming from the macro-financial environment, in the vast majority of the possible simulated paths (85% of cases), even in many of

---

[5] Demosthenes Ioannou and Javier J. Pérez (eds.) (2023). "The EU's Open Strategic Autonomy from a central banking perspective. Challenges to the monetary policy landscape from a changing geopolitical environment". Occasional Paper Series, 311, European Central Bank.

[6] European Commission. (2024). "Securing our future. Europe's 2040 climate target and path to climate neutrality by 2050, building a sustainable, just and prosperous society", Staff Working Document, 63.

[7] See Pablo Hernández de Cos, David López Rodríguez and Javier J. Pérez. (2018) "The challenges of public deleveraging". Documentos Ocasionales, 1803, Banco de España; and Pablo Burriel, Iván Kataryniuk and Javier J. Pérez (2022). "Computing the EU's SURE interest savings using an extended debt sustainability assessment tool". Documentos Ocasionales, 2210, Banco de España, for a specific use case.

[8] Mario Alloza, Jorge Martínez, Juan Rojas and Iacopo Varotto. (2024). "Public debt dynamics: a stochastic approach applied to Spain". Documentos Ocasionales, Banco de España. Forthcoming.

Box 1.2

THE VULNERABILITY OF HIGH PUBLIC DEBT IN THE CONTEXT OF THE REFORM OF THE EU ECONOMIC GOVERNANCE FRAMEWORK (cont'd)

Chart 3
Simulated public debt-to-GDP path in Spain. No fiscal consolidation plan

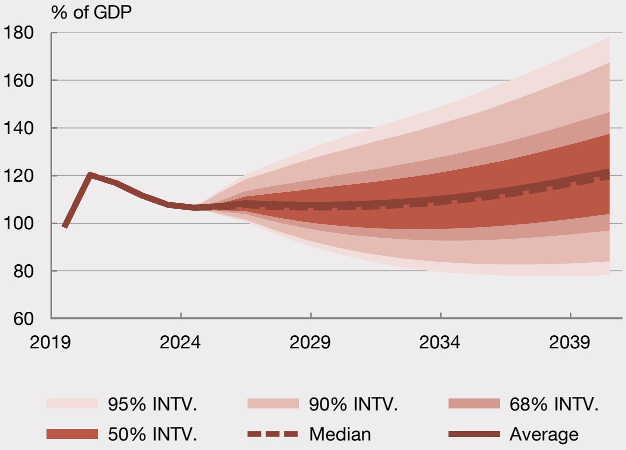
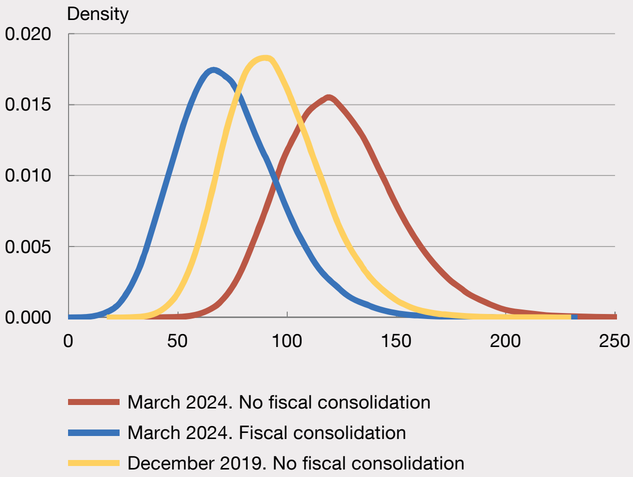


Chart 4
Distribution of Spanish debt-to-GDP ratios in 2040 under different scenarios



SOURCES: INE, IGAE, AIReF and Banco de España.

those which include more intense and longer-lasting expansionary phases than the baseline scenario or more favourable financing conditions, this ratio would stand above the pre-pandemic levels (98% of GDP in 2019).

As a result of the current more adverse starting point of public finances and the changes in financing conditions, the long-term scenario envisaged in this simulation is significantly less favourable than that which would have been projected with the information available at December 2019. In that case (yellow line in Chart 4), the distribution of possible public debt-to-GDP ratios would have shown a more benign picture, where debt levels of 120% of GDP would only have been reached in slightly more than 10% of the possible simulated paths (the most adverse ones).

That said, based on the information available in the Banco de España's latest projection exercise of March 2023, the implementation of a fiscal consolidation plan characterised by an adjustment of 0.5% of GDP to achieve equilibrium in the structural balance[9] would lead to substantially different dynamics.[10] Under this scenario, the public debt-to-GDP ratio would follow a sustained and declining path, reaching, on average, levels close to 75% of GDP in 2040 (red line in Chart 4). Against this backdrop, despite possible changes in macro-financial conditions, this fiscal consolidation effort would succeed in bringing the government debt ratio below pre-pandemic levels in nearly 90% of the simulated paths.

An analysis of these debt dynamics shows the need to implement, as quickly as possible and in the setting of the new EU economic governance framework, a fiscal consolidation plan that gradually reduces indebtedness and improves the Spanish economy's resilience to address future challenges.

Implementing this consolidation plan is key for monetary policy to function properly within the euro area.[11]

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[9] Structural balance refers to the difference between government revenue and expenditure after adjusting for the effects of the economic cycle.

[10] This adjustment would be broadly consistent with the new EU economic governance framework, according to some preliminary estimates by Bruegel for a seven-year plan.

[11] For instance, Fernando Broner, Aitor Erce, Alberto Martin and Jaume Ventura. (2014). "Sovereign debt markets in turbulent times: Creditor discrimination and crowding-out effects". *Journal of Monetary Economics,* 61, 114-142, analyse the setting of financial turmoil that leads to the replacement of private credit with public debt, resulting in a crowding-out effect of productive private investment.

Box 1.2

THE VULNERABILITY OF HIGH PUBLIC DEBT IN THE CONTEXT OF THE REFORM OF THE EU ECONOMIC GOVERNANCE FRAMEWORK (cont'd)

Also, maintaining a high level of government debt limits the ability of fiscal policy to respond to future economic shocks. A simple descriptive analysis of international data on government debt behaviour following a recession highlights the need to generate sufficiently large fiscal buffers to allow for possible future fiscal policy action. By way of example, euro area government debt has increased, on average, by around 20 pp in the five years following a recession.[12]

Maintaining a high level of debt and a large budget deficit also remains a source of vulnerability when faced with changes in the financial markets' perception, which would increase the public sector's financing costs, with the risk of this passing through to the private sector, including the banking sector.[13, 14] These scenarios could affect real economic activity and thus further worsen the outlook for the sustainability of public finances.

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[12] Mario Alloza, Javier Andrés, Pablo Burriel, Iván Kataryniuk, Javier J. Pérez and Juan Luis Vega. (2021). "The reform of the European Union's fiscal governance framework in a new macroeconomic environment". Documentos Ocasionales, 2121, Banco de España.

[13] Giancarlo Corsetti, Keith Kuester, Andre Meier and Gernot J. Mueller. (2013). "Sovereign risk, fiscal policy, and macroeconomic stability". *Economic Journal,* 123(566), pp. F99-F132.

[14] See Chapter 5 of Kris J. Mitchener and Christoph Trebesch. (2021). "Sovereign Debt in the 21st Century: Looking Backward, Looking Forward". NBER Working Paper Series, WP28598. National Bureau of Economic Research, for a review of the literature and empirical evidence. Also Emmanuel Farhi and Jean Tirole. (2018). "Deadly Embrace: Sovereign and Financial Balance Sheet Doom Loops". *Review of Financial Studies,* 85 (3), pp. 1781-1823.

2

FINANCIAL SECTOR RISKS AND RESILIENCE

The continuing higher interest rate environment in 2023 added more fuel to the decline in credit to the resident private sector in Spain that began in 2022. This contraction was broadly based across the different portfolios, with notable decreases in lending for house purchase and for business purposes, although their levels tended to stabilise in the final stretch of the year. Credit quality in Spain, which had improved steadily in recent years, interrupted only marginally by the pandemic, deteriorated somewhat, especially in loans to households.

Higher interest rates continued to drive up the cost of all funding instruments for Spanish banks, including the cost of firms' and households' deposits, which are their largest source of funds. However, the pass-through of higher money market rates remains low compared with the pass-through to lending, prompting a substantial improvement in banks' earnings via net interest income growth.

Improved bank profitability has underpinned strong shareholder remuneration and a timid increase in solvency, such that the Common Equity Tier 1 (CET1) ratio gap with the main European banking systems has widened again. The stress tests, such as that presented in Box 2.1 below, evidence the banking sector's high aggregate resilience to adverse scenarios.

Nevertheless, unlike the favourable effects already observed, the bulk of the adverse effects of the recent monetary tightening will take some time to emerge. Consequently, a gradual moderation in net interest income is to be expected, as the pass-through to liability rates moves closer to the pass-through to lending rates. An increase in impairment losses may also be expected, depending on the intensity of the change in trend of credit quality developments.

In this setting, banks would be well advised to earmark a significant share of their current profits to strengthening their ability to absorb any delayed costs resulting from the current higher interest rate environment.

The Spanish non-bank financial intermediation (NBFI) sector was relatively stable in 2023 in terms of size and interconnections, against the backdrop of monetary policy tightening.

2.1 Deposit institutions

2.1.1 Balance sheet structure, risks and vulnerabilities

Credit risk in business in Spain

The decline in credit to the resident private sector intensified in Spain in 2023, both in nominal and real terms. Specifically, the stock of lending by deposit institutions to the resident private sector in Spain fell by 3.4% year-on-year in 2023, 2.8 percentage points (pp) more than in 2022. In real terms,[1] lending fell by 6.7%, also greater (0.8 pp more) than in 2022 (see Chart 2.1.a).

The contractionary dynamics were broadly based across sectors and banks, moderating in the last part of the year. Significant contraction was observed both in lending to non-financial corporations (NFCs) and sole proprietors and in lending to households, while only lending to financial corporations[2] increased. This pattern was broadly based across banks (see Chart 2.1.b). The year-on-year declines in credit to households and to the non-financial corporate segment steadied in 2023 Q4 (see Chart 2.1.c).

In the non-financial corporate sectors, the decline in the volume of credit was significantly larger in 2023 than in 2022. For NFCs and sole proprietors, lending contracted by 5.5% in 2023, 4.1 pp more than in 2022. This decline was broadly based across the different sectors of activity and firm sizes and was partly due to repayment of loans granted under the public guarantee programme introduced in response to the pandemic (the total stock declined by almost 30% year-on-year in 2023). The contraction in lending to firms contributed 2 pp to the total decline in credit to the resident private sector (see Chart 2.1.c). Lending to SMEs fell by 8.8% year-on-year in 2023 (4.1% in 2022), while lending to larger firms fell by 1.8% (compared with growth of 1.8% in 2022).

The stock of lending by deposit institutions to households declined, influenced by developments in loans for house purchase. Lending to households decreased by 2.3% year-on-year, 2.2 pp more than in 2022, mainly owing to loans for house purchase which fell by 3.1% in 2023, the largest year-on-year decline since 2015. As noted in Chapter 1, the extraordinarily high level of loan repayments played a significant part. Of the 3.4 pp decline in credit to the resident private sector in 2023, 1.3 pp corresponded to lending for house purchase. Other lending to households grew by 1.1% in the year, but this barely shaved 0.1 pp off the negative net contribution of lending to households,[3] which stood at -1.2 pp (see Chart 2.1.c).

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[1] The figures for real lending in this paragraph are obtained by deflating the portion of lending to households (not for business purposes) by the consumer price index and all other lending (to non-financial corporations, financial corporations and sole proprietors) by the GDP deflator. All other references to lending in this chapter relate to nominal lending.

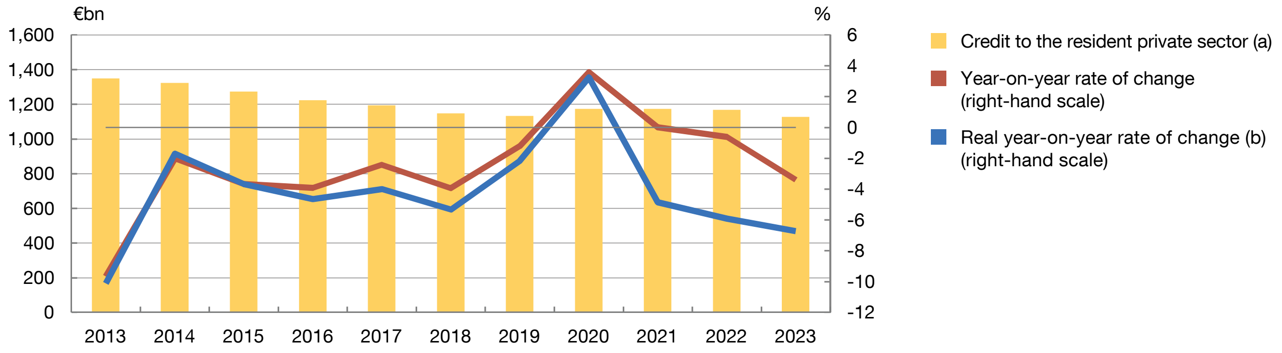
[2] Financial corporations account for a small part of the portfolio of credit to the resident private sector in Spain, amounting to 5.6% at December 2023.

[3] At December 2023 this portfolio accounted for 19% of lending to households and for 10.2% of total credit to the resident private sector.

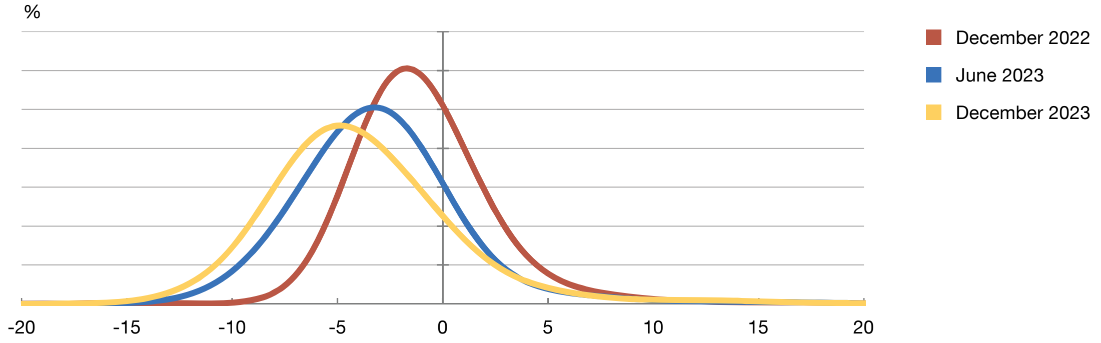
Chart 2.1

Credit to the Spanish resident private sector declined across the board in 2023, albeit at a slower pace in the last stretch of the year

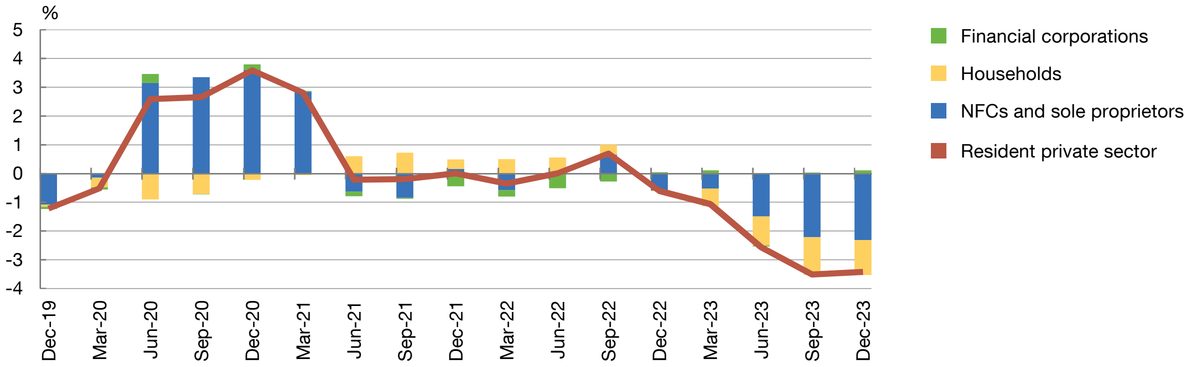
2.1.a Volume of lending and rate of change. Business in Spain. ID



2.1.b Distribution of year-on-year rates of change in credit to the resident private sector, by bank (c). Business in Spain. ID



2.1.c Contributions to year-on-year rates of change in credit to the resident private sector, by sector. Business in Spain. ID



SOURCE: Banco de España.

a The resident private sector includes households, NFCs and sole proprietors, and financial corporations.

b The time series of the real change in credit is obtained by taking into account its composition, deflating the portion of lending to households (not for business purposes) by the consumer price index and all other lending (to NFCs, financial corporations and sole proprietors) by the GDP deflator.

c The chart shows the density function of the rate of change in credit to the resident private sector for Spanish deposit institutions, weighted by the corresponding amount of credit. This density function is proxied using a kernel estimator which enables a non-parametric estimate of the density function, yielding a continuous and smoothed graphical representation of that function.

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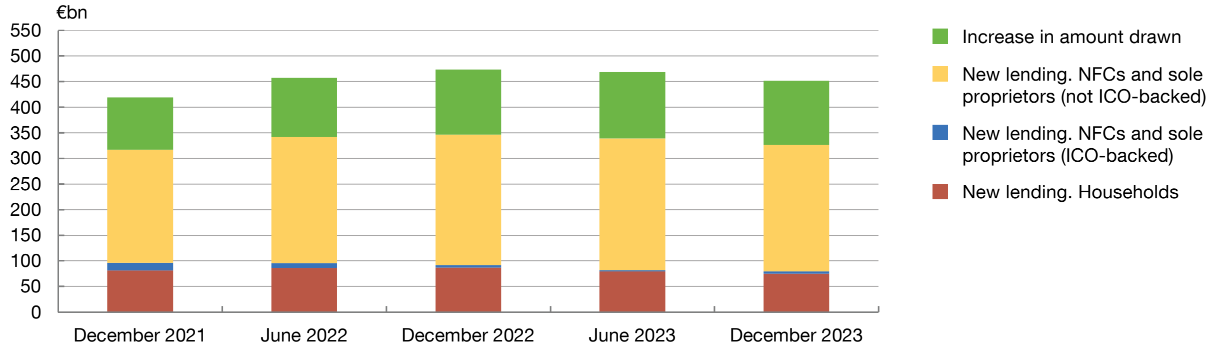
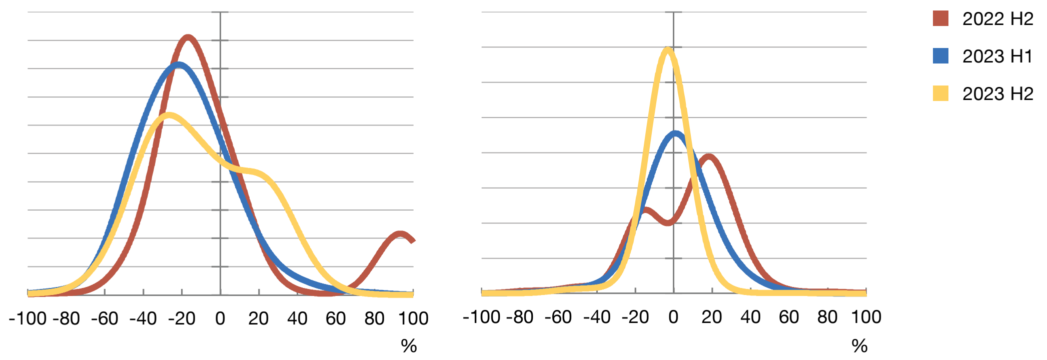
Chart 2.2

New lending to NFCs fell slightly in 2023 while new lending to households fell more markedly

2.2.a New lending volume, 12M cumulative. Households, NFCs and sole proprietors (a). Business in Spain. ID



2.2.b Distribution by bank of year-on-year rate of change in half-yearly new lending flows to households (l-h panel) and NFCs and sole proprietors (r-h panel) (b). Business in Spain. ID



SOURCE: Banco de España.

a Excluding other financial corporations.

b The chart shows the density function of the year-on-year rate of change of the half-yearly new lending flows to households (left-hand panel) and NFCs and sole proprietors (right-hand panel) for Spanish deposit institutions, weighted by the flow of half-yearly new lending for that purpose. The density function is estimated using a kernel estimator which enables a non-parametric estimate of the density function, yielding a continuous and smoothed graphical representation of that function.

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New lending also fell, at a slightly slower pace than the volume of credit. New lending to households and NFCs was 3.1% lower than in 2022 (see Chart 2.2.a). This net decline reflects the 4.3% decrease in new lending, which was partially offset by the increase in amounts drawn under existing loans.

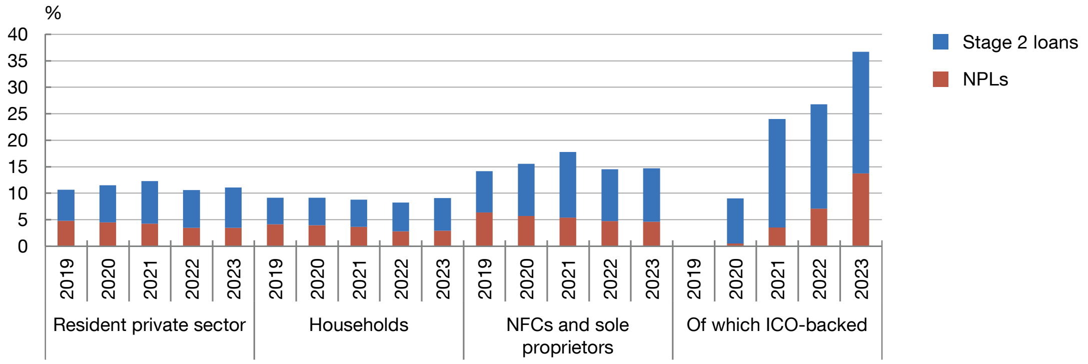
The decline in new lending was most pronounced in loans to households, although it also affected NFCs and sole proprietors. The year-on-year decline in 2023 was smaller for new corporate credit (-1.1%) than for households (-9.5%). For NFCs, the decline was most marked among SMEs, where new lending fell by 5.4% year-on-year.

The contraction in new lending in 2023 was broadly based across deposit institutions. In the case of lending to households (see Chart 2.2.b, left-hand panel), the dispersion in year-on-year growth increased in 2023 H2, with some banks moving towards positive values. This

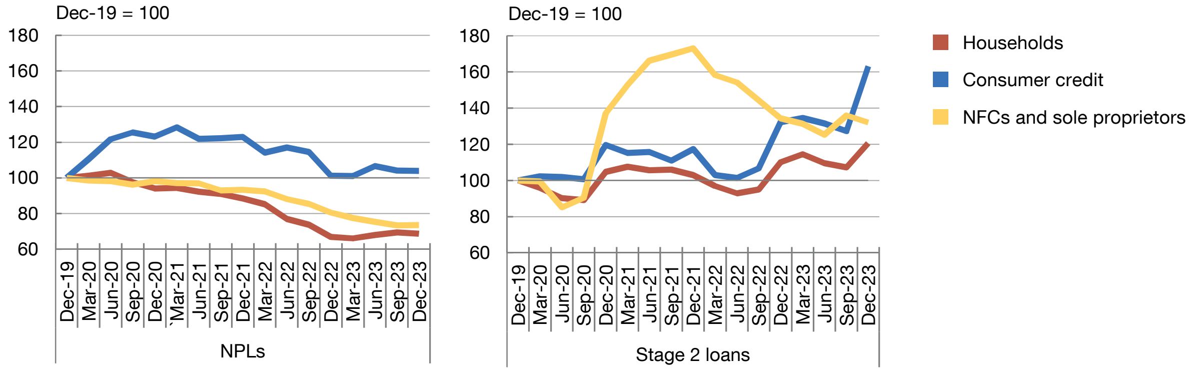
Chart 2.3

Problem loans worsened in 2023, the decline in NPLs stalled and Stage 2 loans increased, especially on account of the adverse performance of the household segment

2.3.a Share of NPLs and Stage 2 loans. At December of each year. Business in Spain. ID



2.3.b Volume of NPLs (left-hand panel) and Stage 2 loans (right-hand panel). Business in Spain. ID



SOURCE: Banco de España.

can probably be attributed, at least in part, to competitive dynamics in the banking sector, with certain groups of banks looking to shore up their market share. In any event, this change in distribution will have to be monitored, to ascertain whether it indicates a change in aggregate lending to households. By contrast, in the case of the non-financial corporate sectors (see Chart 2.2.b, right-hand panel), compared with previous half-yearly periods more homogeneity was observed across banks as they converged closer to the average rate of decline.[4]

The non-performing loan (NPL) ratio held broadly steady in 2023, with a small decline in the volume of NPLs that offset the upward momentum stemming from the contraction in the total stock. The NPL ratio decreased by less than 0.1 pp in 2023, standing at 3.4% for the resident private sector as a whole (see Chart 2.3.a). As a result, the sharp declines observed since the end of the global financial crisis, mainly as a result of the reduction in the stock of non-performing loans, came to a halt. In particular, the cumulative total for the year decreased by 3.7% (well below the fall of 18.5% in 2022). The decline in the total stock of lending to the resident private sector is estimated to have contributed 0.1 pp to its NPL ratio.[5]

---

[4] In the most recent period (2023 H2), higher growth in new lending to households and NFCs appears to be linked to a higher solvency ratio and a lower NPL ratio in business in Spain. This growth also seems to be driven by the banks that started out with a lower level of net interest income to total assets in business in Spain.

Non-performing loans for house purchase rose in 2023, driving up the NPL ratio in lending to households. Specifically, NPLs to households rose by 2.7% year-on-year (compared with a decline of 24.3% in 2022), driven by a significant increase (6.9%) in NPLs for house purchase (see Chart 2.3.b). In consequence, the NPL ratio stood at 2.4%, up 0.3 pp in the year.

The volume of non-performing loans to the non-financial corporate sector continued to decline in 2023, albeit at a slower pace than in previous years. NPLs to NFCs and sole proprietors fell by 8.8% in 2023, a smaller drop than in the previous year (-13.7%) (see Chart 2.3.b). This decline was broadly based across sectors of activity and firm size, with the exception of large firms, whose NPLs grew by 0.3% in the year.

The NPL ratio of loans to firms backed by the Official Credit Institute (ICO-backed loans) rose in 2023, partly owing to the decline in this portfolio. The ratio rose by 6.6 pp year-on-year to 13.7%. Although the NPLs in this portfolio increased considerably in 2023 (37.6%), the pace of growth slowed in the final stretch of the year. Moreover, a significant part of the climb in the NPL ratio was due to the substantial decrease in the stock of these loans (-29% in 2023) as a result of the gradual repayment process. Had the total loan stock in the ICO portfolio (the denominator of the ratio) remained constant in 2023, the share of NPLs would have risen by 2.7 pp in the year, to 9.7% at December.

Stage 2 loans also increased in the year, again owing to lending to households. Stage 2 loans rose by 3.2% in 2023 for the resident private sector as a whole. This is a reversal of the 2022 pattern. In addition, 23% of ICO-backed loans to firms were classified as Stage 2, 3.3 pp more than a year earlier. Had the total loan stock in the ICO portfolio (the denominator of the ratio) remained constant in 2023, the share of Stage 2 loans would have fallen by 3.4 pp in the year, to 16.3% at December.

The change in NPLs was driven by higher Stage 2 inflows and lower Stage 2 outflows. Specifically, in 2023 new NPLs increased by 18.2% (see Chart 2.4.a). In addition, outflows to write-offs fell by 6.8%, while all other outflows (mainly repayments, recoveries to performing or Stage 2, and portfolio sales) fell by 14.5% compared with 2022.

The increase in Stage 2 loans is also explained by the higher inflows and lower outflows in the year. In 2023 Stage 2 inflows increased by 15.3% on a year earlier, owing to loans reclassified from performing which rose by 19.3%. Meanwhile, Stage 2 outflows fell by 15.1% in the year, mainly due to the lower flow of loans reclassified to performing which decreased by 22.9%.

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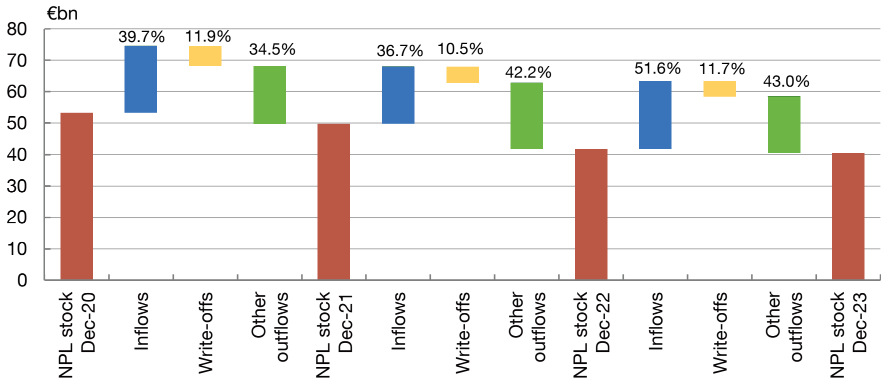
[5] Had the stock remained constant, the NPL ratio of credit to the resident private sector would have stood at 3.3% at December 2023, compared with the 3.4% actually observed.

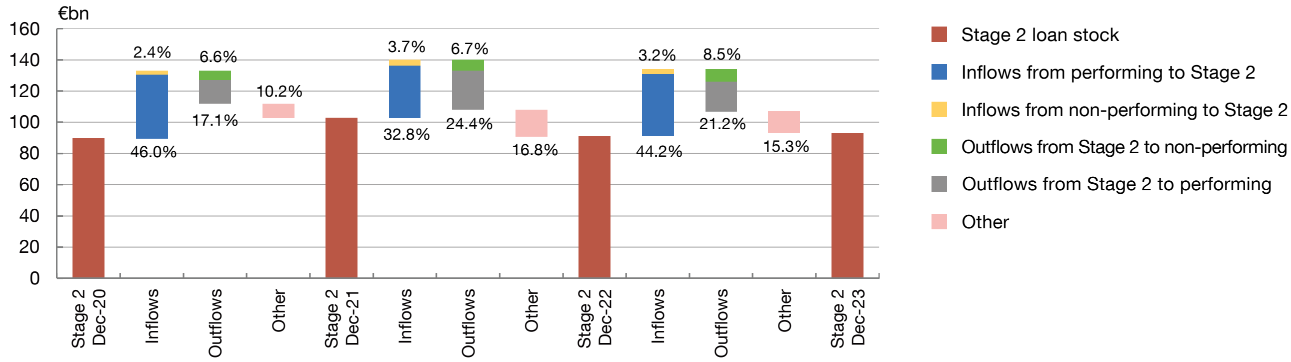
Chart 2.4

In 2023 inflows to NPLs and Stage 2 loans increased, both in absolute terms and as a proportion of the total loan stock

2.4.a Inflows and outflows of non-performing loans and advances (a). Business in Spain. ID



2.4.b Inflows and outflows of Stage 2 loans and advances (b). Business in Spain. ID



SOURCE: Banco de España.

a The stock of non-performing loans and advances in each year corresponds to the carrying amounts on banks' balance sheets. NPL inflows are movements of loans from performing and Stage 2, along with loans acquired from third parties. NPL outflows include movements to performing and Stage 2, along with asset foreclosures, portfolio sales and securitisations. The percentages above the inflows and outflows over the course of a year denote their share of the stock of non-performing loans and advances at December of the previous year.

b The volume of Stage 2 loans is measured using the carrying amount on banks' individual balance sheets. To be included as inflows and outflows, at year-end loans must have a different stage of impairment than at the start of the year or at the time of initial balance sheet recognition, if later. The percentages above and below the bars of the Stage 2 inflows and outflows denote their share of the stock of Stage 2 loans on balance sheets at December of the previous year. The "Other" bar includes loans which, having been in Stage 2 at the previous year-end, were repaid or sold in the current year.

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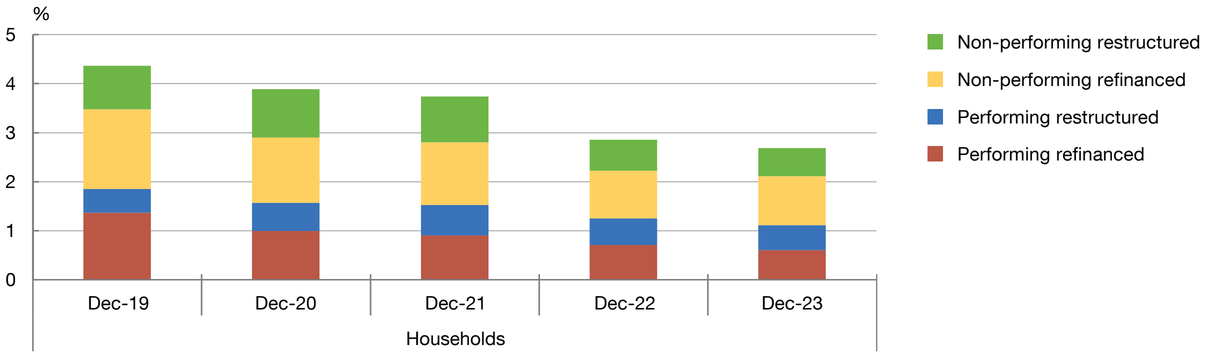
The proportion of forborne loans in lending to households continued to decline in 2023. At year-end they accounted for 2.7% of lending, somewhat less than at December 2022 (2.9%) and substantially lower than at December 2019 (4.4%) before the onset of the pandemic (see Chart 2.5.a). In terms of credit quality, while the NPL ratio in the restructured loan portfolio fell slightly (53.1% at December 2023 compared with 53.9% at December 2022), in the refinanced loan portfolio it rose slightly (62.3% at December 2023 compared with 58% at December 2022).

The share of forborne loans in lending to the non-financial corporate sector also declined. Compared with December 2022, it fell by 1.2 pp to 5.5% of total lending to NFCs at December 2023 (see Chart 2.5.b). The NPL ratio in the refinanced loan portfolio fell to 57.2%

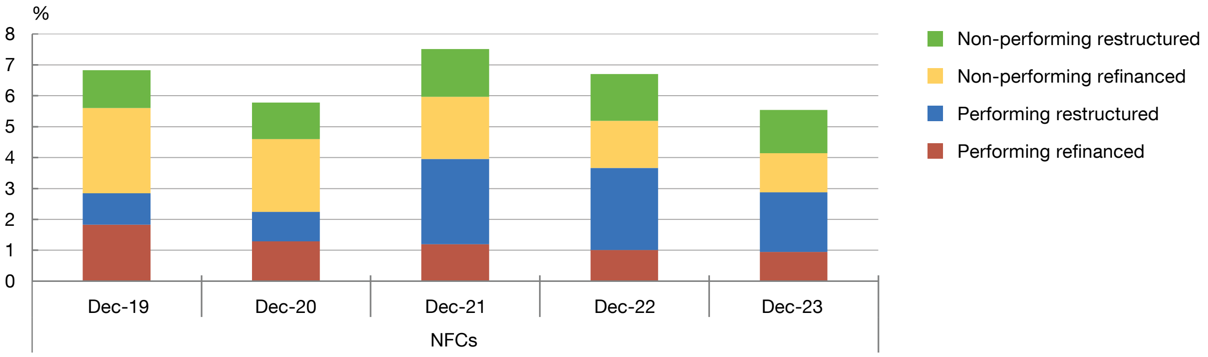
Chart 2.5

The proportion of forborne loans to households and NFCs has continued to decline, albeit concentrated on performing exposures

2.5.a Share of performing and non-performing forborne loans. Households (a). Business in Spain. ID



2.5.b Share of performing and non-performing forborne loans. NFCs. Business in Spain. ID



SOURCE: Banco de España.

a To calculate the share of forborne loans, sole proprietors are included under households.

at December 2023 (compared with 60.3% at December 2022), while in the restructured loan portfolio it rose to 42.1% at December 2023 (up from 36.4% at December 2022).

The volume of loans granted under the Codes of Good Practice (CGP), while remaining contained, increased considerably in 2023. The cumulative total of outstanding loans granted in 2023 under the 2012 CGP and the new 2022 CGP amounted to €907 million in almost 7,900 loans (0.2% of the outstanding amount of loans to households for house purchase at end-2022). This compares with loans granted in 2022 under the 2012 CGP totalling €135 million in almost 1,350 loans (0.03% of the outstanding amount of loans to households for house purchase at end-2021). In 2023, new applications for CGP measures were made for loans totalling €7.6 billion (1.5% of the outstanding amount of loans to households for house purchase at end-2022). Of these applications, loans accounting for 12% by volume were admitted and 43% were rejected.[6]

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[6] With data to December 2023, more than 80% of these rejections are due to a failure to meet the objective eligibility requirements.

The credit quality of the loans subject to CGP measures worsened somewhat in 2023. As these facilities target vulnerable households or households at risk of vulnerability, credit quality ratios are expected to be worse than for lending for house purchase overall. Of the total stock of loans subject to CGP measures, at December 2023 46.9% were non-performing restructured exposures, 2.7% were non-performing non-restructured exposures and 26.3% were Stage 2 exposures. This is a minor deterioration in credit quality compared with December 2022 (increases of 1.5 pp, 2.2 pp and 5.3 pp, respectively), consistent with the greater fragility of this portfolio and with the deterioration observed in lending for house purchase overall.

Financial assets in the consolidated business

Financial assets in business abroad increased by 6% in 2023, in contrast to the contraction in Spain. Specifically, in business in Spain, financial assets decreased by 1.4% year-on-year in 2023. Meanwhile, the main contributors to balance sheet growth abroad were loans to credit institutions (24.4% year-on-year), loans to resident private sectors in countries other than Spain (3.1%) and debt securities (13.2%). In Spain, as mentioned above, the significant decline in credit to the private sector was the largest contributory factor to the decrease in financial assets in business in Spain overall (see Chart 2.6.a).

Lending by Spanish banks declined in the United Kingdom and Türkiye and increased in the other countries where Spanish banks conduct significant international business. In the United Kingdom, which accounts for more than a quarter of loans to the resident private sector abroad, lending contracted by 5% in 2023, despite the slight appreciation of the pound in the year. In Mexico, lending rose by 20.1% in euro terms, partly owing to the significant appreciation of the Mexican peso against the euro. In the United States, lending increased by 1.8% year-on-year, despite the depreciation of the dollar, while in Brazil the appreciation of the *real* contributed to the 10.8% rise in lending in euro terms. Lastly, exposure in Türkiye declined by just 2.4%, despite the sharp depreciation of the Turkish lira in the period (see Chart 2.6.b).

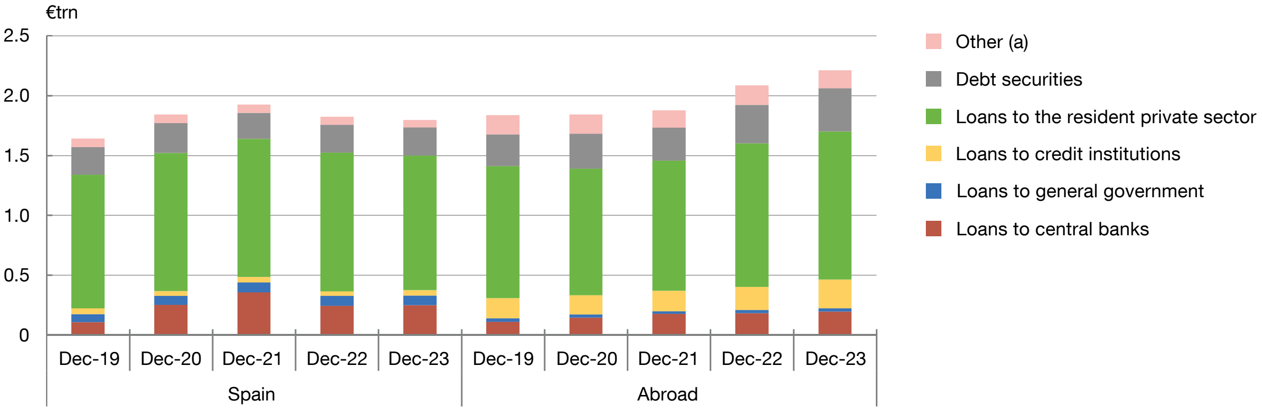
Non-performing financial assets increased in business abroad, as did the NPL ratio, albeit in both cases unevenly across jurisdictions (see Chart 2.7.a). The NPL ratio of credit to the resident private sector rose markedly in the United States (by 1.4 pp to 4.9%), driven by a strong increase of more than 40% in NPLs, especially in lending to households where the NPL ratio climbed to 12.9%. There were no notable changes in NPL ratios in the other geographical areas, with the exception of Türkiye where the NPL ratio fell by 1.8 pp to 4.6%, mainly owing to the decline in NPLs to firms.

The consolidated balance sheet mix of Spanish banks has shifted since the start of the interest rate hiking cycle in 2022, with an increased share of debt securities. While credit to the resident private sector has continued to account for just over 55% of total assets since December 2021, in the last two years the share of debt securities rose by almost 2 pp to 14.3%. Government debt securities increased by 18.8% in the period, accounting for 11.6% of total assets at end-2023 (1.3 pp more than in 2021), while private sector debt securities grew

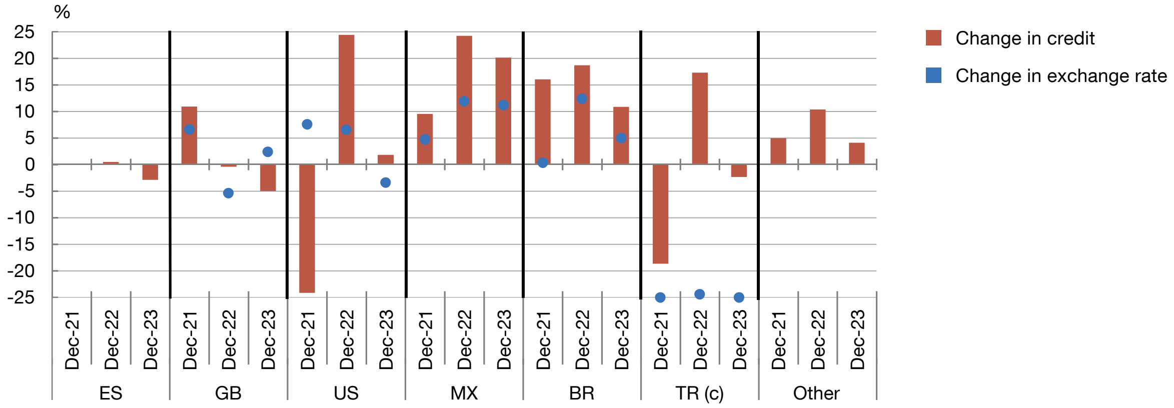
Chart 2.6

The share of financial assets in business abroad increased in 2023

2.6.a Financial assets in Spain and abroad, by asset type



2.6.b Year-on-year rate of change in credit to the resident private sector in Spain and abroad and in exchange rates (b). Consolidated data



SOURCE: Banco de España.

a “Other” comprises cash balances, derivatives and equity instruments.
b A positive (negative) sign for the change in exchange rate indicates appreciation (depreciation) of the currency against the euro.
c The changes in the exchange rate of the Turkish lira against the euro were –39.8% in 2021, –24.4% in 2022 and –38.8% in 2023.

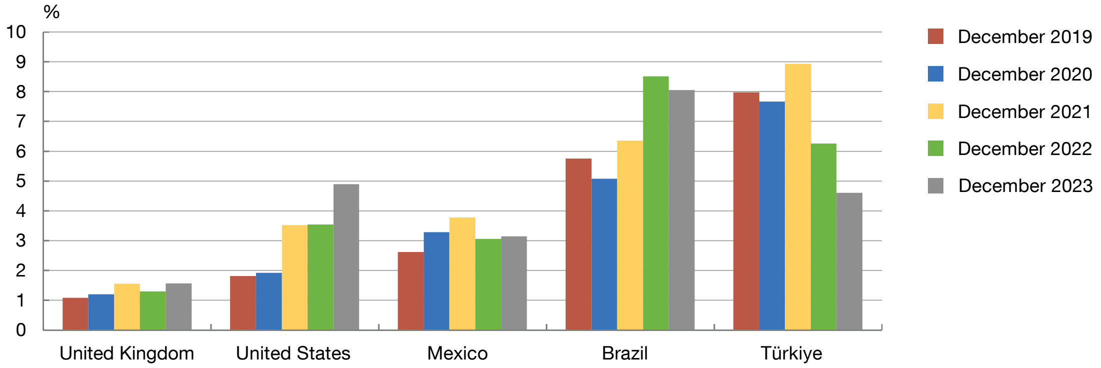
by 32.4%, although their share of the balance sheet is much smaller (2.7% at December 2023, 0.6 pp more than in 2021). Amortised cost debt securities accounted for 62% of the total at December 2023, 11 pp more than in 2021. As regards credit to the non-financial private sector, since 2021 the share of loans to NFCs has risen (by 0.4 pp to 20.4%), while the share of loans to households has declined (by 0.6 pp to 31.4%), the latter owing to the fall in lending for house purchase, which more than offset the increase in consumer credit.

Banks’ business in Spain balance sheets also show an increase in the share of debt securities. This growth is comparable to that recorded at the consolidated level (between 2021 and December 2023 the share of debt securities rose by 2.1 pp to 14.2%). As discussed at the beginning of this chapter, lending to NFCs recorded the sharpest decline in credit, with

Chart 2.7

The NPL ratio increased in business abroad overall, partly on account of the United States and despite the improvements in other areas, especially in Türkiye

2.7.a NPL ratio in the main countries of interest for the Spanish banking sector (a)



SOURCE: Banco de España.

a Data on portfolios of loans to the resident private sector of Spanish deposit institutions in countries where they conduct significant international business.

consumer credit being the only portfolio to have grown its share. Various supply and demand factors arising from the interest rate hikes, such as lower agents' demand for credit and higher credit risk and returns for banks, played an important role in this shift in the balance sheet mix.

Liquidity and financing conditions

The Eurosystem has continued to adjust its balance sheet as a result of its monetary policy normalisation, contributing to the reduction of excess liquidity[7] at European banks. Since the cut-off date of the last FSR the balance sheet has been reduced by €448 billion to €6,591 billion. This is also reflected in a reduction of €346 billion, to almost €3,244 billion, in banks' excess liquidity[8] (see Chart 2.8).

The decline in the Eurosystem's balance sheet is partly explained by the contraction in the stock of the purchase programmes. This stems from the Governing Council's decision to discontinue, from July 2023, reinvestments of maturing assets under all asset purchase programmes (with the exception of those acquired under the Pandemic Emergency Purchase Programme (PEPP)). Specifically, since the last FSR was published, the stock of these programmes has fallen by €162 billion to €4,589 billion.

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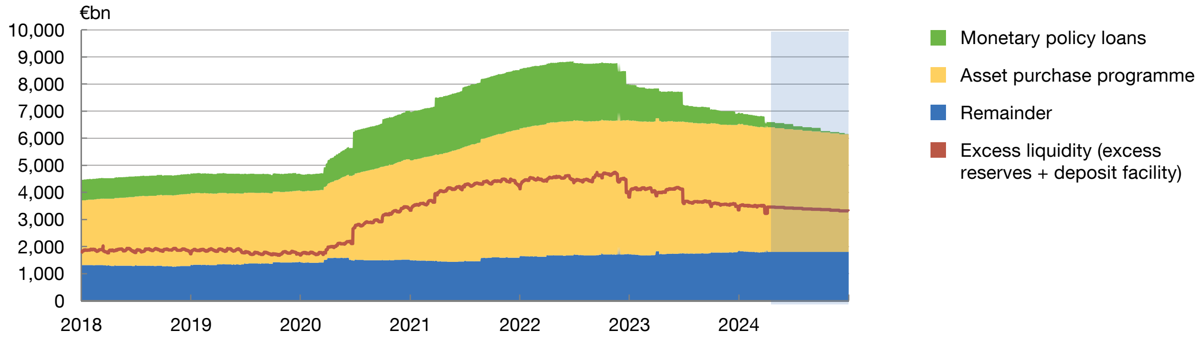
[7] Excess liquidity is the sum of a commercial bank's holdings at the central bank, whether on the current account or in the deposit facility, above the reserve requirements.

[8] The decline in excess liquidity is smaller than the reduction in the Eurosystem's monetary policy assets owing to shifts in autonomous liquidity factors that affect the net liquidity supply. Specifically, the decrease in government deposits with central banks and in deposits of non-euro area residents (non-monetary policy deposits) entail a release of liquidity to banks.

Chart 2.8

Monetary policy normalisation has reduced the direct exposure of European banks' balance sheets to the Eurosystem

2.8.a Eurosystem balance sheet and excess liquidity of European banks (a)



SOURCE: ECB.

a The data capture the balances that resident banks in each country, and their subsidiaries and branches abroad, hold with the ECB and national central banks. The forecasts include non-reinvested maturities under monetary policy loans and the asset purchase programme, and the assumption that the last excess liquidity ratio on both these items will remain constant. The shaded section shows the forecast for the rest of 2024.

The reduction in the aggregate volume of purchase programme assets is set to gather pace in the coming months. The Eurosystem also intends to reduce the reinvestment of PEPP assets by €7.5 billion per month from June 2024, before discontinuing reinvestments entirely from the end of the year. These decisions will lead to a further balance sheet reduction of more than €270 billion in 2024.

The decline in long-term monetary policy loans has also driven the reduction in the Eurosystem's balance sheet. Monetary policy loans to banks have fallen by €354 billion since the last FSR was published, mainly owing to repayment of two of the third series of targeted longer-term refinancing operations (TLTRO III) on 20 December and 27 March, in amounts of €99 billion and €251 billion, respectively. According to the latest data available, the stock of these loans stands at €153 billion.[9] Most of the remaining balance will be repaid in 2024.

The further reduction in the Eurosystem's balance sheet triggered no significant movements in money market rates. The main money market rates, such as the €STR (for unsecured transactions) and EURIBOR (for the interbank and mortgage markets), and secured money market rates (repos), which had quickly adjusted to the European Central Bank's policy rate hikes, held around 4% in the opening months of 2024 (see Chart 2.9.a).

Lower excess liquidity and banks' lower recourse to Eurosystem funding is revitalising money markets in the search for alternative sources of funding. The repo market has performed better and become less volatile, especially at year and quarter-ends, as its problems of collateral shortage have eased. The increase in available collateral is explained, at least

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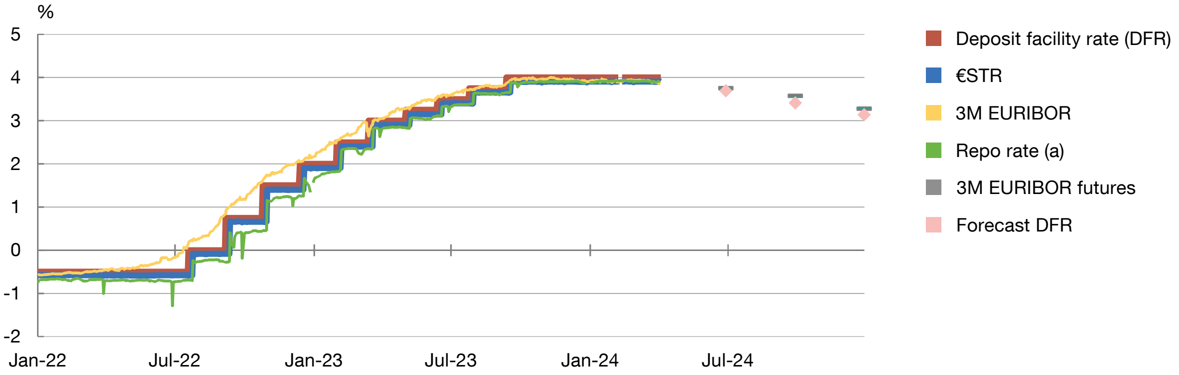
[9] Compared with €1,321 billion at end-2022.

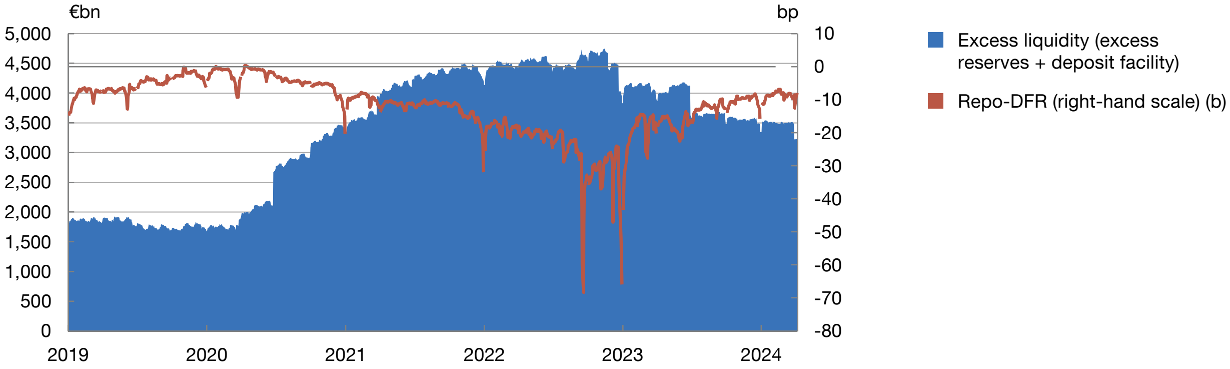
Chart 2.9

Money market and interbank rates rose only moderately in the second half of 2023, as policy rates steadied

2.9.a Risk-free rates



2.9.b Repo-DFR spread and excess liquidity



SOURCES: ECB and Banco de España.

a The repo rate is calculated as a weighted average based on the volume of each transaction made in Spain, France, Germany and Portugal (only overnight transactions with effective value over €1 million and collateralised by government debt).

b The repo-DFR spread is defined as the volume-weighted average rate for fixed-rate transactions collateralised by government debt, based on transactions reported in the Money Market Statistical Reporting (MMSR) dataset. These include transactions that are settled on the trade date (overnight or O/N), one day after the trade date (tomorrow-next or T/N) or two days after the trade date (spot-next or S/N). The DFR is the interest rate (remuneration) applicable to overnight deposits made by Eurosystem monetary policy counterparties.

partially, by the high repayments of funds borrowed by banks under TLTRO III, which have freed up collateral, and by the discontinuation of the Eurosystem's reinvestments. Moreover, although the need to borrow collateral is still the main driver of repo market activity, as excess liquidity in the system declines banks are increasingly turning to this market to obtain funding, as shown by the growth in repo volumes compared with collateral overall. This better repo market performance owing to lower collateral shortage is also reflected in the narrowing of the negative spread between the repo rate and the deposit facility rate (DFR)[10] (see Chart 2.9.b). By contrast, there has been no resurgence in unsecured money market operations.

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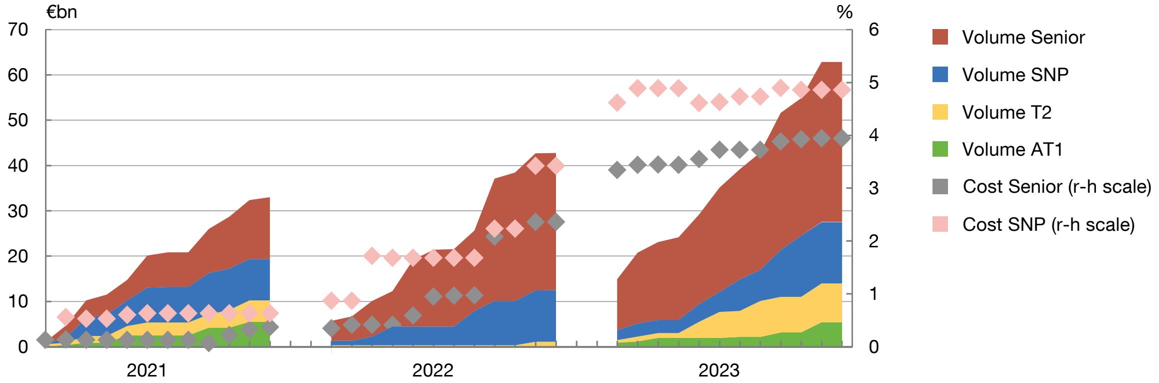
[10] The repo-DFR spread widened substantially during the period of monetary expansion owing to problems of collateral shortage, putting downward pressure on repo rates. See Claudio Vela and Alicia Aguilar. (2024). "The impact of monetary policy normalisation on secured money markets". *Economic Bulletin – Banco de España,* 2024/Q1, 04.

Chart 2.10

Banking sector debt issuance has continued to grow, underpinned by strong investor demand, and its cost steadied in the second half of 2023

2.10.a Volume (in year) and primary market issuance cost (a)



SOURCES: Dealogic and Banco de España.

a The chart depicts the cumulative monthly issuance volume over the course of each year. Primary market issuance costs for euro-denominated bonds are calculated as the volume-weighted average in each period of the year. The primary market cost of T2 and AT1 issues is not included, owing to their low issuance volume in 2022.

Debt issuance by the Spanish banking sector continued to grow at a good pace in 2023 H2 in all segments, including senior debt.[11] Issuance was driven by the need to meet the requirements laid down in the resolution regulations[12] and to replace part[13] of the reduced funding obtained through TLTRO III,[14] against a backdrop of strong investment demand in search of higher yields. In 2023 Spanish banks issued almost 50% more debt than in 2022, with a slight drop in the share of senior debt, which nevertheless continues to account for more than 50% of the total, growing some 17% in the year (see Chart 2.10).

In 2023 Spanish banks were able to issue subordinated debt, both Additional Tier 1 (AT1) and Tier 2 eligible instruments. The uncertainty generated by the Credit Suisse crisis[15] and the events at SVB and other US banks in March 2023 had a very negative impact on the AT1 and Tier 2 markets, which gradually reopened for larger banks from the summer onwards. In the closing months of the year these markets also opened up to smaller banks, fuelled by a strong and growing demand for instruments offering higher returns, amid improved market sentiment and lower volatility. Thus, AT1 and Tier 2 instruments accounted for more than 22% of all issuances in 2023, compared with a modest 2.5% in 2022 (see Chart 2.10).

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[11] Both secured and unsecured.

[12] In 2023 Spanish banks issued some €46.7 billion in MREL-eligible instruments: a net increase in minimum required eligible liabilities (MREL) of around €13.1 billion, plus €33.6 billion to meet maturities or replace previous issuances.

[13] Spanish banks had more capacity to use money markets to meet TLTRO III repayments. See M.ª Carmen Castillo Lozoya, Enrique Esteban García-Escudero and M.ª Luisa Pérez Ortiz. "The effect of the redemption of TLTRO III on Spanish banks' balance sheets". Documentos Ocasionales, Banco de España (forthcoming).

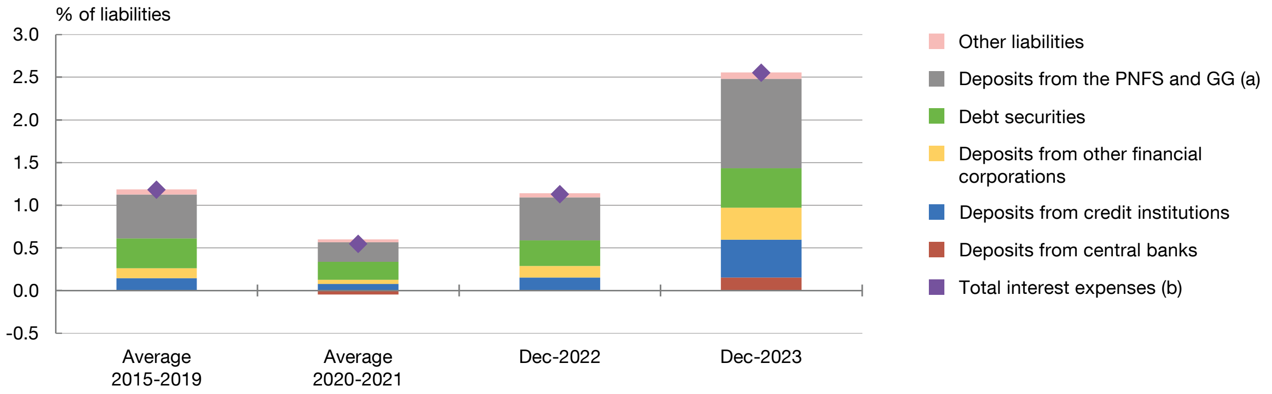
[14] The stock of Spanish banks' TLTRO III funds decreased from €133.9 billion at the start of 2023 to €96.2 billion at June and to €22.7 billion at end-2023.

[15] When the Swiss authorities resolved to protect shareholders at the expense of AT1 holders.

Chart 2.11

The average cost of liabilities rose significantly in 2023, driven by the higher cost of the different sources of bank funding

2.11.a Interest expenses on funding. Data at consolidated level



SOURCE: Banco de España.

a PNFS = private non-financial sector; GG = general government.
b Excludes expenses associated with interest rate hedge derivatives.

The debt issuance costs of Spanish banks continued to increase over 2023, particularly in the case of senior debt, albeit less so than in 2022, in line with monetary policy developments. The cost of senior debt went from 2.4% at December 2022 to around 3.9% in late December 2023. For senior non-preferred debt, this figure rose from 3.4% to 4.9% (see Chart 2.10).

The average overall cost of bank liabilities rose significantly in 2023, as the different sources of funding became more expensive across the board. At December 2023 the average cost of liabilities for banks as a whole stood at 2.6%, 140 basis points (bp) higher than at December 2022 and well above the low recorded in the pandemic years (0.6%). The higher remuneration of non-financial private sector deposits, which represent the main source of bank funding, accounts for 38% of this increase (see Chart 2.11), even though their unit remuneration remained low.

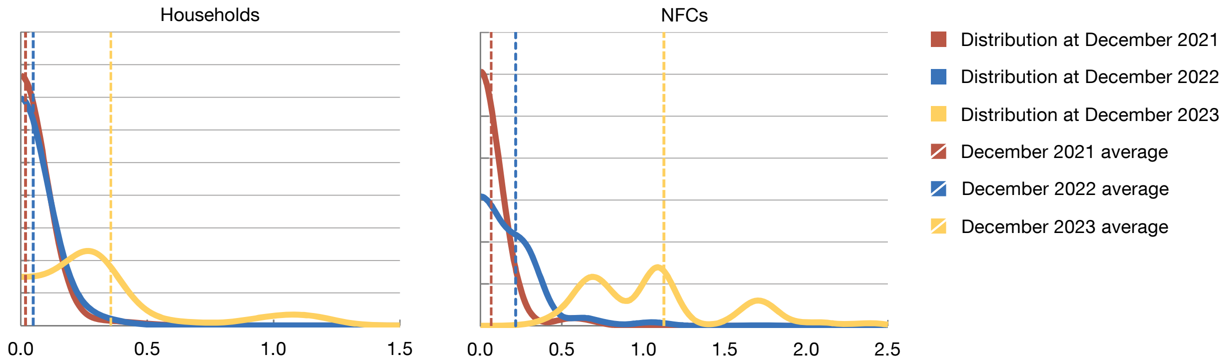
The remuneration of household and NFC deposits in Spain increased in 2023, although the average cost remained low. The pass-through from the reference interest rates to the overall remuneration of the sight and term deposits of the non-financial private sector in Spain gathered pace over 2023, while the flow of funds from sight accounts to higher-yield term deposits also increased considerably. At December 2023, for banks as a whole, the average interest rate paid on household deposits stood at 0.4%, up from 0.1% a year earlier. In the case of NFC deposits, the average rate was 1.1% (compared with 0.2% at December 2022).

The rise in deposit interest rates in Spain was widespread across banks, albeit with notable heterogeneity. Thus, the distributions of average deposit rates shifted to the right,

Chart 2.12

Deposit interest rates in Spain increased in 2023, while becoming more heterogeneous across banks, particularly in the case of NFC deposits

2.12.a Distribution of deposit interest rates. Business in Spain (a)



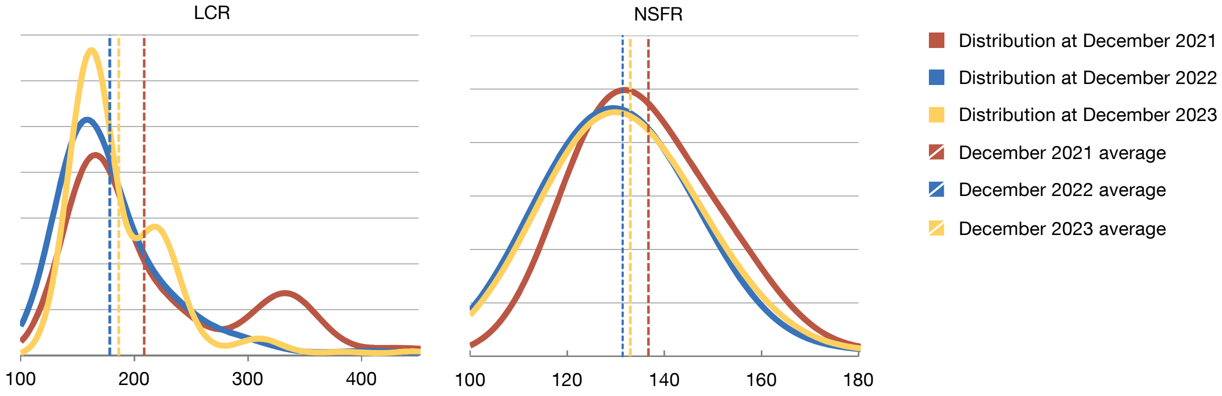
SOURCE: Banco de España.

a The charts show the density functions of the average interest rates applied by the different financial institutions to household and NFC deposits, weighted by the volume that such deposits represent at each institution. These density functions are proxied using a kernel estimator, which enables a non-parametric estimate of the density function, yielding a continuous and smoothed graphical representation of that function. The vertical broken lines show the average interest rates on each of the dates considered.

Chart 2.13

The liquidity position of Spanish banks remains robust despite the monetary policy tightening

2.13.a Distribution of the LCR and the NSFR. Consolidated data (a)



SOURCE: Banco de España.

a The charts show the density functions of the LCR and NSFR for the different financial institutions, weighted by the volume of assets at each institution. Such density functions are proxied using a kernel estimator, which enables a non-parametric estimate of the density function, yielding a continuous and smoothed graphical representation of that function. The vertical broken lines show the Spanish banking system's overall LCR and NSFR on each of the dates considered.

but also widened. In the case of households, the distribution of the rates applied by the different banks hovered around 0.3%, with some banks offering substantially higher rates (above 1%). Similarly, the interest rates paid on NFC deposits varied much more from bank to bank than in previous years (see Chart 2.12).

Household and NFC term deposits increased by 7 pp in 2023, though they remain below the level seen before the negative interest rate period (14.6% at December 2023 versus 47.2% in 2014). In aggregate terms, at December 2023 sight deposits accounted for 85.3% of total non-financial private sector deposits.

Despite monetary policy tightening and the adjustments to the value of debt instruments, liquidity levels at Spanish banks remained robust. The overall liquidity ratio (LCR) of Spanish banks stood at 186.3% at December 2023, around 8 pp up on the figure at end-2022 and comfortably exceeding the regulatory minimum (100%). This improvement was widespread across banks. The net stable funding ratio (NSFR) remained at levels similar to those seen in recent years, standing at 133% at December 2023, up from 131.4% a year earlier, again above the minimum required (100%) (see Chart 2.13).

2.1.2 Profitability and solvency

Profitability

The Spanish banking sector's consolidated net profit in 2023 increased by 27.7% compared to 2022, primarily due to growth in net interest income. Thanks to this improvement in net profit, the return on assets (ROA) rose from 0.6% in 2022 to 0.8% in 2023 (see Chart 2.14.a). In the same vein, the return on equity (ROE) stood at 12.4%, 2.3 pp higher than a year earlier, and above the estimated cost of equity (COE), which stood at 9% at December 2023,[16] although this figure is subject to much uncertainty. The COE rose by 0.2 pp in 2023, as the rise in the real risk-free rate and the Spanish banking sector risk premium was not offset by the fall in the overall equity risk premium. Excluding the impact of the temporary levy on banks and other extraordinary items in both years,[17] profits would have grown 31.6% year-on-year, with ROE standing at 12.9%.

Profits were buoyed by the rise in income from the business abroad of the main banks with an international presence. The most significant boost came from Mexico (29% year-on-year), which, together with the growth in the United Kingdom and Türkiye, helped offset the fall in income in Brazil and the United States (see Chart 2.14.b).

Consolidated net interest income increased markedly in 2023 (up 22.4% year-on-year), as a result of higher unit margins. The growth in net interest income, which was more pronounced in business in Spain than in business abroad, was primarily due to the significant price effect (see Chart 2.15.a), as a result of the greater pass-through of higher interest rates

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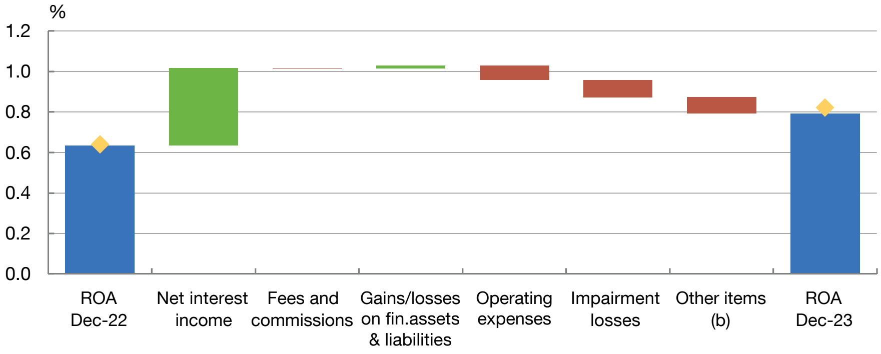
[16] Excluding the inflation risk premium from the main component of the COE could bring it down to 6.9%, even further below the ROE. COE is unobservable and its estimation may vary significantly depending on the model used. See Luis Fernández Lafuerza and Javier Mencía. (2021). "Estimating the cost of equity for financial institutions", *Financial Stability Review - Banco de España,* 40, pp. 43-60.

[17] The extraordinary levy on banks raised €1,263 million in 2023, while extraordinary losses were recognised in 2022 as a result of the €200 million-purchase of offices by one bank.

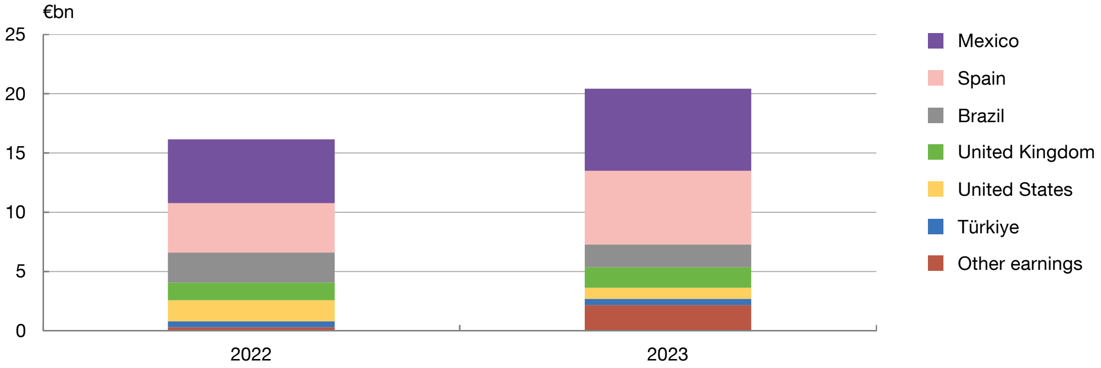
Chart 2.14

Consolidated profit grew by 28% in 2023, driven primarily by net interest income and by strong business in Mexico and Spain

2.14.a Breakdown of change in profit. Consolidated net profit as a percentage of ATA (a)



2.14.b Geographical distribution of ordinary profit attributable to the parent of banks with the most significant international activity (c). Consolidated data



SOURCES: Banco de España and banks' financial reports.

a The red (green) colour of the bars denotes a negative (positive) contribution of the corresponding item to the change in consolidated profit at December 2023 compared with December 2022. The yellow diamonds denote the ROA excluding extraordinary losses in 2022 from the purchase of offices by a bank (-€0.2 billion) and the impact of the temporary levy on the banking sector in 2023 (-€1.3 billion).
b Includes, among other items, the extraordinary losses and temporary levy on the banking sector mentioned in the previous note.
c The group of banks with significant international activity includes the three in which such activity is most important and longest-running, with profit measured excluding non-recurring items in the period considered. The "Other earnings"category includes earnings in other countries and those of the banks' corporate centres.

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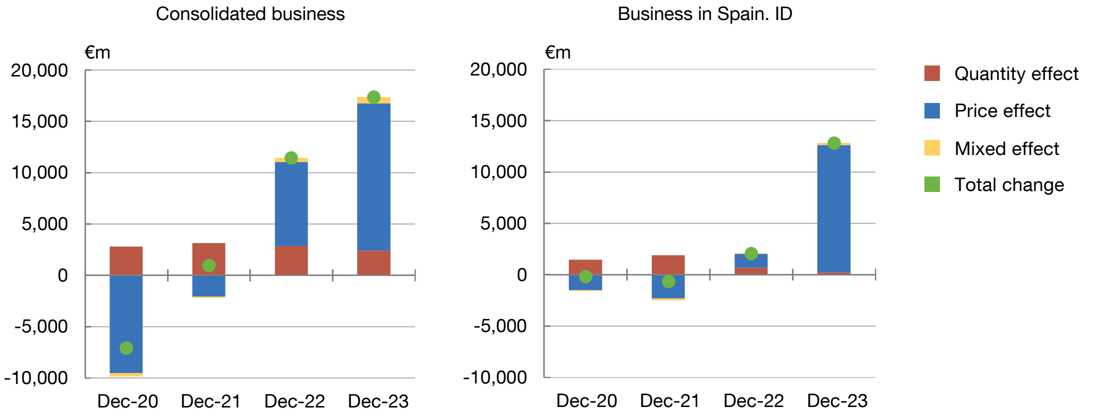
to lending than to deposits. The quantity effect was also positive, although its beneficial impact on net interest income was much smaller at the consolidated level, while business in Spain was barely affected. This growth was helped by the prevalence of variable rate loans and the fact that the Spanish banking sector is characteristically geared towards the retail sector.

Pass-through of the key policy rate hikes to bank assets was greater than to bank liabilities. On data for business in Spain, at December 2023 the cumulative pass-through to loans to the resident private sector stood at around 57% overall for loans to households for house purchase and to NFCs, some 10 pp higher than six months earlier. The overall pass-through rate for other lending to households stood at 37.7%. On the liabilities side, despite the

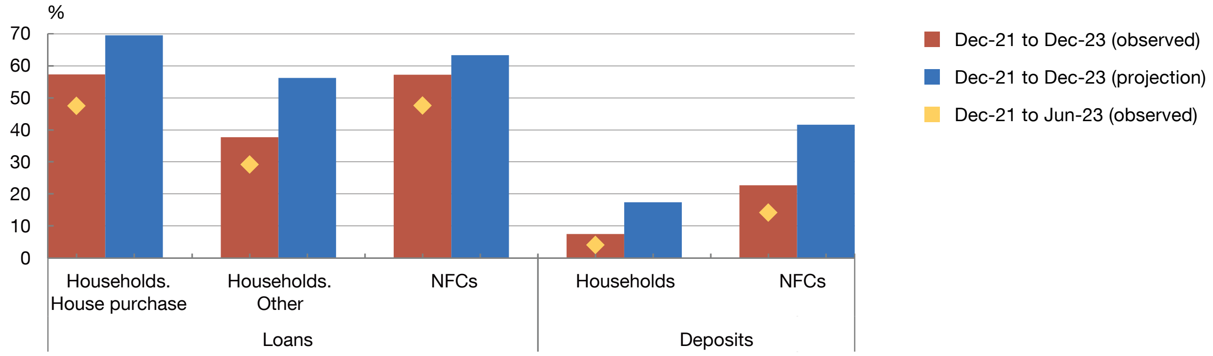
Chart 2.15

The notable increase in net interest income in 2023 was essentially due to the widening of unit margins in the different areas of the banking business

2.15.a Breakdown of the change in net interest income (a)



2.15.b Pass-through of the increase in the EURIBOR to loan and deposit interest rates (b)



SOURCE: Banco de España.

a The quantity effect is calculated as the product of the change in investments (in the case of income) or funding (in the case of expenses) and the return (income) or cost (expenses) held constant at the values of the initial period. The price effect is calculated as the product of the change in return (income) or cost (expenses) and the investments (income) or funding (expenses) held constant at the values of the initial period. The mixed effect is a residual calculated as the difference between the total change and the sum of the price and quantity effects. The effects on net interest income are calculated as the difference between the effects on interest income and interest expense.

b Pass-through is defined as the ratio between the cumulative change (in pp) in interest rates on bank loans and deposits in the period considered and the maximum change in the 12-month EURIBOR in the same period. Changes in bank loan and deposit interest rates are projected using a multivariate structural SVAR model based on interest rate data reported to the ECB.

increase in retail deposit remuneration seen in 2023, the overall pass-through rates were a mere 7.5% and 22.6% for household and NFC deposits,[18] respectively. While the rate at which the higher interest rates passed through to deposits increased in the second half of the year (by 3.5 pp for households and 8.5 pp for NFCs), it remained below the levels of pass-through on the asset side, and still short of the levels to be expected based on past experience (see Chart 2.15.b), in large part owing to the fact that liquidity remained plentiful.

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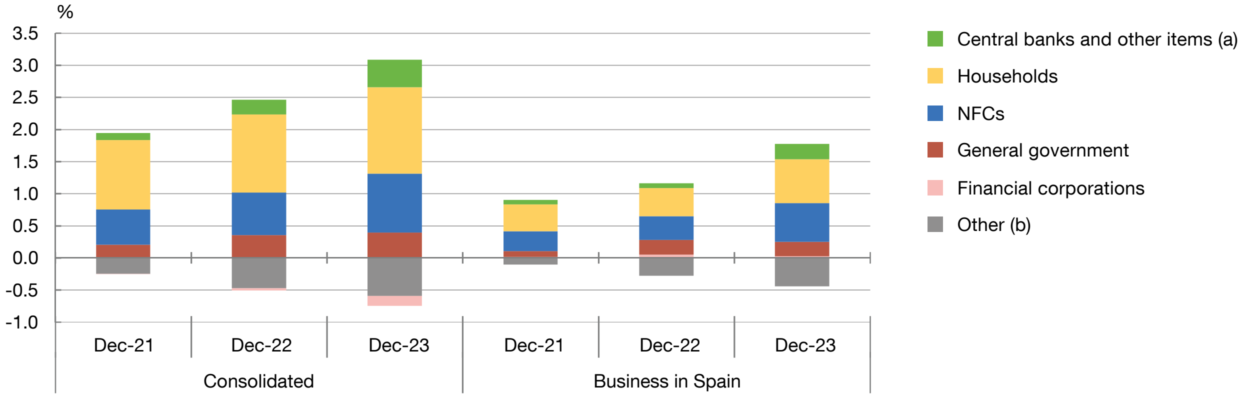
[18] Including both sight and term deposits.

Chart 2.16

The weight of interest paid by central banks increased in 2023, although households and firms still constitute the main sources of net interest income

2.16.a Breakdown of net interest income by counterparty



SOURCE: Banco de España.

a “Central banks and other items” includes finance income and expenses from “Other assets”, which includes the interest on cash balances at central banks but does not allow such interest to be broken down as it also includes other less important items, such as cash-related interest, non-current assets and disposal groups held for sale, net income from defined benefit assets, etc.

b “Other” includes, among other items, derivatives (trading derivatives, hedge accounting, interest rate risk derivatives) and any debt securities issued whose finance costs are greater than the income they earn, thereby reducing net interest income.

While the weight of interest paid by central banks increased over 2022 and 2023, the margin paid by households and NFCs remained the main contributor to net interest income. Between December 2021 and December 2023, the interest paid by central banks as a proportion of average total assets (ATA) rose by 0.32 pp in consolidated terms (from 0.11% to 0.43%, see Chart 2.16), while in the case of households and firms it rose more, by 0.63 pp. Thus, households and firms still constitute the main sources of net interest income, accounting, at consolidated level, for 1.35% in the case of households and 0.92% in the case of firms. The trend is similar for business in Spain.

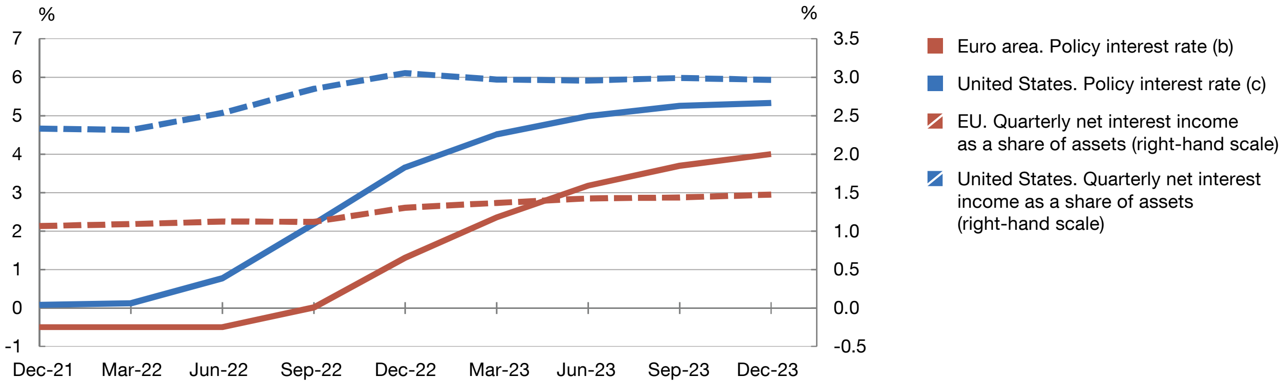
The end of the monetary tightening cycle suggested by the current landscape is likely to limit the scope for further growth in interest income. The latest available data on new lending to households and NFCs in Spain show that interest rate hikes now appear to have run their course, as borne out by the latest EURIBOR developments. As a result, if the market expectations of interest rate cuts prove well-founded, interest income appears to be nearing the end of its expansionary cycle. Moreover, variable rate loans should adjust automatically to a possible interest rate cut, in accordance with the rate reset periods established.

By contrast, the cost of bank deposits still has some upside. First, the shift from current accounts to higher-yield term deposits may continue, even though the latter cannot be used to manage customers’ cash flows. Moreover, although the key policy rates are expected to ease in 2024, they would still stand well above average Spanish deposit rates (which remain among the lowest of the main European countries). This should help ensure that the returns

Chart 2.17

Net interest income growth in Europe and the United States appears to have run its course as the interest rate hiking cycle comes to an end

2.17.a Net interest income and policy rates in the euro area and the US (a)



SOURCES: EBA, ECB, FDIC and the Federal Reserve System.

a European banks' net interest income as a share of assets corresponds to the sample of main EU banks considered by the EBA, while the United States considers a broader set of US institutions, including all banks reporting data to the FDIC.
b ECB marginal deposit facility rate.
c Federal Funds rate.

offered by alternative savings instruments – such as government debt, directly or indirectly via investment funds, or insurance savings products – remain an attractive option. The expected decline in ECB liquidity should also play a part.

Net interest income at Europe's banks showed signs of levelling off in the final stretch of 2023, and even fell in the United States. According to data from the European Banking Authority (EBA), quarter-on-quarter growth in net interest income as a share of assets at the main European banks slowed in the second half of 2023, mainly due to the greater pass-through of the higher interest rates to their cost of liabilities (see Chart 2.17). In the United States, where the monetary tightening cycle started and stabilised earlier, net interest income as a share of assets at December 2023 had fallen from its 2022 Q4 peak. These developments in net interest income help explain why ROA declined both in the United States and in Europe in the final quarter of 2023.

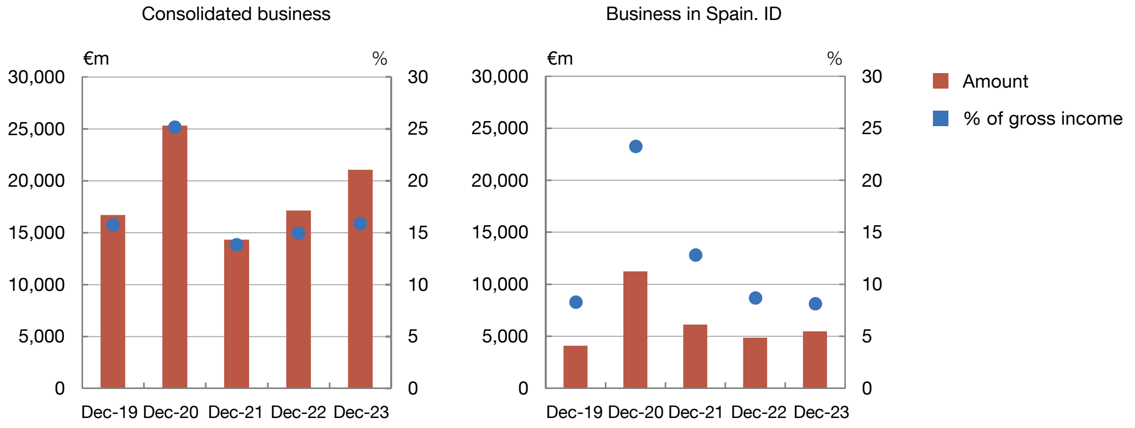
In line with net interest income, net operating income also rose in 2023 (by 22.4% year-on-year), despite the increase in operating expenses (up 7.8% in 2023) driven by the high inflation environment. Meanwhile, net fee and commission income rose by 2.2% year-on-year (see Annex 2), significantly below the increases in net interest income and operating expenses, while gains on financial assets and liabilities (up 14.2%) also contributed positively to net operating income.

Financial impairment losses increased by 22.9% year-on-year at consolidated level, largely due to higher losses in business abroad, albeit also in business in Spain. The rise

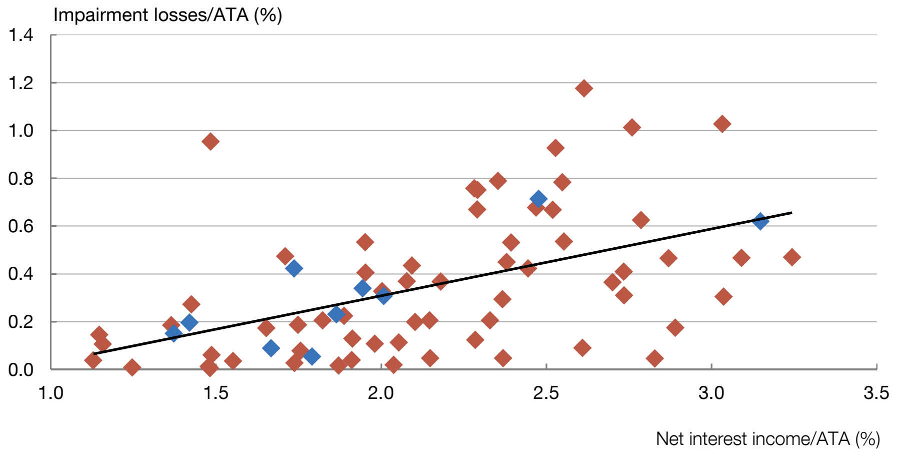
Chart 2.18

Impairment losses increased in 2023, both at consolidated level and in business in Spain, and a positive correlation can be seen between such losses and net interest income

2.18.a Impairment losses



2.18.b Correlation between net interest income and impairment losses. Consolidated data (a). December 2023



SOURCE: Banco de España.

a Significant institutions in blue.

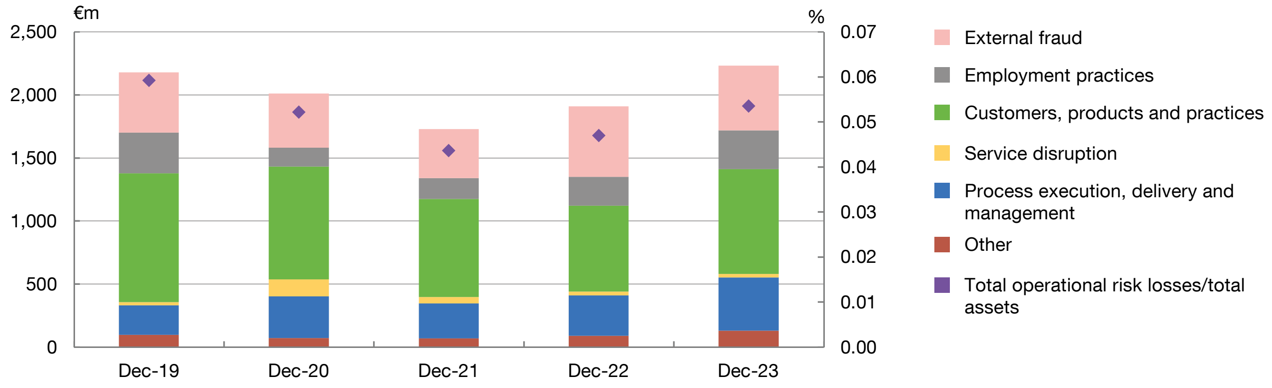
in consolidated impairment losses began midway through 2022, whereas in Spain, in line with the recent downturn in credit quality (see Charts 2.3.b and 2.4.a), increases in impairment losses only began to emerge in the most recent quarters (with year-on-year growth of 2.5% in September and 12.6% in December) (see Chart 2.18.a). In any event, impairment losses continue to account for only a small share of the gross margin.

A positive correlation can be seen between net interest income and impairment losses, signalling the link between profitability and risk. In 2023 the banks posting higher net interest income (relative to ATA) were generally also those that had to recognise higher provisions (relative to ATA) (see Chart 2.18.b). Developments in these two variables over the coming quarters will have to be closely monitored, given that, on the one hand, net interest

Chart 2.19

Conduct-related events continued to account for the bulk of gross operational risk losses, which rose in 2023

2.19.a Gross operational risk losses. New events. Consolidated data



SOURCE: Banco de España.

income could level off or decline, while, on the other, impairment losses may increase due to an economic slowdown or the persistence of relatively high interest rates. Banks that have taken on more risks in their credit portfolios are likely to be more exposed to this risk.

Gross operational risk losses from new events increased in 2023 compared with the previous two years. The operational risk losses recorded in 2023 stood at €2.23 billion, accounting for 0.05% of the system's total assets, up 0.007 pp on 2022 (see Chart 2.19). This increase can be attributed to incidents relating to banks' customers, products and practices.

The impact of cyber risks is currently limited, but they are a matter of increasing concern. As an example of their potential impact, in November 2023 Redsys (the leading processor of card and Bizum payments) suffered two outages, temporarily interrupting these payment services, albeit without affecting interbank settlements. Both failures were due to technical infrastructure-related incidents that affected the transaction authorisation service, and any form of cyber attack was ruled out. In response to these incidents, Redsys activated its contingency plans, which, with the support of retailers and the other parties involved, helped mitigate the impact.[19] Ongoing vigilance is needed to guard against potentially more serious events, particularly those of a possibly malicious nature. The Special Feature in this FSR takes a more detailed look at cyber risks and the supervisory initiatives that seek to contain them.

The dividend distribution rate in 2023 (44%) remained virtually unchanged from a year earlier, although, given the rise in profits, shareholder remuneration increased

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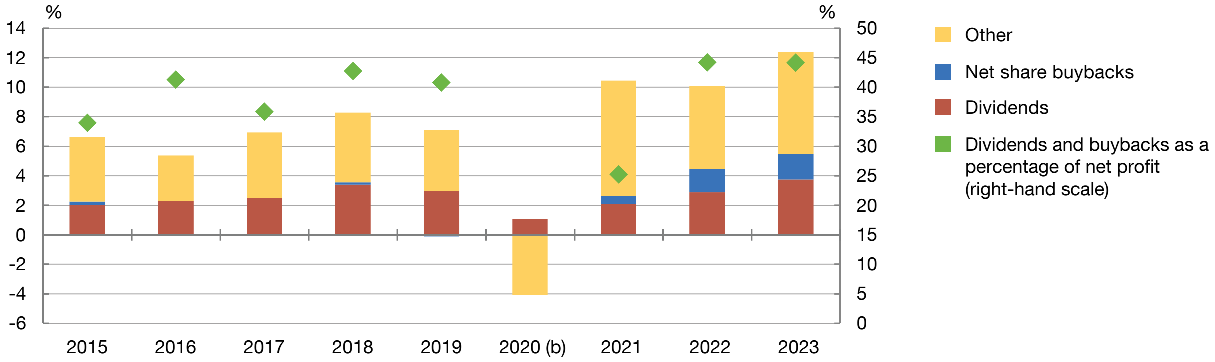
[19] Royal Decree-Law 8/2023 of 27 December 2023 has broadened the scope of the parties subject to certain requirements under the Digital Operational Resilience Act with a view to strengthening the operational resilience of the payments system. The technology firms affected will have to set in place the necessary measures to comply with these new obligations. Any breach of the new regulations may be sanctioned by the Banco de España.

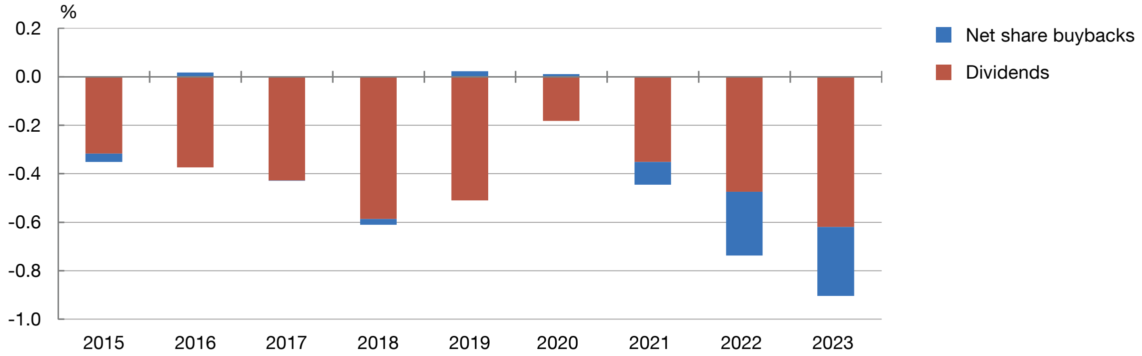
Chart 2.20

Higher profits led to an increase in dividend distributions, which stand at relatively high levels vis-à-vis risk-weighted assets

2.20.a Dividends and net share buybacks in terms of ROE and net profit (a)



2.20.b Dividends and net share buybacks as a percentage of risk-weighted assets (a)



SOURCE: Banco de España.

a The information on dividends and net share buybacks comes from statements of changes in equity. The impact of dividends recognised in a particular year may derive from profits other than those earned in that year.

b Dividends and buybacks as a percentage of net profit was not calculated in 2020, as losses were recorded.

significantly (see Chart 2.20.a). This is expected to make the banking sector more attractive to investors seeking regular profit distributions.[20] However, the distribution or use of profits also means that less is done to shore up solvency. In terms of risk-weighted assets (RWA, the denominator of the different capital ratios), the share of profits[21] used for dividend payments or share buybacks (0.9%) was at its highest level in recent years (see Chart 2.20.b). Again, this is due primarily to the growth in profits, which, by rising relative to RWAs, make it easier to strengthen solvency ratios by retaining earnings as reserves. The potential worsening in the coming quarters of key variables for the sector's profitability, such as net interest income and impairment losses, means that banks would be well advised to observe a prudent profit management policy that would leave them better placed to withstand potential adverse shocks in the current macro-financial context.

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[20] See Esther Cáceres and Matías Lamas. (2023). "Dividend Restrictions and Search for Income", Documentos de Trabajo 2332, Banco de España.

[21] 2023 was an exceptional year given that, for only the second time in the last ten years, the balance sheet adjustments deriving from "accumulated other comprehensive income" were positive.

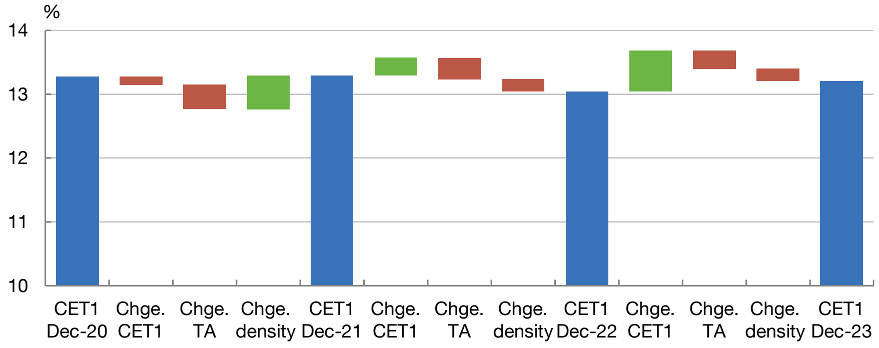
Solvency

The Common Equity Tier 1 (CET1) ratio rose very moderately over 2023, to stand at 13.2% at December 2023. This represents a 17 bp increase on the figure reported at end-2022. This modest climb was due to the increase in CET1 capital (the numerator in the ratio), which rose by 5% year-on-year (see Chart 2.20.a). This increase offset the negative contribution made to the CET1 ratio by the growth in RWAs (the denominator in the ratio), which rose by 3.7% year-on-year. The negative contribution by RWAs was due primarily to the year-on-year growth of 2.3% in total assets in 2023 and, to a lesser extent, to the increase (55 bp) in asset density over the same period (see Chart 2.21.a). This greater RWA density can be attributed to the fact that assets with lower weightings (such as central bank or government-backed deposits) account for a smaller share of the total.

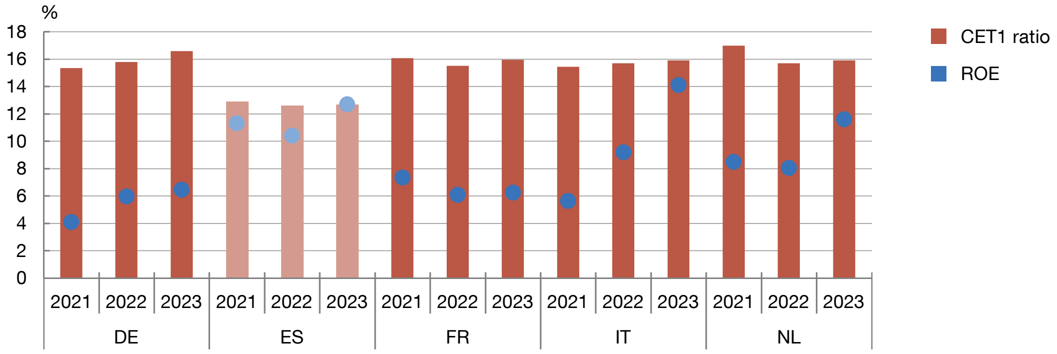
Chart 2.21

Spanish banks' CET1 ratio rose very moderately in 2023

2.21.a Breakdown of the change in the CET1 ratio between 2020 and 2023 (a). Consolidated data



2.21.b European comparison of the CET1 ratio. Consolidated data. December 2021-2023



SOURCES: EBA and Banco de España.

a The CET1 ratio is broken down into the change in CET1, total assets (TA) and density, where density is calculated as the ratio of RWAs to total assets. Therefore, the CET1 ratio is calculated as CET1 to TA x density. The green (red) bars denote positive (negative) contributions from components.

Despite having higher overall levels of ROE, the gap between the CET1 ratios of the Spanish banking sector and those of the other main European banking systems widened in 2023. At end-2023, Spain's CET1 ratio was lower than that for countries such as Germany, France, Italy or the Netherlands (see Chart 2.21.b). Although these lower capital levels can in part be attributed to structural factors, such as the lower use of internal models and greater asset density, it should be noted that, despite the increase over the past year, Spain's CET1 ratio rose less than that of the benchmark economies. By contrast, compared with the same group of economies, the Spanish banking system has been among the most profitable over the last three years (see Chart 2.21.b).[22]

2.2 Non-bank financial sector and systemic interconnections

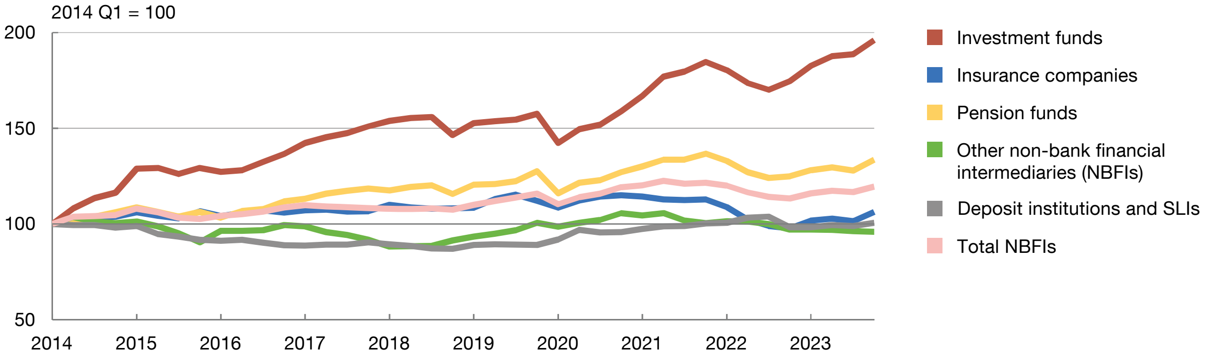
2.2.1 Non-bank financial sector

The non-bank financial sector's total assets grew slightly in Spain over the course of 2023, reversing the downward trend of a year earlier. In the first half of 2023, virtually all segments of the non-bank financial sector posted steady growth, with the most notable increase being among investment funds (see Chart 2.22). However, the trend was more uneven in the second half of the year: certain segments (such as investment funds) continued to grow, albeit more moderately, whereas others (such as pension funds) saw a slight decline.

Chart 2.22

The non-bank financial sector's total assets have steadied following the downward trend that began in early 2022, with investment funds performing particularly well

2.22.a Total assets in the different financial sectors in Spain. Non-consolidated data (a)



SOURCE: Banco de España (Financial Accounts).

a Total non-consolidated assets in Spain in 2014 Q1: investment funds (monetary and non-monetary), €203 billion; insurance companies, €285 billion; pension funds, €118 billion; all other non-bank financial intermediaries (NBFIs), €571 billion; and deposit institutions and specialised lending institutions (SLIs), €2,922 billion.

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[22] The difference between the ROE figure in Chart 2.21.b (12.8%) and the ROE level indicated in the previous sub-section (12.4%) stems from the fact that the first figure relates to the sample of main banks (that account for more than 90% of total consolidated assets in the system) used by the EBA, whereas the second figures relates to all deposit institutions in the Spanish banking system.

The relative weight of the non-bank financial sector also rose moderately in 2023. With a year-on-year increase of 0.41 pp, it represented 32.1% of the Spanish financial system's total assets at end-2023. The relative growth of this segment was helped by the fact that the total overall assets of deposit and specialised lending institutions in Spain essentially remained unchanged throughout 2023, continuing the stable trend of the last decade. The stronger growth of investment funds since 2022 compared with the banking sector partly reflects a shift to these funds from some savers, in a context in which bank deposits offer low returns.

Investment funds

Investment funds domiciled in Spain continued to increase their government debt holdings, as part of a portfolio reallocation that had already begun in 2022 H2. This sector's debt securities holdings in 2023 Q3 were 2.3 times larger than its equity holdings (not including holdings in other investment funds), with the ratio between the two types of holdings (debt securities-to-equity) rising by almost 70 bp, compared with the 161% observed at December 2021. This is likely due to the higher returns on debt securities due to the interest rate hikes. This reallocation was accompanied by a sizeable increase in the weight of investment grade instruments and, in particular, higher credit rated instruments (above BBB+), primarily government debt. Lastly, the cash holdings and deposits of funds domiciled in Spain continued to decline, gradually trending towards the levels typical of investment funds in the euro area.

Pension funds

While contributions to pension funds continue to decline, in 2023 their total assets and average annual returns continued to increase compared with end-2022. The downward trend in gross pension contributions eased somewhat, declining by only 0.4% over 2023. Despite this, total pension scheme assets increased by 5.8% at December 2023, compared with the same month a year earlier. In any event, the average annual profitability of pension funds rose significantly, from -9.7% at December 2022 to 8.8% at December 2023. Cumulative three-year profitability also returned to positive territory (2.2% at December 2023 vs -0.4% at December 2022).

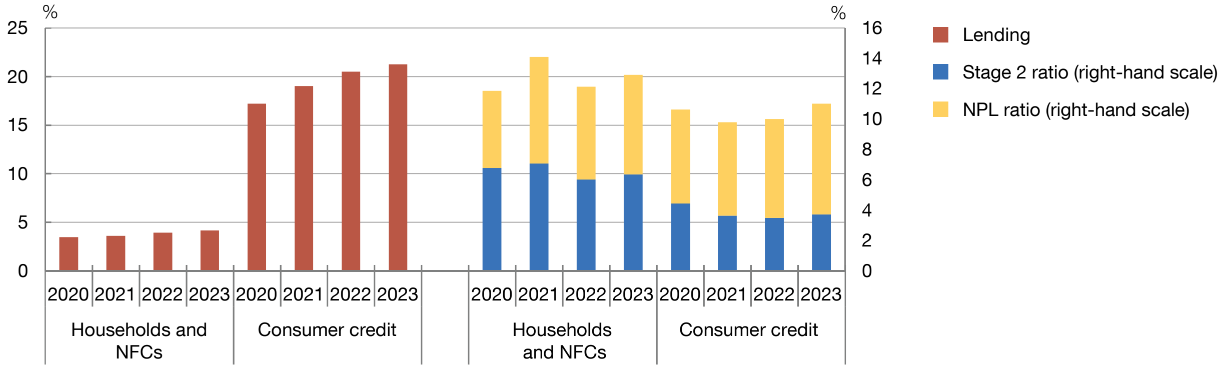
Specialised lending institutions

The market share of specialised lending institutions (SLIs) in overall lending by SLIs and deposit institutions increased slightly to 4.2%. This recent trend has been shaped by consumer lending, a business segment in which these institutions specialise and in which their share has grown by 4 pp over the last three years (0.2 pp in 2023), standing at 21.2% at end-2023 (see Chart 2.23, left-hand side). This was possible thanks to the 30.6% cumulative growth in consumer lending by SLIs over the last three years (6.7% in 2023), in contrast to the modest 0.6% growth over the same period in the case of deposit institutions (2.1% in 2023).

Chart 2.23

The share of SLIs in overall system lending (SLIs and deposit institutions) increased very slightly in 2023, as did the share of SLIs in problem assets

2.23.a SLIs' share of total (l-h side). SLIs' NPL and Stage 2 loan ratios as % of total (r-h side). Business in Spain. ID



SOURCE: Banco de España.

The NPL and Stage 2 ratios in lending by SLIs increased over 2023, albeit moderately. This can be seen in both total lending to households and NFCs and in the consumer credit portfolio. Specifically, the consumer credit portfolio's NPL ratio increased year-on-year by 23 bp, to stand at 3.71%, while the Stage 2 ratio rose by 79 bp, to stand at 7.30% (see Chart 2.23, right-hand side).

2.2.2 Systemic interconnections

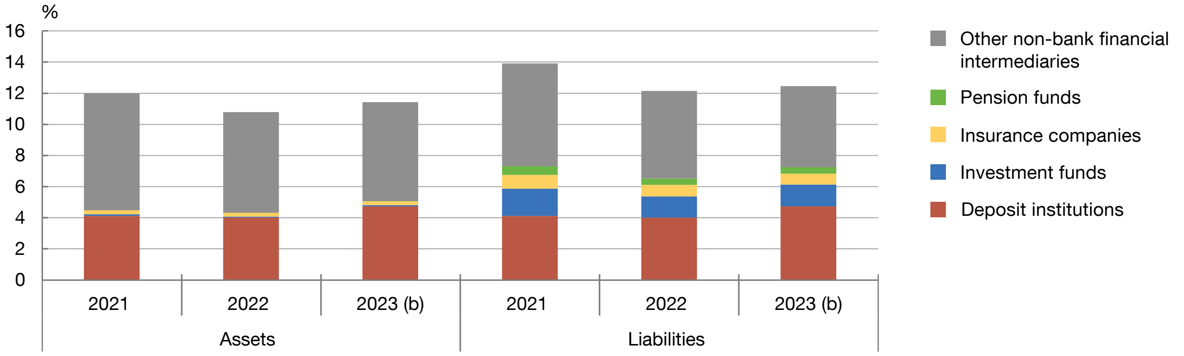
Direct interconnections between the banking sector and the other Spanish financial sectors continued to decline in 2023, albeit much more moderately than in 2022 (see Chart 2.24). Conversely, as noted in the section on liquidity and financing, exposures between banking sector institutions, albeit limited relative to the sector's total assets (4.7% at September 2023), increased significantly over 2023 (by 0.7 pp as a share of total assets) amid greater interbank activity due to the decline in Eurosystem funding, thus reversing the small downward trend seen in 2022.

The weight of common securities holdings of the banking sector and the other resident financial sectors increased slightly in 2023. This was a continuation of the moderate upward trend seen in 2022 and was most significant in the case of banks' common holdings with insurance companies, whose share in the banking sector's securities portfolio rose by 1.7 pp (see Chart 2.25). Conversely, growth was more moderate in the case of common holdings with investment funds, whose share rose by only 0.8 pp. Most of this growth was in mid-investment grade securities (i.e. between A- and AA+). Lastly, by type of instrument and issuer sector, the most notable increase came in holdings of public sector debt.

Gráfico 2.24

Direct interconnections between the banking sector and the other financial sectors declined only slightly in 2023

2.24.a. Breakdown of banking sector assets and liabilities from exposures to other financial sectors (% of total assets) (a)



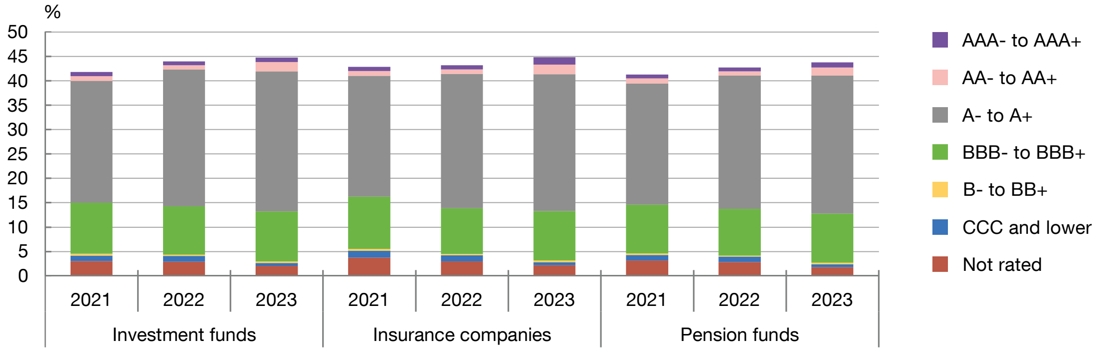
SOURCE: Banco de España (Financial Accounts).

a Other non-bank financial intermediaries include SLIs, other financial intermediaries, financial auxiliaries, and captive financial institutions and money lenders.
b Data at September 2023.

Chart 2.25

Banks' common marketable securities holdings with other financial sectors rose moderately in 2023

2.25.a Share of common holdings between banks and other financial sectors in the banking sector's marketable securities portfolio (a)



SOURCE: ECB (Securities Holdings Statistics by Sector).

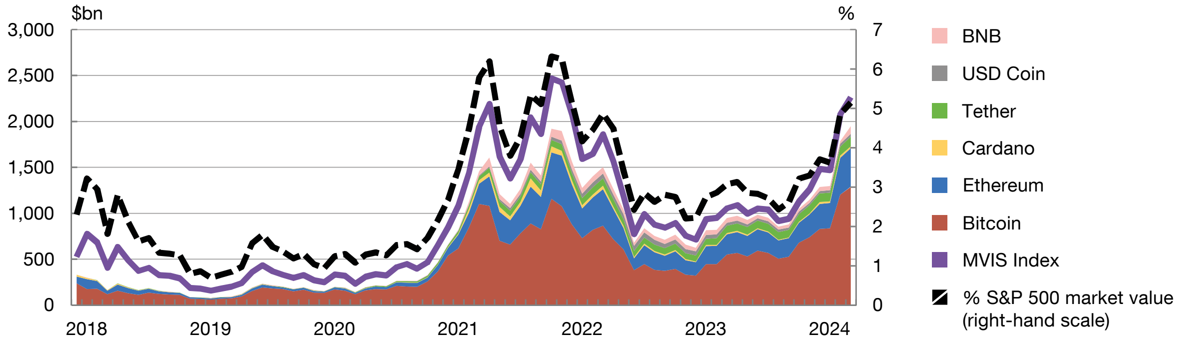
a The banking sector's marketable securities portfolio includes securities that are also held by other sectors in their portfolios. The bars depict the share of the common holdings of banks and other Spanish financial sectors as a proportion of the banking sector's marketable securities portfolio, including both debt securities and equities, broken down by credit rating.

The value of crypto-assets recovered strongly in the most recent period, although they still represent a small fraction of financial markets. Thus, the market capitalisation of the MVIS CryptoCompare Digital Assets 100 Index, which groups the top 100 crypto-assets by market value, rose by more than 140% between early 2023 and March 2024 (see Chart 2.26). Both backed crypto-assets and the other crypto-currencies (including Bitcoin) played a part in this rally. The valuation of Bitcoin again hit an all-time high. Expectations that the monetary policy tightening cycle could be nearing its end may have heightened the appetite for certain high-risk assets, such as crypto-currencies. Moreover, the approval in the United States of a

Chart 2.26

The main crypto-assets recovered notably in value in 2023, with some moving ahead of their all-time highs

2.26.a Market value of main crypto-assets (a)



SOURCES: Banco de España, MVIS and CoinMarketCap.

a The crypto-asset index depicted is the MVIS CryptoCompare Digital Assets 100 Index, which comprises the 100 main (backed and unbacked) crypto-assets, based on their market value. In the chart, BNB, USD Coin and Tether are backed crypto-currencies, All the others are unbacked.

Bitcoin Exchange Traded Fund (ETF) that could expand the investor base for such assets in future[23] may also have played a significant role in this rally.

Crypto-assets continue to represent a source of emerging risks to financial stability. The market and liquidity risks associated with these instruments can be high, particularly when they are not backed by traditional financial assets. Moreover, such instruments may be used for unlawful activities, can pose significant operational risks and may impact climate-related risks, owing to the high energy consumption linked, inter alia, to mining activities. Although these assets are becoming increasingly familiar and some are now regulated, looking ahead they will still have to be monitored and properly supervised, while rounding out the prudential regulations in any areas not currently covered so as to avoid excessive risk-taking in this segment.[24]

If crypto-asset markets and their interconnectedness were to scale up, they could become systemic. While it is necessary to continue closing data gaps, there are as yet no signs at global level that the banking sector is systemically exposed to crypto-assets.[25]

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[23] For more details, see this statement of the U.S. Securities and Exchange Commission.

[24] For more details, see Banco de España. (2022). "Crypto-Assets". In Banco de España, *Financial Stability Report* Spring 2022.

[25] For further information, see BIS. (2022). "Banks' exposures to cryptoassets – a novel dataset", *Basel III Monitoring Report.* September 2022, BIS.

Box 2.1

ANALYSIS OF BANKING SECTOR RESILIENCE TO HOUSING SHOCKS

Over the last year, real estate sector vulnerabilities have been subdued, in particular with house price imbalance indicators close to neutral. However, as shown in Chapters 1 and 3, monitoring of the real estate sector – which saw some resurgence in the housing segment in the second half of 2023 – must continue, so that any potential build-up of risks may be detected early.

This box complements these monitoring efforts by measuring how well banking sector solvency would withstand a significant materialisation of potential real estate risks. For this purpose, the FLESB (Forward-Looking Exercise on Spanish Banks) methodological framework for stress testing[1] is used to analyse the sensitivity of banking sector solvency to housing shocks.

Specifically, the exercise envisages marked falls in house prices and investment in housing that would place significant constraints on construction and real estate activity, with repercussions for other productive sectors and, consequently, for investment and employment, which would also impact household consumption. The time horizon considered is 2024-2025, and the order of magnitude of the impact assumed on house prices and investment in housing is based on that used in the first two years of the adverse scenario defined for the European Banking Authority's 2023 stress test.[2]

This is currently a very low probability scenario. At this juncture, with no significant real estate market imbalances, a severe adjustment in this market is unlikely in the absence of a broader macroeconomic crisis. So far, despite monetary policy tightening, the slowdown in house prices has been contained. For an adjustment as severe as the one assumed under the scenario to materialise, other productive sector shocks or instability affecting real estate investment would need to occur. Indeed, both scenarios – a housing or a broad-based crisis – are also far removed from the current outlook. Yet despite its counterfactual nature, the exercise is useful to measure the impact on banking sector solvency, which is key to financial stability, materialised through various specific channels, and to identify the most appropriate macroprudential policy response should potential vulnerabilities be detected.

Chart 1 shows how house prices evolve under the baseline and the adverse scenario, with a difference between the two of 10.6 percentage points (pp) of average growth over the 2024-2025 horizon.[3] Compared with the past performance of this variable, the average fall in house prices under the adverse scenario is in line with that observed during the global financial crisis,[4] albeit more concentrated over time.

The impact of the adverse scenario on the construction and real estate sector, and on relevant macroeconomic variables, is presented in Chart 2. The estimated average annual impact on the real gross value added (GVA) of the construction and real estate sector is -3.3 pp over the exercise horizon, while its estimated indirect impact on activity is a decrease of 0.6 pp in average real GDP growth and an increase of 0.7 pp in the unemployment rate. The estimated impacts on the growth of lending to households for house purchase and of lending to firms are -1.5 pp and -2.2 pp, respectively.[5]

In this setting, the estimated impact on the aggregate CET1 ratio of Spanish deposit institutions is 0.2 pp at the end of the two-year exercise horizon.[6] This impact occurs through various channels (see Chart 3).

Falling house prices have a negative impact – known as the "wealth effect" – on the financial position of households and firms, and on the value of their mortgage collateral. This effect weighs on consumption decisions, which are also influenced by the drag on activity and investment, particularly in the sectors directly affected. All of which drives up the probability of default (PD) of bank loans to households and firms.

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[1] The FLESB is a top-down methodological framework, developed internally by the Banco de España, which applies the same scenarios, assumptions and models consistently across all banks analysed. The data sources available are highly granular, reaching down to the level of individual transactions and foreclosed assets in business in Spain. The main features of this framework were described in the November 2013 *Financial Stability Report* (FSR). Since then, the FSR has presented the main improvements and new developments included in the model, which is a dynamic framework in continuous development. The analysis presented here uses the historical information observed in the latest stress test, with data at end-2022.

[2] In this case, however, in order to study the impact of the real estate sector shock in isolation, other shocks that could affect the macroeconomic and financial picture, such as changes in interest rates or in the international economic setting, are not considered.

[3] The scenario also envisages an impact of -13.3 pp on land prices in terms of the difference in average growth between the baseline and the adverse scenario over the 2024-2025 horizon.

[4] The comparison is with 2011-2013, the three worst years of the global crisis in terms of house price declines.

[5] These impacts refer to the difference in the average changes (over the 2024-2025 horizon) in the loan stock between the adverse and the baseline scenario.

[6] For purposes of comparison of the severity of these results with those obtained in other exercises conducted using the FLESB tool published in previous FSRs, it is important to note that in this case the horizon exercise is shorter (two years rather than three).

Chart 4 shows the average increase in the PDs estimated under the adverse scenario compared with the baseline scenario, analysed relative to the average impact assumed on house prices. The largest increases in PD are in the real estate and construction sectors, while the credit quality of household mortgages and all other portfolios deteriorates to a significantly lesser degree.

Although household mortgage loans account for a large share of total lending by Spanish banks to the non-financial private sector (around 45%), the modest increase in their PD means that this transmission channel has a small impact on banks' solvency. Overall, the increase in PDs

Chart 1
House prices

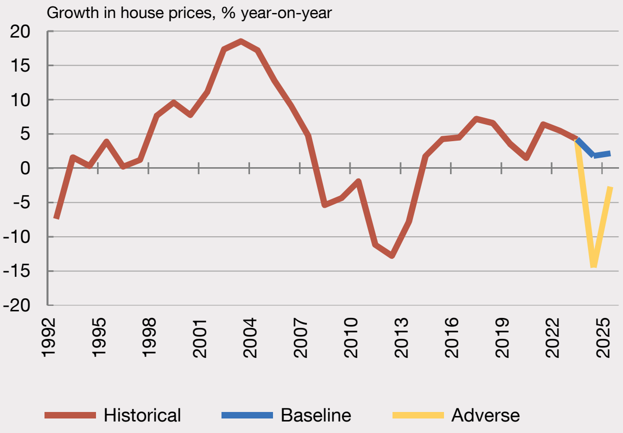
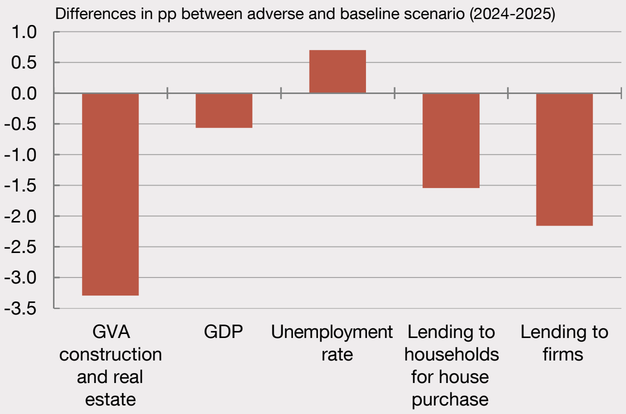


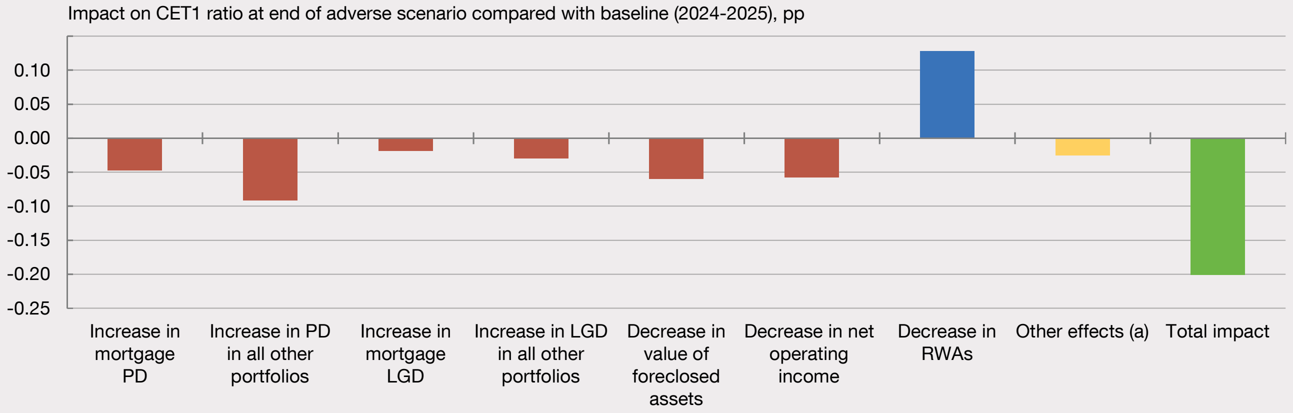
Chart 2
Macroeconomic impact of adverse scenario (a)



SOURCES: INE and Banco de España.

a As in other scenarios used for the FLESB stress tests, the real GVA of the construction and real estate sector and real GDP are used. For the unemployment rate, the differences in average levels in the period 2024-2025 between the baseline and the adverse scenario are shown, and for all other variables the differences in the average rates of change over that period.

Chart 3
CET1 ratio impact channels



SOURCE: Banco de España.

a The negative impact of the other effects is mainly due to the combined impact of the interaction of impairment of the different credit risk parameters.

under the adverse scenario leads to a decline in the CET1 ratio of 0.14 pp (-0.05 pp for the increase in mortgage PDs and -0.09 pp for all other portfolios).

Moreover, under the house price correction scenario, the loss given default (LGD) of loans collateralised by real estate increases. This effect is directly linked to the decline in the value of such collateral since, in the event of default, the value that banks could recover from the real estate would be lower. Its impact on banks' solvency – estimated at -0.02 pp for mortgages and -0.03 pp for all other portfolios – is also limited. The Spanish banking system's resilience to this impact is mainly explained by the fact that loan-to-value (LTV) ratios are relatively low in outstanding mortgage amounts (the median was approximately 40% at December 2023). Naturally, the impact tends to be greater for newer mortgages, as they typically have higher LTV ratios.

Similarly, the foreclosed assets on banks' balance sheets give rise to losses due to value adjustments. However, these assets account for only 1.2% of the exposures on which the stress-testing exercises focus,[7] and under the adverse scenario the estimated impact of the value adjustment on the CET1 ratio is just -0.06 pp.

Lastly, banks' profits also decrease owing to weaker net operating income generation resulting from the decline in performing loans, particularly in the construction and real estate sectors. This decline is due to a decrease in the amount of credit extended and an increase in defaults, which naturally also affects interest income. This channel leads to a decrease of 0.06 pp, adding to the above-mentioned negative effects.

The effects that contribute positively to the solvency ratio notably include the decline in risk-weighted assets (resulting in an effect of +0.13 pp in the CET1 ratio at the end of the exercise compared with the baseline scenario), owing to the reduced volume of lending under the adverse scenario.

These impact channels appear to affect banks unevenly, as Chart 5 shows. Banks with a negative impact on their CET1 ratio of less than 0.2 pp account for close to 60% of the system's total consolidated assets, but there are banks where the impact is greater. This is the case for banks with impacts of between 0.4 pp and 0.6 pp, which account for 20% of total assets, and for those at the tail of the impact distribution (0.6 pp to 0.8 pp and 0.8 pp to 1.6 pp), which account for around 4.5% and 1.7% of total system assets, respectively.

Chart 4
Effect of the adverse scenario on the probability of default (a)

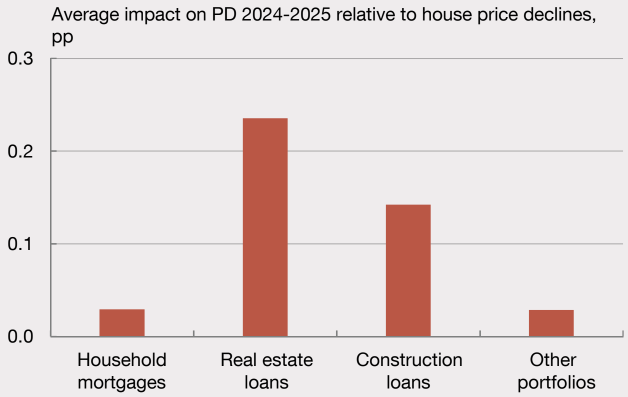
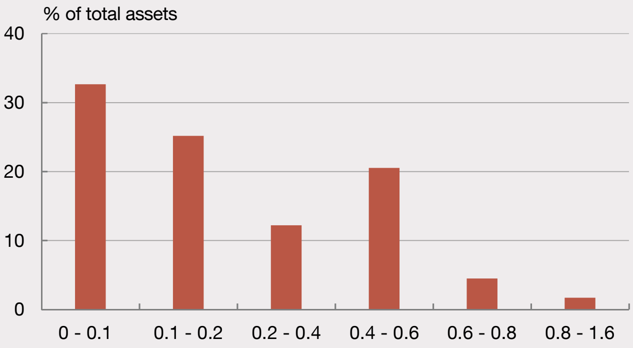


Chart 5
Share of banks' assets with negative impact on capital, according to the fall in CET1 under the adverse scenario compared with the baseline scenario (b)



SOURCE: Banco de España.

a Average increase in PD in 2024-2025 by portfolio, analysed relative to the average impact on house prices. The estimate includes the PDs of loan portfolios of SIs and LSIs. The PDs are estimated for each bank and portfolio, but the impact shown is that of the aggregate average of each portfolio weighted by the number of borrowers.

b The horizontal axis shows the percentage point fall in the CET1 ratio under the adverse scenario compared with the baseline scenario at the end of the stress test exercise, in different impact ranges (from low to high).

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[7] These exposures consider total credit extended to the private sector and foreclosed assets held in Spain together with the debt securities portfolio in banks' total assets.

Box 2.1

ANALYSIS OF BANKING SECTOR RESILIENCE TO HOUSING SHOCKS (cont'd)

In any event, this sensitivity exercise suggests that a significant adjustment in house prices and in investment in housing, isolated from other macro-financial shocks, would not have a critical impact on the aggregate solvency of Spanish banks. The notable cross-bank heterogeneity of the effects also underscores the importance of individual monitoring of real estate risk exposures to complement this aggregate analysis.

3

SYSTEMIC RISK AND PRUDENTIAL POLICY

Contemporaneous indicators of financial stress have held at very low levels as a result of the favourable conditions observed on the financial markets in recent months. Meanwhile, the Spanish credit-to-GDP gap has remained at negative values, although its downward trend slowed in 2023 Q4. No warning signals are discernible either in the other complementary indicators used to calibrate the countercyclical capital buffer (CCyB). These developments are consistent with the absence of cyclical imbalances in the financial system and the Spanish economy. Accordingly, and bearing in mind that the backdrop is still marked by high uncertainty, the CCyB rate has so far been maintained at 0%.

In the real estate sector, housing loans continue to contract, and the credit standards relating to borrower income and collateral value remain stable at historically demanding levels. However, the latest data point to an easing in the decline of such credit. Moreover, house price growth has held on an upward path since 2023 Q2, meaning that further close monitoring of this sector is needed.

The recent regulatory and supervisory developments notably include the technical amendments to the Basel III global standards on the treatment of crypto-assets, interest rate risk and the disclosure of climate-related financial risks, the latter of which has also been the focus of recent work by the European Banking Authority (EBA). Two notable areas of work for the European Systemic Risk Board (ESRB) in recent quarters have been the macroprudential policy strategy for climate-related risks and the overall macroprudential stance assessment. Meanwhile, the European Commission has resumed its review of the macroprudential framework for the banking sector, publishing a report identifying various potential reform areas and the next steps to be taken before any potential draft legislative proposal.

3.1 Analysis of risk indicators and systemic vulnerabilities

After declining in 2023, the estimated probability of default of European listed firms increased slightly in Q4. Coinciding with the tensions triggered by Russia launching its invasion of Ukraine, this metric rose in the first three quarters of 2022, but it went on to follow a downward trend, which came to an end in 2023 Q4. The ensuing increase has been accompanied by a slight rise in stock price volatility, and is proving sharper in the financial sector, services and construction. Nevertheless, the estimated probability of default in 2022-2023 remains at much lower levels than at the outset of the COVID-19 pandemic (see Chart 3.1.a).[1]

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[1] The method used to estimate probability of default, described in Box 3.1 of the Spring 2021 *Financial Stability Report* (FSR), has recently been refined, thus improving convergence in the numerical method used. As a result, the estimates are now somewhat lower than those published in the Spring 2023 FSR, which mainly affects the 10th-90th percentile range presented.

The estimated probability of default of Spanish firms has been lower than the European average since end-2021. This owes mainly to a relative improvement in the probability of default of Spanish non-financial corporations as, on average, the country's financial institutions have followed a path more closely in line with that of their European counterparts.

Systemic stress in the financial markets has continued to ease. The Banco de España's systemic risk indicator (SRI), which draws on information from Spain's financial markets,[2] saw its last marked rise in the spring of 2023, at the time of the banking sector turmoil in the United States and Switzerland. It has since trended downwards and currently stands at very low levels, similar to those before the war in Ukraine began (see Chart 3.1.b). The four financial segments used to calculate the SRI indicate that tensions are easing, and are doing so slightly more in the equity market.

The systemic risk indicator for banks (SRISK)[3] remains at low levels, mainly on account of favourable conditions in the financial markets. There is, however, some cross-country heterogeneity. Thus, despite this indicator remaining below its pre-pandemic level, its value is currently higher for Spanish banks than for those in the EU as a whole (see Chart 3.1.c). Further, while the median SRISK rose slightly for Spanish banks at end-2023, it declined in the EU as a whole. This gap is partly due to banks in the EU as a whole having higher market capitalisation-to-total asset ratios than the average for Spanish banks.

By contrast, the funding liquidity risk indicator remains at high levels. This composite indicator of the Banco de España summarises information on three key risk dimensions: collateral value and availability, the volume of redemptions and rollover costs.[4] The data indicate that the rollover cost has been the largest contributor to the deterioration in this indicator since early 2023, as it is the dimension most directly impacted by the effect of the interest rate hikes (see Chart 3.2). If the expectations of interest rate cuts are borne out, this indicator will likely ease more. Moreover, redemption risk (in particular, for deposits) was the main driver of the increases in the indicator during 2023 H1, but it subsequently fell back to a lower level.

The decline in the credit-to-GDP gap slowed in 2023 Q4. This was attributable to both an easing in GDP growth during 2023 and the ongoing downward correction of the statistical

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[2] This indicator comprises information on the four most representative segments of Spain's financial markets (the money, government debt and equity markets and financial intermediaries) and is designed to increase in value when tensions arise simultaneously in these four segments. For a detailed explanation of the SRI calculation methodology, see Box 1.1 of the May 2013 FSR.

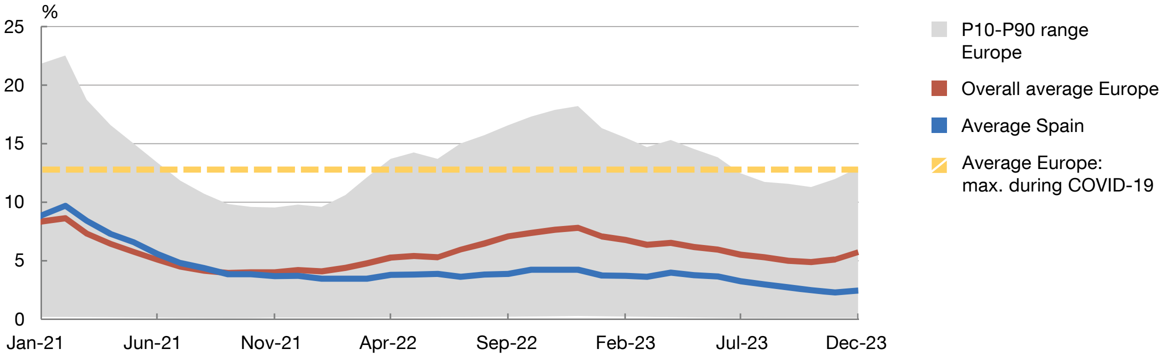
[3] Christian Brownlees and Robert F. Engle (2017) "*SRISK: a conditional capital shortfall measure of systemic risk*". *The Review of Financial Studies,* 30, pp. 48-79. This indicator measures the market value of the regulatory capital shortfall of an individual bank or the banking sector overall following a significant correction in the equity market. It is, therefore, a systemic risk metric, since the high cost of making up a capital shortfall for the banking sector could distort financial intermediation.

[4] Margin risk is the risk of a change in value of the collateral provided and, therefore, in the haircut or margin of a secured loan; redemption risk is the risk of depositors withdrawing their funds; and rollover risk is the risk of maturing short-term funding being replaced or rolled over at a higher cost.

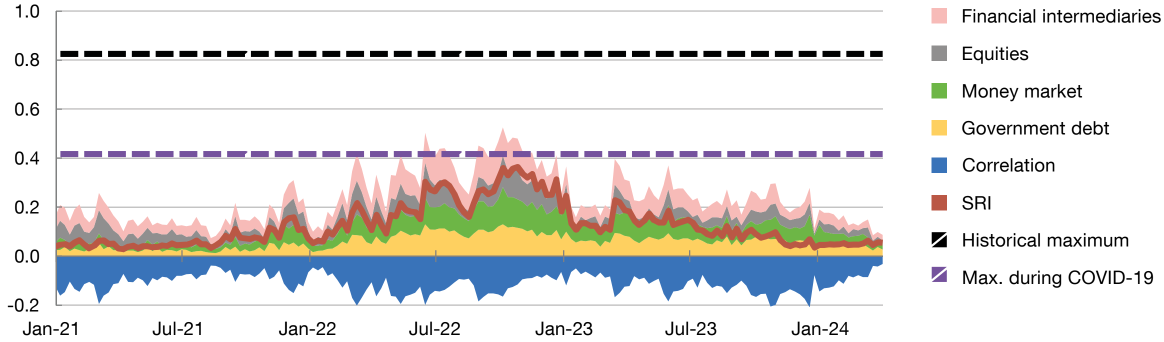
Chart 3.1

The indicators of systemic risks in the financial markets are at very low levels

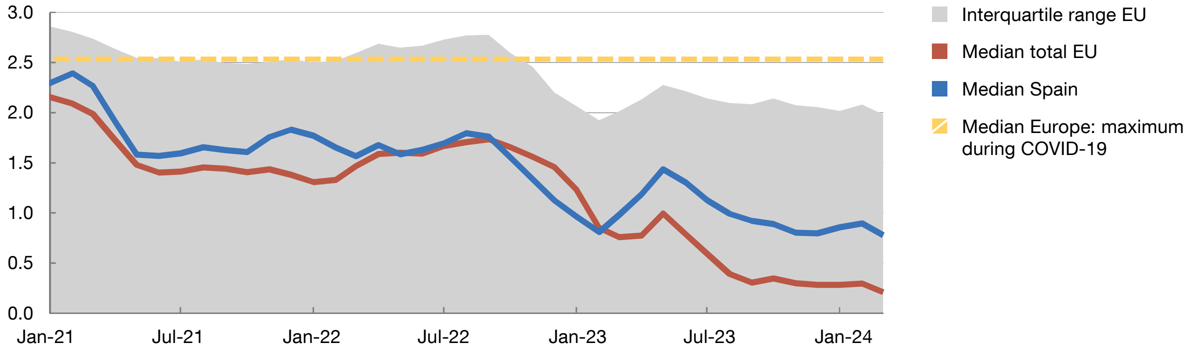
3.1.a Distribution of implied probability of default of European listed firms. Percentile range and averages for Europe and Spain (a)



3.1.b Systemic risk indicator (b)



3.1.c SRISK systemic risk indicator distribution (c)



SOURCES: Datastream, INE, OECD, S&P Capital IQ and Banco de España.

a Probability of default estimated on the basis of the Merton valuation model; see Box 3.1 of the Spring 2021 FSR. The firms considered are those listed on the EURO STOXX 600 index as at December 2023. The sample totals 513 firms (including 24 Spanish firms) with the available information required to perform the exercise's calculations. The series have been smoothed using a three-month moving average. The 90th percentile of European firms reached a maximum value of 38% during the COVID-19 pandemic. Data updated as at 31 December 2023.

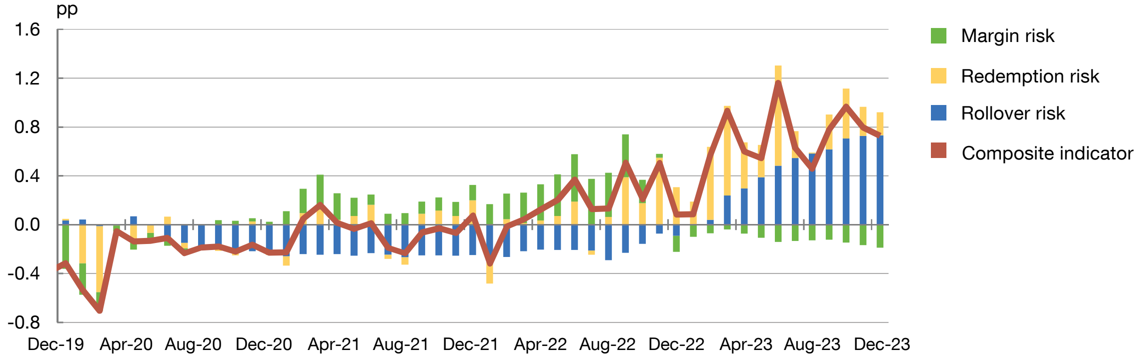
b The systemic risk indicator (SRI) aggregates 12 individual stress indicators (including volatilities, interest rate spreads and maximum historical losses) from four segments of the Spanish financial system. The effect of cross-correlations is taken into account to calculate the SRI, such that it registers higher values when the correlation between the four markets is high and lower values when the correlation is low or negative. For a detailed explanation of this indicator, see Box 1.1 of the May 2013 FSR. The black dotted line represents the SRI's historical maximum (since January 2000). The purple dotted line represents the SRI's maximum value since the COVID-19 crisis. Data updated as at 3 April 2024.

c The SRISK indicator is expressed as a percentage of each bank's total assets. The parameters used are 4.5% for capital requirements, 10% for the decline in the European equities index and 22 business days for the period over which the hypothetical market decline occurs; for more details see Carmen Broto, Luis Fernández Lafuerza and Mariya Melnychuk. (2022). "Do buffer requirements for European systemically important banks make them less systemic?". Documentos de Trabajo, 2243, Banco de España. The SRISK indicator for the months of 2024 Q1 is calculated based on 2023 Q4 assets and liabilities values, drawing on the stock price data of the corresponding month. The series have been smoothed using a three-month moving average. The interquartile range is defined as the difference between the 75th and 25th percentiles of the SRISK distribution for EU banks. The dotted line represents the SRISK's maximum value since the COVID-19 crisis. Data updated as at 31 March 2024.

Chart 3.2

Funding liquidity risk is still under pressure owing to the higher rollover cost for short-term operations

3.2.a Composite indicator of funding liquidity (a)



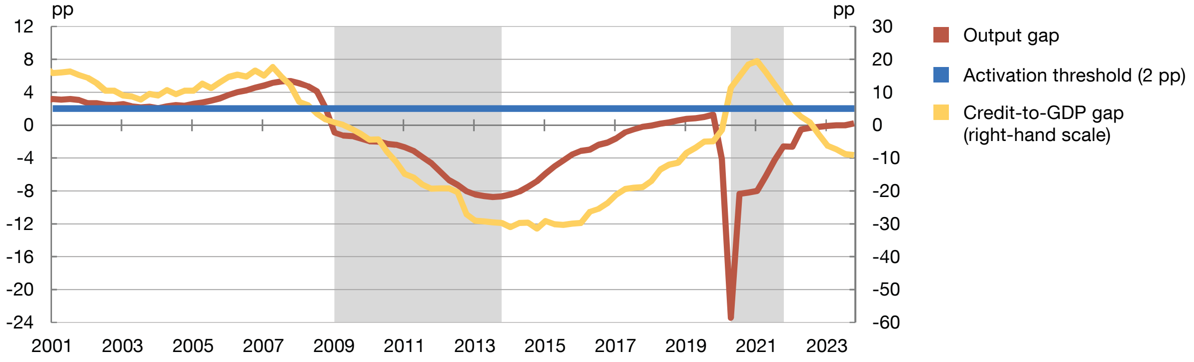
SOURCE: Banco de España.

a The funding liquidity index draws on thirteen indicators grouped into three dimensions: (i) margin risk (asset encumbrance ratio, re-use of collateral); (ii) redemption risk (monthly change in deposit rates for households and firms, liquidity coverage ratio); and (iii) rollover risk (level of deposit rates for households and firms, percentage of market funding, EURIBOR-OIS spread). The composite index measures the number of standard deviations from the mean of the indicators that make up each of the three dimensions (all the dimensions have the same weight). Higher composite indicator levels denote lower liquidity. The chart also shows the contribution that each dimension makes to the composite indicator. Data available up to December 2023.

Chart 3.3

The downward trend in the credit-to-GDP gap has slowed, while the output gap is holding close to the equilibrium

3.3.a Credit-to-GDP gap and output gap (a)



SOURCES: Banco de España and INE.

a The output gap represents the percentage difference between observed GDP and its quarterly potential level. Values calculated at constant 2010 prices. See Pilar Cuadrado and Enrique Moral-Benito. (2016). “Potential growth of the Spanish economy”, Documentos Ocasionales, 1603, Banco de España. The credit-to-GDP gap is calculated as the percentage point difference between the observed ratio and its long-term trend calculated by applying a one-sided statistical Hodrick-Prescott filter with a smoothing parameter of 25,000. This parameter is calibrated to the financial cycles historically observed in Spain. See Jorge E. Galán. (2019). “Measuring credit-to-GDP gaps. The Hodrick-Prescott filter revisited”, Documentos Ocasionales, 1906, Banco de España. Data available up to December 2023. The grey shaded areas show two crisis periods identified in Spain since 2009: the systemic banking crisis (2009 Q1 to 2013 Q4) and the economic crisis triggered by the COVID-19 pandemic (2020 Q1 to 2021 Q4). The horizontal line denotes the reference threshold for activation of the CCyB, equal to 2 pp for the credit-to-GDP gap.

trend that estimates the equilibrium level of the credit-to-GDP ratio.[5] This gap is in negative territory and far from the 2 percentage point (pp) reference threshold that signals the possible existence of credit cycle imbalances (see Chart 3.3). Meanwhile, the output gap, which

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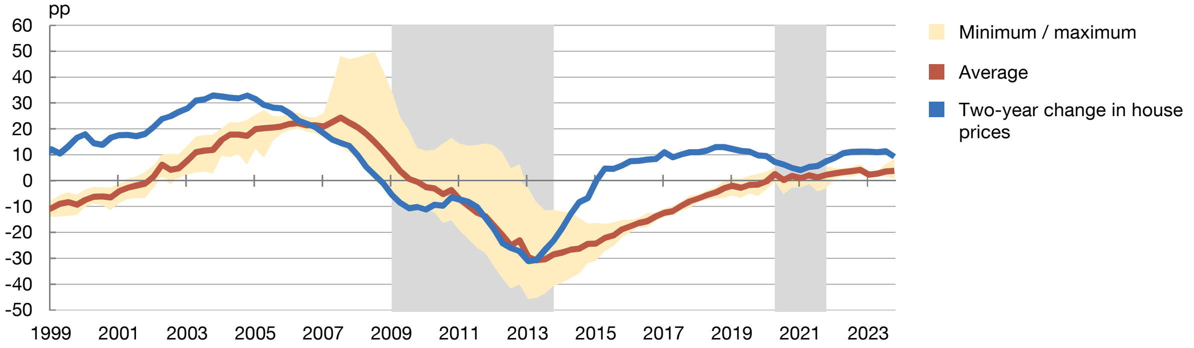
[5] The estimated trend corresponds to the moving average of the credit-to-GDP ratio over the past ten years. Consequently, its quarterly update entails including data that are far lower than the average for these ten years, owing to the intense deleveraging process observed in Spain in the wake of the global financial crisis.

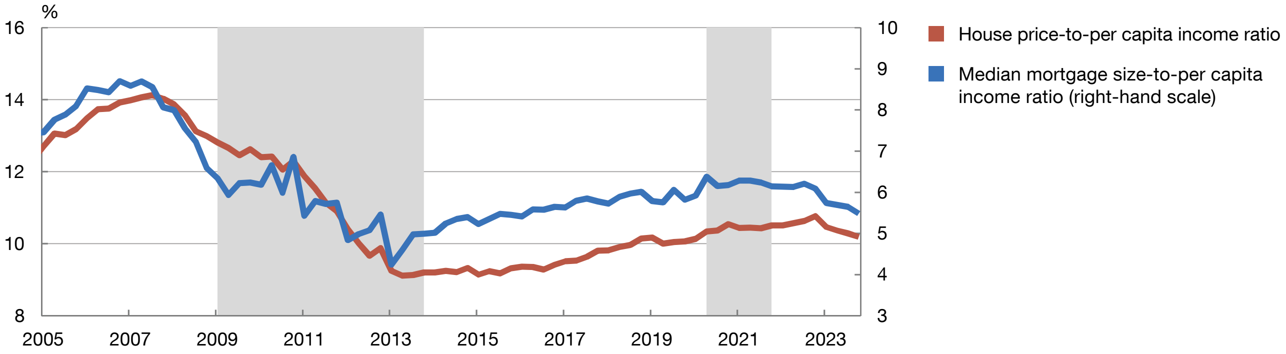
Chart 3.4

The indicators of house price imbalances rose slightly in 2023, despite being dampened by the growth in per capita income

3.4.a Indicators of house price imbalances (a) (b)



3.4.b House price-to-per capita income ratio and mortgage size-to-per capita income ratio (a) (c)



SOURCES: Banco de España and INE.

a The vertical grey shaded areas denote the periods of the two financial crises in Spain since 2009: the last systemic banking crisis (2009 Q1-2013 Q4) and the economic crisis triggered by the COVID-19 pandemic (2020 Q1-2021 Q4). Data updated as at December 2023.

b The yellow shaded area denotes the minimum and maximum values of four indicators of house price imbalances: (i) the real house price gap; (ii) the house price-to-household disposable income ratio gap; (iii) the ordinary least squares (OLS) model that estimates house prices based on long-term trends in household disposable income and mortgage rates; and (iv) the error correction model that estimates house prices based on household disposable income, mortgage rates and fiscal effects. The long-term trends for indicators (i) to (iii) are calculated using a statistical one-sided Hodrick-Prescott filter with a smoothing parameter equal to 400,000. All four indicators have an equilibrium value of zero.

c House prices calculated based on price per square metre in the current quarter. All magnitudes are expressed in real terms. The definition of per capita income refers to disposable income.

measures the difference between the actual level of economic activity and its potential growth, is hovering at values very close to the equilibrium. In particular, it turned positive in December 2023, after holding at marginally negative levels throughout the rest of the year.

Nor do the indicators for monitoring sectoral credit cycles show signs of imbalance.[6] Almost all the indicators of sectoral imbalances have eased, thanks to the favourable developments in household income and the gross value added of activities. The intensity of consumer credit to households continues to increase, albeit at a slower pace than in previous quarters.

The indicators of house price imbalances rose in 2023 H2, owing mainly to price growth (see Chart 3.4.a). However, the rise in income has prevented a sharper increase in these

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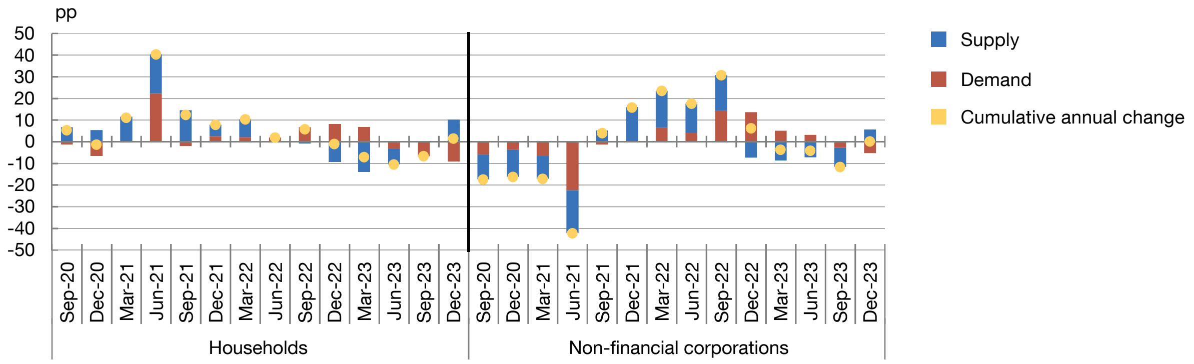
[6] For a detailed description of the indicators used to monitor sectoral credit cycles, see C. Broto, E. Cáceres and M. Melnychuk. (2022). "Sectoral indicators for applying the Banco de España's new macroprudential tools". *Financial Stability Review – Banco de España,* 42. Also, Box 3.1 of the Spring 2022 Financial Stability Report.

Chart 3.5

New lending to non-financial corporations and households stabilised at end-2023, with supply and demand factors operating in opposite directions

3.5.a Macroeconomic decomposition of new lending to households and non-financial corporations, by supply and demand factors (a)



SOURCES: ECB and Banco de España.

a Cumulative year-on-year change. Supply and demand effects estimated with an S-VAR model, using data on volumes and loan-deposit interest rate spreads for new lending in euro area countries. The model is estimated by means of Bayesian inference, using a Gibbs sampling algorithm and Minnesota priors, drawing on 5,000 MCMC (Monte Carlo Markov Chain) samples out of a total of 50,000 iterations.

indicators. Indeed, thanks to the strong performance of income, the ratios of prices and median mortgage amounts to per capita income decreased in 2023, thus interrupting the upward trend that had previously been observed in these ratios (see Chart 3.4.b). Nevertheless, the relative performance of house prices and household income will need to be carefully monitored in future quarters.

Against a backdrop of higher interest rates, the granular analysis of the financial position of firms in the construction and real estate activities sectors is also important. As a whole, such firms – whose systemic importance has decreased substantially since the global financial crisis – show financial resilience to some degree of adverse shock to interest rates or their ability to generate gross profits. However, a certain proportion of them are in a more vulnerable position (see Box 3.1).

Positive supply factors helped to stabilise growth in new loans to households and non-financial corporations in 2023 Q4, leaving behind the negative trend observed in the first three quarters of the year. According to the econometric models developed by the Banco de España to decompose credit growth into supply and demand factors, these operated in opposite directions in 2023 Q4 (see Chart 3.5).[7] Thus, in contrast to previous quarters, supply factors have had a positive impact on new loans to non-financial corporations and households, as reflected by the narrowing of loan-deposit spreads in recent quarters. Meanwhile, demand factors have continued to contribute negatively, owing to the high level of interest rates. The trends in these results are largely in line with those observed in the Bank Lending Survey (BLS) in 2023 Q4, which finds that the tightening observed in previous quarters in the credit standards and terms and conditions on new loans has eased, while demand, particularly among households, continues to contract.[8]

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[7] Box 3.1 of the Autumn 2023 FSR of the Banco de España.

Interest rate spreads[9] have widened for new loans to non-financial corporations and, albeit more moderately, for new mortgages to households (see Chart 3.6.a). After narrowing in 2022, spreads on new loans to non-financial corporations widened throughout 2023. Meanwhile, spreads on new mortgage loans to households widened slightly in 2023 H1, and continued to widen in H2. The relative weight of fixed-rate mortgages in the total volume of new mortgage loans declined by 11.5 pp year-on-year, from 66.2% in 2022 Q4 to 54.7% in 2023 Q4.

Loan maturities for new mortgages to households and lending to non-financial corporations have shortened slightly (see Chart 3.6.b). In 2023, the relative weight of mortgage loans granted with maturities of over 30 years declined with respect to 2022, while the share of those with maturities of between 20 and 30 years mainly increased. As regards loans to non-financial corporations, the share of those with a maturity of up to one year increased, while that of loans with maturities of between one and five years decreased, and the weight of loans maturing after more than five years remained mostly unchanged.

The leverage of new mortgage loans declined moderately in 2023. The average loan-to-value (LTV) ratio for new mortgages arranged with households fell by 2.3 pp year-on-year in 2023, to 65.8% at year-end. Moreover, the portion of new mortgage loans with an LTV ratio higher than 80% stood at 9.3% in 2023, somewhat lower than in the previous two years (see Chart 3.7). The share of house purchases financed with mortgage credit stood at 44.7% in December 2023, higher than the 43.3% recorded in June 2023, but still lower than the 46.1% observed at end-2022.

The ratio between the amount of new mortgages and households' income is also stable, but their debt burden has increased. Consequently, the loan-to-income (LTI) ratio remains almost unchanged from previous years. Meanwhile, the debt burden – as measured by the loan service-to-income (LSTI) ratio – continued to climb in 2023, to an average of 21.7%, as a result of the interest rate hikes. However, the percentage of new mortgages with an LSTI ratio of over 30% is slightly lower than in the previous two years.[10] The LSTI ratio may begin to decline over the coming quarters, given the recent developments and expected trend in the EURIBOR, a benchmark for the bulk of variable-rate mortgages.

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[8] Nota de Prensa of the Banco de España (available only in Spanish) on the results of the 2023 Q4 BLS, Banco de España, of 23 January 2024. For the BLS data at European level (which include the Spanish data), see Euro area bank lending survey.

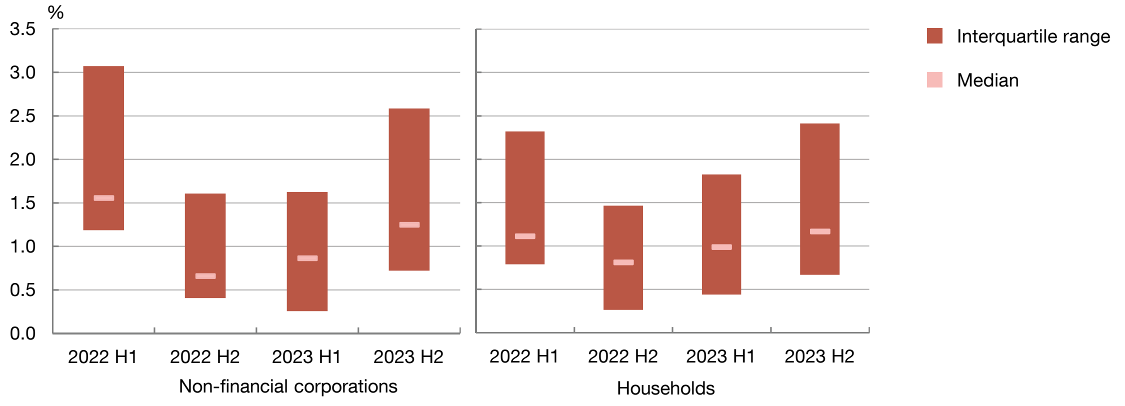
[9] The spreads are calculated by reference to the interest rate swap (IRS) benchmark rate according to their maturity.

[10] The borrower income used to calculate the LTI and LSTI ratios is proxied using average household income by postcode. As a result, the actual LTI and LSTI ratios may deviate from the estimate, as the borrowers' income may differ from the average values in their geographical area.

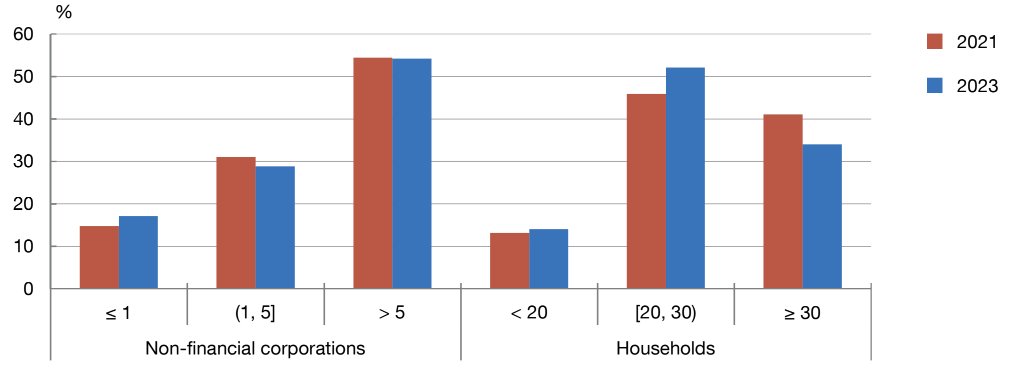
Chart 3.6

Interest rate spreads have widened in lending to non-financial corporations and, more moderately, in mortgages to households, while maturities have shortened slightly

3.6.a Distribution, by institution, of the interest rate spreads for new lending to non-financial corporations and new mortgages to households (a)



3.6.b Percentage of lending, by maturity. Mortgages to households and credit to non-financial corporations (b)



SOURCE: Banco de España.

a The chart depicts the interquartile range (difference between the 75th and 25th percentiles) and the median of the average interest rate spread (weighted by the loan amount) applied by deposit institutions over the IRS curve, for new mortgages to households and new lending to non-financial corporations in the corresponding half-year period. For households, the spread is calculated based on new loans in four maturity intervals (floating and initial rate fixation periods of up to one year, between one and five years, between five and ten years, and over ten years). Each interval is compared with the IRS rate for the mortgage term at the midpoint of the respective interval. For floating-rate loans with a rate fixation period of up to one year the 1-year IRS rate is used, and for loans with a fixation period of over ten years the 25-year IRS rate is used (25 years being the average term of new mortgages with a term of over ten years). For non-financial corporations, the spread is calculated based on new loans in six maturity intervals (floating and initial rate fixation periods of up to three months, between three months and one year, between one and three years, between three and five years, between five and ten years, and over ten years). Each interval is compared with the IRS rate at the midpoint of the respective interval. For floating-rate loans with a rate fixation period of up to one year the 1-year IRS rate is used, and for loans with a fixation period of over ten years the 25-year IRS rate is used.

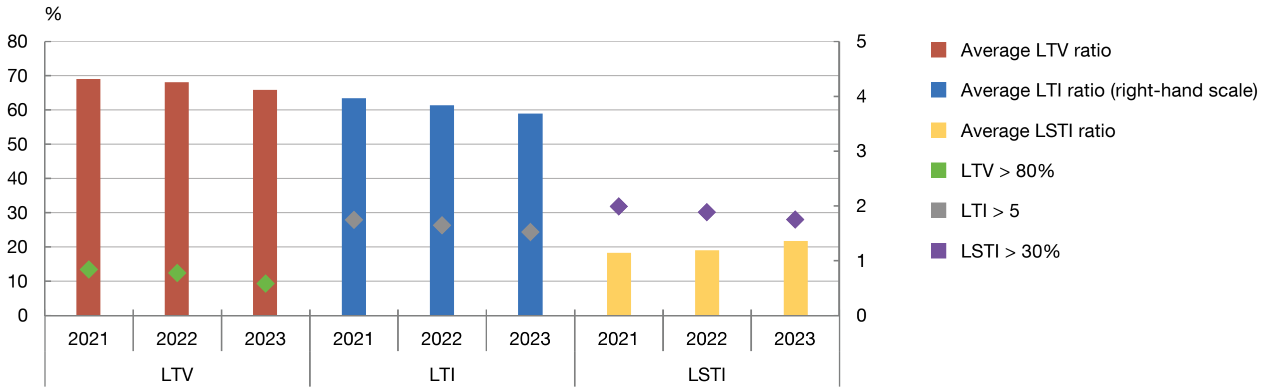
b Maturity (measured in years) at origination. New loans are considered in the case of households, while outstanding loans are considered in that of non-financial corporations.

In view of the still high uncertainty in the near term and the subdued situation in Spain's credit cycle, the Banco de España has decided to hold the CCyB rate at 0%. As discussed in the summary, despite receding upside risks to inflation, geopolitical risks remain high. There could also be an abrupt correction in the financial markets, and the risks to economic growth are still tilted to the downside. Maintaining the CCyB rate at 0% reflects this current uncertainty and the absence of signs of new credit imbalances building up in Spain. If disinflation and the

Chart 3.7

The leverage of new mortgage loans continues to decline, although households' average debt burden has increased due to the interest rate hikes

3.7.a Credit standards for new mortgage lending to households (a) (b) (c)



SOURCES: Banco de España and Colegio de Registradores.

a The LTV ratio is the amount of the mortgage principal relative to the appraisal value of the property. The average LTV ratios are weighted by the principal of each mortgage and calculated for new mortgages.

b The LTI ratio is estimated for each mortgage as the ratio of the initial mortgage amount to average annual gross household income in the postcode area where the youngest mortgagor resides. The LSTI ratio for each mortgage is estimated as the ratio of the mortgage instalments over the next 12 months to average annual gross household income in the postcode area where the youngest mortgagor resides.

c The average LTI and LSTI ratios are calculated as the averages of those ratios in each mortgage weighted by their relative share (in terms of the principal) in the total mortgage portfolio for which the information needed to calculate the ratio is available.

favourable trends in economic activity and bank profitability (both of which proved resilient to the backdrop of elevated geopolitical risks in 2022 and 2023) were to take hold, it could help lessen economic uncertainty over the quarters ahead.

The pace of increases in other European countries' macroprudential buffers has slowed down since the last FSR was published. Latvia has announced that it will activate its CCyB rate at 1%, while Slovenia has announced its intention to raise its CCyB rate from 0.5% to 1%, effective from January 2025.[11] In addition, systemic risk buffers (SyRBs) have been activated in some countries, with the sectoral SyRB being used in many cases to address real estate market vulnerabilities in particular. Specifically, Portugal recently announced the introduction of a sectoral SyRB, applicable to retail exposures to natural persons secured by residential real estate located in the country. Further, Italy has launched a public consultation on a proposal to activate a sectoral SyRB of 1% of domestic credit exposures, to enhance the capacity of its banking sector to absorb systemic shocks while continuing to provide financing to the economy.[12]

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[11] To offset the increase in capital requirements available for release resulting from the higher CCyB rate, Banka Slovenije has reduced, from 1% to 0.5%, Slovenia's sectoral SyRB for retail exposures secured by residential real estate.

[12] Banca d'Italia press release of 8 March 2024.

In December 2023, the Banco de España announced the designation of Banco Santander, S.A. as a global systemically important institution (G-SII) in 2025.[13] The identification of this institution as a G-SII for another year entails the need to maintain a macroprudential capital buffer of 1% of CET1.[14] Under current regulations, the effective capital buffer rate applicable to Banco Santander, S.A. in 2025 as a systemically important institution will be the higher of: (i) the aforementioned G-SII buffer rate and (ii) the buffer rate to be set for other systemically important institutions (O-SIIs) by the Banco de España in 2024.

Lastly, the ESRB published its third report[15] **on the macroprudential stance framework.** The macroprudential stance assessment is a conceptual framework for comparing systemic risks with the policy measures taken to address them. To do so, the ESRB follows two complementary approaches, namely:

(i) a growth-at-risk approach, in which a model is used to estimate the impact that macroprudential policy has on forecasts regarding the distribution of future economic growth, both in normal times and in recessions; and

(ii) an indicator approach, in which indicators for risks, resilience and policy (for example, housing prices and bank capitalisation) are compared.

The aim of these assessments is to see whether the financial system is resilient enough, and whether a country's macroprudential policy stance is neutral, loose or tight relative to the risks it aims to address.

3.2 Regulatory and supervisory developments relevant to financial stability

3.2.1 Structural challenges: climate change and crypto-assets

The EBA has recommended targeted enhancements to the Pillar 1 framework to capture environmental and social risks. In its October report,[16] the EBA assesses how the current prudential framework captures these risks and proposes a series of enhancements aimed at supporting the transition towards a more sustainable economy, while ensuring that the banking sector remains resilient.

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[13] See the press release of 14 December 2023 "The Banco de España designates a Global Systemically Important Institution and sets its macroprudential capital buffer rate for 2025".

[14] This Banco de España measure is a macroprudential action envisaged in the prevailing EU and Spanish legislation, formalising the prior designation of this bank as a global systemically important bank (G-SIB) by the Financial Stability Board (FSB). "2023 List of Global Systemically Important Banks (G-SIBs)", FSB press release, 27 November 2023.

[15] ESRB press release, *"ESRB improves its macroprudential stance framework",* of 15 January 2024.

[16] EBA press release, *"The EBA recommends enhancements to the Pillar 1 framework to capture environmental and social risks",* of 12 October 2023.

The EBA has put forward recommendations for short-term actions to be taken over the next three years as part of the implementation of the latest revisions to the Capital Requirements Regulation and Capital Requirements Directive (CRR3/CRD6). Specifically, the EBA proposes to:

(a) include environmental risks as part of stress testing programmes;

(b) encourage the inclusion of environmental and social factors as part of external credit assessments by credit rating agencies, and as part of due diligence requirements and the valuation of immovable property collateral;

(c) require institutions to identify whether environmental and social factors constitute triggers of operational risk losses; and

(d) progressively develop environment-related concentration risk metrics as part of supervisory reporting.

In the report the EBA also proposes possible medium to long-term enhancements, which will take into consideration the developments agreed to at the international level:

(i) the possible use of environmental risk-related scenario analysis to enhance the forward-looking elements of the prudential framework;

(ii) the role of transition plans in future enhancements to the Pillar 1 framework;

(iii) the revision of the internal ratings-based (IRB) supervisory formula and the corresponding standardised approach (SA) for credit risk to better reflect environmental risk elements; and

(iv) the introduction of environment-related concentration risk metrics under the Pillar 1 framework.

The European Central Bank (ECB) and the ESRB published a joint report[17] **on the impact of climate change on the EU financial system.** The two authorities highlighted that banks were significantly exposed to high-emitting firms and households, with future climate risks underpriced and underinsured. Against this background, the report: (i) gathers evidence on the most important financial stability indicators (including projected extreme weather events, such as floods, fires and droughts); (ii) acknowledges the macroprudential impact of climate risk and proposes a macroprudential strategy for addressing it that complements other microprudential efforts; and (iii) extends the scope from climate-related risks to broader nature-related risks.[18]

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[17] ECB press release, *"Banks and insurance have key role to play in reducing climate-related financial stability risks, joint ECB/ESRB report finds",* of 18 December 2023.

[18] As defined in the report, "nature" refers to biodiversity as well as climate.

Figure 3.1

Regulatory developments relevant to financial stability

Climate change

The EBA (at EU level) and the BCBS (at global level) have made headway in the development of prudential requirements for climate-related banking sector risks. The ESRB has completed an initial analysis of the use of macroprudential policy in this field

Crypto-assets

The BCBS has revised its global prudential standard on crypto-assets to incorporate a differential treatment for stablecoins. The FSB is analysing the risks posed by multifunction crypto-asset intermediaries

Review of the macroprudential framework in the EU

The European Commission has published a report on the macroprudential review of the EU banking sector which includes some of the matters and goals identified that will inform a potential legislative proposal to amend the CRR/CRD

US legislation

Federal banking supervisory authorities continue working on implementing the outstanding Basel III reforms and on the regulatory review linked to the turmoil of spring 2023. The legislative changes subjected to public consultation last year would entail tightening the requirements currently applicable

The joint ECB/ESRB report identifies a set of macroprudential tools that could be used to address climate-related risks, and the need to analyse their costs and benefits. Specifically, it points to tools that already exist in EU banking regulations – such as the SyRB – or in most EU Member States' national financial legislation, e.g. borrower-based measures.

The EBA also published the final templates[19] that will be used to collect climate-related data from EU banks. The data collected will be used for the scenario analysis that the EBA – in coordination with the other European supervisory authorities, the ECB and the ESRB – must conduct as part of the European Commission's Fit-for-55 package.[20] The aim of this initiative is to assess the financial system's ability to support the transition to a low-carbon economy.

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[19] EBA press release, *"The EBA publishes final templates to collect climate-related data from EU banks"*, of 17 November 2023.

[20] "Fit for 55" refers to the target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

The new data will notably be used to assess concentration risk of large climate exposures and to capture amplification mechanisms and second-round effects should climate-related risks materialise.

At international level, the Basel Committee on Banking Supervision (BCBS) issued a public consultation on a proposal to incorporate climate-related financial risks into the Pillar 3 disclosure framework. This consultation[21] forms part of the BCBS' holistic approach (prudential regulation and supervision) to address climate-related financial risks to the global banking system.[22] The BCBS recognises that the accuracy, consistency and quality of climate-related data are still evolving, but expects that the new Pillar 3 requirements will accelerate the availability of such information and facilitate forward-looking risk assessments in this field.

The BCBS has also analysed the use of climate scenarios by banks and supervisors. This topic was addressed at a BCBS meeting held in Madrid[23] on 28-29 February 2024, along with other matters, including: (i) the risks to, and vulnerabilities of, the banking system; (ii) the revisions to the Basel Core Principles; (iii) the technical adjustments to the assessment framework for G-SIBs;[24] and (iv) the implementation status of Basel III reforms.

The FSB published a report on the risks of multifunction crypto-asset intermediaries (MCIs). The FSB report[25] analyses, in particular, the financial stability implications of MCIs, which are firms that combine a broad range of crypto-asset services, products and functions typically centred around the operation of a trading platform. The identified vulnerabilities of MCIs are similar to those of traditional finance, but may be amplified by, among other factors, a lack of effective controls, unsuitable governance and risk management frameworks and conflicts of interest. Looking ahead, the FSB highlights the need to enhance cross-border cooperation between authorities and to address information gaps.

In parallel, the BCBS launched a public consultation[26] on changes in the prudential standards on the treatment of crypto-assets. In December 2022 the BCBS published its first standard on the treatment of banks' exposures to crypto-assets and how they fit into the Basel III framework. Due to the rapid pace of market developments, and taking into consideration the reviews performed by the BCBS in 2023, it proposes to discriminate between different types of stablecoins.[27] Specifically, those stablecoins that meet a set of conditions on the composition of reserve assets (credit quality, maturity and liquidity) will be subject to the requirements of the existing general capital framework, rather than those of the more conservative specific prudential treatment applicable to other types of crypto-assets.

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[21] BCBS press release, *"Basel Committee consults on a disclosure framework for climate-related financial risk",* of 29 November 2023.

[22] In 2021 the BCBS published two analytical reports: *Climate-related risk drivers and their transmission channels* and *Climate-related financial risks – measurement methodologies.*

[23] BCBS press release, *"Basel Committee agrees to revisions to Basel Core Principles, consults on addressing window-dressing in the G-SIB framework and reaffirms expectation about Basel III implementation",* of 29 February 2024.

[24] To prevent window-dressing in the data provided by banks, the BCBS has proposed collecting certain information needed to calculate systemic importance indicators more frequently. BCBS press release, *"Basel Committee consults on measures to address window-dressing in the G-SIB framework",* of 7 March 2024.

[25] FSB report, *The Financial Stability Implications of Multifunction Crypto-asset Intermediaries*, of 28 November 2023.

[26] BCBS press release, *"Basel Committee consults on targeted adjustments to tighten its standard on banks' exposures to cryptoassets",* of 14 December 2023.

3.2.2 Other prudential regulatory changes and developments

The European Commission has published a forward-looking report[28] **on the macroprudential review of the banking sector.** The report, which satisfies the requirement for a five-yearly review under the CRR, includes some of the matters and goals identified that will inform the reviews leading to legislative proposals to amend the CRR/CRD. Specifically, the European Commission highlights the goals of:

- (i) enhancing macroprudential capital buffer usability and releasability;
- (ii) promoting more consistency in the use of certain requirements (in particular the O-SII buffer and the SyRB);
- (iii) assessing options to simplify the current framework and enable it to address new types of systemic risks; and
- (iv) making headway in developing a macroprudential toolkit for the non-bank financial sector, for which a public consultation will be conducted at the end of 2024.

The BCBS has continued to work on revising its standard on interest rate risk in the banking book (IRRBB). In a recent public consultation,[29] the BCBS proposes targeted adjustments to update the calibration of the interest rate shock parameters used in the IRRBB standard. The BCBS also proposes targeted adjustments to the methodology when interest rates are close to zero. This consultation is unrelated to any further changes the BCBS could pursue on the basis of the conclusions of its ongoing analytical work[30] on interest rate risk following the March 2023 banking turmoil in the United States and Switzerland.

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[27] Stablecoins are a type of cryptocurrency designed to minimise fluctuations in their value by linking it to one or several assets with a stable value or to a currency, such as the dollar or the euro.

[28] Report from the Commission to the European Parliament and the Council on the macroprudential review for credit institutions, the systemic risks relating to Non-Bank Financial Intermediaries (NBFIs) and their interconnectedness with credit institutions, under Article 513 of Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and amending Regulation (EU) No 648/2012, of 24 January 2024.

[29] BCBS press release, *"Basel Committee consults on targeted adjustments to its standard on interest rate risk in the banking book",* of 12 December 2023.

[30] BCBS report, *Report on the 2023 banking turmoil,* of 5 October 2023.

The FSB will continue to work to further increase the resolvability of banks, central counterparties and insurers. In its 2023 Resolution Report,[31] the FSB took stock of the resolution-related work of the past year as well as of the progress made in implementing resolution reforms and enhancing resolvability across the banking, financial market infrastructure and insurance sectors. The FSB considers that the lessons from the 2023 bank failures in the United States and Switzerland reinforce the need to maintain momentum and advance the work on bank resolvability. Specifically, the FSB will focus its efforts on enhancing implementation of the bail-in resolution tool[32] at a global level and on continuing to address operational challenges. The FSB also plans to review whether existing public sector backstop funding mechanisms are adequate for the range of potential failure scenarios.

The Federal Reserve System and other US supervisory authorities have continued working on finalising several regulatory proposals on bank capital requirements. After extending the comment period to January 2024,[33] federal bank regulatory agencies are analysing possible amendments to the draft standards that would implement:

(i) the final elements of the Basel III Capital Accord;

(ii) various technical amendments to the Federal Reserve's methodology for assessing and determining G-SIB capital buffers; and

(iii) a long-term debt requirement for non-G-SIBs with assets of more than $100 billion.

These measures aim to strengthen the solvency and resilience of the US banking sector and demonstrate the United States' commitment to internationally agreed banking standards.

Under the Spanish presidency of the Council of the European Union, in November the Council adopted[34] a regulation on central securities depositories (CSDs) that will improve the efficiency of securities settlement in the EU. The new regulation, which will become effective in 2024, will reduce compliance costs and regulatory burdens for CSDs, improve cooperation between supervisors and, after simplifying the existing passporting[35] regime, also make it easier for CSDs to offer services across borders.

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[31] FSB press release, *"FSB outlines work to further increase the resolvability of banks, central counterparties and insurers"*, of 15 December 2023.

[32] This tool enables the resolution authority to write down capital and, where appropriate, certain debt instruments to absorb any losses the institution may have incurred. Subsequently, other debt instruments are converted into capital in order to recapitalise the institution.

[33] Joint press release of the Federal Reserve Board, Federal Deposit Insurance Corporation and Office of the Comptroller of the Currency, *"Agencies extend comment period on proposed rules to strengthen large bank capital requirements"*, of 20 October 2023.

[34] Council of the European Union press release, *"Council adopts regulation on Central Securities Depositories"*, of 27 November 2023.

[35] 'Passporting' refers to the procedure whereby credit and other financial institutions based in one EU Member State can provide services in another Member State.

Lastly, in March the ECB issued a statement[36] on advancing the capital markets union (CMU). The ECB Governing Council believes there are strong reasons for supporting and enhancing this initiative, which was launched by the European Commission in 2015 to diversify the EU financial system and mitigate its fragmentation. Specifically, an effective CMU would contribute positively to the goal of a more integrated European banking sector as it would benefit from more cross-border financial services activities and a wider investor base. As a result, the CMU would make European banks more resilient and help lower the remaining barriers within the banking union.

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[36] "*Statement by the ECB Governing Council on advancing the Capital Markets Union*", of 7 March 2024.

Box 3.1

SENSITIVITY ANALYSIS OF THE BANK DEBT BURDEN OF FIRMS ENGAGED IN CONSTRUCTION AND REAL ESTATE ACTIVITIES[1]

Spanish deposit institutions' credit exposure to the real estate activities and construction sectors has decreased considerably since the global financial crisis (see Chart 1). However, it remains relevant to financial stability, due to both its size as a percentage of GDP (6.5% in December 2023) and its share of total bank finance to the private sector in business in Spain (8.3% at the same date).

The significance of this sectoral exposure in Spain and the evidence that has become available since the global financial crisis, linking real estate market imbalances to an increased likelihood of deeper recessions and also slower recoveries,[2] mean that it is important to assess the resilience of firms in these sectors to economic and/or financial shocks, such as the interest rate hiking cycle since 2022 H2.

This box describes, first, the financial position of these firms drawing on the latest information available (data at end-2022 and end-2023), homing in on their interest coverage ratio, among other indicators. It then analyses the effects of different types of shocks (to interest rates and EBITDA generation) on their debt burden.

To do so, it uses granular data on the volume and cost of these firms' bank borrowing, available in the Banco de España's Central Credit Register (CCR), together with information from their balance sheets and income statements drawn from the Banco de España's Central Balance Sheet Data Office integrated database (CBI). As the CBI does not have financial and economic information on all firms with outstanding loans in the CCR, different parts of the analysis, in particular that referring to the shocks, are conducted on the sample of firms present in both databases.[3, 4, 5] In any event, this exercise constitutes a lower bound of these firms' debt burden, as it only analyses their bank debt and other financial obligations may exert further payment pressures on them.

The total CCR data reveal that bank lending to firms linked to the real estate activities and construction sectors amounted to €113 billion at end-2023[6]. It is mostly arranged as floating-rate loans (close to 70% of the total). Therefore, at end-2023, these firms had already largely absorbed the increase in interest rates associated with the monetary tightening cycle the European Central Bank launched around two years ago. This preponderance of floating-rate loans means the sectors' financing costs are highly sensitive to changes in market rates. Meanwhile, rollover risks appear to be contained, at least in the short term, as the vast majority (somewhat more than 90%) of the bank debt of such firms has a residual maturity of over one year (see Chart 2).

To analyse the debt service capacity of these firms, we need to study not only their financial obligations, but also the gross operating profit that they generate and the ratio between the two. To do so, an analysis was conducted of the distribution of the interest coverage ratio (ratio of EBITDA to interest expenditure) in 2019 and 2022. An interest coverage ratio of below 1 indicates that a firm does not generate enough EBITDA to pay the interest expenses on its bank debt.

This ratio is significantly more dispersed in 2022 (last year with complete data for the CBI) than in 2019 (see Chart 3). According to this metric, just over one-third of bank financing to the sectors analysed is to firms with low debt service capacity, i.e. firms with interest coverage ratios of below 1 or even negative ratios. Meanwhile, there are a significant number of firms with an interest coverage ratio of above 1 (most firms actually have a ratio of over 2). Other financial ratios for these sectors,

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[1] This box was amended on June 21, 2024, after the FSR's publication on 15 April 2024, to include this footnote and footnote 6.

[2] for example, Ò. Jordà, M. Schularick and A. M. Taylor. (2016). "The great mortgaging: housing finance, crises and business cycles". *Economic Policy*, 31(85), pp. 107-152.

[3] The CBI contains financial and economic information reported voluntarily by Spanish non-financial corporations, in addition to the information that firms and groups are required to report to the Mercantile Registry or to the National Securities Market Commission. The complete CBI sample is collected annually and its latest wave refers to 2022. By contrast, the CCR contains information on the loans, claims, guarantees and collateral of each reporting agent vis-à-vis its customers, with minimum reporting thresholds, reported monthly.

[4] The sample of firms engaging in real estate activities and construction present in both the CCR and the CBI account for one-third of the credit exposures to these sectors in the CCR at end-2023. They are bigger than the other firms, in terms of their turnover (3.5x), headcount (4.3x) and total assets (1.1x). These exposures also have a better credit classification (higher share of performing exposures: 89%, versus 79% for all the exposures to these sectors in the CCR).

[5] In 2022 the bank debt of the sample firms reported to the CCR accounted for close to 80% of total bank financing reported by these firms to the CBI, and around 45% of long-term borrowing and short-term interest-bearing financing.

[6] The bank lending reported to the CCR used for the analysis in this box includes that transferred to Sareb after its origination (21% of the lending analysed).

Box 3.1

SENSITIVITY ANALYSIS OF THE BANK DEBT BURDEN OF FIRMS ENGAGED IN CONSTRUCTION AND REAL ESTATE ACTIVITIES (cont'd)

such as the debt-to-assets ratio, also show high cross-firm heterogeneity.[7]

To supplement the foregoing descriptive analysis, the interest coverage ratio is projected for 2023 onwards. To

Chart 1
Bank lending to real estate activities and construction firms (a)

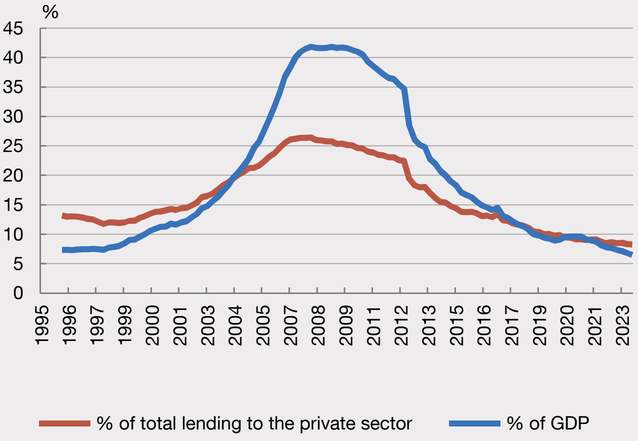


Chart 2
Residual maturity of bank loans to construction and real estate activities firms at Dec-23 (b)

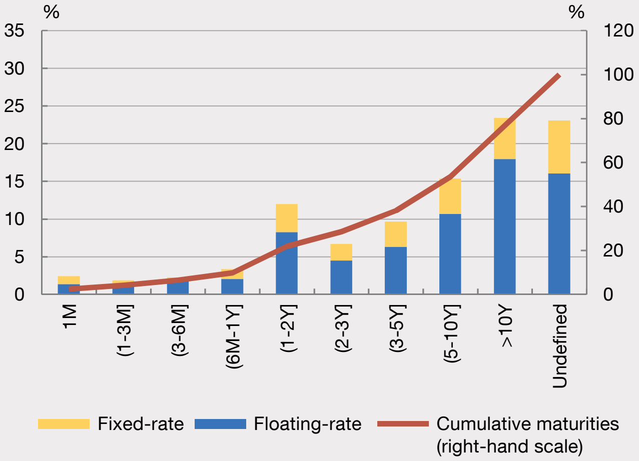


Chart 3
Distribution of the interest coverage ratio (c)

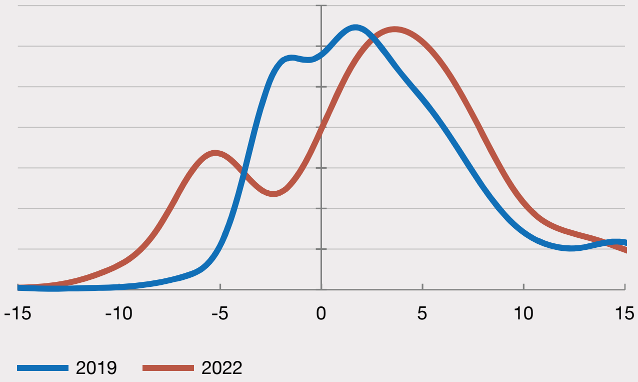
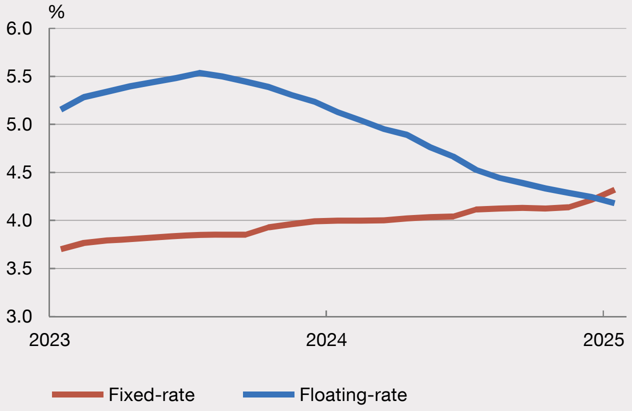


Chart 4
Interest rates on bank lending to real estate activities and construction firms. Projection (baseline scenario) (d)



SOURCES: Banco de España, INE, CCR and CBI.

a “% of total lending to the private sector” is calculated as the ratio of lending to non-financial corporations engaging in real estate activities and construction to total lending to customers resident in Spain, drawing on information from quarterly individual confidential returns. "% of GDP" uses the same numerator, but the denominator is GDP at market prices, drawing on the INE's Quarterly National Accounts.

b The chart depicts the residual maturity of all lending to non-financial corporations engaging in construction and real estate activities (NACE Rev. 2 groups: 411, 412, 681, 682, 683, 431, 421, 422, 429), according to the granular information available in the CCR. Loans where the residual maturity is not reported have been grouped in the category “Undefined”. The simulations in this box only consider loans where the information available in the CCR can be matched to the financial and economic information on the firms' consolidated financial statements in the CBI. The percentage of operations with a maturity of 2-3 years is higher in the CCR subsample that links to the CBI (10.7%, versus 6.4% in the CCR), and the percentage with a maturity of more than 10 years is somewhat lower (18.9%, versus 20.6% in the CCR).

c The chart depicts density functions proxied by kernel estimators of the interest coverage ratio of real estate firms, weighted by each firm’s outstanding amount of lending in the corresponding year, according to the information available in December of each year. The distributions consider the same set of firms in the years depicted, to make the distributions more comparable.

d The chart depicts the average interest rates on bank loans to the real estate firms considered in the simulation, according to the assumptions of the baseline scenario (see the text for more details). This average is weighted by the amount drawn down against each loan at December 2023.

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[7] The figures refer to firms in the CCR matched to the CBI. For example, around one-third of bank lending to the real estate activities and construction sectors is to firms with a bank debt-to-asset ratio of more than 80%, while one-quarter is to firms with a ratio of less than 20%. More highly leveraged firms tend to have worse interest coverage ratios and a poorer credit standing (higher proportion of loans classified as non-performing or in Stage 2). Further, it should also be borne in mind that some of these firms’ assets could have a very low liquidation value (e.g. housing under construction). Therefore, a low debt-to-asset ratio does not always mean greater debt servicing capacity.

do so, the observed (up to 2023) and projected future (2024-2025) paths of interest rates (to which the future performance of interest expenses is linked) and economic growth (which is relevant to EBITDA) are considered. In this exercise, it is assumed that the loans maturing over the projection horizon (up to 2025) are renewed for the same amount as at end-2023 and that their original maturities and interest rate reset frequencies are unchanged. In this case, their new interest rate level is recalibrated taking into account the risk premium of loans arranged in 2023.[8]

This exercise assumes firms' assets grow at the same pace as nominal GDP, based on the Banco de España's latest macroeconomic projections.[9] It also assumes that the EBITDA-to-total assets ratio remains stable (and thus grows at the same rate as GDP)[10] and that euro area benchmark interest rates decline over the 2023-2025 horizon, in line with market expectations at end-March 2024.[11]

The course of benchmark rates has a significant effect on the interest expenses of the firms analysed. Specifically, the cost of their floating-rate financing declines over the horizon analysed (see Chart 4), whereas that of fixed-rate contracts rises moderately, as a large portion of such financing was granted in a context of lower interest rates and the updated interest rate upon renewal is higher than the original rate. Under this baseline scenario, interest expenses decline in net terms owing to the greater weight of floating-rate contracts in these sectors' bank debt.

In addition, a sensitivity analysis is conducted considering three alternative scenarios for EBITDA and interest rates. The first two scenarios assume market rates are 1 and 2 percentage points (pp) higher than market expectations at end-March 2024, while EBITDA continues to grow at the same pace as GDP. These scenarios effectively assume that the declines in interest rates expected at end-March 2024 do not occur or are far more moderate.

The third alternative scenario considers that interest rates move as envisaged under the baseline scenario, but that firms' EBITDA decreases. The magnitude of the decline is calibrated by first considering the average EBITDA-to-assets ratio in the period 1999-2019. The standard deviation of this time series is then calculated and subtracted from the EBITDA-to-assets ratio observed for each firm, to obtain its stressed EBITDA level (in euro).[12]

Chart 5 breaks down the results of this sensitivity analysis by considering various interest coverage ratio intervals. Under the baseline scenario, the interest coverage ratio improves, with the proportion of firms with more comfortable ratios (higher than 2) increasing. In 2023, this improvement is largely attributable to deleveraging by the firms that had worse ratios in 2022. From 2023 onwards, the dynamic of increasing EBITDA and lower interest expenses would ease the debt service burden. No such improvement, however, is observed under the stressed interest rate scenarios. The most adverse path for these sectors' debt service burden is obtained when EBITDA is stressed; under this scenario, the proportion of firms whose interest coverage ratio is below unity or at negative values would increase, and those with a ratio higher than 1 would represent less than 50%.

Lastly, the median ratio of EBITDA less interest expenses to total assets is analysed under the various scenarios. This enables both the excess and the shortfall in interest coverage to be calculated, without leading to definition issues for firms with negative EBITDA. This ratio is calculated separately for firms with different interest expense-to-assets ratios at the 2023 reference date.

As in the foregoing analysis, the most evident deterioration in this ratio occurs when EBITDA contracts. Under this scenario, only firms with lower interest expenses at the outset (below 2% of total assets, accounting for close to 65% of loans to these sectors) are able to generate

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[8] For this purpose, a distinction is drawn between new fixed and floating-rate loans arranged in 2023, and several groups of loans, classified by original maturity, are also considered. Subsequently, the average risk premium – i.e. the average difference between the interest rate on the loan and the swap reference rate – for each of these groups of loans is calculated. This difference is imputed to the loans whose characteristics match those of these groups and that are renewed over the projection horizon.

[9] Banco de España. (2024). "Macroeconomic projections for the Spanish economy (2024-2026)".

[10] For firms with negative EBITDA, it is assumed that such EBITDA becomes less negative, and decreases at the same pace as that of nominal GDP growth.

[11] Specifically, considering the euro swap yield curve at end-December 2023, and calculating the implied path of short-term swap rates to end-2025. The changes in benchmark interest rates on loans are attributable to changes in this swap rate.

[12] The shock to the EBITDA-to-assets ratio is somewhat smaller than that observed at the onset of the 2008 financial crisis. In practice, simultaneous shocks could occur to interest rates and EBITDA. The analysis in this box does not present the possible interactions between the two variables, and instead focuses on characterising the sensitivity of each channel.

Box 3.1

SENSITIVITY ANALYSIS OF THE BANK DEBT BURDEN OF FIRMS ENGAGED IN CONSTRUCTION AND REAL ESTATE ACTIVITIES (cont'd)

EBITDA in excess of their interest expense. The other groups of firms in the sample either begin to present shortfalls or see existing shortfalls increase (see Chart 6).

While the stressed interest rate scenarios envisage a smaller impact, it is still relatively large for firms that initially had higher interest expense-to-assets ratios (above 3%) in 2023. It should be noted that the financing extended to these firms accounts for a relatively limited proportion (under 20%) of the total loans to the firms in the sample (see Chart 7).

In sum, the volume of bank financing extended to firms engaged in real estate activities and construction is far smaller than that observed before the global financial crisis. However, their financial position presents some heterogeneity. Although a contained number of firms have difficulties in generating sufficient EBITDA to cover their interest expenses, most firms have comfortable interest coverage ratios.

In addition, it is estimated that, should the path of interest rates exceed market expectations at end-March 2024, about which there is some uncertainty, any deterioration in the sector's bank debt servicing capacity would be limited. However, in the event of such shocks, firms with a larger debt service burden would see a more pronounced worsening of their financial position.

The bank debt burden of the firms in these sectors would be most affected if there were a significant decline in their activity. As no signs of significant imbalances have been detected in the Spanish residential and commercial real estate market in the current environment, in the short term the likelihood of this risk materialising appears to be contained.

Chart 5
Distribution of bank loans by tranche of bank debt interest coverage ratio (a) (b)

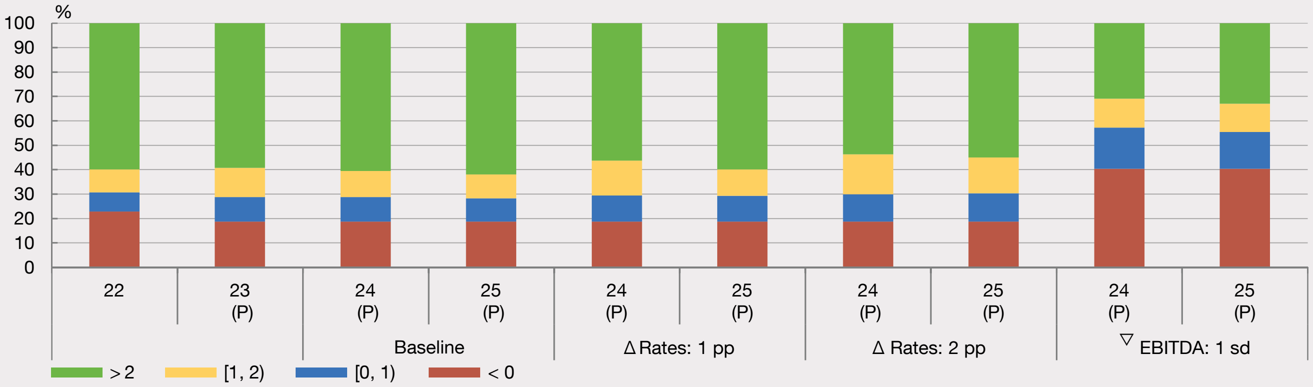


Chart 6
Ratio (EBITDA-Interest expenses on bank debt)/Assets x 100 (b) (c)

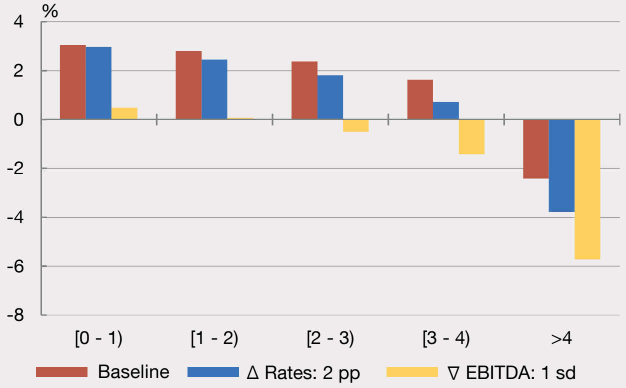
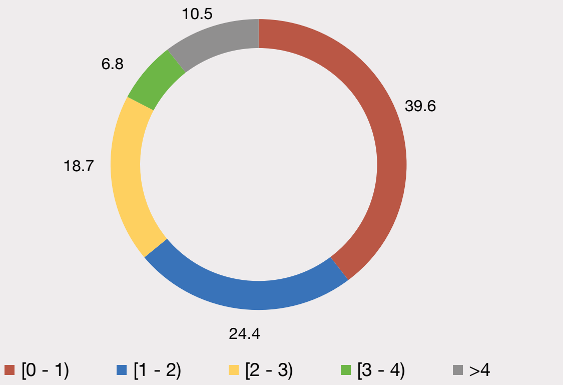


Chart 7
Share of loans by ratio of bank interest expenses to assets (2023, in %)



SOURCES: Banco de España, INE, CCR and CBI.

a The chart shows the distribution of bank loans to firms with different interest coverage ratios, drawing on CCR and CBI data. The interest coverage ratio for 2022 is an observed value. From 2023 onwards, interest expenses are approximated considering the interest rate on loans in the CCR and future developments. Under the baseline scenario, these future developments coincide with the market expectations at end-March 2024.

b The scenarios "Δ Rates: 1 pp" and "Δ Rates: 2 pp" assume that market rates are 1 pp and 2 pp, respectively, higher than under the baseline scenario. EBITDA in all cases is estimated assuming that firms' assets grow at the same pace as nominal GDP, with the EBITDA-to-assets ratio remaining stable except in the scenario "▽ EBITDA: 1 sd". This latter scenario assumes a decline in EBITDA equivalent to one standard deviation of the average EBITDA-to-assets ratio observed during the period 1999-2019. The values depicted in the chart reflect the composition of lending in December each year.

c The chart depicts the median value of the ratio (EBITDA-Interest expenses)/Assets (%) under several scenarios for firms with different interest expense-to-assets ratios (as % of assets, horizontal axis).

Special Feature

CYBER RISK

SF CYBER RISK

Cyber risk can be defined as the combination of the probability of cyber incidents ocurring and their impact,[1] where cyber incident means a cyber event that adversely affects the confidentiality, integrity and availability of information or an information system, whether resulting from malicious activity or not. These events are in fact becoming increasingly relevant to the financial system as a whole and to other productive sectors as the digitalisation of the economy and society progresses.[2] Moreover, financial and technological interconnectedness means that cyber incidents can spread rapidly across banks, non-banks and financial market infrastructures with potential financial stability implications. Reliance on critical services provided by third parties entails new vulnerabilities and concentration risks within the financial system.

Against this background, prudential regulators and supervisors are paying the utmost attention to these new risks and promoting initiatives to make financial institutions more resilient to them, i.e. to strengthen their cyber resilience. The authorities' initiatives increase the already high incentives for financial institutions to invest in technological resources, in order to protect not only their data but also the integrity of the provision of services to their customers.

The European authorities' initiatives include the recent approval of the Digital Operational Resilience Act (DORA),[3] the NIS 2 Directive on cyber security,[4] the ongoing work to implement the European Systemic Risk Board (ESRB) recommendation on coordination in the event of systemic cyber incidents, and supervisory stress testing of banks' resilience to cyber attacks by the Single Supervisory Mechanism in 2024.

The rest of this special feature is structured as follows. Section SF.1 analyses the concepts of cyber risk and cyber resilience in the context of the digitalisation of the financial system. Section SF.2 describes the growing frequency and impact of cyber risk. Both sections draw on publicly available cyber risk data, subject to multiple limitations. Section SF.3 sets out the various initiatives of financial institutions themselves, micro- and macroprudential authorities and other organisations to strengthen cyber resilience. Section SF.4 concludes with possible outlooks for cyber risk, for example in relation to the impact of artificial intelligence, and for institutions' and authorities' tools to mitigate them, which will have to focus on the provision of adequate technological resources, on top of the financial resources used to absorb operational losses.

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[1] See the Financial Stability Board's (FSB) Cyber-Lexicon for definitions of relevant cyber risk terms.

[2] See the European Commission report of 24 January 2024.

[3] Regulation (EU) 2022/2554 of the European Parliament and of the Council of 14 December 2022 on digital operational resilience for the financial sector and amending Regulations (EC) No 1060/2009, (EU) No 648/2012, (EU) No 600/2014, (EU) No 909/2014 and (EU) 2016/1011.

[4] Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a high common level of cybersecurity across the Union, amending Regulation (EU) No 910/2014 and Directive (EU) 2018/1972, and repealing Directive (EU) 2016/1148 (NIS 2 Directive).

SF.1 Cyber risk and the financial system

SF.1.1 The financial system as an ecosystem

The financial system is highly complex, with many highly interconnected and interdependent participants. This system comprises market infrastructures, the various types of financial institutions (banks and non-banks) and their main technology service providers, as well as all of their supervisory authorities. Financial institutions have both direct interconnections through their assets and liabilities and indirect ones, since they invest and raise funds using those same types of instruments (see Section 2 of Chapter 2 of this *Financial Stability Report).* In addition, there are numerous operational interconnections between participants in the sector, through market infrastructures, common service providers and even the provision of services between financial institutions.

Because of these interconnections between institutions and other characteristics of the financial system, cyber risk can threaten financial stability.[5] Thus, cyber incidents may not only affect each individual participant, but also spread and magnify, and have systemic implications for the sector as a whole. In addition to interconnectedness, other relevant features of the financial system for assessing cyber risk include its strong reliance on technology, its appeal to attackers with different motivations (e.g. financial and political) and a high sensitivity to a loss of confidence among its participants.[6]

Financial institutions complement their technological capabilities through various relationships with other agents. These include procurement of services from suppliers, participation in consortia, investments in start-ups or purchases of products from third parties.

In many cases, the supply of technology services is highly concentrated among a relatively small number of providers, particularly in the area of cloud computing.[7] In fact, some of these providers have come to form the backbone of the financial system, at a level comparable to market infrastructures. In cloud computing, for example, three companies account for more than 60% of the market share[8] and their simultaneous failure would have an adverse systemic impact on operations. They are therefore single points of failure, since the incidents affecting them, including unintentional ones, have an impact on the sector as a whole. Moreover, many of these suppliers also provide their services to companies in other sectors, making them potentially critical to the economy of entire countries or even groups of countries.

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[5] F. J. Herrera Luque, J. Munera López and P. Williams. (2021). "Cyber risk as a threat to financial stability", *Financial Stability Review – Banco de España,* 40.

[6] See the ESRB report *Systemic cyber risk* of February 2020.

[7] The European Banking Authority (EBA) defines cloud computing as a model for enabling ubiquitous, convenient and on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

[8] Ting Yang Koh and Jermy Prenio. (2023). *Managing cloud risk - some considerations for the oversight of critical cloud service providers in the financial sector.* FSI Insights on policy implementation No 53.

Identifying all of the sector's interdependencies is a complex challenge. Traditional financial institutions are connected with each other and with market infrastructures, there are new players offering financial services (e.g. FinTech)[9] and there is a growing reliance on direct technology providers. But there are also other dependencies on third parties that have not been properly identified, created by successive outsourcing along the technological product and services procurement chains, over which financial institutions have little or no control. This has led initiatives such as the FSB's toolkit[10] for enhancing third-party risk management or the European Union's DORA Regulation, analysed in more detail in Section SF.3, to focus on these dependencies.

SF.1.2 Digital transformation and cyber risk exposure

The financial system is highly digitalised and financial institutions rely on technology not only to do business, but as a differential and competitive factor. In recent years the digital transformation process has accelerated enormously,[11] in terms of both improving the efficiency of financial institutions' internal processes and providing their customers with flexible, personalised and immediately accessible services, from anywhere and on different types of devices.[12] This has been reinforced by the emergence of new competitors for traditional financial institutions, such as BigTech[13] and FinTech firms, which can provide highly attractive solutions in a very agile and innovative way.

The high level of digitalisation in the financial system increases its exposure to cyber risk. Most financial institutions have extraordinarily complex technological environments, where legacy applications coexist with others based on more innovative technologies, as a result not only of transformation processes but also in some cases of successive mergers and acquisitions.[14] This complexity makes it difficult for institutions to maintain an adequate control environment and, therefore, makes them more vulnerable to both system failures and cyber attacks.

Against this background, the COVID-19 pandemic has acted as an accelerator, changing the way financial institutions operate and their relationship with customers. For example, teleworking, which remains stable at a higher level than before the pandemic, poses additional risks to institutions and their staff, including those arising from accessing corporate systems from personal devices and home networks and handling confidential data in employees' homes. Customers' electronic access to various financial services was boosted by restrictions on mobility during the initial stages of the pandemic, and part of this momentum continued thereafter as social relations returned to normal.

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[9] The FSB defines FinTech as technologically enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services. The companies using these technological innovations are commonly referred to with the same term.

[10] See the FSB report *Enhancing third-party risk management and oversight – a toolkit for financial institutions and financial authorities* of 4 December 2023.

[11] According to the FUNCAS – KPMG Financial Digitalisation Observatory report, *La digitalización como eje de transformación bancaria* (only available in Spanish), the penetration of digital banking in Spain increased from 54.9% in 2019 to 69.6% in 2022, almost 10 percentage points higher than the European average for 2022 (59.7%). The report also highlights that advancing the digital transformation was a strategic priority for 58% of institutions in 2022, outranking mitigating the effects of inflation, which was a priority for 53%.

[12] José Ramón Martínez Resano. (2022). *Regulating for Competition with Bigtechs: Banking-As-A-Service and 'Beyond Banking'.*

[13] The FSB defines BigTechs as large technology companies with extensive customer networks.

[14] See "Changes in the main Spanish banking groups (2009-2021)", Banco de España.

The greater availability of remote financial services has increased the exposure of the customers using these services to cyber attacks and fraud. There has been a very significant increase in social engineering fraud such as phishing,[15] smishing[16] and vishing,[17] as well as scam websites and mobile applications, among others. Despite institutions' efforts to improve customer cyber security education, some customers continue to be highly vulnerable, particularly those who had never used digital channels prior to the pandemic.

Although some studies suggest that the financial sector is one of the critical sectors best prepared for cyber risk, there is some heterogeneity at the level of individual institutions. While the sector's better relative position is partly due to its high level of regulation and supervision, in some cases the security measures and controls implemented by institutions (particularly smaller ones) still need to be improved to adequately manage cyber risk.

SF.1.3 Non-malicious events and cyber attacks

Cyber incidents are not limited to cyber attacks. The definition of cyber incident in the FSB's Cyber Lexicon (see footnote 1) refers to events whether resulting from malicious activity (caused by cyber attacks) or not. The latter, which include events caused by natural disasters (e.g. earthquakes), human error or accidental system failures, may also affect the ability of institutions and the sector to continue operating normally. Accordingly, resilience to these cyber incidents is equally important.

The different types of cyber incidents vary in frequency and impact. Looking at the main causes of cyber incidents reported annually to the European Union Agency for Cybersecurity (ENISA) across all sectors, non-malicious incidents, such as system failures or human error, are the most common (see Chart SF.1).[18] Despite their prevalence, in most cases these incidents do not have a significant impact, either individually or systemically. Malicious incidents, which account for around 22% of the total, have a greater impact.

The very nature of malicious cyber incidents and their intentionality explain their greater impact despite their lower frequency. In most cases, these are attacks designed to have the

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[15] Phishing attacks are those where the attacker tries to fraudulently obtain confidential information (passwords, bank details, etc.) from legitimate users, by posing as a trustworthy institution.

[16] Smishing is the practice of sending text messages purporting to be from a legitimate institution with the aim of stealing users' private information or money.

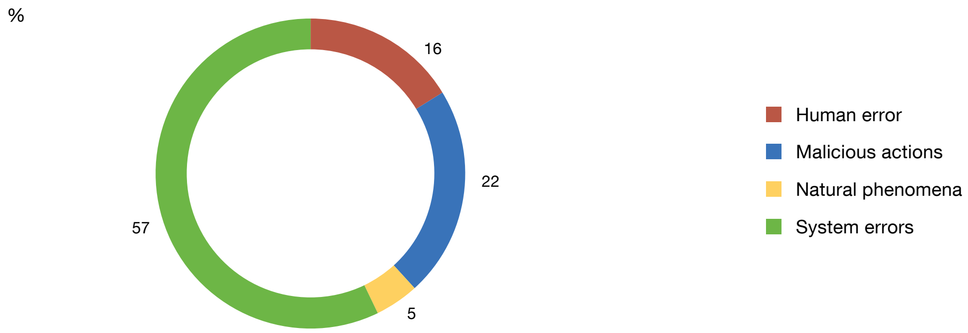
[17] Vishing is a type of social engineering scam via telephone, where the identity of a trustworthy firm, organisation or person is supplanted through a call, with the aim of obtaining the victim's personal and sensitive information.

[18] All the charts in this special feature use the best possible approximation based on publicly available data to illustrate various relevant stylised facts relating to cyber risk. These approximations have important limitations in terms of the quantity and quality of the available data. Supervisors have far superior confidential data. The high priority of cyber risk on the regulatory and supervisory agenda suggests that more aggregate data will become available in the future.

Chart SF.1

Despite their stronger impacts, malicious cyber incidents account for a limited percentage of total reported cyber incidents

SF.1.a Causes of the cyber incidents reported to ENISA in Europe between 2013 and 2023



SOURCES: ENISA, Cybersecurity Incident Reporting and Analysis System.

greatest possible impact on their victims, for example by paralysing their operations or stealing confidential data. In addition to this, attackers may try to increase their scope and impact: from a single user to a wider group of one or more institutions. The long-term effects of these incidents, such as reputational damage, also contribute to their greater impact.

SF.1.4 From cyber security to cyber resilience

The concept of cyber security has a well-defined scope. The FSB's Cyber Lexicon defines cyber security as the preservation of confidentiality, integrity and availability of information and/or information systems through the cyber medium. It therefore primarily concerns prevention and protection. However, as we move towards a fully digital world where cyber threats are becoming more frequent and sophisticated, a paradigm shift is required in which we must assume that a major cyber incident will occur at some point in time.

The concept of cyber resilience builds on that of cyber security. The FSB's Cyber Lexicon defines cyber resilience as an organisation's ability to continue to perform its mission by anticipating and adapting to cyber threats and other relevant changes in the environment and by withstanding, containing and rapidly recovering from cyber incidents.

Thus, cyber resilience relates to the broader concept of operational resilience. The Basel Committee on Banking Supervision (BCBS) defined operational resilience in its Principles for Operational Resilience[19] as the ability of a bank to deliver critical operations through disruption. This definition can be applied not only to banks, but also to all kinds of private firms and public institutions inside and outside the financial system. This is a more holistic approach that does not focus solely on the technology itself, but gives the same importance to people and processes in organisations and links up with existing disciplines, such as business continuity.

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[19] See the BCBS report *Principles for Operational Resilience* of March 2021.

SF.1.5 The relationship between cyber risk and economic and financial risks

Individual level

Cyber risk events can have a significant individual impact at the operational level, but also beyond. In a highly digitalised environment, technology is a factor that affects all areas of business activity. Cyber risk can therefore have an impact on other risks, such as legal, reputational or traditional financial risks.

Cyber incidents can have a potentially serious impact on an institution's reputation. Unavailability of services or breaches of confidentiality or of the integrity of information held by financial institutions, whether due to malicious or accidental events, may have an impact on the confidence of customers and the market in general. These reputational impacts may be exacerbated if the public disclosure of the cyber incidents is not properly managed.

Systemic level

The interaction between cyber risk and other risks (such as financial risk) increases at the systemic level. In addition to the implications of cyber risk at individual level, at systemic level the high interconnectedness and interdependence between financial institutions must also be taken into account. Thus, the impact of a cyber incident in one institution may spread to others, adding to the operational, financial and reputational impact, and potentially eroding confidence in the sector, a crucial element that could exponentially increase the impact at the systemic level. Other scenarios with a potential systemic effect include, for example, a massive attack against a large number of institutions or a critical provider, or failures of software commonly used in the sector.

The systemic financial stability implications of cyber risk are being analysed by the macroprudential authorities. For example, over the last few years the ESRB has been studying the impact of cyber risk on financial stability,[20] the potential channels of contagion through which the impact of a cyber incident may threaten financial stability[21] and possible measures to mitigate it.[22]

The materialisation of risks linked to the credit or business cycle does not necessarily reduce the probability of cyber incidents. On the contrary, a recession could increase incentives for financially motivated malicious attacks, as it would reduce technological agents' ability to generate legitimate income and institutions' capacity to invest in cyber resilience. While more research is needed on this issue, should cyber risk remain neutral or intensify with the economic/financial cycle, it would be necessary to set aside dedicated resources to absorb it. These resources would have to be specifically categorised as such and would be adapted to the technological nature of these risks.

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[20] See the ESRB report *Systemic cyber risk* of 19 February 2020.

[21] ESRB. (2020). "The making of a cyber crash: a conceptual model for systemic risk in the financial sector", ESRB Occasional Paper Series, 16.

[22] See the ESRB report *Mitigating systemic cyber risk* of 27 January 2022.

SF.2 The impact of cyber risk

SF.2.1 Main cyber threats

There are different types of cyber threat actors, varying in their motivations, the sophistication of attacks and the impact they have. Amateur attackers[23] and activists[24] usually seek publicity and tend to carry out less sophisticated and low or moderate impact attacks. So-called insiders[25] are often motivated by revenge or hired as spies by others; their knowledge of the company and easy access to it make them potentially dangerous, even if they do not always have strong technical skills. However, there are other types of attackers, that may be geopolitically or purely economically motivated, with highly sophisticated technical capabilities, that can cause very serious damage.

Cyber attacks attributed to organised crime, for financial gain, are on the rise worldwide. This is resulting in growing costs (see Chart SF.2). The existing legislation is essentially limited to a physical environment with well-defined sovereign jurisdictions, making it difficult to apply to the digital world. There are also huge differences between jurisdictions, and global agreements to pursue this type of crime are virtually non-existent. This situation, combined with the difficulty of tracing crimes to their perpetrators, makes cyber attacks a criminal offence with low risk for the offender and high costs for the institutions and individuals affected.

There has also been an increase in geopolitically motivated cyber attacks. The targets and techniques used vary from one another. For example, in the context of the conflict between Russia and Ukraine, supporters of both sides have launched numerous denial of service attacks[26] against public administrations and companies in countries supporting the other side, in order to create instability and hinder all types of activity in those countries, including financial activity. In other cases, State-backed groups seek financial gain from their attacks,[27] by making fraudulent transfers,[28] stealing cryptocurrencies[29] or demanding ransom in exchange for returning information encrypted by the attackers to their victims and not disseminating it

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[23] Also known as script kiddies.

[24] They are often called hacktivists.

[25] In this context, insiders are employees acting for malicious purposes against their companies.

[26] A denial of service attack consists of flooding a website with requests until it becomes inoperable.

[27] United Nations Security Council report (2019).

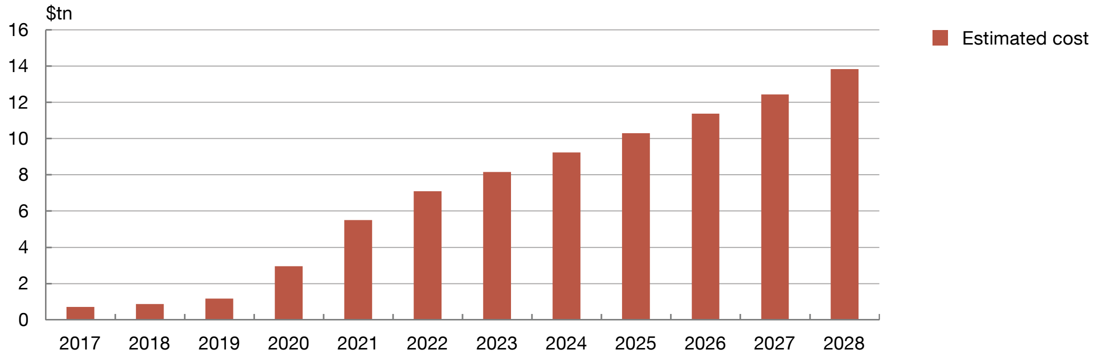
[28] For example, the attack on the central bank of Bangladesh in 2016 in which fraudulent transfers were made via the SWIFT network totalling over $80 million. See news article.

[29] For example, it is estimated that the Lazarus group, associated with the government of North Korea, was responsible for 20% of crypto-asset thefts in 2023 (over $300 million). See news article.

Chart SF.2

The estimated global cost of cyber crime has increased almost tenfold in the last five years and this growing trend is expected to continue

SF.2.a Estimated global cost of cyber crime



SOURCE: Statista, Statista Technology Market Insights.

(ransomware).[30] Data theft is another channel used by attackers to obtain financing and State-financed cyber attacks seeking to obtain sensitive information that may be economically or politically useful are becoming increasingly frequent.

The number and sophistication of cyber attacks against financial system providers, carried out by attackers with high technical skills, has grown. Some attacks are limited to exploiting existing vulnerabilities in these providers' hardware or software products.[31] Other more sophisticated attacks alter these products to introduce weaknesses that can then be exploited.[32] Despite the time and resources needed to prepare and carry out such an operation, this can allow the attackers to infiltrate thousands of organisations and firms through a single point of entry, thereby significantly multiplying the attack's effectiveness and efficiency.

SF.2.2 Cyber incidents and losses

Cyber incident volumes

The number of cyber incidents has risen steadily around the world in recent years, with a significant increase in malicious incidents following the COVID-19 pandemic. As expected, the increased use of digital technologies by firms, individuals and public

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[30] Ransomware is a type of malicious software that restricts access to certain parts or files of the infected operating system and then demands a ransom, often in cryptocurrency, to remove the restriction.

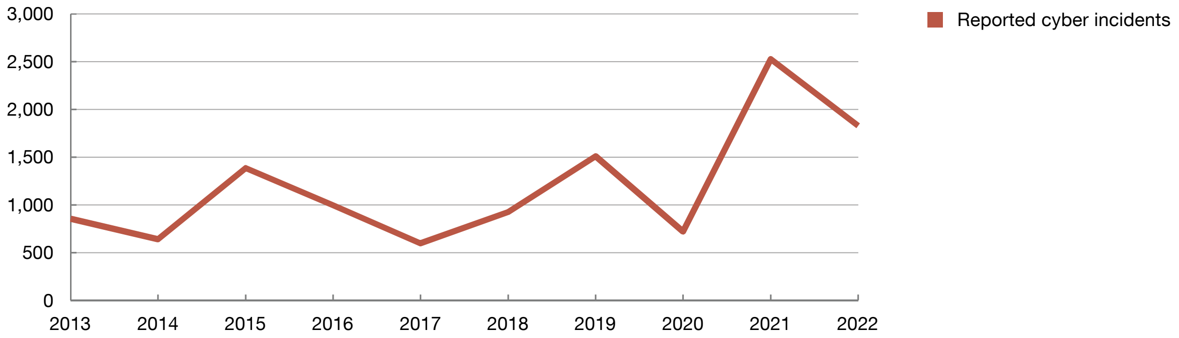
[31] One of the many examples that can be cited is the exploitation of a vulnerability in the commercial file transfer software MOVEit by the Cl0p ransomware group, which affected thousands of organisations worldwide in 2023. See news article.

[32] SolarWinds is the prime example of this. In December 2020 it was discovered that software distributed by this company had been modified by a group of cyber attackers so that it would grant them access to all of the software's users. Among the thousands of affected users were US federal agencies as well as NATO, the European Parliament, companies such as Microsoft, and others. See news article.

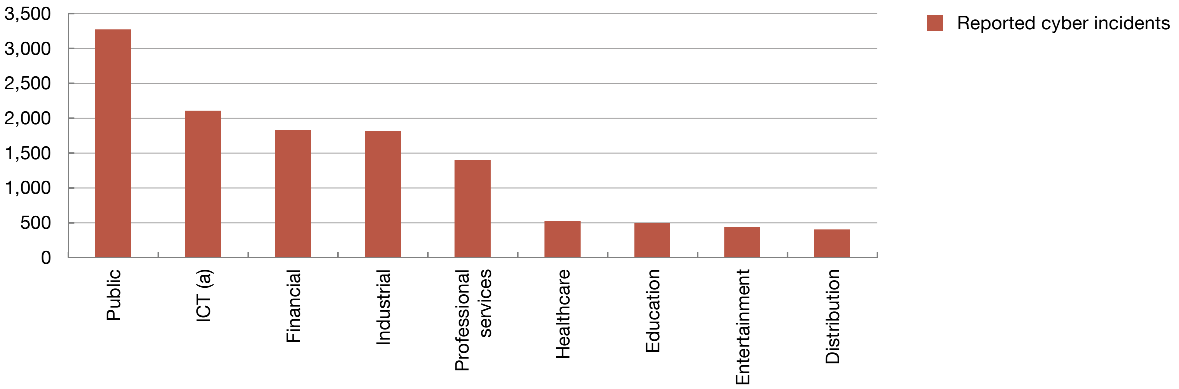
Chart SF.3

The financial sector continues to be one of the sectors with the highest number of cyber incidents worldwide. The annual number of cyber incidents reported in the financial sector has been growing steadily, doubling between 2018 and 2022

SF.3.a Global number of cyber incidents in the financial sector



SF.3.b Global number of cyber incidents in 2022, by sector



SOURCE: Verizon, *Data Breach Investigations Report 2023*

a Information and communication technologies.

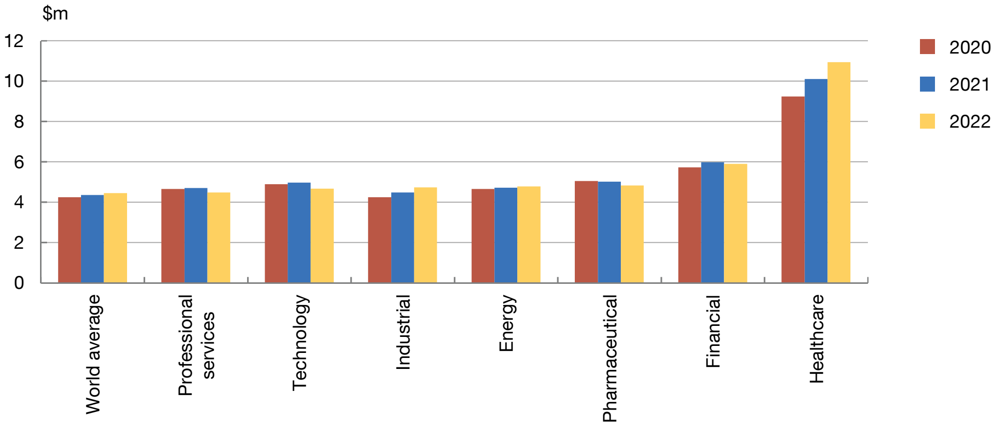
bodies has led to a steady rise in cyber incidents. For example, the sharp increase in the use of technology after the outbreak of the COVID-19 pandemic led to a significant overall increase in the number of cyber incidents reported in the financial system (see Chart SF.3.a). While the increase slowed after the worst of the pandemic, the upward trend is expected to continue.

The financial system is one of the most attacked sectors. This high relative prevalence of cyber incidents in the financial system (see Chart SF.3.b) persists, despite the fact that other sectors may occasionally be targeted. For example, the health sector was among the hardest hit during the COVID-19 pandemic and public administrations were the main target during the geopolitical tensions in 2022 (see Chart SF.3.b).

Chart SF.4

The global average cost of cyber incidents involving data breaches for the financial sector is second only to that for the healthcare sector

SF.4.a Average cost of a cyber incident involving data breaches, by sector



SOURCE: IBM, Ponemon Institute, *Cost of a Data Breach Report 2023.*

Losses

Losses from cyber incidents may vary considerably depending on different factors. As seen above, malicious cyber incidents typically result in higher losses for institutions due to their potential for greater impact. Data breaches, one of the most common cyber attacks, are also one of the costliest for institutions. The average cost of this type of incident is increasing globally each year, reaching $4.45 million in 2023.[33] In addition to being the one of the most targeted, the financial system is also one of the sectors with the highest average cost of data breach cyber incidents ($5.9 million in 2022) (see Chart SF.4).

Cyber insurance as a partial mitigant

The strategy of transferring risk has a limited scope in the case of cyber risk. Insurance against cyber risk, also known as cyber insurance, has a limited effect, as the financial coverage it provides may not be sufficient to mitigate the impact of a cyber incident. For example, monetary compensation cannot cover some of the most important impacts of a ransomware attack, such as the shutdown of an institution's infected systems, which must be resolved as quickly as possible.

Moreover, global cyber insurance terms and conditions have tightened. The insurance sector started to cover cyber risk without historical information or sufficient knowledge to correctly estimate premia. This was compounded by the significant increase in the frequency and impact of cyber incidents, leading to a rise in reported cyber insurance claims, which, for example, quadrupled in Spain between 2017 and 2020.[34] This increase, coupled with the low premia, had a negative impact on the profitability of this type of insurance policies. In recent years, insurance companies have responded by tightening renewal terms and conditions, increasing insurance premia and adding special clauses to exclude circumstances such as ransomware and wars.

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[33] See the IBM report *Cost of a Data Breach Report 2023*.

SF.3 Managing cyber risk in order to strengthen individual and systemic resilience

SF.3.1 Good practices, regulation and supervision

Discussions on cyber risk in the financial system are high on the agenda of many international organisations. As economic activity has become increasingly digitalised and exposure to cyber risk has grown, these organisations have issued best practices, reports and tools. Among the most important in recent years are the FSB's Cyber Lexicon, mentioned above, and its effective practices for responding to and recovering from cyber incidents.[35] The FSB is also working on a common format for its reporting.[36]

The Basel Committee on Banking Supervision issued a noteworthy publication in this area: the Principles for Operational Resilience.[37] These aim to strengthen banks' capacity to withstand the impact of operational events that may disrupt their critical services. The Committee declared that banks should operate under the assumption that such events will occur and define their level of tolerance for disruption. The principles encompass both preventive and pre-emptive measures as well as those aimed at response and recovery when disruption to critical services occurs. They address (i) governance, (ii) operational risk management and ongoing identification of threats, (iii) identification of interconnections and interdependencies, (iv) management of third parties, (v) business continuity, (vi) incident management and (vii) technology management, including cyber security. Since their publication, jurisdictions have worked to incorporate these principles into their regulatory framework and supervisory practice, and banks are making progress in aligning their policies, strategies and management frameworks with them.[38]

At the global regulatory level, discussions are under way as to whether financial capital is an appropriate measure to mitigate cyber risk.[39] For example, in the scenario of an institution affected by a ransomware attack that encrypts the entirety of its critical systems, the institution's survival would depend on whether or not it has technical measures in place that can allow it to recover. Financial capital would not be the main determinant of resilience in this case, although it could affect the ability to finance the roll-out of these technical measures. In less extreme events, with partial loss of systems, greater solvency may be of greater relative benefit, as institutions would have more options to take actions requiring funding. In any case, it is necessary to assess whether the additional resilience to cyber risk provided by a certain amount of financial capital can be more efficiently achieved by accumulating more technological resources. Moreover, many experts disagree on whether or not technology-related risks should be a sub-category of operational risk, given their cross-cutting nature, which has become more pronounced as the digital transformation has progressed.

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[34] According to AON's 4th annual study on cyber security and cyber risk management in Spain 2023 (only available in Spanish), between 2017 and 2020 the number of cyber insurance claims in Spain quadrupled.

[35] See the FSB report *Effective Practices for Cyber Incident Response and Recovery* of October 2020.

[36] See the FSB report *Format for Incident Reporting Exchange (FIRE)* of April 2023.

[37] See *Principles for Operational Resilience,* March 2021.

[38] See the *BCBS Supervisory newsletter on the adoption of POR and PSMOR* of November 2023.

[39] L. F. Signorini. (2021). "Implementing Basel III in the EU: remaining challenges and timing". *Eurofi Magazine.*

Regulation and supervision act as catalysts for financial institutions to properly manage cyber risk. Many jurisdictions such as the EU, the United Kingdom,[40] the United States[41] and Australia[42] have consequently developed regulatory and supervisory frameworks and tools in this area.

The EU has been host to intense regulatory activity to address cyber risk. The 2016 Network and Information Security Directive (NISD), on measures for a high common level of security of network and information systems, was a clear commitment by the EU to improve cyber security in all national critical sectors, including credit institutions and market infrastructures. The Directive has been overhauled and replaced by the NIS 2 Directive, which expands its scope and must be transposed into the national legislation of Member States by October 2024. Other recent regulations could also be mentioned here, such as the Directive on the resilience of critical entities,[43] the cyber security Regulation,[44] and the draft cyber resilience Regulation.[45]

The EU's financial system has more regulations on cyber risk than any other. Other sectoral rules include the EBA's 2017 Guidelines on ICT Risk Assessment under the Supervisory Review and Evaluation Process[46] (SREP) and its Guidelines on ICT and security risk management,[47] which have served as benchmarks ever since they were released. Relationships with third parties have also been in the EBA's spotlight, evidenced by the publication of its

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[40] *Operational resilience of the financial sector,* Bank of England.

[41] See the Federal Reserve's annual *Cybersecurity and Financial System Resilience Report,* the Cybersecurity and Infrastructure Security Agency's *Cyber Resilience Review* and the National Institute of Standards and Technology's *Cybersecurity Framework 2.0* report.

[42] See Cyber Security, Council of Financial Regulators.

[43] Directive (EU) 2022/2557 of the European Parliament and of the Council of 14 December 2022 on the resilience of critical entities and repealing Council Directive 2008/114/EC.

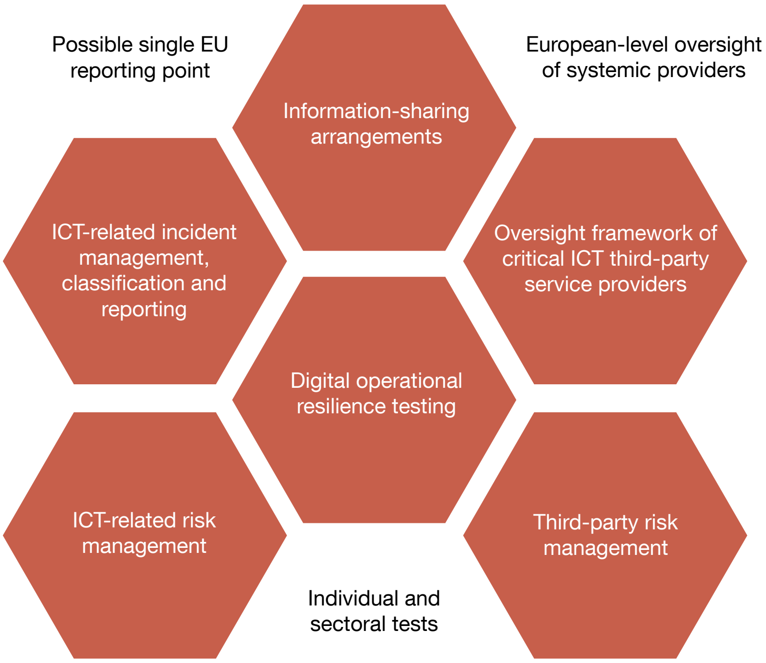
[44] Regulation (EU) 2019/881 of the European Parliament and of the Council of 17 April 2019 on ENISA (the EU Agency for Cybersecurity) and on information and communications technology cybersecurity certification and repealing Regulation (EU) No 526/2013 (Cybersecurity Act).

[45] Draft Cyber Resilience Act.

[46] EBA Guidelines on ICT Risk Assessment under the Supervisory Review and Evaluation Process (SREP) (EBA/GL/2017/05).

[47] EBA Guidelines on ICT and security risk management (EBA/GL/2019/04).

Figure SF.1
Main parts of DORA


Possible single EU reporting point
Information-sharing arrangements
European-level oversight of systemic providers
ICT-related incident management, classification and reporting
Oversight framework of critical ICT third-party service providers
Digital operational resilience testing
ICT-related risk management
Third-party risk management
Individual and sectoral tests

SOURCE: Banco de España

Guidelines on outsourcing arrangements in 2019.[48] In the area of market infrastructures, the European Central Bank (ECB) published its expectations for cyber resilience in 2018,[49] based on the guidelines published in 2016 by the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions.

DORA will be a turning point for the cyber resilience of the EU's financial system from its application in January 2025. This Regulation is part of the European Commission's digital finance strategy and its aim is to mitigate the risks associated with digitalisation and strengthen the resilience of the European financial system. It includes requirements for financial institutions on managing technology-related risks, managing technological incidents and notifying supervisors, testing of systems' resilience and managing relations with third parties (see Figure SF.1).

In addition to its microprudential scope, DORA also addresses certain aspects of the systemic dimension of cyber risk. To do so, it promotes information sharing between institutions and establishes mechanisms for cooperation between authorities within and beyond the financial system (both supervisory authorities and non-financial sector ones, such as security agencies); orders a feasibility study of a single incident reporting point for all European financial institutions; and establishes an oversight framework for those technology providers that are critical for the European financial system.

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[48] EBA Guidelines on outsourcing arrangements (EBA/GL/2019/02).

[49] See the ECB report Cyber resilience oversight expectations for financial market infrastructures of 2018.

In the area of microprudential supervision, financial authorities in the European banking sector have incorporated cyber risk into both ongoing monitoring and on-site inspections of institutions and horizontal activities. To this end, these authorities have been equipped with specialised resources and have laid down methodologies and working procedures adapted to the specific features of this risk. In addition, most of them have established reporting requirements for major cyber incidents so that potential adverse events that may require some form of intervention by the authorities can be detected as early as possible.

Beyond the strictly supervisory approach, many authorities have established cyber resilience testing frameworks based on threat intelligence. These tests seek to simulate a sophisticated and as-realistic-as-possible cyber attack on an institution's operational systems, drawing on intelligence on the most likely attackers and their techniques and procedures. The aim is to assess the institutions' technical, human and organisational capabilities to detect and react to the attack without the defence being forewarned of any such test. The authority monitors all stages of the test to check that the requirements of the framework are met. In the case of the EU, 16 jurisdictions, including Spain, have already adopted the ECB's TIBER-EU testing framework.[50]

SF.3.2 Managing cyber risk at financial institutions

In response to the increasing volume and sophistication of cyber threats, as well as regulatory and supervisory requirements, financial institutions are pushing to improve their cyber risk management. Many of them rely on market standards and best practices, and sometimes specialist consultancy firms, to improve their technical measures and cyber resilience. This involves working on prevention aspects and detection capabilities as well as on the procedures and solutions needed to respond to a cyber incident and, if necessary, recover from its impact. Given the complexity of institutions' systems and the rapid pace of technological developments, sustaining this effort over time poses a challenge for many of them, leading to varying levels of cyber resilience.

Financial institutions have shifted towards a more holistic approach, focusing not only on technology but also on the human factor and organisational aspects. Thus, in addition to the constant updating and improvement of technical measures, significant efforts have been made to train employees and raise their cyber security awareness in order to prevent their exploitation as an attack vector. Similarly, awareness and understanding of cyber risk among institutions' senior management has grown in recent years, and the second and third lines of defence (i.e. the risk management and compliance functions and the audit function, respectively) have been strengthened in this area.

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[50] See the information on the ECB website on the TIBER-EU framework.

In the same vein, financial institutions have worked to raise awareness among their customers of the importance of cyber security. The digitalisation of financial services has led to a shift of traditional fraud towards digital channels, using social engineering techniques to mislead customers. Institutions carry out frequent training and awareness-raising campaigns to help customers detect and prevent such attacks, as well as to safeguard and protect their credentials and devices, but these are not enough. Cooperation with other actors, such as telecommunications providers, is also required, e.g. to prevent attacks based on fraudulent duplication of SIM cards or phishing campaigns.

Cyber resilience is based on the assumption that cyber incidents will occur and that they can lead to disruptions to critical services, from which it will be necessary to recover. This is why institutions establish and test their business continuity plans, envisaging an array of adverse scenarios, including cyber attacks. Moreover, they conduct crisis management simulations to check that the procedures in place are adequate throughout the entire incident simulated. Some of these exercises take into account the concentration in the technology provider sectors, in particular cloud services, and the resulting difficulty in substituting services in the event of an incident.

SF.3.3 Assessment and management of systemic risk linked to cyber risk

From individual to systemic

In recent years financial authorities have also started to focus on the systemic implications of cyber risk. While the regulatory and supervisory spotlight was initially aimed at managing and assessing cyber risk at the individual level, the increase in the sector's technological dependence, as well as the number and impact of cyber incidents, have made it necessary to address cyber risk from a systemic perspective. Although the earliest publications on the systemic aspect of cyber risk predate 2020,[51] there is a significant increase in studies from that year onwards.

In 2017 the ESRB set up a dedicated task force to study cyber risk's potential impact on financial stability: the European Systemic Cyber Group. As a result of this group's work, the ESRB published a number of reports analysing the impact propagation model for cyber incidents that could jeopardise financial stability[52] and proposing tools for the assessment and mitigation of systemic cyber risk.[53, 54]

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[51] For example, *Cyber Security & Financial Stability: How cyber-attacks could materially impact the global financial system* (2017), *Cyber Risk, Market Failures, and Financial Stability* (2017), *The Future of Financial Stability and Cyber Risk* (2018), *Cyber Risk Scenarios, the Financial System, and Systemic Risk Assessment* (2019).

[52] See the ESRB report *Systemic cyber risk* of 19 February 2020.

[53] See the ESRB report *Mitigating systemic cyber risk* of 27 January 2022.

[54] See the ESRB report *Advancing macroprudential tools for cyber resilience* of 14 February 2023.

The various studies and analyses carried out on the systemic aspect of cyber risk share a number of important conclusions. First, assessing cyber risk and its impact at a systemic level is complex. Quantifying impacts is difficult even at the level of an individual institution, but attempting to do so at a systemic level is far more complex. Another important aspect is the need for authorities to have systemic cyber incident response plans and regularly review and test them. Finally, ensuring close coordination between authorities is seen as a crucial element for managing systemic cyber incidents.

Latest initiatives

In the EU, a significant portion of the most recent initiatives relating to the systemic component of cyber risk focus on measuring its impact. The ESRB has done some notable work in this area, such as developing the Systemic Impact Tolerance Objective (SITO).[55] Estimating and analysing the SITOs for different economic functions can help in the complex task of assessing cyber risk at the systemic level. Owing to their application at the macroprudential level, SITOs differ from previous approaches to resilience and technological risk, such as the Recovery Time Objective (a measure of the time during which an individual organisation can tolerate systems not operating and the associated drop in service levels without compromising business continuity).

SITOs define the point after which the financial system as a whole is unable to absorb the impact of a systemic cyber incident. Establishing these measures will help authorities understand the conditions under which a crisis may be triggered during an ongoing systemic cyber incident They also aid in setting thresholds below such points and conditions, which are related to a certain amount of deterioration, so that institutions can react and try to mitigate impacts before they trigger a broader crisis. A SITO could be defined for a specific economic function based on the number of affected transactions, their value in euro, the duration of the cyber incident and the number of affected institutions and jurisdictions. Thus, insofar as a cyber incident could spread to different institutions and jurisdictions (if, for example, they all used the same application that has been compromised by cyber criminals), it could last longer, affect more transactions and, consequently, have a costlier impact. This would increase the overall impact of the cyber incident, potentially reaching a point where financial stability would be compromised. The high degree of concentration among technology providers, which limits alternative choices in the event of failure, may, under certain circumstances, increase the probability of SITO thresholds being exceeded, as well as the speed at which that could happen, and thus the supervisory focus on them.

Operationalising SITOs poses some conceptual challenges. The ESRB has provided some principles to direct these efforts. In particular, SITOs should reflect impacts on all economic functions that may be affected by cyber risk and account for the interconnections

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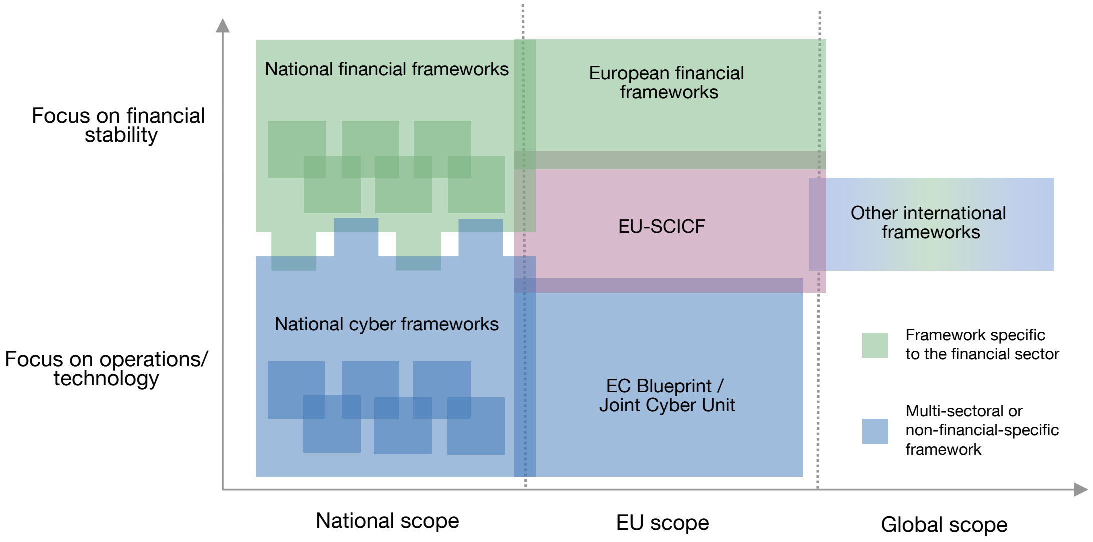
[55] See the ESRB report *Advancing macroprudential tools for cyber resilience* of 14 February 2023.

Figure SF.2

Frameworks for coordination between authorities dealing with cyber risk


Focus on financial stability
Focus on operations/ technology
National financial frameworks
European financial frameworks
EU-SCICF
Other international frameworks
National cyber frameworks
EC Blueprint / Joint Cyber Unit
Framework specific to the financial sector
Multi-sectoral or non-financial-specific framework
National scope
EU scope
Global scope

SOURCE: ESRB. (2022). *Mitigating systemic cyber risk.*

between these functions and across jurisdictions and sectors of economic activity. These metrics should capture the varying severity and duration of the events and should also be easy to communicate and reviewed on a regular basis.

Also noteworthy is the ESRB recommendation to establish a pan-European systemic cyber incident coordination framework. The aim is to fill the gap between cyber incident management frameworks at European level that focus on financial stability and those specifically focused on the technical and operational response (see Figure SF.2). The potential scale and contagion speed of systemic cyber incidents required a framework that would enable financial authorities to react swiftly and flexibly at European level, something that does not seem feasible with what is currently in place.

The ESRB also studied cyber resilience test scenarios[56] at a systemic level. The ESRB proposes this type of test in its report as a new tool to, among other things, enable an assessment of the financial system's ability to absorb shocks from systemic cyber incidents that could potentially affect financial stability. The cyber risk scenarios for these tests are focused on operational issues, in contrast to the macro-financial scenarios used in traditional stress tests, and can provide a framework for combining different tools and capabilities to manage cyber risk.

Furthermore, DORA encourages authorities to organise crisis and contingency management exercises that include cyber attack scenarios. The aim is to gradually enable an effective coordinated response at EU level. The ECB is conducting a cyber resilience stress test[57] on all its supervised institutions in 2024. The importance of these tests is also illustrated by the implementation of sector-specific exercises by the authorities[58] and industry.[59]

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[56] Cyber Resilience Scenario Testing (CyRST).

Macroprudential tools and other systemic actions taken by financial authorities to address cyber risk

The macroprudential tools included in current banking sector regulations were not specifically designed to address external non-financial threats, such as cyber risk. However, the potential disruptive consequences[60] of a cyber incident for the financial system as a whole may warrant the release of previously accumulated macroprudential capital buffers so that banks can continue supplying credit to the economy. Thus, the macroprudential toolkit could be adapted to deal with cyber risk. For example, the systemic risk buffer could be applied differently to banks based on their level of technological systemicity. This could help limit the occurrence of systemic events and subsequent contagion events. This is, however, an issue which is at a very preliminary stage and still requires significant research before more detailed policy recommendations can be adopted in the future.

The materialisation of cyber incidents with a significant financial impact may require financial instruments to be used for crisis management. A financial crisis, regardless of its origin, can be managed using existing instruments, including deposit insurance, moratoria or special liquidity injections, as long as their conditions of use are tailored to the technological and risk context. A cyber incident could cause a bank to limit operations, leading to liquidity problems. Central banks providing liquidity to solvent banks whose liquidity has dried up because of a cyber incident could allow such banks to continue their activity, helping to mitigate the risk that the incident may pose to financial stability and allowing them to continue providing services to the economy.

Similarly, bank resolution frameworks can also be useful in these scenarios. Resolution and recovery plans, while not specifically designed for such situations, may be modified to ensure the continuity of the critical functions of banks potentially affected by the incident.

It should be noted that the conditions of application of financial instruments must be modified in light of the technological context of the risks.[61] Simultaneous disruptions in operational and financial areas warrant combined approaches to action. The availability of adequate technological resources may be a necessary condition for applying the traditional financial resources (e.g. emergency liquidity and the aforementioned resolution framework) to address these cyber incidents. These technological resources comprise the software, hardware, know-how and specialised staff that enable institutions to effectively and efficiently manage their ICT systems and, in particular, guarantee their security and cyber-resilience. Increasing technological resources may be the most efficient way to limit systemic cyber risk by significantly reducing the financial impact of cyber incidents.[62] Investing in the modernisation and replacement of legacy ICT systems is acutely important here.

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[57] See the ECB press release *ECB to stress test banks' ability to recover from cyberattack*.

[58] For example, the Bank of England's exercises with industry partners (SIMEX), *SIMEX 22 – A two-day market wide simulation exercise exercise to test the UK financial sector's resilience to a major operational disruption*.

[59] The exercises organised in Spain by the Centro de Cooperación Interbancaria, for example, or the ISMS Forum, The ISMS Forum puts the cyber resilience capabilities of 35 Spanish firms to the test at the Cross-sector Cyber Exercises (only available in Spanish).

[60] Beyond the initial operational difficulties they may cause, cyber incidents also undermine the profitability of financial institutions and, potentially, their liquidity and solvency. As a result, credit supply could be impaired in the wake of a cyber incident.

[61] José Ramón Martínez Resano. (2022). *Digital Resilience And Financial Stability. The Quest For Policy Tools In The Financial Sector.*

Two possible examples that need to be explored are the introduction of circuit breakers and the use of cross-institution collective support mechanisms that allow the system as a whole to share technological resources. The first measure involves suspending processes in the event of simultaneous technological and financial crises. This freeze allows more data on the nature of the crisis to be gathered so that the financial and operational response can be better targeted. The second would make it possible to implement redundancy and security in the system, thus enabling cross-bank collaborative restructuring of processes should one fail or, similarly, providing data access (via a data vault) if one bank's data are compromised in an isolated cyber attack.

SF.4 Conclusions and outlook

The digitalisation of society, the economy and the financial system will proceed apace, forcing all actors in the financial system, including supervisory and regulatory authorities, to step up their work on cyber risk. This adaptation will require the necessary technical roles to be recruited and incorporated into organisations in sufficient numbers, meaning that attracting and retaining talent will remain a challenge for the sector, especially for smaller institutions.

The potential of artificial intelligence will equip both cyber attackers and defence teams with new tools. Content generation capacities, whether text, voice or image-based, will facilitate identity theft and make social engineering attacks much more credible. Artificial intelligence can also help to create malware and optimise attacks. At the same time, it allows defence teams to identify cyber threats at an early stage by recognising patterns from the analysis of large volumes of near-real-time information. It is also possible to partially automate responses, thus complementing the work of analysts and substantially shortening reaction times.

The possibilities offered by quantum computing[63] mean that many current encryption methods will be breached in the medium term. This affects the confidentiality of encrypted information, including backups, as current thefts of encrypted data could provide the attacker with decrypted information in the future. It also affects most authentication mechanisms and, therefore, data integrity, as false credentials could be created and authentic private keys fraudulently obtained. This could lead to the alteration of legal history via tampering with signed documents or the creation of validly signed falsified documents. Work is already under way[64] to create cryptographic algorithms resilient to quantum computing and to plan the migration of hardware, software and services using potentially vulnerable cryptography to such hardened algorithms.

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[62] For example, a cyber incident that completely paralyses the financial system has a high economic cost per unit of time. Investing in technological resources that reduce the likelihood of such an occurrence may be more efficient and feasible than accumulating capital equivalent to the losses in these types of incidents.

[63] Quantum computing uses quantum mechanics laws to solve complex problems that cannot be solved by classical systems.

From the perspective of the financial system's cyber resilience, initiatives are under way to ensure that critical data can be recovered in the event of a major incident. Data vaulting strategies include offline and offsite storage of the information that an institution needs to operate its critical services. The most advanced example is Sheltered Harbor,[65] which involves and is supported by the main US banking associations. Participating institutions send their encrypted data in an agreed format to shared data vaulting facilities so that their data can be recovered and processed on a recovery platform, should the need arise. Potential micro- and macroprudential data vaulting requirements could be a useful element of cyber risk regulation and supervision, but the issue is still at an early stage.

Sharing data on cyber threats and incidents is key to improving collective defence capabilities. Technical details of a cyber attack that has had an impact on one institution can help others protect themselves against a similar attack. There are already numerous forums in the financial system allowing data sharing, both industry-specific[66] and involving authorities.[67] The central role of authorities, which under DORA will receive reports of cyber incidents from the institutions under their remit, will allow them to feed back useful information to the industry.

Similarly, sectoral cyber resilience tests and crisis management exercises and even getting other sectors involved will be key in the coming years. It will be necessary to guarantee not only the response and recovery capacity of each financial institution, but that of the system as a whole. Doing so will involve carrying out sector-specific tests that include the participation of the appropriate providers. Ideally, where operational inter-dependencies exist with other sectors, they will need to be integrated into such tests in the future. This inclusion would be done gradually, as these sectors reach the proper level of maturity. The authorities will have to play a fundamental coordinating role in the event of a crisis. It is therefore essential that they encourage and are involved in the conduct of such exercises.

Further progress is needed on the quantification and understanding of cyber risk for financial stability and the potential role of macroprudential policies in mitigating them.

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[64] See the competition organised by the US National Institute of Standards and Technology for post-quantum cryptography standards.

[65] See the Sheltered Harbor website.

[66] The FS-ISAC, for example.

[67] The Cyber Information and Intelligence Sharing Initiative, for example.

Financial interconnections are a complex subject of analysis and the digitalisation process has expanded these networks with new agents, such as technology providers. This transformation requires assessing the potential role in cyber risk mitigation of traditional macroprudential measures (e.g. capital buffers) and also the extent to which requirements for technological resources (e.g. data vaulting, operational resilience tests) may substitute them more effectively and efficiently.

Annex 1

Consolidated balance sheet. Deposit institutions

Assets	Dec-23	Change Dec-23/Dec-22	% of total assets Dec-22	% of total assets Dec-23
	€m	%	%	%
Cash and balances at central banks	467,818	4.3	11.0	11.3
Loans and advances to credit institutions	286,481	23.3	5.7	6.9
General government	105,356	-3.1	2.7	2.5
Other private sectors	2,306,344	0.0	56.8	55.5
Debt securities	592,091	8.0	13.5	14.3
Other equity instruments	35,003	20.1	0.7	0.8
Investments	22,199	1.0	0.5	0.5
Derivatives	130,129	-17.2	3.9	3.1
Tangible assets	57,354	-1.6	1.4	1.4
Other	150,950	1.5	3.7	3.6
Total assets	**4,153,726**	**2.3**	**100.0**	**100.0**
MEMORANDUM ITEMS				
Financing to private sector	2,370,923	0.4	58.2	57.1
Financing to general government	586,258	4.7	13.8	14.1
Total NPLs	83,862	2.2	2.0	2.0
Total NPL ratio	2.3	1.7 (b)		

Liabilities and equity	Dec-23	Change Dec-23/Dec-22	% of total assets Dec-22	% of total assets Dec-23
	€m	%	%	%
Balances from central banks	101,865	-54.5	5.5	2.5
Deposits from credit institutions	321,120	30.0	6.1	7.7
General government	133,716	5.6	3.1	3.2
Other private sectors	2,509,472	3.1	60.0	60.4
Marketable debt securities and subordinated debt	499,525	12.9	10.9	12.0
Derivatives	120,064	-18.4	3.6	2.9
Provisions (including provisions for pensions)	21,755	-4.0	0.6	0.5
Other	175,190	8.3	4.0	4.2
Total liabilities	**3,882,706**	**2.0**	**93.8**	**93.5**
MEMORANDUM ITEM				
Eurosystem net lending (a)	27,860	-85.6	4.8	0.7
Own funds	312,187	4.5	7.4	7.5
Minority interests	12,477	2.2	0.3	0.3
Valuation adjustments	-53,645	-6.6	-1.4	-1.3
Total equity	**271,020**	**6.9**	**6.2**	**6.5**
Total liabilities and equity	**4,153,726**	**2.3**	**100.0**	**100.0**

SOURCE: Banco de España.

a Difference between funds received in liquidity-providing operations and funds delivered in liquidity-absorbing operations. December 2023 data.
b Difference calculated in basis points.

Annex 2

Consolidated income statement. Deposit institutions

	Dec-23		Dec-22	Dec-23
	€m	% change Dec-23/Dec-22	% ATA	% ATA
Interest income	204,239	59.8	3.19	4.98
Interest expense	108,490	119.1	1.24	2.64
Net interest income	95,750	22.4	1.95	2.33
Return on equity instruments	1,226	9.6	0.03	0.03
Net financial income	96,976	22.2	1.98	2.36
Share of profit or loss of entities accounted for using the equity method	3,947	17.1	0.08	0.10
Net fees and commissions	30,121	2.2	0.73	0.73
Gains and losses on financial assets and liabilities	5,280	14.2	0.12	0.13
Other operating income (net)	-3,898	74.3	-0.06	-0.09
Gross income	132,426	15.6	2.86	3.23
Operating expenses	57,556	7.8	1.33	1.40
Net operating income	74,869	22.4	1.53	1.82
Impairment losses on financial assets	21,046	22.9	0.43	0.51
Other provisioning expense (net)	3,750	24.6	0.08	0.09
Other gains or losses (net)	-5,370	4.7	-0.13	-0.13
Profit before tax (including discontinued operations)	44,702	24.4	0.90	1.09
Net profit	32,470	27.7	0.63	0.79
MEMORANDUM ITEM				
Profit attributable to the controlling entity	30,954	29.7	0.60	0.75

SOURCE: Banco de España.

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SYMBOLS AND ABBREVIATIONS

APP	Asset purchase programme
AT1	Additional Tier 1
ATAs	Average total assets
BCBS	Basel Committee on Banking Supervision
BCP	Basel Core Principales
BIS	Bank for International Settlements
BLS	Bank Lending Survey
bn	Billion
bp	Basis points
CBQ	Banco de España Central Balance Sheet Data Office Quarterly Survey
CCR	Banco de España Central Credit Register
CCyB	Countercyclical capital buffer
CET1	Common Equity Tier 1
CGP	Code of Good Practice
CMDI	Crisis Management and Deposit Insurance
CMU	Capital Markets Union
COE	Cost of equity
COVID-19	Coronavirus disease 2019
CPI	Consumer Price Index
CRD	Capital Requirements Directive
CRR	Capital Requirements Regulation
DeFi	Decentralised Finance
DFR	Deposit facility rate
DGS	Deposit Guarantee Scheme
DIs	Deposit institutions
DORA	Digital Operational Resilience Act
EBA	European Banking Authority
EBAE	Encuesta del Banco de España sobre la Actividad Empresarial (Banco de España Business Activity Survey)
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortisation
ECB	European Central Bank
EEA	European Economic Area
EFF	Encuesta Financiera de las Familias (Spanish Survey of Household Finances)
EPC	Energy performance certificate
ESG	Environmental, social and governance
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
€STR	Euro short-term rate
ETF	Exchange Traded Fund
EU	European Union
EURIBOR	Euro Interbank Offered Rate
FDIC	Federal Deposit Insurance Corporation
FLESB	Forward-looking exercise on Spanish banks
FOMC	Federal Open Market Committee
FSB	Financial Stability Board
FSR	Financial Stability Report
GAR	Green Asset Ratio
GDP	Gross domestic product
GHG	Greenhouse gas
G-SIBs	Global systemically important banks
G-SIIs	Global systemically important institutions
GVA	Gross value added
H	Half-year
HICP	Harmonised Index of Consumer Prices
HQLAs	High Quality Liquid Assets
ICO	Instituto Oficial de Crédito (Official Credit Institute)
ID	Data obtained from individual financial statements
IGAE	Intervención General de la Administración del Estado (National Audit Office)
IIP	International investment position
IMF	International Monetary Fund
INE	Instituto Nacional de Estadística (National Statistics Institute)
IRB	Internal Ratings-Based
LCCTE	Law 7/2021 on climate change and the energy transition
LCR	Liquidity Coverage Ratio
LGFV	Local government financing vehicle
IRS	Interest-rate swap
LSIs	Less significant institutions
LSTI	Loan service-to-income
LTI	Loan-to-income ratio
LTP	Loan-to-price ratio
LTV	Loan-to-value ratio
m	Million
MiCA	Markets in Crypto-assets Regulation
MREL	Minimum Requirement for own funds and Eligible Liabilities
NBER	National Bureau of Economic Research
NBFI	Non-bank financial intermediation
NDERs	Narrowly defined effective rates
NFCs	Non-financial corporations
NGEU	Next Generation EU
NPLs	Non-performing loans
NSFR	Net Stable Funding Ratio
OCC	Office of the Comptroller of the Currency
OECD	Organisation for Economic Co-operation and Development
OIS	Overnight Interest Swap
OPEC	Organization of the Petroleum Exporting Countries
OPEC+	Expanded Organization of the Petroleum Exporting Countries
O-SIIs	Other systemically important institutions
OTC	Over-the-counter
PD	Probability of default
PEPP	Pandemic emergency purchase programme
PMI	Purchasing Managers’ Index
pp	Percentage points
PRA	Prudential Regulation Authority
Q	Quarter
q-o-q	Quarter-on-quarter
Repo	Repurchase agreement
ROA	Return on assets
ROE	Return on equity
RWAs	Risk-weighted assets
SAFE	Survey on the access to finance of enterprises
SCR	Solvency Capital Requirement
SHSG	Securities Holdings Statistics Group
SIs	Significant institutions
SLIs	Specialised lending institutions
SMEs	Small and medium-sized enterprises
SNP	Senior non-preferred
SOCIMI	Spanish real estate investment trust
SRI	Systemic risk indicator
SRM	Single Resolution Mechanism
SSM	Single Supervisory Mechanism
sSyRB	Sectoral systemic risk buffer
SyRB	Systemic risk buffer
TLTROs	Targeted longer-term refinancing operations
VAR	Vector autoregression
WEO	World Economic Outlook
y-o-y	Year-on-year

ISO COUNTRY CODES

AT	Austria
AU	Australia
BE	Belgium
BG	Bulgaria
BR	Brazil
CA	Canada
CH	Switzerland
CL	Chile
CN	China
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GB	United Kingdom
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
JP	Japan
KR	South Korea
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
MX	Mexico
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
TR	Türkiye
US	United States