FINANCIAL STABILITY REPORT

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BANCO DE ESPAÑA
Eurosistema

1 RISKS LINKED TO THE MACRO-FINANCIAL ENVIRONMENT

2 RISKS TO THE FINANCIAL SECTOR AND ITS RESILIENCE

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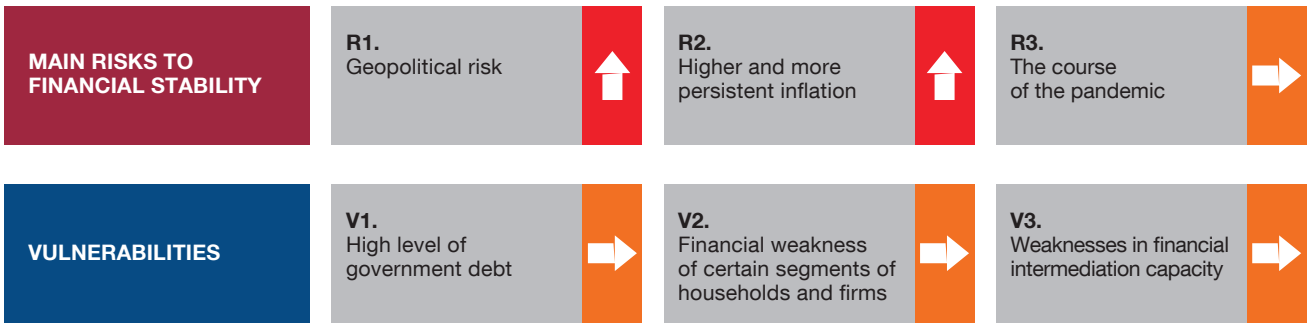
FINANCIAL STABILITY: MAIN VULNERABILITIES AND RISKS

More than two years after the onset of the economic crisis triggered by the outbreak of the COVID-19 pandemic, the world economy has been hit by the effects of the Russian army's invasion of Ukraine. The consequences of the invasion, albeit difficult to predict, will foreseeably be global and far-reaching, both geopolitically and from an economic and financial standpoint, and introduce new risks to financial stability (see Figure 1).

This new shock to the Spanish economy comes amid a gradual recovery, which remained incomplete, uneven across sectors and influenced by the course of the pandemic and continuous upside inflation surprises. However, the invasion of Ukraine and the western authorities' reaction, which have led to the imposition of unprecedented economic sanctions on Moscow, introduce a great level of uncertainty, with adverse consequences in terms of poorer economic performance and increased inflationary pressures, especially through energy and other commodity prices.

The Spanish financial sector faces this new shock having recovered its pre-pandemic profitability levels and with resilience generally remaining high. While Spanish banks have very limited direct financial exposure to Russia and Ukraine, the indirect effects of the new shock may be significant, particularly via the impact on those business sectors and population groups in which the post-pandemic recovery was slower or

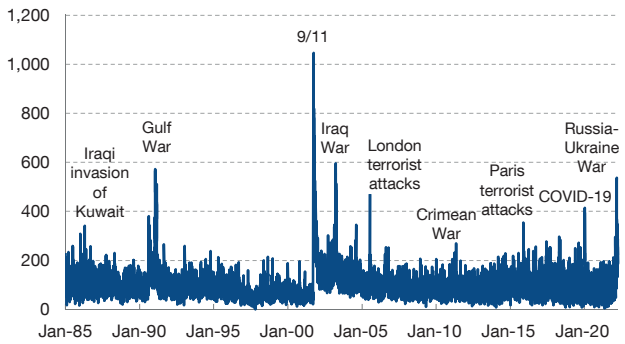
Figure 1
FINANCIAL STABILITY: MAIN VULNERABILITIES AND RISKS (a) (b)



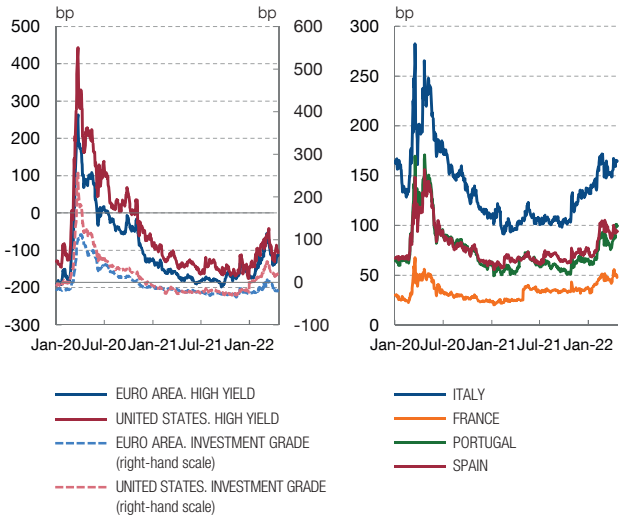
SOURCE: Banco de España.

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 in this figure 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.

1 GEOPOLITICAL RISK



2 DEVIATIONS FROM THE HISTORICAL AVERAGE OF THE SPREADS OF NFCs' BONDS AGAINST THE SWAP CURVE (L-H PANEL) (a) AND 10-YEAR SOVEREIGN YIELD SPREAD AGAINST GERMANY (R-H PANEL)



SOURCES: Refinitiv Datastream and Banco de España.

a High yield: ICE Bank of America Merrill Lynch Non-Financial High Yield Index. Investment grade: ICE Bank of America Merrill Lynch Non-Financial Index. The deviations are calculated vis-à-vis the historical average between 1998 and 2022.

came later and which are also especially exposed to the economic consequences stemming from the invasion of Ukraine.

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

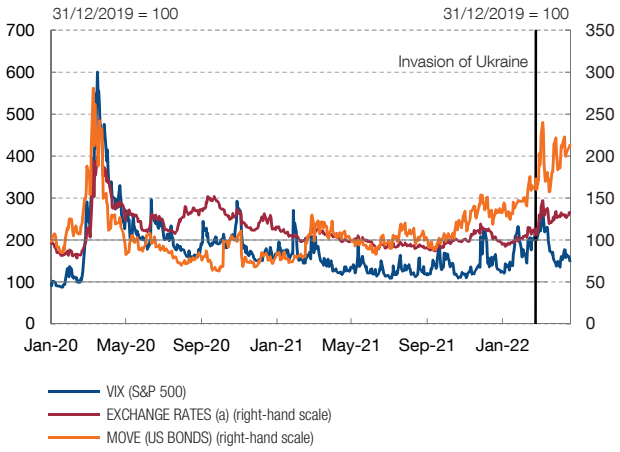
R1 Heightened geopolitical risks

The war between Russia and Ukraine has further strained global geopolitical tensions. The sanctions imposed on Russia by a large fraction of the international community in response to the invasion of Ukraine and Russia's response to those sanctions create a situation without precedent since the end of the Cold War, the severity and duration of which remain uncertain (see Chart 1).

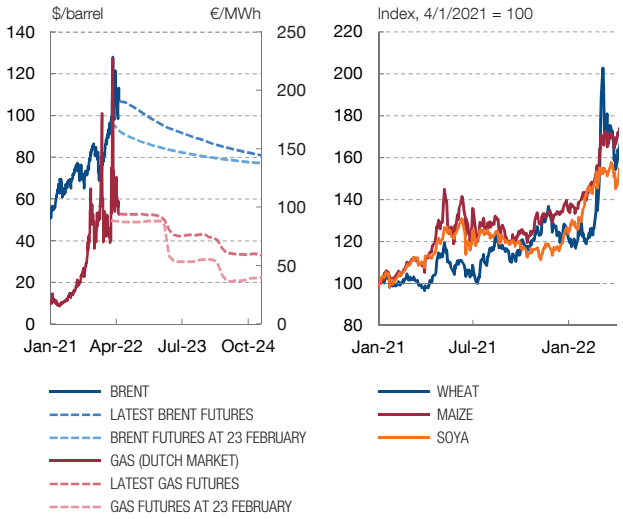
On the financial markets, the higher uncertainty induced by the invasion could make investors more risk averse. This would drive up the premia associated with risky assets, although these have so far remained subdued (see Chart 2), and also lead to greater volatility (see Chart 3). The likelihood of certain events has increased, including further adverse corrections to risky asset prices, when there were already signs of overvaluation

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.

3 VOLATILITY



4 PRICE OF OIL, NATURAL GAS (L-H PANEL) AND AGRICULTURAL COMMODITIES (R-H PANEL)



SOURCES: Refinitiv Datastream and and Banco de España.

a Average three-month volatility of USD/EUR, USD/GBP and JPY/USD.

in some assets and geographical areas before the conflict broke out, in addition to an increase in financial fragmentation and a deterioration in financing conditions.

The foreseeable decline in activity in Russia and Ukraine, together with greater uncertainty, also has an adverse impact on global trade and on households' and firms' confidence. As a result, they may postpone their consumption and investment decisions, which would contribute to weaker economic growth.

That said, the war's largest short and medium-term impact stems from Russia and Ukraine being major commodity producers: energy and metal commodities in the case of the former and agricultural commodities in the case of the latter. Europe is also particularly reliant on Russian oil and gas. Indeed, the war has already made energy prices skyrocket (see Chart 4). Against the pre-war background of high inflation, rising energy prices could compound inflationary pressures and dent activity. Possible disruptions to the transportation and supply of certain materials may also exacerbate the global value chain bottlenecks, compounding the downside risks to growth.

The Spanish economy and banks have very limited direct trade and financial exposures to Russia and Ukraine. This should mitigate the initial direct effects of the crisis. However, the indirect effects of the new shock, stemming from the impact on uncertainty, inflation and economic activity, may be significant.

Another consideration to bear in mind is that the current crisis will also significantly impact the financial and other sectors' operational risks, in light of the possible increase in cyber attacks.

R2 Higher and more persistent inflation

The Autumn 2021 FSR already signalled higher inflation rates worldwide, triggered by factors such as the spike in energy and food prices and the global supply chain disruptions, as being a risk factor. Since then, price rises have been higher and more persistent than expected, increasing the risk that they pose to economic activity and the maintenance of favourable financing conditions. Indeed, the main central banks have expressed their intention to adopt a less accommodative monetary policy to control this surge in inflation. In the short term, the combination of higher inflation, which erodes households' and firms' real income, and an increase in interest rates, could reduce these agents' ability to pay.

Due to its influence on global financing conditions, the comparatively swift and sharp expected tightening of monetary policy in the United States, where the steep upturn in inflation has partly fed through to monetary policy expectations, is especially significant. Inflationary pressures are also particularly high in some emerging market economies. This has led their central banks to tighten their monetary policy.

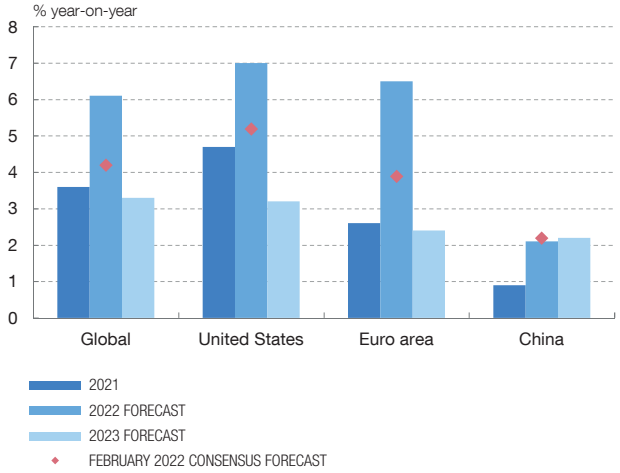
Inflation has risen dramatically in the euro area, but less so than in other economies, particularly the United States (see Chart 5), and the medium-term outlook remains anchored to the target of 2%. These developments, together with a slower recovery from the pandemic crisis in Europe and a greater expected impact of the invasion of Ukraine on activity in this geographical area, mean that the normalisation of ECB monetary policy, which is already under way, can be more gradual.

In the short term, however, the invasion of Ukraine is driving up inflation significantly and weakening growth, making monetary policy decision-making much more complex. In particular, while the moderation in economic activity stemming from the war could ease inflationary pressures in the medium term, the magnitude and persistence of the upturn in inflation already observed in the short term increase the risks of second-round effects on wages and on business margins materialising.

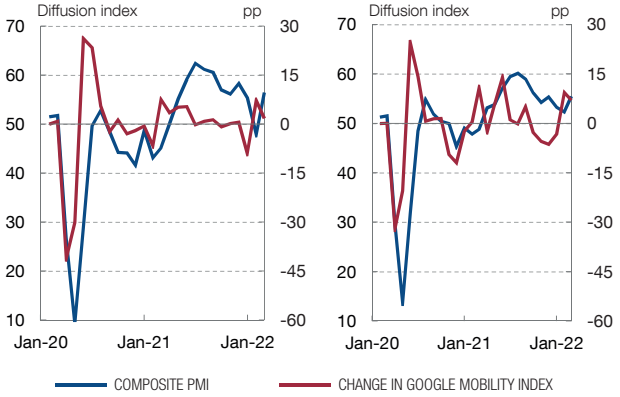
R3 The course of the pandemic

The progress made with vaccination programmes in 2021 boosted economic agents' confidence and facilitated the recovery in activity. However, the spread of the Delta variant (2021 Q2 and Q3) and the Omicron variant (2021 Q4) slowed the pace of this recovery around the world. In the case of Spain, the spike in infections in late 2021 and early 2022 adversely affected activity and employment, but its impact was smaller than in previous waves, due to less stringent restrictions on mobility and agents adapting to these adverse health conditions (see Chart 6).

5 INFLATION FORECASTS (2021-2023)
April 2022 Consensus Forecast



6 IMPACT OF THE PANDEMIC ON MOBILITY IN SPAIN (L-H PANEL)
AND EUROPE (R-H PANEL)



SOURCE: Banco de España.

In any event, the pandemic has contributed to supply and demand mismatches in many countries' economies, and the restrictive "zero-COVID" policies imposed in certain geographical areas, such as China, may further disrupt activity, prolonging the bottlenecks that continue to affect global value chains. Against this backdrop, the possibility of new, more dangerous variants emerging that are capable of generating further waves of the epidemic with an adverse impact on economic growth lingers. However, the experience gained in prior waves would suggest that the economy is more practised at withstanding adverse epidemic developments. Also, some of the Spanish economy's structural characteristics could increase the relative impact compared with other countries should the COVID-19 pandemic take a turn for the worse. In this regard, the services sector's and, in particular, tourism's greater share of activity compared with other European countries, in addition to the greater importance of SMEs in the productive system, would be relevant.

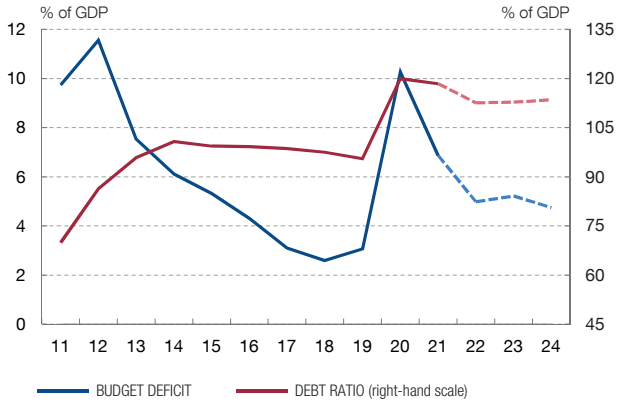
The main vulnerabilities[2] of the Spanish economy and financial system include:

V1 High level of government debt

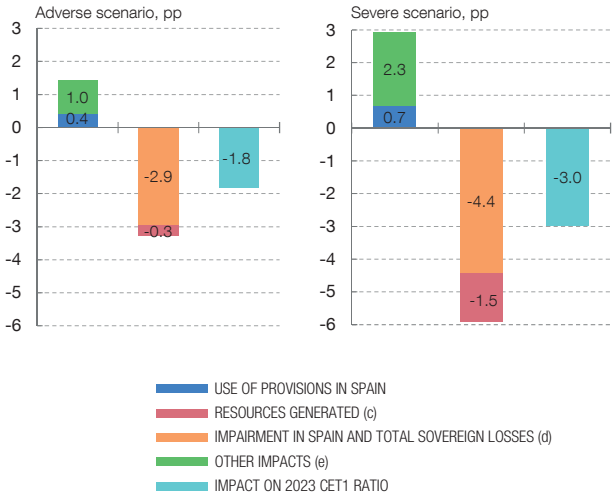
Despite falling by 1.6 percentage points (pp) in 2021, Spain's government debt-to-GDP ratio stands at very high levels and is roughly 20 pp higher than its pre-pandemic level. Meanwhile, the budget deficit fell by 3.4 pp in 2021, to reach 6.9% of GDP at the end of the year.

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

7 GENERAL GOVERNMENT FINANCIAL POSITION (a)



8 IMPACT ON THE BANK CET1 RATIO OF THE POTENTIAL MATERIALISATION OF RISKS IDENTIFIED FOLLOWING THE OUTBREAK OF THE WAR IN UKRAINE. CONSOLIDATED BUSINESS (b)



SOURCES: IGAE and Banco de España.

a For 2022-2024, the Banco de España's macroeconomic projections published on 5 April 2022 are used.
b Impacts are defined as changes in the expected CET1 ratio in 2023 and the different financial flows in 2023-2023 (i.e. generation of funds) that would result from the materialization of the negative variations of macro-financial conditions considered in the scenarios of Box 1.3.
c This variable includes net operating income in Spain and net profit attributable to business abroad. The aim is to compare the possible capital generation for the group of banks overall with impairment losses in Spain and the sovereign portfolio at consolidated level, which are the focus of these exercises.
d This variable represents the projected gross impairment losses in 2022-2023 of the private sector credit portfolio in Spain and other losses (associated with the debt securities portfolio, management of foreclosed assets and the sovereign portfolio).
e Other impacts include, among other effects, the change in RWAs between 2022 and 2023 and the effect of ICO guarantees.

In the short term, Russia's invasion of Ukraine may exert greater pressure on government spending to offset the temporary increase in energy and food prices and to reduce the reliance on foreign energy, thereby speeding up the green transition, which would also potentially be less orderly and costlier. In the medium and long term, greater government spending will be required to address the new European military defence needs.

The normalisation of monetary policy has already triggered an increase of over 150 basis points in the yields on the new 10-year Spanish government bonds issued since January 2021. Average costs, however, have continued to fall, as the bonds that are currently maturing were issued at higher yields. The relatively long maturities of Spain's sovereign debt are also a factor mitigating the immediate impact of this tightening of financing conditions on the interest burden.

Nevertheless, the high budget deficit and government debt levels render the Spanish economy vulnerable to the deterioration in financing conditions and limit the fiscal space to respond should fresh risks materialise (see Chart 7). Specifically, this vulnerability may become more evident amid the current high uncertainty, with potential bouts of risk aversion associated with a further deterioration in the geopolitical situation.

Against this background, a medium-term fiscal consolidation plan, which contains and reduces the vulnerabilities associated with high government debt levels, must be designed for implementation once the recovery has taken hold. This plan should detail the timeframes and measures necessary for achieving fiscal consolidation, with particular emphasis on the composition of the adjustment (revenue increases and expenditure cuts), which will be key to determining the plan's impact on economic growth. In addition, the fiscal stimulus measures should continue to be selective and target the most vulnerable agents bearing the brunt of the higher uncertainty and commodity prices. Structural reforms that improve the economy's potential growth should be a vital complement to this strategy.

V2 The financial weakness of certain segments of households and firms

2021 H2 saw a further recovery in corporate sector turnover and profitability figures, although these remain well below pre-pandemic levels in the sectors hardest hit by the COVID-19 crisis. Financing conditions held stable at favourable levels, thus easing liquidity risks and underpinning this sector's financial position.

However, it should first be noted that a large fraction of the State-backed loans extended in 2020 continue to benefit from grace periods. Most of these grace periods will come to an end before summer 2022, driving up the sector's debt burden and with it the possibility of latent impairment materialising in the stock of bank loans, particularly in the sectors most affected by the pandemic. Second, the adverse price developments in energy and other production inputs observed in recent months could impair the economic and financial situation of firms, particularly those that the health crisis has left in a more vulnerable position. The adoption of measures to alleviate the economic effects of the war in Ukraine, which include new government guarantee facilities and the extension of grace periods in the sectors hardest hit by the current crisis, could mitigate the deterioration in firms' financial position.

In the case of households, effective employment already exceeds pre-crisis levels and, on the information available up to 2021 Q3, aggregate net wealth has risen since the onset of the pandemic, easing concerns over their ability to meet their financial obligations.

However, the number of hours worked and average gross disposable income are still below pre-crisis levels. Likewise, lower-income households and those with close links to employment in the sectors hardest hit by the health crisis remain in a position of greater vulnerability. In addition, the effects of high inflation on economic activity and employment and the potential increase in financing costs could hamper the correction of the vulnerabilities observed in households' financial situation.

V3 Weaknesses in the financial intermediation capacity of the financial sector

The banking sector's earnings for 2021 confirmed the recovery of their pre-crisis profitability levels observed in the H1 figures. The absence of any negative extraordinary items such as those recorded in 2020, the growth in net fee and commission income and the reduction in provisions for financial impairments contributed to this recovery. The positive contribution of profits from business abroad was also confirmed (and was larger than estimated at the onset of the pandemic), despite the high incidence of COVID-19 in some key regions for Spanish banks.

However, there are still latent credit portfolio impairments that could materialise over the coming quarters. Further, the possible worsening of the global macro-financial environment due to the flare-up in geopolitical tensions and rising inflationary pressures could drive up costs in terms of provisioning for such impairments, heightening the risks to banking sector profitability. In addition, the persistence of the current high level of uncertainty could drive up the financing costs of the banking sector.

Against this backdrop, banks must exercise considerable prudence, with suitable and timely recognition of the associated risks, in order to preserve confidence in the sector and support the continued flow of credit to the economy.

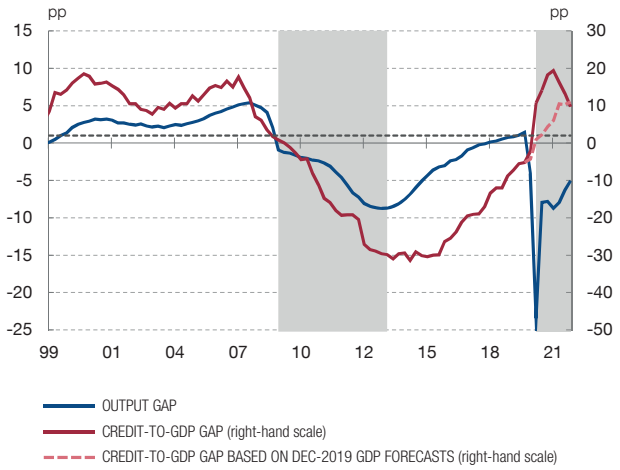
The stress tests conducted by the Banco de España, based on potential stress scenarios stemming from the current crisis, show that the sector's aggregate solvency would hold at adequate levels (see Chart 8), with an uneven impact across banks.

As noted in previous FSRs, recent developments confirm the need to address the structural challenges that already faced the banking sector and other segments of the financial system. In particular, these include growing competition from tech firms and the crypto-asset boom (see the special chapter in this report), the increase in cyber risks (now exacerbated by geopolitical tensions) and the potential adverse effects associated with climate-related risks.

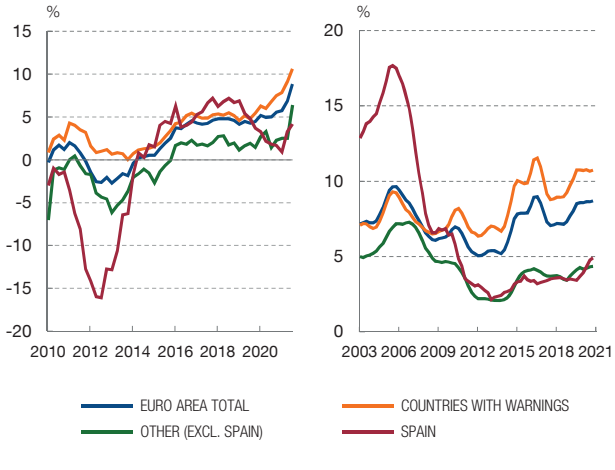
Macroprudential policy stance

From the macroprudential policy standpoint, the aforementioned heightened uncertainty and the absence of any indications of systemic financial imbalances building up in Spain make it advisable to maintain a loose stance at present. The output gap remains negative, key indicators of financial imbalances, such as the credit-to-GDP gap, are still conditioned by the sharp output decline in Spain in 2020 (see Chart 9), and growth in overall bank lending remains moderate, meaning the level of

9 CREDIT-TO-GDP GAP AND OUTPUT GAP (a) (b)



10 YEAR-ON-YEAR GROWTH RATE OF HOUSE PRICES (b) (L-H PANEL) AND THE RATIO OF NEW MORTGAGE LENDING TO GDP (R-H PANEL) (c)



SOURCES: INE and Banco de España.

a The shaded areas show the two periods of financial crisis identified in Spain since 2009. These correspond to a period of systemic banking crisis (2009 Q1-2013 Q4) and the crisis caused by COVID-19 (2020 Q1-2021 Q4). The output gap is the percentage difference between observed GDP and its potential quarterly value. Values calculated at constant 2010 prices. See P. Cuadrado and E. Moral-Benito (2016), "Potential growth of the Spanish economy", *Occasional Paper* No 1603, Banco de España. The credit-to-GDP gap is calculated as the difference in percentage points between the observed ratio and its long-term trend, calculated by applying a one-sided Hodrick-Prescott filter with a smoothing parameter equal to 25,000. This parameter is calibrated to fit the financial cycles observed in the past in Spain (see J. E. Galán (2019), "Measuring credit-to-GDP gaps. The Hodrick-Prescott filter revisited", *Occasional Paper* No 1906, Banco de España). Data available to December 2021. The dotted line represents a counterfactual credit-to-GDP gap, constructed using the Banco de España's 2019 GDP forecasts for the two subsequent years.
b The weight of the countries in the different groups is determined by their GDP.
c The ratio of new mortgage lending to GDP of each group is calculated as the ratio of new mortgage lending for all countries in each group (12-month cumulative) to GDP at current prices for that group (12-month cumulative).

the credit-to-GDP gap should not be interpreted as signalling a build-up of risk. Going forward, a gradual improvement in the output gap and a narrowing of the credit gap are expected, although the war poses downside risks to activity. In this setting of high uncertainty, a premature activation of macroprudential measures is to be avoided.

Nevertheless, if the credit-to-GDP gap holds at high levels against a backdrop of economic activity returning to a normal footing, or should clear signs of excessive credit growth in certain segments emerge, this would indicate the need for a more active macroprudential policy that provides the adequate incentives to build up additional loss-absorbing resources.

Macroprudential policy has been tightened in many European countries since the publication of the previous FSR, chiefly owing to warning signals in their real estate markets. House prices in the euro area as a whole are rising at their fastest pace since 2005. In some countries there are signs of these prices outstripping their long-run equilibrium value, while at the same time mortgage credit standards are deteriorating. In Spain, house prices rose sharply in 2021, with the correction that

followed the global financial crisis being reversed in recent years. However, these prices stand close to their long-run equilibrium value, meaning there are no clear indications of overvaluation as yet. Nonetheless, we must closely monitor developments in this market and the associated lending, with a view to identifying early any significant price imbalances or credit quality impairment that would require action being taken before risks materialise. In sum, we must remain watchful of developments in the Spanish real estate market.

A final reflection on the process of European integration

Lastly, like the pandemic crisis before it, the war has brought home the need to accelerate European integration. The financial arena is a cornerstone of that integration. Pan-European bond issuances to fund NGEU, and any other issuances as part of the response to the invasion of Ukraine, are an important step towards creating a European safe asset and a fiscal union, which would require establishing a permanent European fiscal stabiliser. In addition, deeper capital market integration in the euro area would pave the way for greater risk-sharing in the face of asymmetric shocks. The euro area's institutional architecture would also be enormously strengthened by the establishment of a European deposit insurance scheme and a common framework for resolving systemic crises.

1

RISKS LINKED TO THE MACRO-FINANCIAL ENVIRONMENT

The notable recovery of economic activity in Spain in 2021 H2 has contributed to bolstering the financial position of both public and private non-financial agents, although certain sectors and segments continue to show greater vulnerability than before the COVID-19 pandemic. The economic recovery is expected to continue in the short and medium term, albeit at a slower rate owing to the rise in inflation and the armed conflict in Ukraine. Nonetheless, the economic consequences of the war are highly uncertain. The materialisation of risks to economic activity, which are mainly global in nature, such as a greater than expected persistence of inflation or a worsening of the health situation, could result in a less dynamic recovery than anticipated and in an increase in credit risk. Agents' risk aversion could also increase and the possible persistence of inflation could lead to a faster withdrawal of central banks' monetary stimuli than anticipated by investors. Both factors could trigger sharper asset price corrections than observed to date and a tightening of financial conditions, with potentially adverse implications for financial stability.

1.1 Macroeconomic environment

1.1.1 Systemic and materially significant countries

Global economic activity moderated its pace of recovery in 2021 H2, affected by the worsening of the pandemic and by the persistence of bottlenecks. The strong increase in the incidence of COVID-19 owing to the spread of the Delta and Omicron variants and the persistence of bottlenecks affecting the global supply chains in 2021 curbed global growth in the closing months of the year.

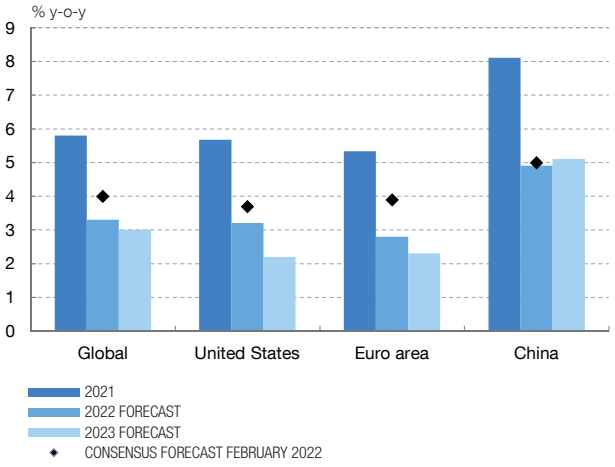
The Russian invasion of Ukraine has compounded the prospects of a slowdown in activity (see Chart 1.1.1). The growth forecasts available before the outbreak of the war already pointed to a gradual slowdown in global activity in the coming years, with downward revisions for some regions. Following the strong rebound in 2021, these prospects reflected the expectation of a reduction in economic support policies as the health crisis gave way to new challenges. This factor would outweigh others that appear to have bolstered growth expectations in the preceding months, such as signs of overcoming the wave of infections associated with the Omicron variant and the incipient signs of an easing of global bottlenecks and lower transport costs (see Chart 1.1.2). The war in Ukraine, to which Western countries have responded by imposing harsh economic sanctions on Russia and Belarus (see Box 1.1), severely

Chart 1.1

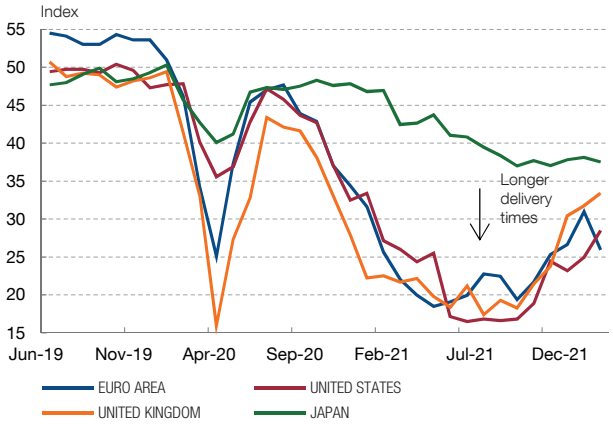
IN 2021 H2, THE RECOVERY OF THE WORLD ECONOMY SLOWED AND INFLATION SURGED, WITH THE EXPECTATION OF REMAINING HIGH IN 2022

The spread of the Omicron variant, the persistence of bottlenecks, labour market mismatches in some economies and the slowdown in China's economy explain the moderation of global economic growth in the final stretch of 2021. The inflation rate continues to rise owing to factors of varying importance across countries. The war between Russia and Ukraine brings uncertainty over growth and inflation expectations.

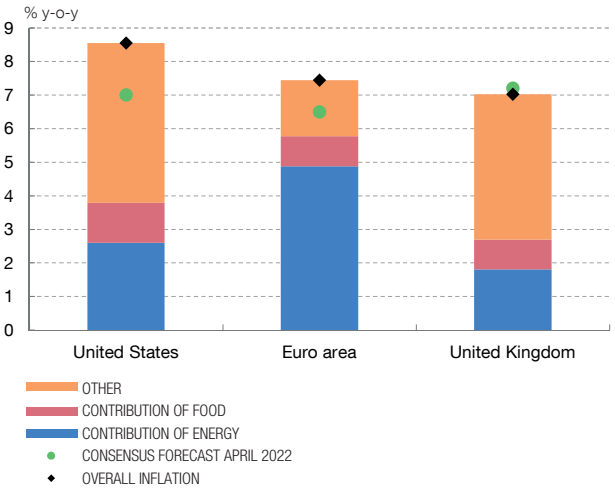
1 GDP GROWTH FORECASTS (2021-2023)
Consensus Forecast April 2022



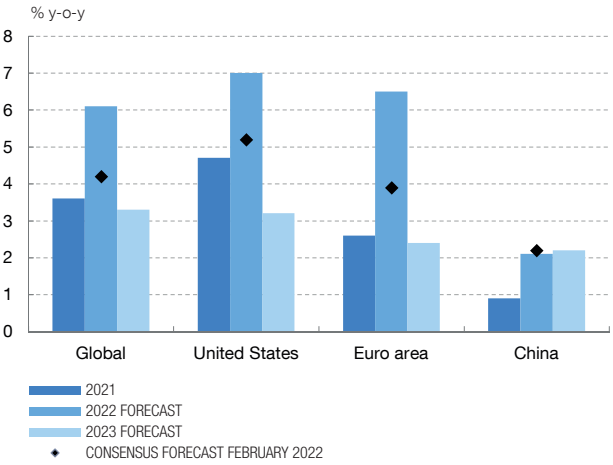
2 MANUFACTURING PMI: SUPPLIERS' DELIVERY TIMES



3 CONTRIBUTION OF ENERGY AND FOOD TO HEADLINE INFLATION: MARCH 2022



4 INFLATION FORECASTS (2021-2023)
Consensus Forecast April 2022



SOURCES: IHS Markit, national statistics, Consensus Forecast, Eikon, Eurostat.

affects these prospects through several channels: heightened uncertainty, which raises risk premia and tends to tighten financial conditions; the increase in commodity prices, particularly energy commodities; and the effects on global trade and demand.

Inflation continued to rise globally in recent quarters, driven by a variety of factors that have been exacerbated since the outbreak of the armed conflict. First, on account of fossil fuel prices, the contribution of the energy component to

inflation shot up in 2021, especially in Europe (see Chart 1.1.3). Food prices also increased considerably, owing to higher production and transport costs, the outbreak of the war in Ukraine and adverse weather conditions in certain regions. Also, the persistence of bottlenecks in 2021 contributed to exert further upward pressure on prices, against a backdrop of a strong increase in demand. Lastly, second-round effects, materialising in significant increases in wage costs, have been observed in certain economies, such as the United States and the United Kingdom, particularly in the sectors hardest hit by the pandemic.

The inflation outlook for 2022 has been revised substantially upwards in almost all regions, although the persistence of the upturn in inflation will ultimately depend on variables that are particularly difficult to forecast in the current setting. Price risks are also skewed significantly upwards, particularly in Europe, owing to its dependence on energy imports from Russia (see Chart 1.14). The war has led to a strong increase in the gas and oil futures curves, which factor in prices remaining very high in 2022, but gradually decreasing in 2023. The persistence of the high inflation episode also makes second round effects on wages and inflation expectations more probable. This last risk factor seems to be particularly relevant in the United States, compared with the euro area, given the reduced slack in the labour market and the more widespread increase in inflation by component.

In the euro area, the ECB has revised substantially upwards its inflation outlook for the coming quarters. Under its baseline scenario, the March Macroeconomic Projection Exercise (MPE) expects the annual average inflation rate to rise to 5.1% in 2022 (up from 2.6% in 2021) and to subsequently ease to 2.1% in 2023 and 1.9% in 2024. Underlying inflation is expected to remain relatively high in 2022 (at an average annual rate of 2.6%), declining to 1.8% in 2023 and 1.9% in 2024. The MPE also presents two alternative scenarios envisaging more adverse developments in the Ukraine war and its economic implications. In particular, the most adverse scenario assumes, among other developments, more serious disruptions in global value chains, a further worsening of financing conditions and cuts in oil and natural gas supply, which could give rise to additional increases in energy costs and consumer prices, and some de-anchoring of inflation expectations. Under this scenario, headline inflation would rise to 7.1% in 2022 and 2.7% in 2023, decreasing to 1.9% at the end of the projection horizon. More recently, inflation expectations for the euro area in 2022 according to the April 2022 Consensus Forecast stand at 6.5%, midway between the baseline scenario and the most adverse scenario in the MPE.

Beyond the war and its effects on growth and inflation, the uncertain course of the pandemic is another risk factor conditioning the global economic outlook, which is also influenced by the economic policies adopted. The low vaccination rates in developing countries and the possible appearance of new variants more harmful than Omicron entail additional risks to the economic recovery.

In particular, the restrictive zero-COVID-19 policies imposed in countries such as China may prolong the global supply chain bottlenecks. More generally, the persistence of a high incidence of the disease in other regions may also contribute to supply and demand mismatches in various countries' economies. Growth will largely depend on the adequate calibration of fiscal and particularly, monetary, policy responses. The latter should maintain its medium-term stance, in view of the nature of the shocks currently affecting the world economy. In a setting of high indebtedness, an increase in financing costs might exert further pressure on households and, especially, firms. Also, in the case of public finances, it could reduce the fiscal policy space, requiring governments to adopt premature fiscal consolidation strategies.

The effects of the tightening of financial conditions have already been felt in emerging economies. In recent months, emerging markets recorded falling stock market prices, exchange rate depreciations and increases in risk premia. Both global factors (expectations of a withdrawal of monetary stimuli in advanced economies and geostrategic risks) and idiosyncratic factors appear to have contributed to this downturn. Thus, the increase in inflation observed and expected in most emerging economies (see Chart 1.2.1) led central banks to accelerate, from mid-2021, the cycle of policy interest rate hikes (see Chart 1.2.2) and gave rise to a strong rebound in long-term interest rates in local currency –in some cases exacerbated by social and political tensions–. Lastly, the tightening of financial conditions, together with the full or partial withdrawal of credit support plans in most of these economies, prompted a slowdown in bank lending, with possible adverse effects on economic activity (see Chart 1.2.3).

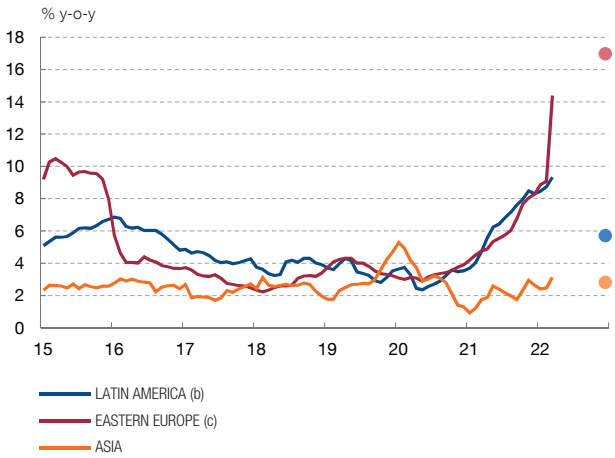
The impact on emerging economies of the armed conflict in Ukraine, combined with the tightening of financial conditions, could be highly adverse. First, a fall in global demand would particularly affect those economies that are more open and more integrated into global value chains (for instance, Mexico) and, more specifically, those with close ties to EU countries and to the countries involved in the conflict, such as Eastern European economies and Turkey. Second, an increase in risk aversion might tighten global financial conditions and lead to dollar appreciation, with adverse effects on capital inflows to emerging economies, which would be more pronounced in the most vulnerable economies (such as Turkey, owing to its external position, and Brazil, in the fiscal realm). Third, the commodity prices increase deriving from the war is expected to damage the economies that are more dependent on imports, such as Turkey, while it could have a favourable effect on Latin American exporting countries –Brazil, Colombia and Chile–, a situation already partially reflected in the financial markets. However, this rise in commodity prices might also aggravate inflationary pressures in these countries, leading to greater than expected increases in policy interest rates. Turkey is also subject to a greater geopolitical risk owing to its geographical position and its NATO membership. Aside from the effects deriving from the armed

Chart 1.2

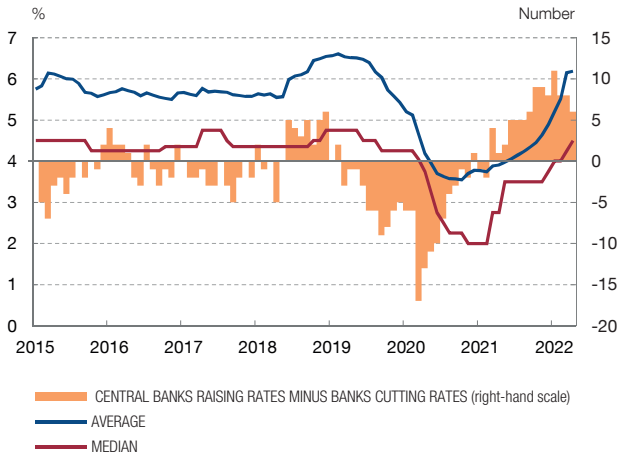
HIGHER THAN EXPECTED INFLATION EXERTS UPWARD PRESSURE ON POLICY INTEREST RATES IN THE EMERGING MARKET ECONOMIES AS A WHOLE, WHILE CREDIT CONTINUES TO LOSE MOMENTUM

Inflation unexpectedly surged in 2021 in the emerging market economies (except in Asia), triggering a further tightening of monetary policy. Credit growth moderated in the face of the full or partial withdrawal of public support plans in most of these economies. In Turkey, the lira depreciated significantly in October and November, and the central bank lowered its policy rates despite the high inflation.

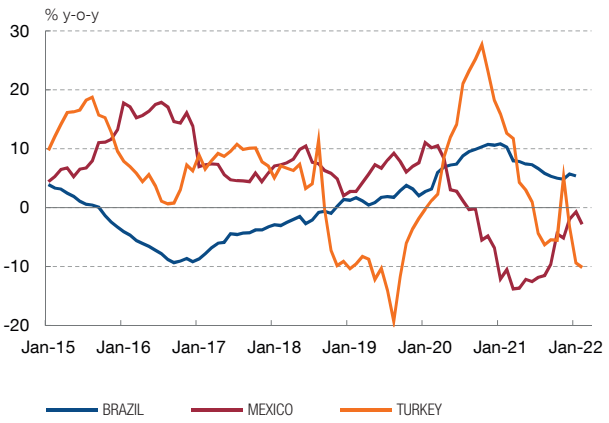
1 INFLATION (a)



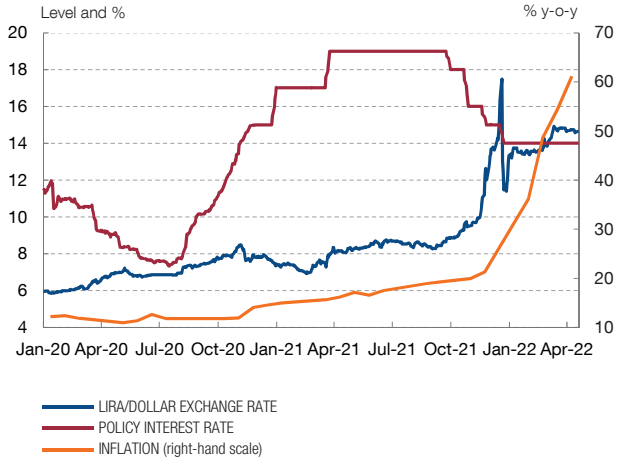
2 EMERGING MARKET ECONOMIES: POLICY INTEREST RATES



3 RATE OF CHANGE OF CREDIT TO THE PRIVATE SECTOR



4 TURKEY: INFLATION, INTE REST RATE AND EXCHANGE RATE



SOURCES: Refinitiv, Consensus Forecast and national statistics.

a The dots denote the inflation expectation at end-2022, according to Consensus Forecast analysts, as at March 2022.
b Excluding Argentina and Venezuela.
c Excluding Turkey.

conflict, emerging economies also face the risk that a faster and stronger than expected withdrawal of monetary stimuli in the advanced economies could severely affect their financial conditions, as it would lead to a further appreciation of the dollar (see Box 1.2). Lastly, other possible risks to emerging market economies are an adverse course of the pandemic or a sharper than expected slowdown of the Chinese economy.

The following can be noted in regard to the main emerging market countries to which Spanish banks are exposed:

In **Mexico,** the economic recovery that had been observed in the first-half of the year came to a halt in 2021 H2, with a quarter-on-quarter fall in GDP in Q3 and no change in Q4. Also, inflationary pressures –with underlying inflation standing above 7% at end-2022, its highest value in the last 20 years– have prompted the central bank to tighten its monetary policy. The falls in bank lending observed in recent quarters moderated, against a backdrop where banks have low NPL ratios and high capital and liquidity ratios.

After two quarters in recession, the **Brazilian** economy posted moderate growth at end-2021. That said, the prospects for 2022 have worsened substantially owing to high inflation, which exceeded 10% at end-2021. As a result, the central bank raised the policy interest rate by 975 basis points (bp) from 2021 Q1, bringing it to 11.75% in March 2022, its highest level since May 2017. The budget deficit has decreased owing to the conclusion of the support schemes implemented during the pandemic, without more structural measures having been adopted. Government debt stood below 90%, but debt servicing costs (closely linked to changes in the policy interest rate and inflation) have increased substantially. As regards changes in bank lending, the conclusion of most of the support schemes approved in 2020 led to practically zero growth in real terms.

In **Turkey,** in 2021 H2, the economy continued to show significant buoyancy, accompanied by a severe worsening of some of its main imbalances as a result of monetary policy easing. Between September and December Turkey's central bank cut its benchmark interest rate four times, for a cumulative total of 500 bp, to 14% (see Chart 1.2.4). The consequent depreciation of the Turkish lira against the dollar (37% in 2021 Q4), together with the other factors driving up inflation globally, led to a historic rise in inflation in Turkey of 61.1% in year-on-year terms in March. To deal with these depreciation pressures on the lira, the central bank carried out fresh foreign exchange interventions, further reducing its already meagre reserves (which became more negative in net terms). In December 2021 it announced a new "liraisation" strategy that aims to incentivise the use of the lira instead of foreign currencies in the Turkish financial system to reduce exchange rate vulnerability.[1] The central bank has also announced that it will monitor credit growth to limit household lending and incentivise business lending, particularly that used to finance investment supporting exports and job creation.

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1 Thus, a new type of deposit in lira, protected from exchange rate fluctuations, was created. This deposit, which has a term of up to 12 months, is geared towards households (not firms) and is not subject to tax withholdings. Under a commitment of holding the deposit for three months, it receives compensation for the spread between the exchange rate depreciation (from the deposit arrangement date to the withdrawal date) and the interest rate offered for the deposit. No details have been provided so far on how this scheme will be funded, although it is expected that the Treasury will assume the risk.

1.1.2 Spain

Following its acceleration in 2021 H2, the Spanish economy will moderate its growth in 2022, basically owing to the impact of the persistence of high inflation on private consumption, aggravated by the war in Ukraine. The economic effects of the upturn in infections due to the Omicron variant are expected to have been less intense than those caused by previous waves, thanks to the progress made in the vaccine rollout and the application of less severe restrictions. However, the persistence of high inflation is eroding household income and restraining the growth of consumption.

The armed conflict in Ukraine will, in all likelihood, weaken economic growth in the short term in Europe and in Spain through several interdependent channels. The first one, which is already occurring, is a strong increase in energy and other commodity prices and its pass-through to firms' costs and consumer prices, affecting investment and spending decisions, and constraining economic growth. The second channel operates through the international financial markets, and it is linked to possible falls in share prices, increases in credit risk premia and dollar appreciation. Other effects might include those associated with the loss of firms' and households' confidence arising from the prolonged economic implications of the war. The effects of the last channel are felt through trade and financial exposures between countries. Spain's direct exposure to Russia and Ukraine is very limited, although some euro area countries with which Spain has closer relationships are more exposed to these two countries and, accordingly, a fall in their demand could affect Spain's exports. In addition, certain specific sectors of the Spanish economy are more dependent on imports from these two countries (particularly some cereals and fertilisers) and will possibly face higher prices for these commodities.

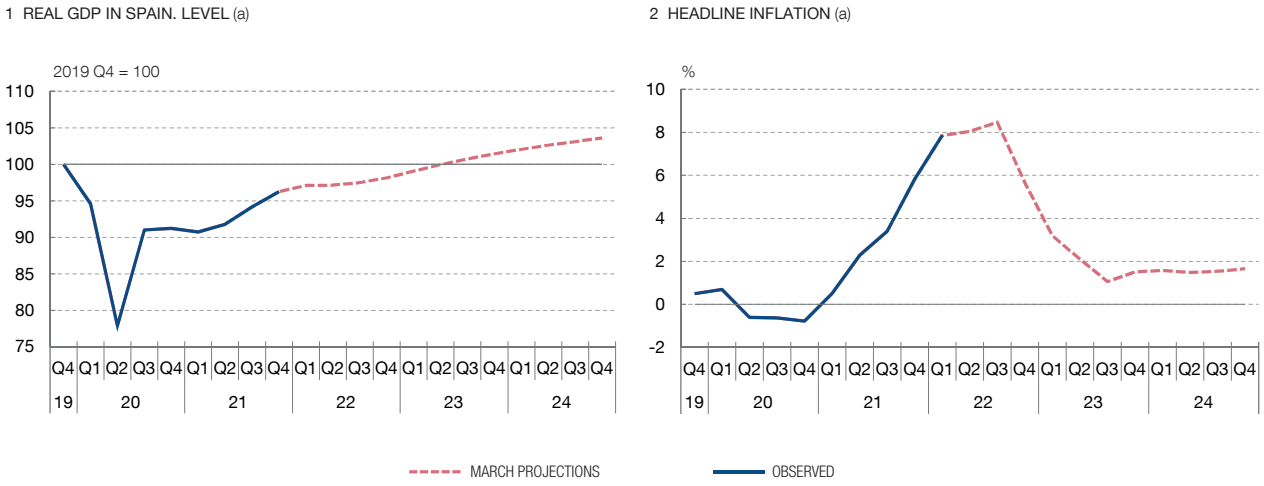
These factors deriving from the war in Ukraine entail a downward revision of the economic prospects for 2022, although other items will underpin economic growth. At end-2022 GDP is forecast to be almost 2 pp below the pre-pandemic level (see Chart 1.3.1).[2] This would, at least in part, be possible thanks to the use of savings built up by households during the pandemic. These savings are expected to help soften the impact of high inflation rates on households' purchasing power, as well as be conducive to them carrying out their expenditure and investment decisions. However, this factor would not affect all households equally, since those with lower income and a greater marginal propensity to consume would not have been able to save as much during the pandemic. Other important factors supporting the recovery include the execution of NGEU-related projects and, depending on how the pandemic is managed in some countries (such as China), the gradual tapering-off of the global

2 See Box 1, "Macroeconomic projections for the Spanish economy (2022-2024)", of the Quarterly Report on the Spanish Economy, *Economic Bulletin* 1/2022, Banco de España.

Chart 1.3

THE SPANISH ECONOMY WILL MODERATE ITS GROWTH IN 2022 H1, AFFECTED BY THE PERSISTENCE OF HIGH INFLATION AND THE ECONOMIC CONSEQUENCES OF THE WAR IN UKRAINE

The economic consequences of the war in Ukraine will steepen and prolong the increase in energy and other commodity prices that had already been observed before the invasion, affecting households' and firms' consumption and investment decisions, and constraining economic growth. Although Spain's direct trade and financial exposure to Russia and Ukraine is very limited, some of our main trading partners in the euro area are more exposed to these two countries and, accordingly, a fall in their demand may hamper our exports. By contrast, other factors, such as the partial release of the savings built up by households during the pandemic, the execution of NGEU-related projects and some normalisation of tourism receipts, will support economic growth.



SOURCES: Banco de España and INE.

a Banco de España macroeconomic projections at March 2022, the cutoff date for which was 31 March 2022.

supply chain disruptions which could nevertheless continue in certain sectors for which Russia and Ukraine are important suppliers of inputs. Also, the gradual recovery of tourist flows will further boost activity.

In the medium term, the growth of the Spanish economy is subject to downside risks, including most notably, once again, the economic effects of the Ukraine invasion. Although inflation is expected to significantly moderate starting at end-2022 (see Chart 1.3.2), it may remain higher than projected for several reasons. The possible lengthening of the armed conflict and potential retaliatory measures by Russia for the economic sanctions imposed might lead to a persistent increase in energy prices, particularly of gas and oil. This would negatively affect the activity of some of Spain's main trading partners and, therefore, Spanish exports. Also, rising labour and input shortages, more pronounced in certain sectors, may ultimately spill over to the rest of the economy, as is happening in several European countries. Should cost pressures fully pass through to final prices, higher wage demands might trigger notable second-round effects, which would lead to a stronger and more protracted upturn in inflation than anticipated to date. This would entail a greater decline in households' real income, which would weigh down consumption, and in

firms' demand for investment and employment. Box 1.3 considers macroeconomic scenarios for Spain, within a global economic framework, in which these risks materialise to a high degree. These adverse scenarios are therefore significantly distant from the baseline expectations, but provide a useful and necessary base to measure the resilience of financial intermediaries to unexpected losses, as discussed in Chapter 2 of this Financial Stability Report for the Spanish banking sector.

Also, significant downside risks associated with the pandemic and its economic repercussions continue to exist. In particular, new, more transmissible, harmful and vaccine-resistant variants of COVID-19 may arise, which could prompt new epidemic waves and the reintroduction of measures with negative implications for activity. Conversely, if the health situation improves faster than anticipated, economic growth could be boosted by agents' greater confidence in carrying out their expenditure and investment plans. Some of the Spanish economy's structural characteristics, such as the importance of SMEs and the services sector, would increase sensitivity to potential adverse developments in the COVID-19 pandemic.

1.2 Financial markets and the real estate sector

1.2.1 Financial markets

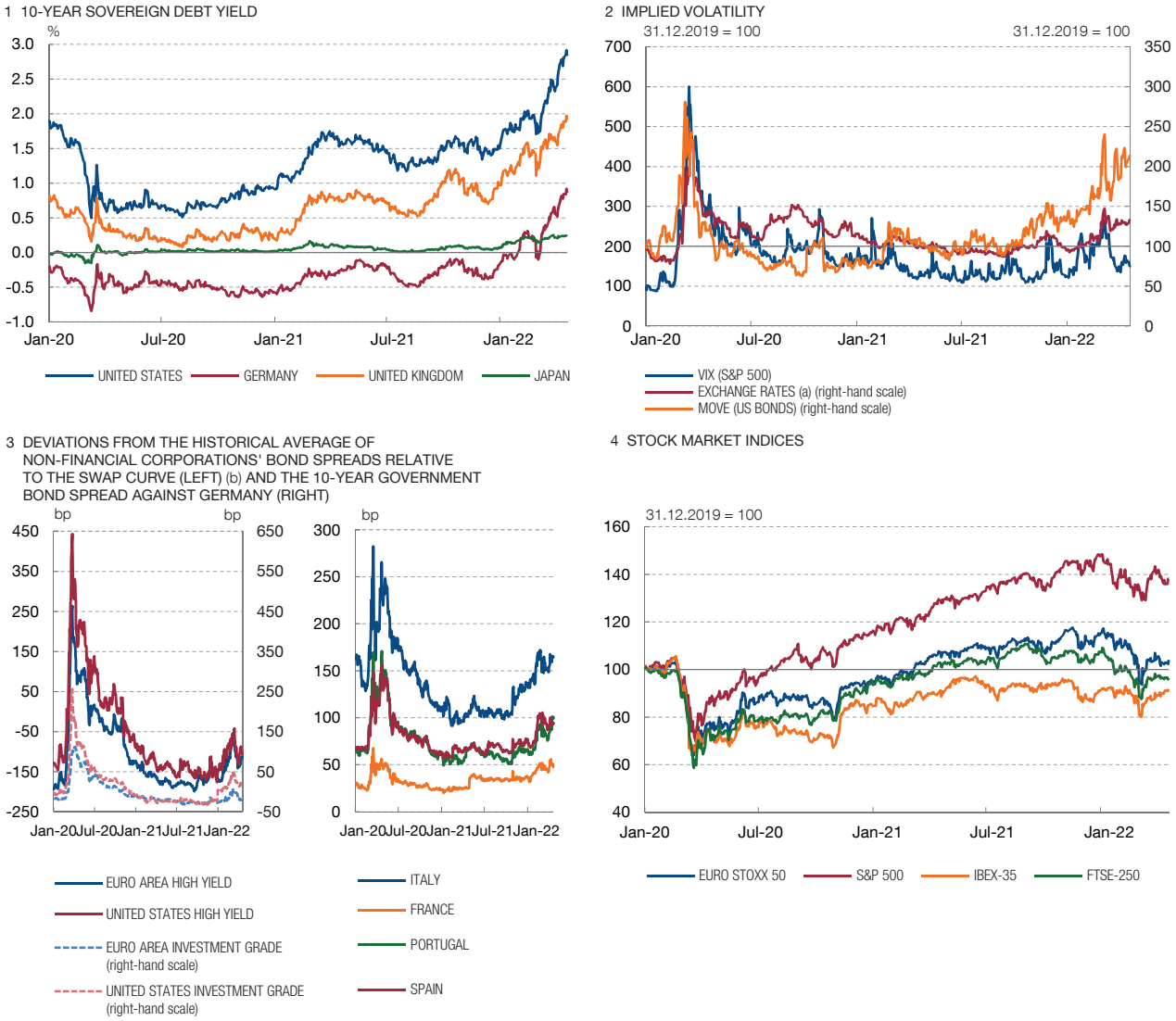
The long-term yields of higher-rated sovereign bonds rose significantly from end-2021, mainly owing to expectations of monetary policy tightening in the advanced economies at a faster pace than previously anticipated by financial markets. The less accommodative stance adopted in monetary authorities' communications in the wake of increasing inflationary pressures led investors to anticipate a faster withdrawal of monetary stimuli, particularly in the case of the United States. As a result, at the cut-off date for this report, long-term sovereign debt yields stood at their highest levels since December 2018 (see Chart 1.4.1). The evidence available suggests that part of the increase in the yield in the economies that are comparatively further behind in the cycle (such as the euro area) cannot be explained by internal factors. On the contrary, part of this increase appears to have been influenced by external determinants and, in particular, by changes in monetary policy expectations in the United States, which would be consistent with the significant role monetary policy plays in global financial conditions.[3] These developments have also been accompanied by an increase in the implied volatility of sovereign debt prices, which rose sharply after the outbreak of the war in Ukraine and have subsequently moderated, though they are still at historically high levels (see Chart 1.4.2).

3 See Box 4 of the "Quarterly report on the Spanish economy", *Economic Bulletin* 1/2022, Banco de España.

Chart 1.4

IN RECENT MONTHS, THE LONG-TERM YIELDS OF HIGHER-RATED SOVEREIGN BONDS HAVE RISEN AND THE PRICES OF RISK-BEARING ASSETS HAVE DECLINED

The long-term yields of higher-rated sovereign bonds rose significantly from end-2021, owing to the less accommodative monetary policy stance adopted. Sovereign and corporate risk premia have risen, likewise influenced by the changes in monetary policy expectations. The rebound in long-term interest rates and the war in Ukraine have adversely affected the stock market indices in the main developed economies. After rising to record highs in January 2022, they have since declined. Following the outbreak of the war in Ukraine, the stock market indices fell sharply and their volatility increased, although these movements reversed subsequently. Bond price and exchange rate volatility remains, however, high.



SOURCES: Refinitiv Datastream and Banco de España.

a Average three-month volatilities of USD/EUR, USD/GBP and JPY/USD.
b High-yield: ICE Bank of America Merrill Lynch Non-Financial High Yield Index. Investment grade: ICE Bank of America Merrill Lynch Non-Financial Index. Deviations are calculated relative to the historical average between 1998 and 2022.

The expectation of a faster than expected withdrawal of monetary stimuli in the advanced economies has translated into increases in sovereign bond yield spreads in the euro area and in corporate credit risk premia. Long-term sovereign bond yield spreads in the euro area against the German benchmark have risen to their highest levels since mid-2020 and above the pre-pandemic

levels (see Chart 1.4.3). The increase since the start of 2022 has been sharper in economies with higher yields, such as Greece (from 149 basis points (bp) to 202 bp) and Italy (from 136 bp to 166 bp), and more moderate in other economies, such as Spain (from 77 bp to 95 bp). Corporate credit risk premia have also increased in recent months, particularly in the high yield segment, also standing above the levels previous to the health crisis.

After rising to record highs in early January 2022, the stock market indices in the main developed economies have since declined. Share prices rose in the period October-January in reaction to the publication of better than expected business profits for 2021 Q3 and Q4. This trend was subsequently interrupted, mainly as a result of the increase in long-term interest rates, which adversely affected share prices insofar as it increases the rate at which future dividends are discounted (see Chart 1.4.4). The heightened geopolitical tensions in Eastern Europe and Russia's subsequent invasion of Ukraine initially contributed to intensifying the downward trend of stock market indices, particularly European ones, and to substantially increasing their volatility. However, share prices have since recovered and their volatility has moderated (see Chart 1.4.2). At the cut-off date for this report, the EURO STOXX 50 and the S&P 500 indices had accumulated losses of 9.3% and 6.4%, respectively, since early 2022, while the IBEX 35 index had increased moderately (0.6%). Stock prices in the banking sector, as well as in other more cyclical sectors, have shown high sensitivity to geopolitical tensions, posting sharp falls in the first two weeks following the outbreak of the war. Specifically, between 23 February and 8 March EURO STOXX Banks and the Madrid Stock Exchange banks sub-index recorded declines of 24.1% and 13.4%, respectively. More recently, banks' stock prices have recovered a significant part of the losses.

A protracted duration of the armed conflict in Ukraine and/or a fresh escalation of related tensions could generate additional bouts of instability in the international financial markets. The materialisation of these risks would raise investors' concerns over the macroeconomic outlook and over firms' economic and financial situation through the various channels discussed in the opening paragraphs of this chapter. All of this could trigger declines in the prices of risk-bearing assets.

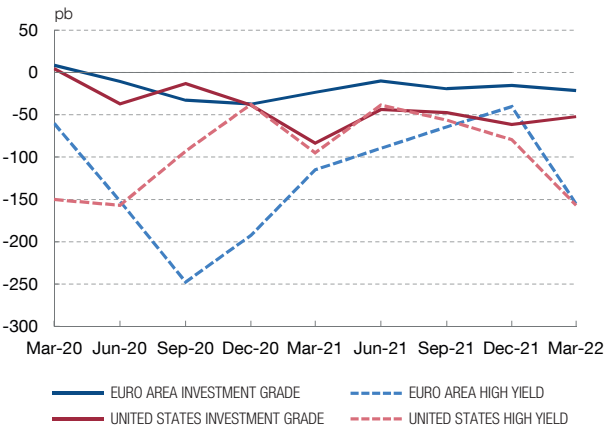
If central banks' monetary stimuli are withdrawn earlier than currently expected by investors, long-term risk-free interest rates might rise further, triggering new asset price corrections. This could occur if certain upside inflation risks discussed in the opening sections of this chapter were to materialise. The possible increase in yields could be transferred more intensely to corporate bonds, since their risk premia are abnormally low according to their historical relationship with their usual determinants (see Chart 1.5.1). Despite recent falls in share prices, they still remain in some geographical areas at very high levels compared with corporate profits, in cyclically-adjusted terms (see Chart 1.5.2).

Chart 1.5

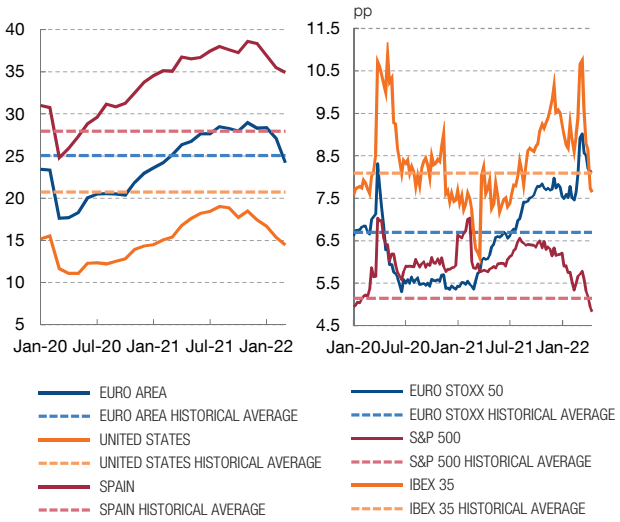
THE PRICES OF RISK-BEARING FINANCIAL ASSETS REMAIN HIGH COMPARED WITH SOME OF THEIR DETERMINANTS

Corporate credit risk premia are still below the level warranted by their historical relationship with determinants such as expected enterprise value and uncertainty over expected enterprise value, leveraging or risk aversion. For their part, stock prices in the United States and the euro area are historically high compared with the cyclically-adjusted earnings of listed firms. Stock market risk premia have declined, following the increase observed at the start of the Russian invasion of Ukraine and, in some cases, stand below their historical average.

1 CORPORATE CREDIT RISK PREMIA, DEVIATIONS FROM TRADITIONAL DETERMINANTS (a)



2 CYCLICALLY-ADJUSTED PER (LEFT) (b). STOCK MARKET RISK PREMIUM (RIGHT) (c)



SOURCES: Refinitiv Datastream and Banco de España.

a The difference between the corporate credit risk premium observed and that predicted by a corporate bond valuation model based on four factors: expected enterprise value (EV), uncertainty over expected EV, corporate sector leverage, and investor risk aversion. For more details, see J. Galvez and I. Roibás, "Asset price misalignments: an empirical analysis", Working Paper (forthcoming), Banco de España.

b The cyclically-adjusted PER is calculated as the ratio of the share price to the 10-year moving average of profits. The historical averages are calculated for the period 1997-2021.

c The stock market risk premium is calculated using a 2-stage dividend discount model. For more details, see R. J. Fuller and C.C. Hsia (1984), "A simplified common stock valuation model", *Financial Analysts Journal.* The historical averages are calculated for the period 2006-2021.

This is largely a reflection of the low interest rates, since in these cases risk premia stand close to their historical averages. In this connection, additional long-term interest rate hikes could lead to further declines in stock prices.

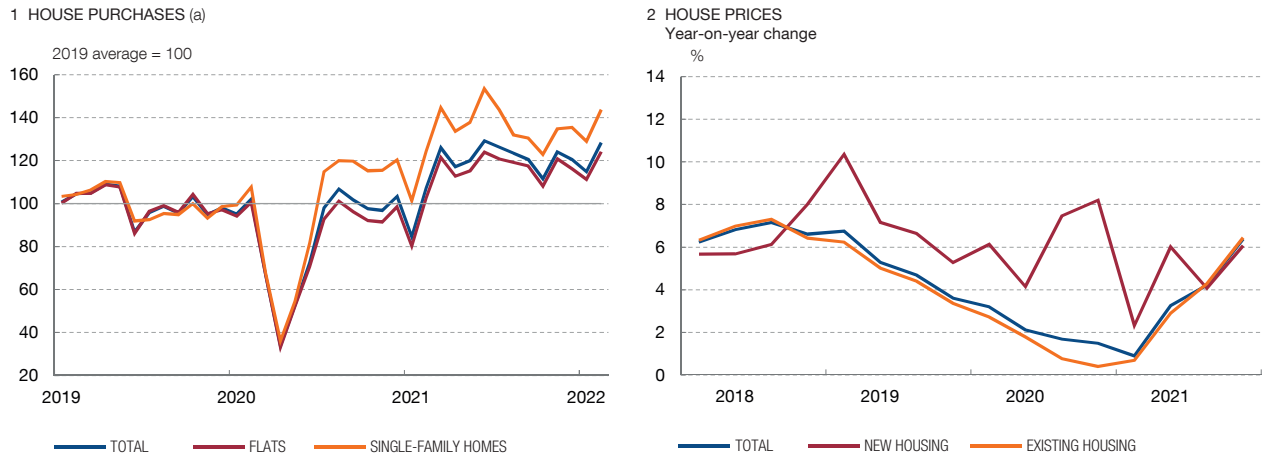
1.2.2 Spanish real estate market

House sales in 2021 H2 remained at figures similar to those of H1, the highest since early 2008, while house supply grew less. These developments continued in the early part of 2022. In 2021 as a whole, housing transactions were 18% above the 2019 levels (see Chart 1.6.1), while housing starts were only 1% higher. Also, between January and February 2022, house sales remained 18% above the volume posted in the same period in 2019, while housing starts at the beginning of 2022 were 4% below their level in early 2019. Several factors lie behind this robust momentum in demand for housing. These include a more encouraging economic

Chart 1.6

GROWTH IN HOUSE PURCHASES ROSE VIGOROUSLY IN 2021 TO SURPASS PRE-PANDEMIC LEVELS IN EARLY 2022, AMID LIMITED SUPPLY OF NEW HOUSING AND PRICE ACCELERATION

The improved economic and health situation, favourable financing conditions and the materialisation of purchase decisions postponed after the onset of the pandemic are among the factors behind the robust momentum of house purchases throughout 2021 and their relatively high levels in early 2022. The pace of housing starts remained relatively slow. Against this background, average house prices accelerated up to 2021 Q4.



SOURCES: Centro de Información Estadística del Notariado, INE and Ministerio de Transportes, Movilidad y Agenda Urbana.

a Seasonally and calendar-effect adjusted series. The latest figure for public-deeded purchases relates to February 2022.

and epidemiological environment, favourable financial conditions, the materialisation of purchase decisions that had been postponed following the onset of the pandemic and changes in households' housing preferences arising from it, such as a greater demand for single-family homes than for multi-family housing and the shift towards peripheral areas of large cities. That said, the current level of construction of new houses is low and unable to absorb the growth of demand. In any event, the Housing Renovation and Urban Regeneration Plan, to be implemented within the framework of the Recovery, Transformation and Resilience Plan (RTRP), which has funding of €6,820 million out of the NGEU funds, will drive activity in the residential sector, in both renovation and new housing.

The greater strength of housing demand vis-à-vis supply translated into a new acceleration of average house prices in 2021 Q4. Drawing on data from the National Statistics Institute (INE, by its Spanish acronym), the year-on-year growth rate for house prices rose to 6.4% in that period, 2.2 pp above the Q3 figure (see Chart 1.6.2). An acceleration was observed in both the second-hand and new dwellings segments (of 2.2 pp and 2 pp, and to 6.4% and 6.1%, respectively). The considerable rise in the costs of inputs and the growing labour supply shortages in the construction sector, which is slowing down and even halting some construction work in progress, which is causing the slowdown and even stoppage of some works in progress, could lead to additional increases in new house prices this year. In addition, the implementation of the RTRP could bring about a further tightening of

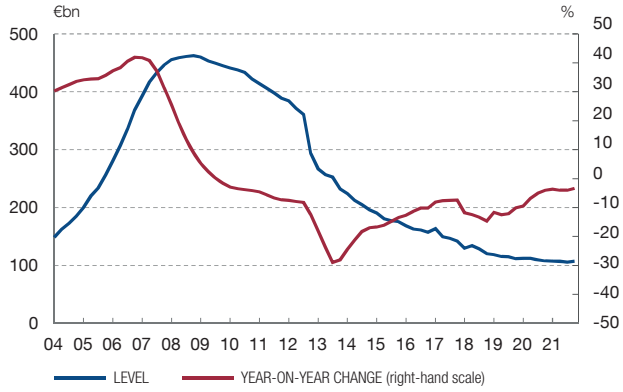
Chart 1.7

THE STOCK OF RESIDENTIAL MORTGAGE LOANS IS GROWING AT A VERY MODERATE PACE, WHILE THAT OF LOANS TO CONSTRUCTION AND REAL ESTATE DEVELOPMENT CONTINUES TO DECLINE

In 2021 H2, new residential mortgage loans held at around the same levels as in H1, which were the highest since 2010. This meant that the stock of these loans continued to grow, albeit at a very moderate rate. The stock of loans to construction and real estate development continued on a downward path, but it is falling at an increasingly slower pace.

1 NEW LOANS FOR HOUSE PURCHASE AND STOCK OF MORTGAGE LOANS (a)

2 LOANS TO CONSTRUCTION AND REAL ESTATE DEVELOPMENT (b)



SOURCE: Banco de España.

a The new loans for house purchase time series (left-hand scale) captures in billions of euro the value of the new lending accumulated at the end of each quarter. The stock of mortgage loans time series (right-hand scale) captures in billions of euro the value of the stock of mortgage loans accumulated at the end of each quarter.
b Quarterly data. The year-on-year change is calculated as the average for the four quarters.

costs in the sector and its pass-through to prices. This would advise a more protracted implementation of the plan than is currently envisaged.

In line with house purchase developments, in 2021 H2 the volume of new residential mortgage lending remained around H1 levels, which were the highest since 2010 (see Chart 1.7.1). Against this backdrop, the stock of such loans continued to grow, rising by 1.2% year-on-year in 2021 Q4, the highest rate of change since early 2011. Conversely, the stock of loans to construction and real estate development (see Chart 1.7.2) held on its downward trend, albeit at a progressively slower pace.

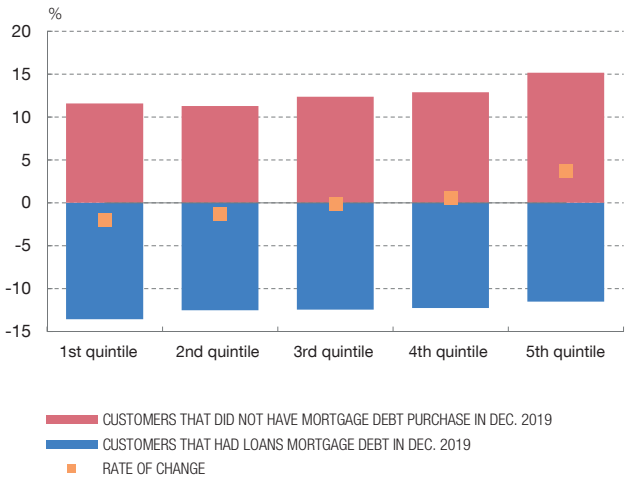
Growth in the overall stock of loans secured by mortgage collateral since the onset of the pandemic has been driven exclusively by households in higher income areas, particularly by those in the top quintile (see Chart 1.8.1). Households that had mortgage debt before the pandemic have since broadly de-leveraged, particularly in the case of households in lower-income areas. Among those that did not have pre-existing mortgage debt, the increase in credit secured by mortgage collateral has been sharpest in households in the top income quintile areas. Consequently, in net terms, only the households in the fourth and fifth income quintile areas made a positive contribution to the growth in the stock of mortgage-backed loans between December 2019 and end-2021. Meanwhile, at end-2021 an

Chart 1.8

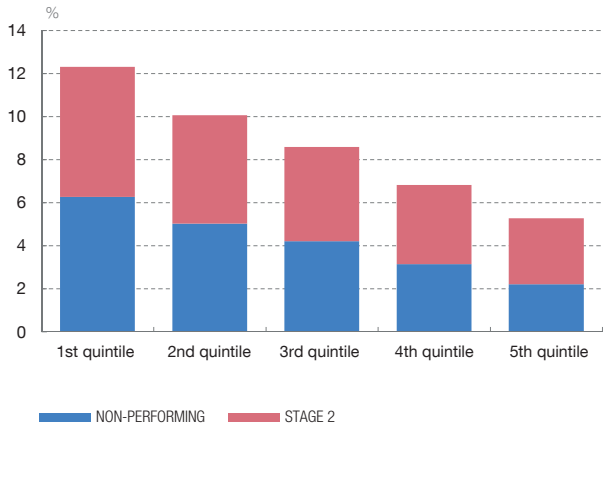
SINCE THE ONSET OF THE PANDEMIC, GROWTH IN LOANS TO HOUSEHOLDS SECURED BY MORTGAGE COLLATERAL HAS BEEN CONCENTRATED IN HIGHER-INCOME AREAS

Only households in the fourth and fifth income quintile areas have seen positive growth, overall, in the stock of loans secured by mortgage collateral since the onset of the pandemic. Households in higher-income areas have, on average, a lower ratio of troubled loans of this kind.

1 CONTRIBUTION TO THE RATE OF CHANGE (BETWEEN DEC. 19 AND DEC. 21) OF LOANS SECURED BY MORTGAGE COLLATERAL BY INCOME QUINTILE AREA (a) (b) (c)



2 RATIO OF STAGE 2 AND NON-PERFORMING LOANS SECURED BY MORTGAGE COLLATERAL BY INCOME QUINTILE AREA (DEC.-21) (a) (b)



SOURCES: Banco de España calculations drawing on information from the Central Credit Register and INE experimental statistics.

a Classification by income quintile at postcode level. Each individual borrower is assigned the credit resulting from the sum of the proportional part of each of the mortgage loans secured by mortgage in their name. Loans to households secured by mortgage guarantee may be for house purchase and renovation or for other purposes. The study also includes non-resident borrowers.

b Postcodes in very small municipalities, for which no postcode-level income data are available, have been excluded. In order for all quintiles to have equal importance, a dual allocation criterion has been used in each one. The postcodes (municipalities) have been ranked by income and also by the stock of credit at the start of the crisis (December 2019). Thus, the first quintile includes the postcodes (municipalities) that account for 20% of loans at the start of the crisis and have the lowest income, and so on for the other quintiles.

c The contribution to the change in lending to households that had no mortgage debt in December 2019 is defined as the ratio of their debt secured by mortgage in December 2021 (accumulated as a result of new lending since December 2019) to the total stock of households' loans secured by mortgage collateralat December 2019.

inverse relationship was observed between the ratio of Stage 2 and non-performing loans secured by mortgage collateral and the average income of the area where the borrowers reside (see Chart 1.8.2). Given the increase in the share of borrowers with fewer distressed loans, these developments would suggest that the average quality of banks' mortgage portfolios has improved since the onset of the pandemic.

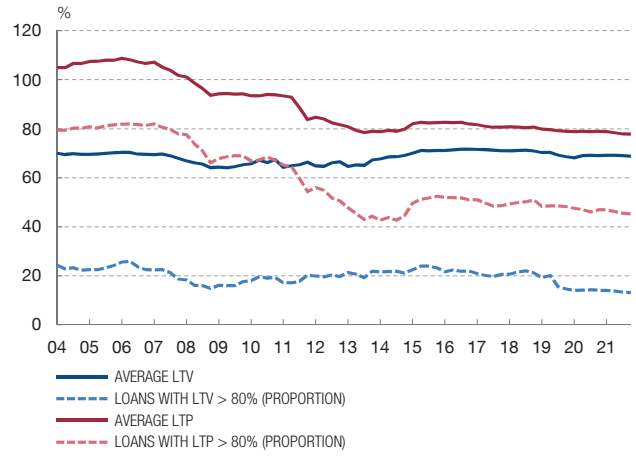
There was no substantial change in credit standards for new residential mortgages in 2021. The average loan-to-value (LTV) and loan-to-price (LTP) ratios, which measure borrowers' indebtedness in new mortgage loans, remained stable in 2021. At the same time, there were no significant variations in the proportion of loans with a higher level of leverage (those with an LTV or LTP ratio of more than 80%) (see Chart 1.9.1). As regards the loan-to-income (LTI) ratio, which reflects the relationship between the mortgage principal and the borrowers' income when the

Chart 1.9

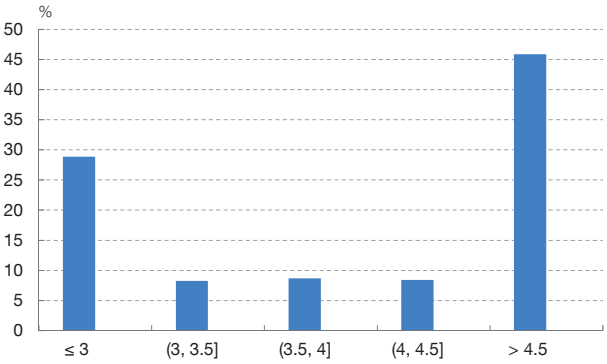
STABILITY HAS BEEN OBSERVED IN THE DISTRIBUTION OF CREDIT STANDARDS FOR NEW RESIDENTIAL MORTGAGES. THE INTEREST RATE SPREADS FOR FIXED-RATE MORTGAGES NARROWED ACROSS THE BOARD UNTIL EARLY 2022

No significant changes have been observed in the distribution of the LTV and LTP ratios of new mortgage loans in the most recent period. Most new residential mortgage lending was concentrated in loans with relatively low or high (not intermediate) LTI ratios. Meanwhile, the interest-rate spread over the risk-free rate of fixed-rate mortgages narrowed in 2021, to stand at its lowest level in recent years. Spreads narrowed in all loan groups by LTP ratio distribution.

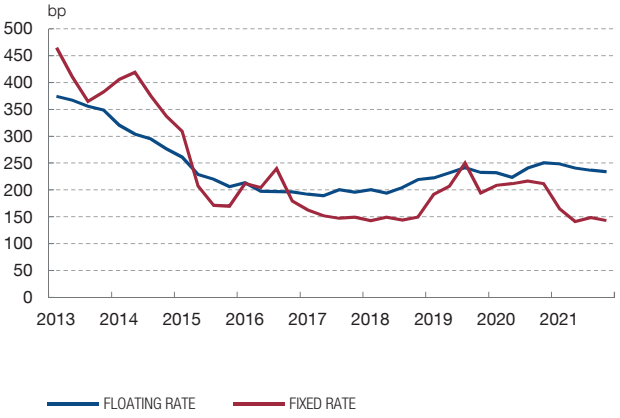
1 LOAN-TO-VALUE AND LOAN-TO-PRICE RATIOS OF NEW MORTGAGES (a)



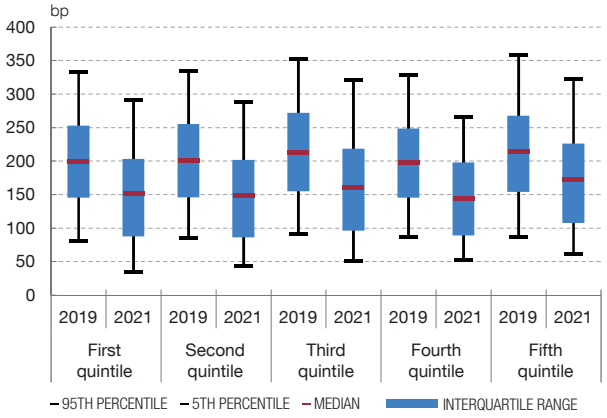
2 LOAN-TO-INCOME RATIO. WEIGHT OF EACH TRANCHE IN NEW MORTGAGES IN 2021 (b)



3 SPREADS OVER RISK-FREE RATES (c)



4 SPREADS OVER SWAP RATE OF NEW FIXED-RATE MORTGAGES, BY LTP QUINTILE (c)



SOURCES: Banco de España, Colegio de Registradores and Refinitiv.

a The LTV ratio is the amount of the mortgage principal relative to the property's appraisal value. The LTP's denominator includes the registered price of the property. The average values in the LTV and the LTP are weighted by the capital of each mortgage. Both indicators are calculated for new mortgages. The LTP ratio is available for a sample of mortgages. Data up to 2021 Q4 (not all loans for this period are yet available).

b The LTI ratio is the amount of the mortgage principal relative to the borrowers' income. The horizontal axis of the chart shows the distribution of credit in each LTI segment. The LTI of loans extended up to 2021 Q4 is represented.

c Interest rate spread of each new mortgage over the euro IRS curve or swap curve. For floating-rate mortgages, the 1-year IRS rate is used to calculate the spread; for fixed-rate mortgages, the term equivalent to the mortgage term is selected. Data up to 2021 Q4.

loan is originated, most new lending was concentrated in loans with a low LTI ratio (below 3) and a high LTI ratio (above 4.5) (see Chart 1.9.2).

Over the course of 2021 the average interest rate spread for fixed-rate mortgages narrowed to its lowest level in recent years. In 2021, the interest rate on new fixed-rate residential mortgages, which currently account for the bulk of new

mortgage lending,[4] continued to fall until converging with that of floating-rate loans, which, on average, stood at around 2% at year-end. This was also accompanied by a narrowing of the spreads over the risk-free rate of fixed-rate loans (see Chart 1.9.3). On more granular data, spreads narrowed in all groups by LTP ratio distribution, including those with a higher ratio, although they are somewhat higher in riskier loans as per this indicator (see Chart 1.9.4). Set against a growing share of fixed-rate mortgages in new lending and a narrowing of spreads, the risk for banks of an interest rate rise associated with a potential tightening of monetary policy becomes more relevant. However, the severity of this risk will depend on the extent to which their exposure to it is covered.

The signs of improvement in real estate activity also extended to the commercial segment, both in terms of price and volume. There was a recovery in the sector's activity in the final stretch of 2021, with prices rising 4.7% year-on-year in 2021 Q3, which was accompanied by a significant increase in the sales of this type of property, according to the latest information available.

1.3 Non-financial sectors

1.3.1 Non-financial corporations and households

In line with the economic recovery, business turnover continued to rise across the board in 2021 H2, although it remained clearly below 2019 levels in some sectors in 2021. On State tax revenue service data, sales[5] in most sectors in 2021 exceeded those for 2019. However, despite posting growth, business revenues in the sectors severely affected by the pandemic have not returned to pre-health crisis levels and, in some cases, are still a considerable way off.[6] Specifically, turnover in 2021 was 27%, 16% and 15% below 2019 levels in the hospitality sector, social, cultural and recreational services, and the manufacture of transport equipment, respectively. In terms of firm size, according to the Banco de España Business

4 In 2021, around 70% of new mortgages on residential property were granted at fixed rate.

5 Each quarter, the State tax revenue service publishes the Sales, Employment and Wages in Large Firms and SMEs statistics, which include aggregate information from the tax returns for VAT and withholdings on labour income for all firms considered to be large for tax purposes and SMEs whose legal form is that of a public limited company or private limited company. The geographical range is the so-called "common tax regime territory", i.e. excluding firms that operate exclusively in the Basque Country and Navarre. In the case of the VAT return variables, the areas where this tax is not levied (the Canary Islands, Ceuta and Melilla) are excluded.

6 The extent to which firms have been affected by the COVID-19 pandemic is measured on the basis of the fall-off in business turnover in 2020 relative to 2019. The sectors are classified as severely affected (those whose sales fell by more than 15%), moderately affected (sales down by between 9% and 15%) and largely unaffected (the rest). The sectors severely affected by the COVID-19 pandemic are: hospitality; the manufacture of refined petroleum products; social, cultural and recreational services; transportation and storage; the manufacture of textiles; and the manufacture of transport equipment.

Activity Survey (EBAE), small and micro firms' sales in 2021 remained farther from their pre-pandemic levels than the average for their sector of activity.[7]

The increase in business turnover seems to have resulted in an across-the-board improvement in firms' profitability, although it appears that the proportion of those reporting accounting losses will remain higher than before the pandemic. According to the sample of firms contributing to the Central Balance Sheet Date Office Quarterly Survey (CBQ), comprising chiefly large firms, in 2021 the percentage of firms with a negative return on assets (ROA) decreased by 5 pp on 2020,[8] but it remains 4 pp higher than in 2019. The proportion of such firms in the severely affected sectors (36%) continues to be higher than in the moderately affected (27%) and largely unaffected sectors (30%) (see Chart 1.10.1).

The recovery of turnover and the subdued growth of debt appear to have enabled an improvement in firms' financial situation, although, on average, it will continue to be more vulnerable than before the pandemic. Thus, firms' average debt and debt burden ratios began to fall in 2021 thanks to the strong increase in income far outpacing the growth of debt. In this context, on the CBQ, the percentage of firms with high debt[9] has decreased across the board: it stands close to pre-pandemic levels in the moderately affected and largely unaffected sectors, but remains 7 pp higher than in 2019 in the severely affected sectors (see Chart 1.10.2).

A potential interest rate hike, especially one that is faster than expected, may increase the percentage of firms under high financial pressure. However, under the baseline scenario envisaging a continuing economic recovery, the vulnerabilities would tend to diminish. Within corporate bank financing, short-term and floating-rate loans predominate, and changes in market interest rates therefore pass through relatively swiftly to the average cost of debt. Under a scenario consistent with the latest Spanish economic projections where, in line with agent expectations, market interest rates would rise progressively in 2022 and 2023, firms' interest expenses as a percentage of gross operating surplus would begin to increase from 2023 onwards to stand, by the end of 2024, 1 pp above 2021 levels. However, according to a sensitivity analysis, if short and long-term interest rates rise by 100 bp more than envisaged in the foregoing scenario, interest expenses as a percentage of business income would increase by a further 1.7 pp in

7 See Box 2, "An analysis of developments in firms' activity in 2021 drawing on other sources of information", in "Economic and financial performance of Spanish firms in 2020 and 2021 according to the Central Balance Sheet Data Office", *Economic Bulletin* 4/2021, Banco de España.

8 See "Results of non-financial corporations to 2021 Q4. Preliminary year-end data", Analytical Article, *Economic Bulletin* 1/2022, Banco de España.

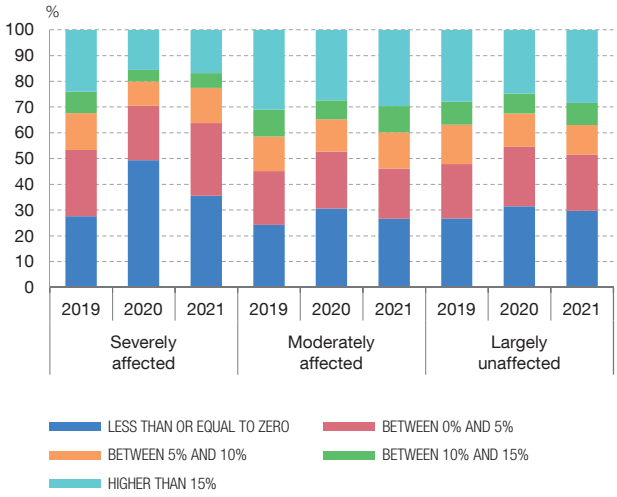
9 Firms are defined as having high debt if their ratio of net debt / (gross operating profit + financial revenue) is higher than 10 or if they have positive net financial debt and zero or negative earnings.

Chart 1.10

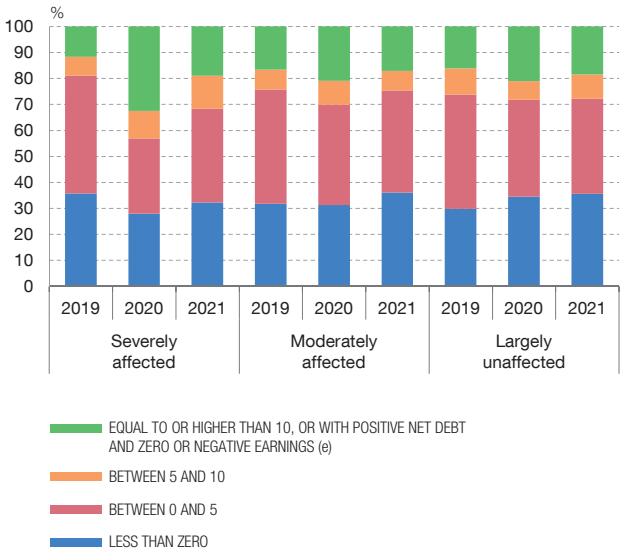
DESPITE THE ACROSS-THE-BOARD IMPROVEMENT IN FIRMS' PROFITABILITY AND FINANCIAL POSITION IN 2021, THE PROPORTION OF THE MOST VULNERABLE FIRMS REMAINS HIGHER THAN IN 2019, ESPECIALLY IN THE SECTORS SEVERELY AFFECTED BY THE PANDEMIC

According to the CBQ, which chiefly comprises large firms, the recovery in business turnover in 2021 has enabled an improvement in the ROA in all sectors. However, the proportion of firms with negative profitability remains higher than in 2019, particularly in the sectors that have been severely affected by the pandemic. Similarly, the increase in income and the moderate growth in debt have led to a reduction in the percentage of firms with a more vulnerable financial position. Despite this, the percentage of such firms appears to still be clearly higher than before the pandemic in the case of the severely affected sectors.

1 PERCENTAGE OF FIRMS BY RANGE OF RETURN ON ASSETS. BREAKDOWN BY SECTOR (a) (b) (c)



2 PERCENTAGE OF FIRMS BY TRANCHE OF RATIO OF NET DEBT / (GROSS OPERATING PROFIT + FINANCIAL REVENUE) (a) (c) (d)



SOURCE: Banco de España.

a Information from the CBQ sample.
b Return on assets = (Ordinary net profit + Financial costs) / Total assets net of non-interest bearing borrowing.
c Sectors are defined as severely affected if their sales fell by more than 15% in 2020; as moderately affected if their sales fell by between 9% and 15%; and as largely unaffected in other cases.
d Net debt is defined as interest-bearing borrowing minus cash and other equivalent liquid assets.

2024.[10] Given that business income may be expected to decline under such a scenario, this increase in the weight of interest expenses should be considered as a floor of the total impact of the rise in interest rates.

The increase in production costs associated with the surge in energy prices may also contribute to a downturn in some firms' economic and financial

10 The baseline scenario envisages a gradual rise in market interest rates, in line with the expectations implicit in the yield curves, that coincides with the "Macroeconomic projections for the Spanish economy (2022-2024)", Box 1, "Quarterly report on the Spanish economy", Economic Bulletin 1/2022, Banco de España. The alternative scenario envisages a hike in short and long-term interest rates that is 100 bp higher than that considered under the baseline scenario over the entire projection horizon. To simplify, it is assumed that the macro-financial variables, such as the gross operating surplus and the outstanding amount of debt, are not affected by the interest rate shocks, with the result that their levels will evolve in accordance with the baseline scenario. That is to say, the shock only has an effect on prices, not quantities.

situation. This impact would be felt regardless of whether firms pass on to their customers the rising costs (since, in this case, their sales could be affected) or if they don't (because their margins will narrow). Corporate profits would decline in either case and, consequently, some firms could become financially vulnerable. These effects would be partially mitigated by the temporary measures approved by the Government to reduce the cost of oil products.[11] Box 1.4 uses simulation exercises to analyse the sensitivity of firms' financial situation to the rise in energy prices, finding moderate average effects, albeit with notable sectoral heterogeneity, for the size of price hikes studied, which is 25%. This rise corresponds to the increase in the average price of energy goods in 2023, between the Banco de España projections published on 17 December 2021 and on 5 April 2022.

Favourable labour market and income developments appear to be contributing to the recovery in households' economic situation. Effective social security registrations[12] have exceeded the pre-pandemic employment level since November 2021. In March 2022, they were 2.1% higher, on a seasonally adjusted basis, than employment in February 2020. Nevertheless, the total number of effective weekly hours worked in 2021 Q4 was 3.8% lower than in 2019 Q4. In 2021, households' gross disposable income (GDI) grew 2.2% in nominal and year-on-year terms, but remained 2.8% down on 2019. Assuming the economy recovers as envisaged under the baseline scenario, this trend may be expected to continue, albeit at a slower rate given the anticipated slowdown in growth. However, according to the European Commission's monthly consumer survey,[13] in March 2022 most households (except those in the top income quartile) expected their financial situation to worsen somewhat in the following 12 months, in line with the economic losses that they anticipated at the beginning of the pandemic.

The information available does not indicate that the pandemic prompted a deterioration in households' financial position. Between the onset of the health crisis and 2021 Q4, their aggregate net wealth increased by 9.8%. This has been fostered by the higher amount of financial assets holdings (driven by the rise in savings) and, above all, by the increase in value of real estate assets (as a result of the appreciation of housing), in addition to the relative debt stability. Preliminary estimates at microeconomic level (available up to 2021 Q3) would suggest that this pattern has been fairly widespread across wealth deciles and according to the

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11 The measures adopted in response to the crisis deriving from the war in Ukraine, which were approved on 29 March 2022 by the Council of Ministers, include a minimum rebate of €0.20 per litre of fuel and certain electricity tax reductions. They are part of a package of direct aid amounting to €6 billion and of measures in other spheres (minimum living income, limits to rental increases, etc.). The plan approved also includes a new ICO guarantee facility amounting to €10 billion and certain improvements in the terms of conditions applied to some existing guaranteed loans, which are discussed in greater detail in Chapter 2.

12 Effective social security registrations are total registrations excluding workers subject to furlough schemes (ERTEs, by their Spanish acronym).

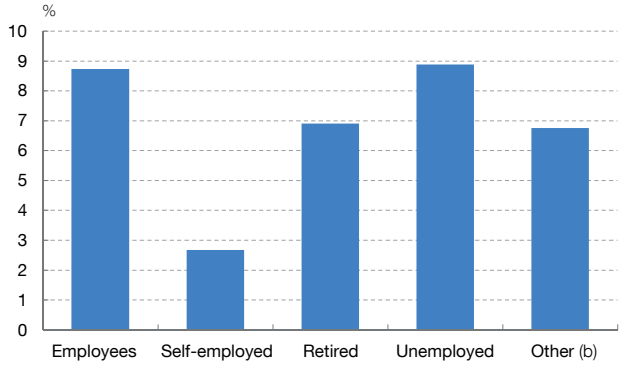
13 The European Commission's monthly consumer survey is available here.

Chart 1.11

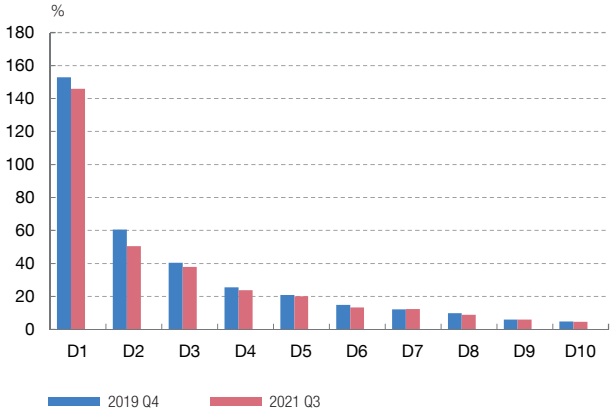
NO DETERIORATION HAS BEEN OBSERVED IN HOUSEHOLDS' FINANCIAL POSITION SINCE THE ONSET OF THE PANDEMIC

According to the provisional information available, between end-2019 and 2021 Q3, households' average net wealth increased, irrespective of the employment status of the household reference person. Similarly, during the same period, the bank debt-to-total asset ratio appears to have decreased across nearly all household net wealth deciles, particularly in the bottom deciles.

1 CHANGE IN AVERAGE HOUSEHOLDS' NET WEALTH BETWEEN 2019 Q4 AND 2021 Q3, BY EMPLOYMENT STATUS OF HOUSEHOLD REFERENCE PERSON (a)



2 BANK DEBT-TO-TOTAL ASSET RATIO BY NET WEALTH DECILE (a) (c)



SOURCES: ECB and Banco de España.

a These results should be treated with caution, as they come from an experimental statistic that is subject to review and improvement and, while the coverage of the instruments is very broad, it is not complete. It combines information from the quarterly sectoral accounts with that of the EFF, the latest available edition of which relates to 2017. Thus, this statistic assumes that the distribution of asset and liability instrument holdings is stable over time during the intervening periods between the different editions of the EFF.

b Includes all households whose reference person is in any of the following situations: is a student, has a permanent disability, is engaged in domestic tasks, does not have remunerated work, or whose employment status is unknown.

c The denominator of the bank debt-to-total asset ratio includes financial and non-financial assets.

employment status of the household reference person[14] (see Chart 1.11.1). There has been quite a broad-based decline in the bank debt-to-total asset ratio,[15] particularly in the bottom net wealth deciles (see Chart 1.11.2). In any event, in the first net wealth decile, debt continues to far exceed the value of assets (by around 50%), signalling this segment's vulnerability to adverse shocks.

Having deteriorated after the outbreak of the pandemic owing to the fall in income, households' debt repayment capacity has improved thanks to the economic recovery, and it is not expected to be severely affected by moderate interest rate hikes. Despite stable household indebtedness, the fall in GDI initially

14 These estimates should be treated with caution, as they come from an experimental statistic that is subject to review and improvement and, while the coverage of the instruments is very broad, it is not complete. It combines information from the quarterly sectoral accounts with that of the Spanish Survey of Household Finances (EFF, by its Spanish acronym), the latest available edition of which relates to 2017. Thus, this statistic assumes that the distribution of asset and liability instrument holdings is stable over time during the intervening periods between the different editions of the EFF.

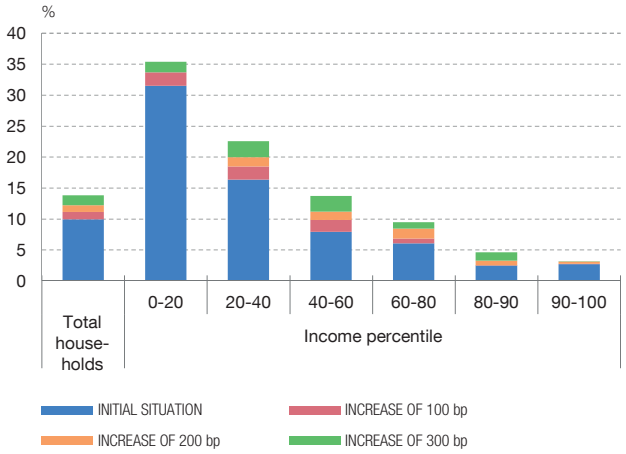
15 Total assets include both financial and non-financial assets.

Chart 1.12

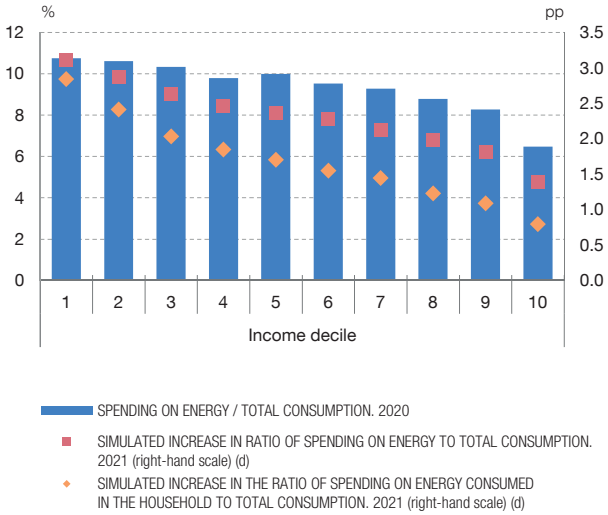
INDEBTED HOUSEHOLDS ON THE LOWEST INCOMES ARE EXPECTED TO BE HIT HARDEST IN THE EVENT OF INTEREST RATE RISES AND A HIKE IN ENERGY PRICES

The proportion of indebted households with a high net interest burden as a result of interest rate rises is expected to increase to a greater extent among those between the 20th and 40th income distribution percentiles. Similarly, spending on energy accounts for a higher percentage of lower-income households' consumption, and the hike in prices in 2020 and 2021 has had a more significant impact on them.

1 IMPACT OF AN INTEREST RATE RISE ON THE PERCENTAGE OF HOUSEHOLDS WITH A HIGH NET INTEREST BURDEN. BREAKDOWN BY INCOME PERCENTILE (a) (b)



2 WEIGHT OF SPENDING ON ENERGY ITEMS AND MEDIAN IMPACT OF THE HIKE IN ENERGY PRICES (2021 AVERAGE VS 2020 AVERAGE). BREAKDOWN BY INCOME DECILE (c)



SOURCES: Banco de España and EFF (2017).

a The increase in debt service expenses is calculated for households with floating-rate debt. It is assumed that the hike in short-term interest rates is passed through in full to the interest rate on floating-rate debt. In the case of deposits, it is assumed that 15% is passed through to sight deposits and 76% to fixed-term deposits.
b The net interest burden is considered to be high when the ratio of (debt service expenses - interest income from deposits) / household income is higher than 40%. Households without debt are excluded from this calculation.
c Income distribution is proxied drawing on total household consumption which, in the case of households owning their own home, is adjusted to reflect an imputed rent.
d Increase in percentage points, assuming stability in the amounts of energy consumed and a price increase equal to the average observed in 2021.

prompted an increase in the average debt and debt burden ratios, which began to decline in 2021 as incomes started to recover. A potential interest rate rise could contribute to the debt repayment capacity deteriorating somewhat, especially if the hike is much sharper than expected. In any event, the effect of a moderate interest rate rise is not expected to be very significant, in part because of the increase in the share of fixed-rate mortgages (households' main liability) observed in recent years, which accounted for 24.9% of the outstanding balance in December 2021. Specifically, on Banco de España simulations, it is estimated that the proportion of households with a high net interest burden[16] would rise by 1.2 pp, 2.3 pp and 3.9 pp if interbank interest rates were raised by 100 bp, 200 bp and 300 bp. Such effects would be felt more strongly among indebted households between the 20th and 40th

16 The net interest burden is considered to be high when the ratio of (debt service expenses - interest income from deposits) / household income is higher than 40%.

income distribution percentiles (see Chart 1.12.1).[17] These percentages should be considered as lower levels of the total impact of the interest rate rise, as it would also reduce agents' income by adversely impacting activity, in addition to slowing down their accumulation of wealth, given the greater debt burdens.

The steep rise in energy prices in 2021 and in 2022 to date could jeopardise the debt repayment capacity of low-income households as spending on this item accounts for a higher proportion of their consumption. Thus, households below the third income decile spent more than 10% of consumption on energy in 2020 (see Chart 1.12.2). Moreover, it was precisely these households whose spending on energy, as a share of their consumption, increased the most in 2020 and 2021. While the impact of the hike in energy prices on households' debt repayment capacity can be cushioned by temporarily reducing their saving rate or using the funds already built up (in particular, the extraordinary savings accumulated during the pandemic), their ability to do so varies by income stratum. Lower-income households will have less scope to absorb such a hike this way, as their saving rates tend to be lower and only a small proportion of such households was able to build up extraordinary savings during the pandemic. The proportion of indebted lower-income households facing a high net interest burden is higher than in the top income strata, and their debt repayment capacity will therefore be comparatively more affected by energy price rises (see Chart 1.12.1). The measures approved by the Government to alleviate the hike in oil derivative prices may mitigate this impact, although they will not help households to reduce their degree of energy dependence.

1.3.2 General government in Spain

The general government deficit fell by 3.4 pp in 2021, to 6.9% of GDP (see Chart 1.13.1), although some less positive developments are also observed. First, there was strong growth in government receipts (11% on 2020), underpinned by the improved economic situation and higher inflation, although the elasticities to their macroeconomic determinants were much higher than have been recorded on average in the past.[18] Thus, in 2021 tax revenue as a percentage of GDP (including social security contributions) stood 3.7 pp above its 2019 levels, an exceptional circumstance that may be expected to be corrected, at least in part, over the coming years. Second, the growth rate of government expenditure declined to 5%, half that posted a year earlier. This was facilitated by the decline in pandemic-related disbursements, which fell from 3.9% of GDP in 2020 to 3% in 2021. Nevertheless,

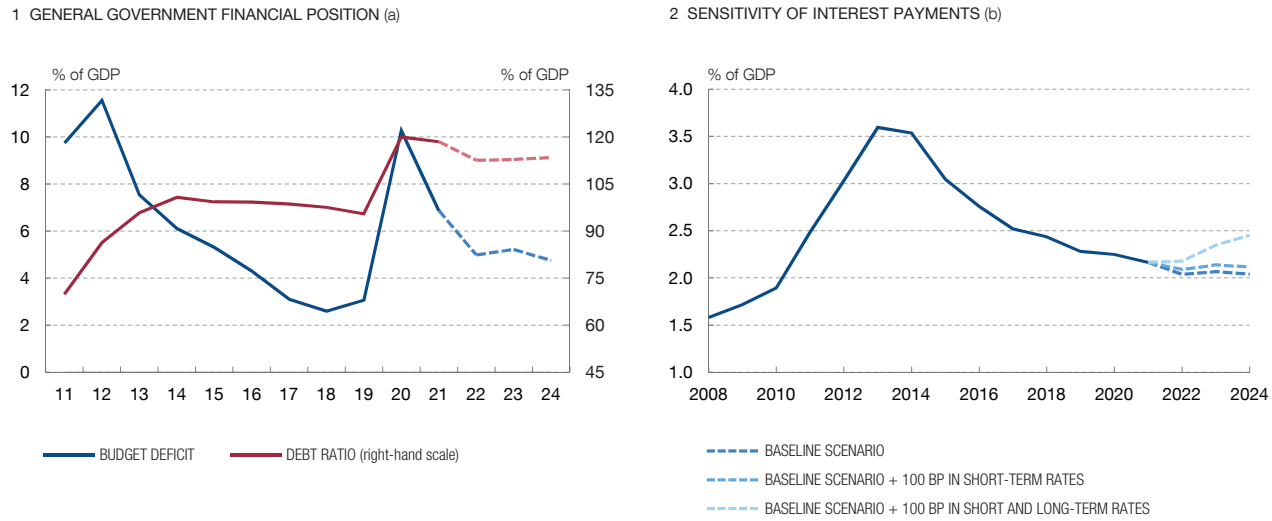
17 These simulations are based on the data from the latest EFF for 2017. They draw on observed data, applying a hike in short-term market interest rates, which is passed through in full to the interest rate on floating-rate debt. In the case of deposits, 15% is passed through to sight deposits and 76% to fixed-term deposits.

18 The various revenue measures had a modest impact, with the tax hikes included at the start of the year being offset by the subsequent cuts adopted to curb the effects on consumers of the sharp surge in electricity prices.

Chart 1.13

SPAIN'S BUDGET DEFICIT DECLINED IN 2021. HOWEVER, IN THE ABSENCE OF NEW MEASURES, IT WILL REMAIN ABOVE ITS PRE-PANDEMIC LEVEL UNTIL 2024, WITH DEBT LEVELS EXCEEDING 110%

The general government deficit fell by 3,4 pp in 2021, to 6.9% of GDP, and is expected to continue to decline in 2022. However, in the absence of new measures and given the higher expenses stemming from population ageing, deficit and public debt levels will remain high, which will be a source of vulnerability for the Spanish economy. Market interest rate increases are now expected to have a larger impact on the debt burden, on account of the higher debt levels. As a result, in the more medium and long term, a credible and sustained consolidation process, that reduces this vulnerability, will be needed.



SOURCES: IGAE and Banco de España.

a For 2022-2024, the Banco de España's macroeconomic projections, published on 5 April 2022, are used.
b Under the baseline scenario, short and long-term interest rates rise gradually, in line with market expectations at 31 March 2022. Merely for illustration purposes, the alternative scenarios simulate the results of an additional 100 bp increase in short-term interest rates and in short and long-term interest rates, from April 2022.

spending in 2021 was 15.8% higher than in 2019, with notable buoyancy in the components not linked to COVID-19 (6.9% compared with 2020). At the same time, public debt stood at 118.4% of GDP, down 1.6 pp on 2020.

The Banco de España's latest projections, published on 5 April,[19] envisage the general government balance continuing to improve, but remaining at high levels over the entire projection horizon (see Chart 1.13.1). These projections (which, owing to the lack of an approved plan, do not include consolidation measures) place the general government deficit for 2024 clearly above its pre-pandemic level, in line with the structural deficit in Spanish public finances (estimated at over 3%). In this regard, the invasion of Ukraine has not only resulted in a more negative macroeconomic scenario in the short term, but it has also put more pressure on public spending. This has led, for the time being, to the Government's approval at end-March of an emergency (albeit temporary) action plan that would raise the

19 See Box 1, "Macroeconomic projections for the Spanish economy (2022-2024)", in the "Quarterly Report on the Spanish Economy", *Economic Bulletin* 1/2022, Banco de España.

deficit by 0.5 pp of GDP. Nevertheless, public debt is set to decline slightly, to somewhat above 110% of GDP, owing to the growth in nominal GDP, which is expected to more than offset the effect of the negative balances foreseen for the next few years.

In the absence of a consolidated plan and/or sustained improvement in productivity growth, and given the foreseeable spending increase associated with population ageing, public debt will tend to hold unchanged or rise in subsequent years, posing a clear risk to the Spanish economy and its agents. In this regard, the first part of the public pension system reform, approved in December 2021, incorporates aspects that will raise expected future spending, such as the return of the indexation to the CPI and the repeal of the sustainability factor. However, for general government as a whole, this increase in expenditure is not sufficiently offset by the other measures included, such as the changes to early retirement penalty schemes, the rebate for late retirement and the new intergenerational equity mechanism.

High debt levels entail public finances' greater sensitivity to market interest rate movements. The low interest rates posted in recent years prompted a continuous decline in the interest burden as a percentage of GDP (see Chart 1.13.2). At the same time, longer average debt maturities limit the short-term impact of increases in issuance costs. That said, under a baseline scenario consistent with the latest projections for the Spanish economy in which market rates are raised according to agents' expectations,[20] the debt burden as a percentage of GDP would cease to decrease over the coming years. The sensitivity of these results to developments in the financial markets is well illustrated by a simple exercise that shows how a permanent 100 bp increase in both short and long-term interest rates as from April 2022, while keeping the rest of variables constant, would push up interest payments (and, therefore, the budget deficit) by 0.4 pp of GDP in 2024.

Consequently, in the medium and long term, these high public debt levels would make the Spanish economy vulnerable. This could only be avoided with a credible and sustained process of fiscal consolidation. From a sustainability perspective, the high structural deficit has so far been amply offset by interest rates being lower than the economy's potential growth. However, as already mentioned, this favourable differential may gradually disappear over the coming years. For this reason, the longer it takes to announce measures countering the current structural deficit and the growing expenses in respect of population ageing, the more likely it is that agents will start to lose confidence in the effective application of these measures, or that a new adverse economic shock will emerge, which the Spanish economy would face with limited scope for manoeuvre. The

20 To -0.2%, 1.0% and 1.3%, in 2022, 2023 and 2024 respectively, for the 3-month interbank rate, and to 1.4%, 1.8% and 1.9%, for the 10-year interest rate.

Russian invasion of Ukraine and the ensuing war will also put pressure on public spending in the short and medium run. Specifically, Europe's need to reduce its external energy dependence could lead to an acceleration of the transition towards a more environmentally-friendly productive system, but the greater urgency of this transition could make it more disorderly, with costs increasing in the short term. Moreover, it also appears that steps are being taken towards strengthening Europe's defensive capacity. All these factors have a clear European dimension, which, together with the nature of this shock (exogenous to countries, and with heterogeneous effects), suggests the need for implementing a public financing programme where such expenses are shared, as was implemented in the pandemic.

Reinforcing the sustainability of Spanish public finances will require, once the pandemic and the adverse effects of the conflict in Ukraine have been overcome, the rigorous implementation of a multi-annual fiscal consolidation plan. Such a programme should be structured around a detailed definition of the budgetary objectives sought and the timeframes and measures required to achieve them. In particular, the plan should put special emphasis on the composition of the adjustment between receipts and expenditure, as it is key to minimising the adverse effects of fiscal consolidation on economic growth. Also, although it may be implemented subsequently, the announcement of the strategy to reduce fiscal imbalances should be made soon, as this would have significant benefits for the credibility of Spanish economic policy and would help boost the expansionary effects of current fiscal actions.

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

In 2021 H2, net financial flows with the rest of the world were positive, although they moderated significantly compared with H1, on both the asset side and, especially, the liability side. Of note are international investors' sales, in net terms, of general government and NFC debt securities (in the case of NFCs, in related companies, i.e. under the "direct investment" heading). Investments abroad by Spanish residents were mainly concentrated in investment fund shares, although to a lesser extent than in the early months of the year, while they divested from shares in the "direct investment" heading and from debt securities issued by monetary financial institutions.

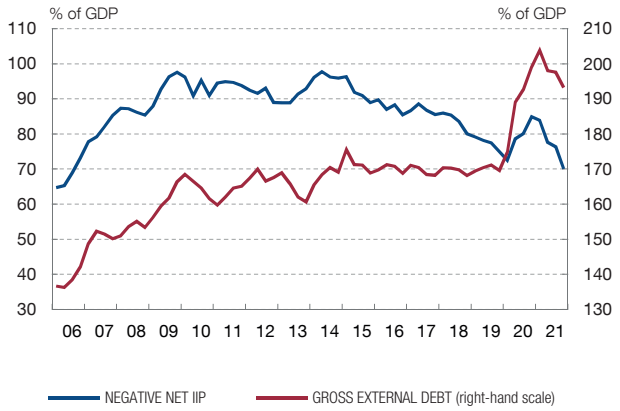
The initial adverse impact of the pandemic on the negative net international investment position (IIP) corrected significantly over the course of 2021, particularly in the final stretch of the year, to stand at 70%, the lowest level since 2006 (see Chart 1.14.1). This is 14.9 pp less than in 2020, of which only 5.9 pp are explained by the growth in output (see Chart 1.14.2). Thus, in terms of volume, the negative net IIP decreased by €108 billion thanks to the positive amounts of financial transactions with the rest of the world (€32.6 billion) and, especially,

Chart 1.14

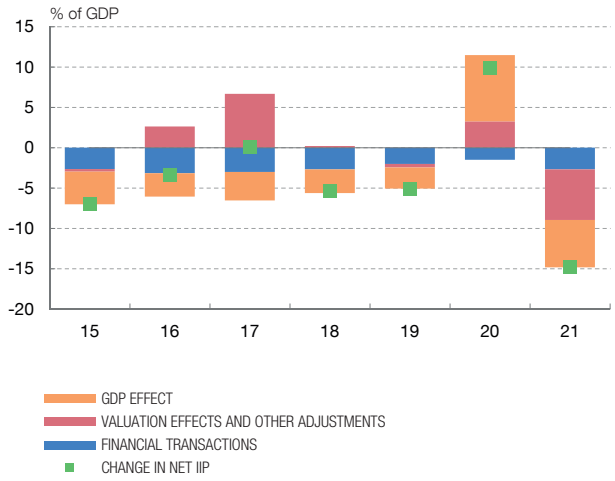
GDP GROWTH IN 2021 HAS REDUCED THE HIGH GROSS EXTERNAL DEBT RATIO AND PARTIALLY CONTRIBUTED TO THE SIGNIFICANT DECREASE IN THE NEGATIVE NET IIP RATIO

Spain's external debt continued to rise and reached a record high at end-2021, although the growth in GDP has led the ratio to begin to decline. Conversely, the negative net IIP saw a significant correction in 2021 to stand, in GDP terms, at levels not observed since 2006, thanks to economic growth but, in particular, on account of valuation effects and other positive adjustments.

1 NEGATIVE NET IIP AND GROSS EXTERNAL DEBT (a) (b)



2 DETERMINANTS OF THE CHANGE IN NEGATIVE NET IIP (a)



SOURCE: Banco de España.

a The net IIP is the difference between the value of resident agents' foreign assets and that of the liabilities to the rest of the world.
b External debt comprises the balance of all liabilities that entail future repayment of principal, interest or both (i.e. all financial instruments, except equity securities, financial derivatives and monetary gold bullion).

valuation effects and other adjustments (€75.8 billion). The latter were primarily the result of the increase in the value of assets and, to a lesser extent, the decrease in that of liabilities. Asset revaluation was mainly concentrated in investment fund shares and units owing to the increase in the price of these instruments, but also as a result of the depreciation of the euro. The decline in the value of the liabilities was mainly the result of the increase in long-term interest rates which affected debt securities, particularly those issued by general government.

Conversely, Spain's gross external debt rose by €94.5 billion in 2021, reaching its historical high, although it fell in GDP terms (by 5.9 pp, to 193.2%), thanks to output growth. This increase in liabilities was concentrated in Banco de España and, to a lesser extent, monetary financial institutions. Spain's gross external debt has increased by €218 billion, or 23.7 pp of GDP, since the outbreak of the pandemic. The high external debt is an element of vulnerability as it exposes issuers to a potential rollover risk and higher financing costs if the conditions for access to international markets tighten or become more expensive. However, these risks are mitigated by the composition of the liabilities, as they have lengthy average repayment periods and are predominantly at fixed rate, and by the fact that 57% is public sector debt (general government and the Banco de España).

Box 1.1

ECONOMIC AND FINANCIAL SANCTIONS AGAINST RUSSIA

The United States, the EU, the United Kingdom and the other G7 members have imposed significant economic sanctions on Russia in response to its invasion of Ukraine. The sanctions date back to 2014, following Russia's annexation of Crimea and its support for the separatists in the Ukrainian regions of Donetsk and Luhansk. However, they have been expanded to a much broader scope since the current armed conflict broke out. The sanctions have been progressively imposed and can be grouped into four categories: finance, trade and industry, individuals and other (diplomats, media and economic cooperation).[1]

The financial sanctions directly target certain financial institutions (70% of the Russian banking market) and the Bank of Russia and the Central Bank of Belarus. The main measures include freezing the assets of these two central banks and preventing them from accessing their foreign currency reserves, as well as a ban on transactions with them. Moreover, seven Russian banks and three Belarusian banks were decoupled from the SWIFT financial messaging system on 12 March, and their transactions on the international financial markets were banned in April.[2] The measures also significantly limit the financial inflows from Russia to the EU, by prohibiting the acceptance of new deposits exceeding certain values from Russian nationals or residents, as well as the selling of euro-denominated securities to Russian clients. Lastly, the EU is also taking measures to prevent crypto-assets from being used to circumvent the sanctions imposed.

Measures have also been applied to restrict access to cutting-edge technology and trade in key sectors such as energy and transport, with bans on exports of high-tech goods (semiconductors and aviation parts) and of the components needed to upgrade Russian refineries, and on investments in the country's energy sector. Furthermore, the United States has banned Russian gas and oil imports, and the EU has banned imports of coal and key goods in the iron and steel sectors. The EU has also imposed a series of sanctions including asset freezes, travel restrictions and a prohibition on making funds available to a wide range of individuals and entities that are responsible for Russia's actions in Ukraine or that provide material or financial support for such actions.

The restrictive measures adopted by the EU are binding for all persons or entities subject to its jurisdiction, i.e. the nationals, legal persons, entities and bodies of EU Member States. In any event, adopting the sanctions globally is key to preventing financial flows from being diverted, which could happen if the sanctions were concentrated in European countries. This is because, unlike those imposed by the United States, the EU sanctions do not create obligations for third-country nationals or entities, unless the activity subject to sanction is performed, at least partially, in the EU (as is the case of SWIFT, for example).[3] Member States are responsible for the proper application of the measures adopted at the EU level within their territory and, in particular, for detecting and issuing penalties for infringements of the restrictive measures. In Spain, the competent national authority for international financial sanctions is the Treasury, through the Deputy-Directorate General of Inspection and Control of Capital Movements.

To quantify the possible medium-term impact of the sanctions adopted against Russia through the trade channel, the effect of previous trade and other sanctions on international trade is analysed. Since 1950, a total of 700 international sanctions have been adopted,[4] most of which have had no major impact on international trade flows. Based on historical experience, the most recent sanctions (i.e. from 1995 onwards) reduced the bilateral trade flows of the countries targeted by an average of 4.5% (see Chart 1). There is, however, much heterogeneity in the effect of the sanctions. In the case of extreme sanctions (such as those imposed on Cuba and North Korea), bilateral trade fell by close to 80%. The sanctions

1 The EU has so far adopted five packages of measures: the first package was adopted on 23 February 2022, the second on 25 February and the third on 28 February and 2 March. On 9 March, the EU adopted additional measures. Lastly, a fourth package was adopted on 15 March, followed by a fifth on 8 April.

2 SWIFT stands for the Society for Worldwide Interbank Financial Telecommunication, the main international financing messaging system, which is headquartered in Belgium. While this measure hampers transactions, it does not prevent them from being conducted, as they can be carried out manually or by using alternative messaging systems, such as Russia's so-called SPFS (Romanised acronym of the Russian name, which may be translated as System for Transfer of Financial Messages). However, very few institutions participate in this Russian system.

3 The EU's sanctions and those of the United States are not perfectly aligned. This, along with the extraterritorial effects of the US measures, poses a risk for EU economic operators of being issued penalties by the US authorities.

4 The sanctions are included in a database of sanctions, published in G. Felbermayr, C. Syropoulous, E. Yalcin, and Y. V. Yotov (2020), "On the Heterogeneous Effects of Sanctions on Trade and Welfare: Evidence from the Sanctions on Iran and a New Database", School of Economics *Working Paper Series* 2020-4, LeBow College of Business, Drexel University.

that most closely resemble those imposed on Russia were those taken against Iran between 2006 and 2014, which also entailed the exclusion of some banks from SWIFT. While not extreme, the sanctions against Iran prompted a significant fall (55%) in its bilateral trade flows with the sanctioning countries.

Taking Iran as a precedent, the impact of the sanctions imposed on Russia by the EU, the United States and other countries is simulated, assuming that bilateral trade responds similarly to how it did in the case of Iran. To this end, a standard general equilibrium model for world trade is used.[5] This model, which only considers the trade channel, does not distinguish between sectors of activity and their possible interconnections, nor does it take into account any dynamic effects (e.g. the impact on investment) that might exacerbate the effects of the sanctions. With this in mind, the findings (see Chart 2) should be interpreted as the minimum effects of sanctions. Similarly, the analogy with the sanctions imposed on Iran is merely an approximation, and there is considerable uncertainty as to the consequences of the current conflict for financial and trade flows, not only for Russia, but also on a global scale.

In any event, according to this model, the euro area's total imports and exports would fall by 1%. However, there is significant disparity across the area, with trade dropping more sharply in eastern European countries. Globally, some countries will benefit from this trade shock, by refraining from imposing sanctions and being able to increase their trade flows with Russia. Examples include Kazakhstan, Israel, Turkey and China. Nonetheless, as a general rule, the increase in trade flows in such cases is small, with Kazakhstan being the only country where an increase of just over 1% is expected. Such increases in trade flows cannot offset the significant trade losses that Russia is facing as a result of the measures set in place, with exports and imports projected to fall by 28% and 40%, respectively. Russia and Ukraine account for a sizeable share of global exports of some products. These include natural gas, oil and certain metals, such as nickel, aluminium and palladium, in the case of Russia, and certain foods, such as sunflower oil, wheat and maize, in the case of Ukraine. Given the current circumstances, these products may soon start running short. For its part, Russian GDP is expected to drop by more than 1% in the medium term.[6]

Chart 1
EFFECT OF PREVIOUS SANCTIONS ON INTERNATIONAL TRADE FLOWS (a)

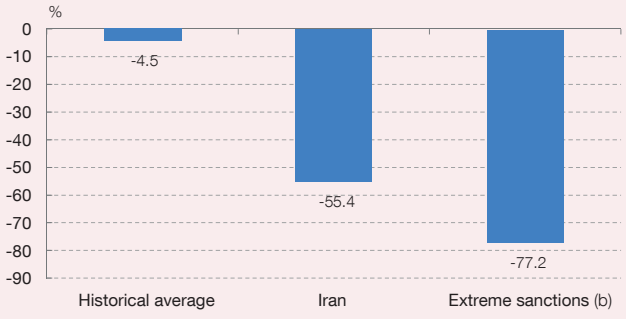


Chart 2
IMPACT OF TRADE SANCTIONS ON EXPORTS, IMPORTS AND GDP

SOURCES: Banco de España calculations, Felbermayr et al. (2021).

a The average historical impact of sanctions on bilateral trade flows is estimated using a model of bilateral trade flows, which covers 66 countries and the period 1995-2018.
b Extreme sanctions refer to those imposed on Cuba and North Korea, for example.

5 S. L. Baier, Y. V. Yotov, and T. Zylkin (2019), "On the widely differing effects of free trade agreements: Lessons from twenty years of trade integration", Journal of International Economics, 116:206-226.

6 As mentioned previously, this estimate is obtained using a model that only considers the trade channel and does not take into account dynamic effects. Consequently, it may represent a lower bound of the impact of the sanctions.

As already addressed in the body of Chapter 1, the main effect of the sanctions taken against Russia on the economic and financial risks facing EU countries is expected to be felt on the energy markets. Russian energy supplies to the EU cannot be replaced overnight, and the adaptation costs incurred could be significant. Thus, while this shock may accelerate technological innovation for the energy transition away from fossil fuel-based models, the switch will not be instantaneous. Moreover, a swift transition may also be less orderly, which would make it more costly in the short term. Given the scale of the measures and the uncertainty over the current macro-financial environment, the extent to which such measures are implemented and their impact will have to be closely monitored in the coming quarters.

Moreover, also worth noting is the indirect impact of the sanctions on the Austrian bank Sberbank Europe AG. This bank is a subsidiary of the Sberbank group (Russia's leading bank), whose largest shareholder is a sovereign wealth fund controlled by the Russian Ministry of Finance. While the subsidiary was not directly targeted by the sanctions imposed, the rapid and significant deterioration in its liquidity situation led the Single Resolution Board (SRB) on 28 February 2022 to declare it as failing or likely to fail, confirming the ECB's previous assessment. On 1 March, the SRB adopted resolution decisions for the subsidiaries in Croatia and Slovenia, transferring their shares to Hrvatska Poštanska Banka and Nova Ljubljanska Banka d.d., respectively. Conversely, the winding up of Sberbank Europe AG in Austria was not thought to pose a financial stability risk and did not therefore call for resolution action. Accordingly, the insolvency proceedings were carried out in line with national law.[7]

Meanwhile, Russia has also responded with a raft of measures that seek to circumvent or minimise the sanctions imposed by the West and its allies. These include its intention to nationalise some assets, currency controls, a ban on selling assets in Russia to foreign firms and the demand that gas be paid for in roubles. If adhered to, this last measure would have major consequences, as it would limit the impact of the sanctions on the Russian foreign exchange market. Lastly, Russia has also banned exports of certain products and commodities (wood and forestry products, grain and unrefined cane sugar) until end-2022. This measure, together with the ban on exporting some foods imposed by Ukraine, may exacerbate food price pressures and the humanitarian consequences for developing countries that rely on such food.

7 Another European subsidiary of a Russian bank has recently been declared bankrupt. Namely, Amsterdam Trade Bank, part of the Russian Alfa Bank. See, e.g. the De Nederlandsche Bank 22 April press release.

Box 1.2

IMPACT ON THE EMERGING ECONOMIES RELEVANT TO THE SPANISH BANKING SYSTEM OF TIGHTER GLOBAL FINANCING CONDITIONS AND RISING COMMODITY PRICES

This box analyses the potential impact of the materialisation of a scenario of tighter global financing conditions and further rises in commodity prices on growth, capital flows and credit in the emerging economies most relevant to the Spanish banking system. The probability that this scenario will materialize has increased as a result of the war in Ukraine.

The analysis mainly covers the two largest Latin American economies (Brazil and Mexico) and Turkey, three countries to which the Spanish banking system has significant exposure (see Chart 2.6 in Chapter 2). A tighter monetary policy in the United States than currently anticipated by markets, triggered by a greater rebound in inflation, would affect these economies through several channels. First, their external demand would decrease as a result of the adverse impact of such a policy on global economic activity. Second, interest rate hikes in the United States would give rise to a tightening of global financial conditions,[1] the effects of which will be stronger than at other times, since they will stem from inflation surprises, as evidenced by the empirical literature.[2]

Vector autoregressive (VAR) models are used to approximate the effects of a tighter US monetary policy. First, a sign-restricted structural VAR model is used to disentangle historical monetary policy surprises in the United States into two categories: those accompanied by an increase in demand and those in which inflation rises and monetary policy is tightened.[3] Then, individual VAR models are estimated for the Brazilian, Mexican and Turkish economies in order to derive the average historical impact of unexpected changes in US monetary policy. Finally, using the set of models estimated in these two steps, a 100 basis point (bp) rise in the US policy interest rate is simulated assuming that this increase is due to an inflation shock.[4]

A monetary policy tightening as a result of an inflation shock would reduce expected growth in Brazil, Mexico and Turkey and would increase the probability of negative tail results as compared with the baseline scenario[5] (see Chart 1). Higher US interest rates would also lead to a hike in domestic interest rates, a widening of sovereign spreads in the three countries and a depreciation of their currencies. In Brazil and Mexico, these effects could be partially offset by an improvement in the terms of trade as a result of rising commodity prices which would, however, have a very negative impact on Turkey. Nevertheless, the countries most affected overall would be Brazil and Mexico, since their median growth in this sensitivity analysis sees a larger decline (see Chart 1).

In any event, the extent of the negative effects of the tightening of global financial conditions will depend on these economies' vulnerabilities. For example, a comparison of certain current vulnerability indicators with those observed in the months leading up to the May 2013 episode (the so-called taper tantrum[6]), which was interpreted as a further unexpected monetary policy tightening by the Federal Reserve, shows that the vulnerabilities related to external imbalances have decreased, while agents' debt is much higher. Specifically, current account balances are now more balanced (see Chart 2), international reserves exceed those recorded in 2013 and there are no signs of exchange rate overvaluation. By contrast, debt – both private and public (see Chart 3) and both domestic and external – has increased substantially.

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1 See, for example, H. Rey (2015), "Dilemma not Trilemma: the global financial cycle and monetary policy independence", *Working Paper* 21162, NBER.

2 These effects would be less adverse if the further tightening by the Federal Reserve were prompted by domestic demand pressures in the US economy. The main reason is that, in this case, the stronger initial surge in US domestic demand would boost exports from emerging countries despite the subsequent constraining effect of monetary policy. See, for example, S. Ahmed, O. Akinci and A. Queralto (2021), "U.S. monetary policy spillovers to emerging markets: both shocks and vulnerabilities matter" and J. Hoek, S. B. Kamin, and E. Yoldas (2020), "When is bad news good news? US monetary policy, macroeconomic news, and financial conditions in emerging markets".

3 This breakdown is standard in the literature. For more details, see R. Fry and A. Pagan (2011), "Sign Restrictions in Structural Vector Autoregressions", *Journal of Economic Literature,* Vol. 49, No 4, pp. 938-960.

4 The autoregressive models for each country include the inflation shock identified for the United States as an exogenous variable, and each country's GDP growth, underlying inflation, interest rate, exchange rate variation and sovereign spread as endogenous variables. The model is estimated using Bayesian techniques drawing on quarterly data from 2000 Q1 to 2019 Q4, which is prior to the outbreak of the COVID-19 pandemic. In the case of Turkey, the estimation period starts in 2003 Q2 owing to the lack of consistent data. The 100 bp rise in the US interest rate implies an inflation shock of 2.2 standard deviations. The predictive density of annual GDP growth is derived by imposing this condition on the country-specific models.

5 This scenario draws on Consensus Forecasts estimates for February 2022.

6 The change in expectations as to the Federal Reserve's policy stance gave rise to a sharp shift in sovereign spreads, CDSs and exchange rates in most emerging economies, but particularly affected those with the greatest vulnerabilities, especially external or fiscal, which were known at the time as the "fragile five" (Brazil, Turkey, India, Indonesia and South Africa).

Furthermore, some of the usual sustainability indicators, such as the proportion of short-term external debt in relation to reserves, have deteriorated considerably and many Latin American economies' credit ratings are lower than in 2013. Lastly, in 2022 public sector financing needs in most of the economies relevant to the Spanish banking system are sizeable (see Chart 4).

A more uncertain international environment and the tightening of US monetary policy could also lead to a reduction in capital flows to the emerging economies. Higher interest rates in the United States and greater global risk aversion, coupled with a possible appreciation of the dollar, would curb capital flows to the emerging economies. In the current situation, the Ukraine war could give rise to a substantial increase in commodity prices, with a favourable effect on capital flows to commodity-exporting economies.[7] Were all these events to occur at the same time (an unexpected 100 bp rise in US policy interest rates, greater global risk aversion, an appreciation of the US dollar and an increase in commodity prices), portfolio capital outflows could

Chart 1
IMPACT OF A RISE IN US INTEREST RATES ON GDP GROWTH (a)

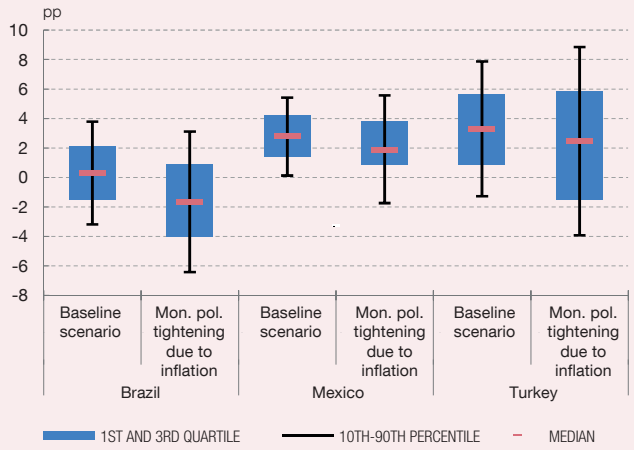


Chart 2
CURRENT ACCOUNT BALANCE (% OF GDP)

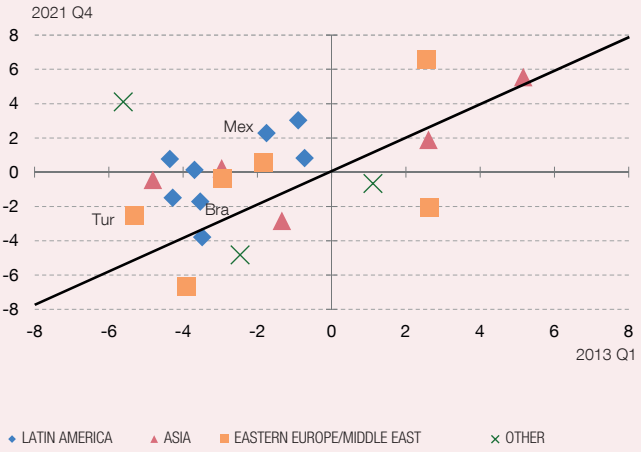


Chart 3
GOVERNMENT DEBT (% OF GDP)

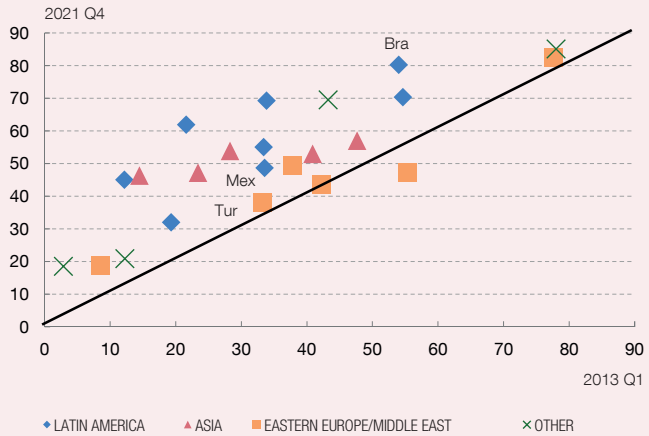
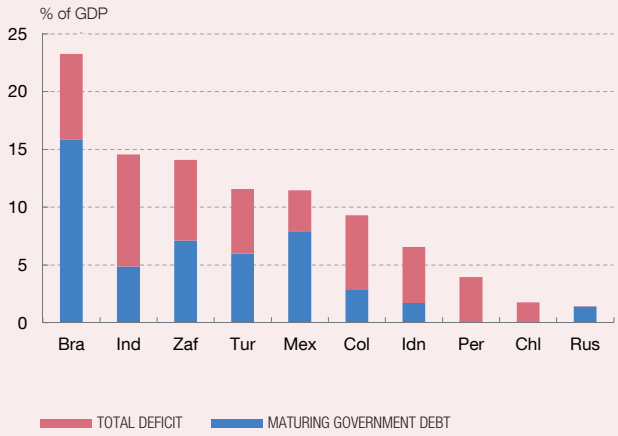


Chart 4
PUBLIC SECTOR FINANCING NEEDS (b)



SOURCES: Banco de España calculations, Felbermayr et al. (2021) and BIS (end-September 2021).

a Estimated impact of an increase in the US policy interest rate 100 bp above market expectations, based on vector autoregressive models.
b Sum of government deficit and government debt expected to mature in 2022.

7 Since the beginning of the war, the aggregate index for commodities rose by 17%, with oil increasing by 11% and wheat by 27%.

amount to around 0.2% of the combined GDP of the emerging countries included in the estimation (approximately $63 billion, or 20% of their portfolio inflows in 2019). However, the impact on Latin American countries could be slightly lower, as their status as commodity exporters means that commodity price increases lead to capital inflows into the region. By contrast, the adverse effect would be somewhat larger on energy-importing countries, such as Turkey, and on the most vulnerable economies (see Chart 5).[8] These amounts are similar to those seen during certain previous episodes of stress, such as the peak of the COVID-19 pandemic at the beginning of 2020 or China's stock market crash in 2015.

Lastly, the combination of tighter global financial conditions, lower GDP and foreign demand growth, and reduced capital flows could have an impact on credit to the private sector, which is of particular interest given Spanish banks' exposure to the three economies addressed in this box. The probability distribution for real credit would shift slightly to more negative values. Additionally, the estimated median in Brazil would stand below the growth figure for 2021, while in Turkey this rate would be lower with more than 90% probability (see Chart 6).[9] The relative stability of real credit stems from the offsetting of the expansionary effects of higher inflation by the contractionary pressure from lower real activity.

Chart 5
IMPACT ON PORTFOLIO CAPITAL FLOWS (c)

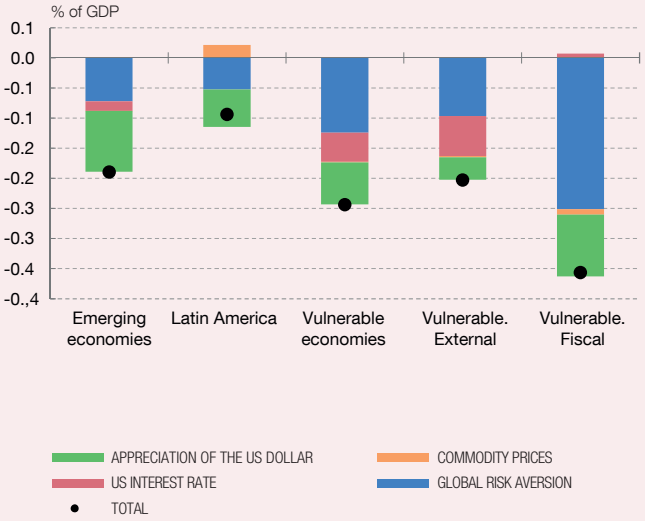
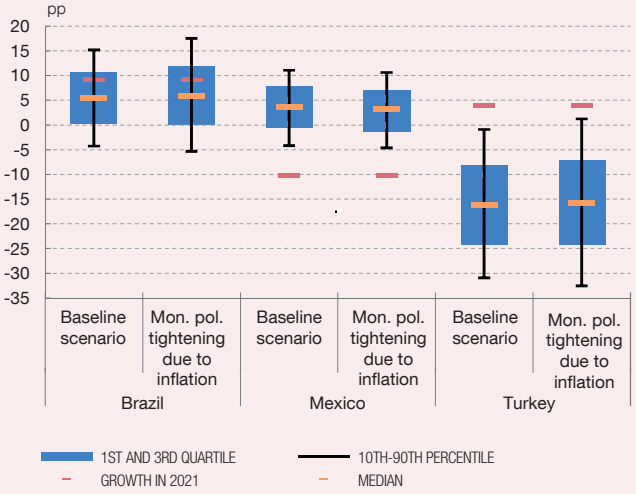


Chart 6
IMPACT ON REAL CREDIT GROWTH (d)



SOURCES: Banco de España calculations, Felbermayr et al. (2021) and BIS (end-September 2021).

c Result of estimating a quarterly panel model for 23 emerging economies since 1999 (see Molina and Viani, 2019) simulating the impact of a rise in US policy rates (100 bp) accompanied by an increase in global risk aversion (132 bp), an appreciation of the US dollar (4.1%) and an increase in commodity prices (15.2%), based on historical correlations between federal fund rates and the first two variables, and on the change in the commodity price index during the first week of the war.
d Estimated change in real credit under each of the GDP scenarios represented in Chart 1, based on vector autoregressive models.

8 These estimates are derived from the updated model presented in L. Molina and F. Viani (2019), "Capital flows to emerging economies: recent developments and drivers" for portfolio flows – based on quarterly data for a panel of 23 emerging economies for the period 1999-2021 – using the Federal Reserve interest rate instead of Federal rate expectations, and calculating with an auxiliary model the reaction of global risk aversion to a 100 bp increase in policy interest rates (it would rise by 132 bp) and the reaction of the dollar exchange rate should interest rates and global risk aversion rise at the same time (a 4% appreciation). The increase applied to commodity prices is that observed in the short-term futures for the global commodity price index from the start of the war to the peak recorded on 15 March 2022 (15.2%). The group of vulnerable economies includes those whose external (international reserves and current account balance) and fiscal (public debt and budget deficit) vulnerability indicators stand in the 90th percentile of the tail risk of the frequency distribution for the entire sample used in the estimation.

9 The paths are derived by applying the scenarios shown in Chart 1 of this box to a set of VAR models for credit growth. See Buesa and Molina (2022), "Credit to private sector forecasting in material countries for Spanish banks: a first approach using a BVAR model", forthcoming.

Box 1.3

MACRO-FINANCIAL RISK SCENARIOS FOR THE STRESS TEST ANALYSIS

Russia's invasion of Ukraine poses significant risks to the macroeconomic and financial environment. These affect both the Spanish economy and the international environment, in particular economies abroad that are important to Spanish banks' business, and have a greater impact on certain economic sectors. This box considers hypothetical scenarios in which the risks to the Spanish financial system's stability identified after the outbreak of the conflict materialise and have a severe impact. Unlike the projections described in the body of this chapter, these scenarios do not provide information on how the economy and the financial environment are expected to perform; instead, they model the impacts (i.e. the changes in macroeconomic and financial variables) that would arise should extreme events, with a much lower probability of occurrence, materialise.[1] The use of this type of extreme scenario is consistent with the goals of prudential regulation, which requires that banks have enough capital to absorb unexpected losses. This ability to maintain their capital adequacy under different scenarios, including those that are farthest away from the baseline expectations, is key to ensuring that financing keeps flowing to households and firms, and to preventing the amplification of the different types of shocks that may impact our economy.

The two adverse scenarios for the Spanish economy assume a series of shocks that exacerbate some recent developments, mainly those related to Russia's invasion of Ukraine and the consequent increase in energy and other commodity prices. The effects of this intensification also spill over to the conditions in the Spanish financial system and to agents' confidence. Impacts on a wide range of economic and financial variables for 2022 and 2023 are drawn from these considerations.

In the case of the adverse scenario, these shocks include a further increase in the energy price and the bottlenecks in international trade having greater effects on European and Spanish prices as a whole. This drives up both headline and underlying inflation and, as a result, the monetary policy response speeds up. In addition, financing conditions deteriorate, which materialises in further increases in Spain's sovereign risk premium and in the spreads in bank lending to households and firms. Furthermore the value of the assets that make up household wealth decreases, with significant declines in both stock prices and house prices.

The severe scenario slightly increases the size of the price shocks compared with the adverse scenario, but the former's main characteristic is the incorporation of a more pronounced worsening of households' and firms' confidence, which causes further falls in the main domestic demand variables (household consumption, housing investment and investment in capital goods). Under this scenario of a greater fall in demand and activity, there is a further rise in risk premia and a greater spread between short and long-term financing conditions and between the yields required on risky assets and safe assets. All these shocks are calibrated quantitatively on the basis of the different variables' recent and historical volatility, with the aim of creating markedly adverse, but plausible, scenarios. Following the usual practice in these exercises, the effect of all these shocks on the macroeconomic projections for the Spanish economy is obtained via simulations conducted using the Quarterly Macroeconometric Model of the Banco de España (MTBE).[2]

A further marked increase in the average year-on-year growth of inflation of up to 3.2 pp (3.6 pp) would be recorded in Spain in 2022-2023 under the adverse (severe) scenario. This general increase in prices would be accompanied by lower GDP growth, with average downturns of 2.8 pp and 5.4 pp under the adverse and severe scenarios, respectively, in addition to a slowdown in house prices, resulting in respective impacts on their average growth in 2022-2023 of -5.3 pp and -8.6 pp, respectively (see Chart 1). The scenarios also capture a deterioration in the financial environment, with increases in short and long-term interest rates and falls in stock market prices (see Chart 2). Under the adverse scenario

1 The use of severe scenarios, which are plausible but have a relatively low probability of occurrence, is an integral characteristic of the main international stress testing exercises. See the scenarios in the EBA's latest European exercise, *"EU Wide Stress Test Exercise (2021)"*, or the scenarios recently defined by the Federal Reserve System for its next exercise, *"2022 Stress Test Scenarios"*.

2 See A. Arencibia Pareja, S. Hurtado, M. de Luis López and E. Ortega (2017), «New version of the Quarterly Model of Banco de España (MTBE)», *Occasional Paper* No 1709, Banco de España.

there is a greater increase in short-term interest rates (2.2 pp for the 12-month EURIBOR), whereas under the severe scenario the greater weakness of demand leads to a smaller rise therein (0.9 pp for the 12-month EURIBOR). The increase in long-term interest rates considered under both scenarios is notable. For example, the average ten-year sovereign bond yield rises by 2.6 pp and 3.0 pp under the adverse scenario and severe scenario, respectively. This contrasts with the type of scenarios envisaged in the exercises of recent years, where, amid low equilibrium real interest rates and inflation that was below the central bank's target, financing costs practically did not increase.[3]

Higher energy commodity costs are one of the main risks crystallised under the adverse scenarios. The input-output tables for the Spanish economy are used to model the uneven impact of this shock on gross value added (GVA) growth in the different economic sectors, on the basis of how intensive energy consumption and production in each sector is. The transportation sector is the hardest hit in terms of nominal GVA under the adverse scenarios, due to its high fuel consumption, which becomes more expensive and squeezes its profitability. Other sectors that are more reliant on energy inputs, such as crop and animal production and certain manufacturing segments, are also relatively harder hit than the average (see Chart 3). The measures recently approved by the Government subsidising a portion of the cost of oil-related products for final consumers will alleviate these impacts. First, demand for oil-related products will decline less. Second, the producer prices of the hardest-hit sectors will rise more moderately and, as a result, demand for the products will also decrease less. The fiscal cost of these measures counterbalances these benefits.

Similar to Spain's case, the adverse scenarios for the foreign economies that are important to Spanish banks are calibrated so that their severity is consistent with the impact of the shocks on the Spanish economy. Internationally, short and long-term interest rates increase in all countries (see Chart 4). Interest rates reaching high levels in some emerging market economies (Brazil and in particular Turkey) under these scenarios reflects their response to inflationary pressures and the rise in risk premia. A further increase in average inflation in 2022-2023 of 5.6 pp (6.2 pp) for Brazil and of 34.3 pp (37.9 pp) in the case of Turkey is projected

Chart 1
ADVERSE AND SEVERE SCENARIOS FOR SPAIN. MACROECONOMIC IMPACT (a)

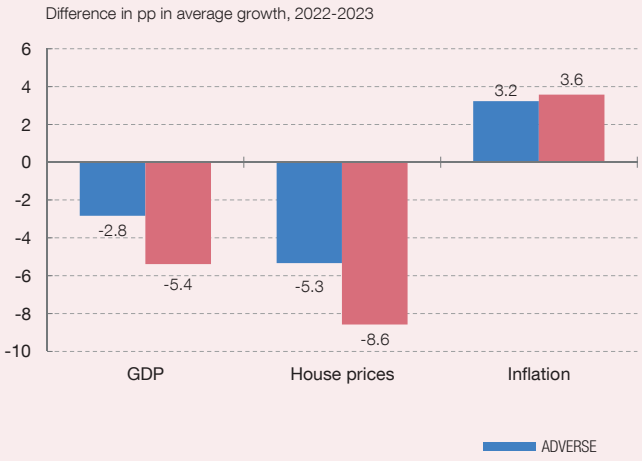
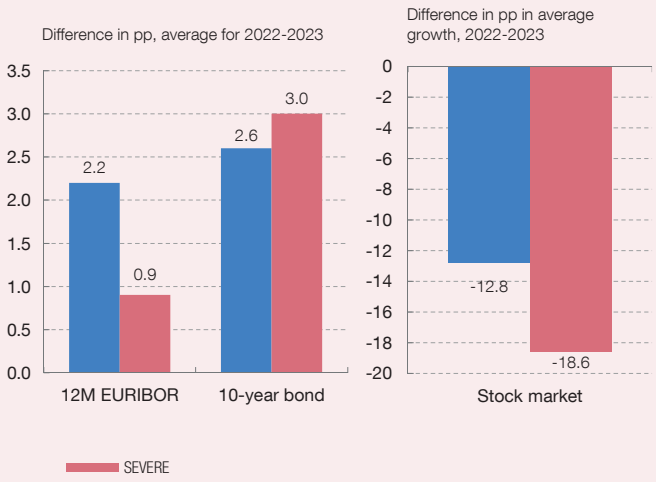


Chart 2
ADVERSE AND SEVERE SCENARIOS FOR SPAIN. IMPACT ON THE FINANCIAL ENVIRONMENT (a)



SOURCE: Banco de España.

a Impacts are defined as the differences in pp in the values of the variables shown compared with the central projections of the analysis.

3 See, for example, the above-mentioned scenario for the EBA's 2021 exercise, *"EU Wide Stress Test Exercise (2021)"*.

under the adverse (severe) scenario. The increase in inflation is widespread and also affects advanced economies. For example, in the case of the United States and the United Kingdom, inflation increases on average in this two-year period by an additional 2.3 pp (2.6 pp) under the adverse (severe) scenario.

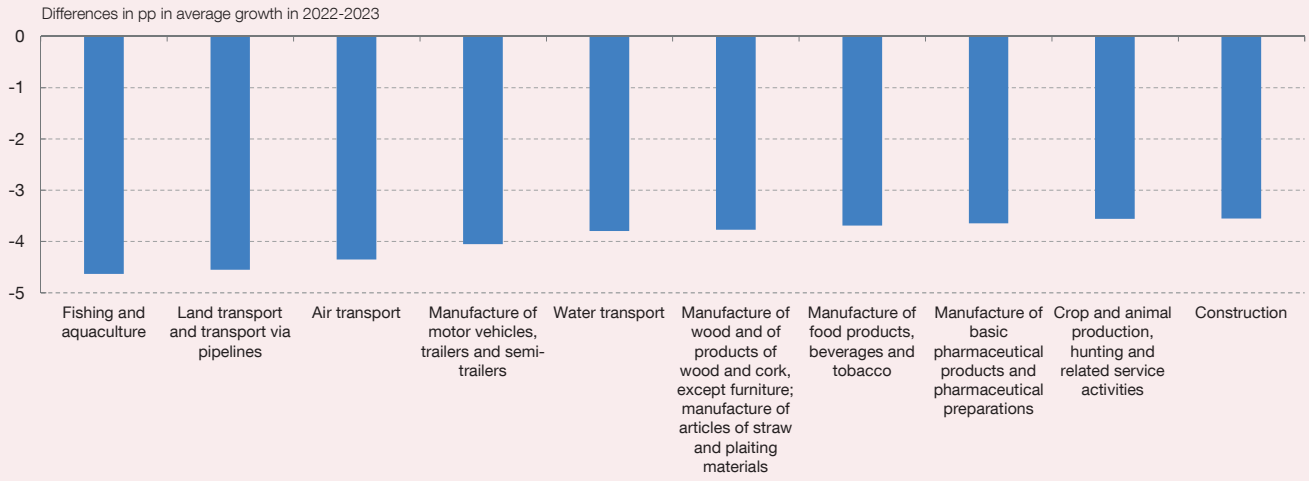
Under both alternative scenarios, real GDP growth falls across the board in the different economies considered (see Chart 5) and the unemployment rate rises. However, the impact is greater on the emerging market economies, which are hit harder by the increase in global uncertainty and the tightening of financing conditions, and experience marked declines in real GDP in some cases (particularly Turkey, whose average growth in 2022-2023 is up to 12.2 pp less under the severe scenario).

The differences in the impact on activity in the emerging market economies are in part a reflection of commodity price developments. Thus, some of the countries considered are net commodity exporters, while others are net importers. This results in the fall in GDP in the Latin American countries (excluding Mexico) being mitigated, as the effects of greater global uncertainty are offset by improvements in their terms of trade. As Turkey is more reliant on energy imports, the opposite effect arises and growth contracts more sharply.

Another important difference across the economies stems from changes in exchange rates. In emerging market economies like Mexico and Brazil, the simulated cumulative impact of currency depreciation due to higher global uncertainty is of approximately 15% (30%) in 2022-2023 under the adverse (severe) scenario and of around 50% for other emerging market economies such as Turkey and Argentina. With regard to the advanced economies outside the euro area, exchange rate shocks are not considered.

Overall, the scenarios consider some markedly adverse macro-financial impacts that are far from the baseline expectations for the Spanish and global economies. While these impacts are unlikely to materialise, they are not implausible. The scenarios thus enable a rigorous analysis of the resilience of the banking sector, and of other sectors to which the scenarios might apply, to the risks faced in the current geopolitical crisis setting.

Chart 3
EFFECT OF THE SEVERE SCENARIO ON NOMINAL GVA GROWTH IN 2022-2023 IN THE 10 HARDEST-HIT SECTORS (a)



SOURCE: Banco de España.

a For the stress tests, impacts on real GVA are used. To take into account the higher prices in energy sectors, the paths to be included in the projection are adjusted.

MACRO-FINANCIAL RISK SCENARIOS FOR THE STRESS TEST ANALYSIS (cont'd)

Chart 4

ADVERSE AND SEVERE SCENARIOS FOR FOREIGN ECONOMIES. IMPACT ON LONG-TERM INTEREST RATES

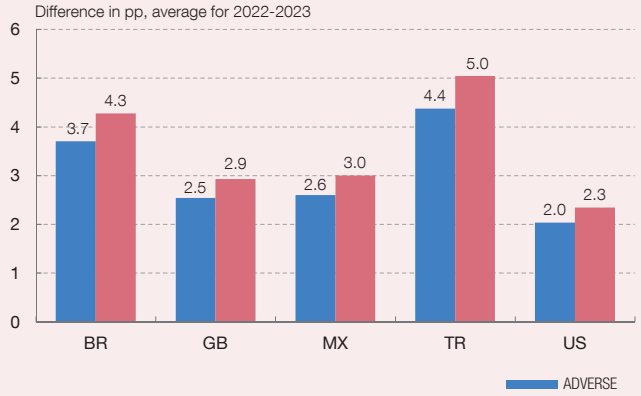
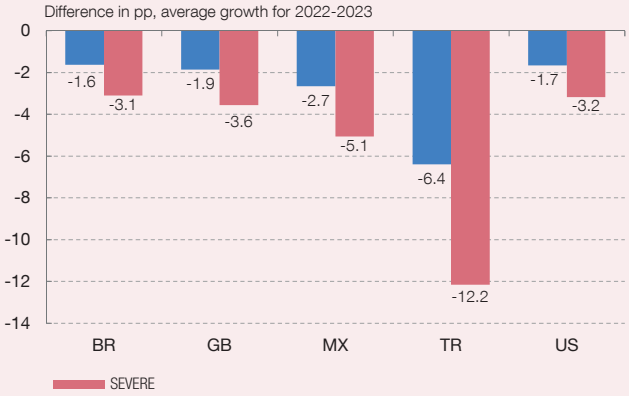


Chart 5

ADVERSE AND SEVERE SCENARIOS FOR FOREIGN ECONOMIES. IMPACT ON GDP GROWTH



SOURCE: Banco de España.

Box 1.4

IMPACT OF THE RISING COST OF ENERGY ON SPANISH FIRMS' ECONOMIC AND FINANCIAL POSITION

In recent months energy prices have continued to increase, largely as a consequence of the outbreak of war in Ukraine, prolonging the upward trend observed during 2021. This has been accompanied by a notable increase in the volatility of such prices, reflecting uncertainty about future energy price developments, largely stemming from doubts as to the duration of the war and its possible escalation. As a result, the implicit average energy prices in the baseline scenario have been revised up in the latest Banco de España macroeconomic projections, published in April.[1] Specifically, it is assumed that their average level for 2022 and 2023 will be 22% and 25% higher, respectively, than in the December 2021 macroeconomic projections.

This box analyses the impact of this increase in energy prices on Spanish firms' economic and financial position. This is done based on individual firms' position in 2020, drawing on the information in the Central Balance Sheet Data Office integrated database, and on a simulation for the following two years consistent with the macroeconomic projections published by the Banco de España in December 2021, which make up the counterfactual baseline scenario. The energy price shock has been applied to this scenario at the sectoral level. Thus, the changes in firms' purchases and sales due to the increase in energy prices are assumed to be the same for all of the firms in each of the 44 sectors considered. Such changes have been taken from the results of a general equilibrium sectoral model.[2] These exercises make it possible to evaluate, first, the impact of the shock on the part of the margin included in gross value added (GVA) in nominal terms (the difference between sales revenue and the costs associated with purchases of materials and energy consumption). This exercise considers both the direct effect of the increase in energy costs and its indirect effect on the rest of the inputs associated with the production chains. GVA per unit of output is assumed to remain constant for the average of each sector.[3] At the individual level, the impact on GVA captures both price and quantity effects, since demand is assumed to contract as a result of higher sale prices.

Chart 1 shows the impact on firms' nominal GVA in 2023 and compares it with a counterfactual scenario where energy prices follow the path projected in December 2021. The chart shows the changes in each sector's GVA in relative terms, in relation to pre-shock sales. It can be seen, first, that practically all sectors would be negatively affected by this shock, albeit moderately. Fishing and aquaculture would see the largest fall in GVA, with a cumulative decline over these two years equivalent to 1.6% of turnover. Some of the sectors hardest hit by the COVID-19 crisis (marked in red), such as maritime transport and air transport, are also among those most affected by this shock. Lastly, the chart also shows that one sector (extraction of crude petroleum and natural gas) would benefit from the increase in energy prices.

The expected changes in two indicators that approximate the impact of rising energy prices on firms' financial vulnerability are analysed below. These indicators measure, respectively, the increase in the share of firms with negative profitability and of highly indebted firms in the corporate sector's gross debt.[4] It has also been assumed that rising energy prices will lead to a slight rise in wages, in line with the results of a macroeconomic model.[5] The results of these exercises are summarised in Charts 2 and 3. Based on the simulations conducted, financial vulnerability is expected to rise relatively moderately as a result of the shock: by just over 3 percentage points (pp) in the case of firms with negative profitability and by more than 2 pp in that of highly indebted companies, in each of the two years analysed (2022 and 2023). This increase is substantially smaller than the one seen in 2020 as a result of the COVID-19 crisis (over 10 pp in both cases). Financial vulnerability is

1 See the Banco de España's April 2022 "Macroeconomic projections for the Spanish Economy (2022-2024)".

2 This is a general equilibrium sectoral production model of an open economy that captures the interactions across sectors (divided into 44 categories) and countries. The calibration of the model also takes into account firms' ability to substitute different inputs and factors of production, which is relatively limited in the case of energy. The trade flows between sectors and countries that are needed to calibrate each sector's production requirements and the input-output relationships are estimated using the 2018 ICIO tables. These tables have information on purchases and sales between 44 sectors for the 65 countries in the sample (plus a "rest of the world" category), and on their sales to final consumers. The parameters for the elasticities of substitution between the different sectors are taken from estimates in the scientific literature. For more information, see J. Quintana (2022), "Consecuencias económicas del cierre comercial entre Rusia y la Unión Europea", *Artículo Analítico,* Banco de España (forthcoming).

3 In other words, it is assumed that, on average in each sector, firms pass on their higher input costs to their customers.

4 Firms are understood to be highly indebted where their ratio of net financial debt / (gross operating profit + financial revenue) is higher than 10 or if they have positive net financial debt and zero or negative earnings.

5 Specifically, the Quarterly Macroeconometric Model of the Banco de España (MTBE) has been used.

therefore expected to continue falling in 2022 and 2023, prolonging the trend that started in 2021, albeit at a slower pace than had been anticipated in the December 2021 projections.

The last two charts contain a breakdown of the sectors whose financial vulnerability is expected to deteriorate most due to rising energy prices, based on the two indicators analysed. The shock has notably disparate effects. Thus, while the impact on firms overall stands at just over 2 pp, it is expected to top 5 pp in the three most affected sectors. As expected, the sectors whose financial vulnerability is expected to rise most include some whose margins would be hardest hit, such as wholesale and retail trade and repair of motor vehicles, land transport, fishing and agriculture. Nonetheless, the degree of financial vulnerability is also expected to rise by more than the average in some sectors in which the impact on sectoral margins is comparatively small, such as metallurgy, in the first indicator, or publishing, cinema, television and radio, in the second. This is largely because before the shock, some of the firms in such sectors were already hovering around the thresholds determining vulnerable status.

In any event, it should be borne in mind that these simulations do not capture other significant adverse effects of the war in Ukraine, and can therefore be deemed to represent a lower bound for the impact of this event on the financial position of firms. Notable examples of these additional effects include, first and foremost, those relating to falling economic confidence and to the trade channel (drop in exports). In addition to the effect on production chains of the shocks analysed in his box, the rising price of energy may also affect margins if it leads to a larger fall in demand than that considered here. Indeed, it has already been observed that inflation is eating into households' gross disposable income, while undermining consumer confidence. Lastly, the financial position of firms may also be adversely affected by a

Chart 1
IMPACT OF A CUMULATIVE 25% RISE IN ENERGY PRICES ON VALUE ADDED IN 2023
With respect to the sales under the counterfactual scenario

SOURCE: Banco de España.

a The sectors severely affected by COVID-19 are defined as those whose sales in 2020 fell by more than 15%.

potential increase in financing costs, should monetary policy be tightened in response to rising inflation. These additional factors fall outside the scope of this box (which aims to identify the most direct channel through which energy prices affect firms' financial positions) and are included in the macro-financial risk scenarios described in Box 1.3

Chart 2
SHARE OF FIRMS WITH NEGATIVE PROFITABILITY IN TOTAL GROSS DEBT (a)

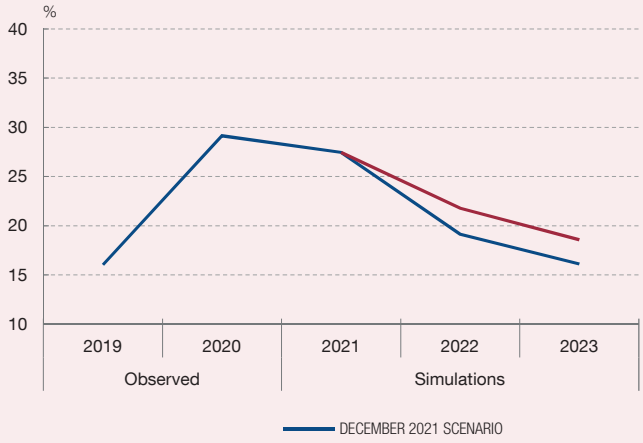


Chart 3
SHARE OF FIRMS WITH HIGH DEBT LEVELS IN TOTAL GROSS DEBT (c)

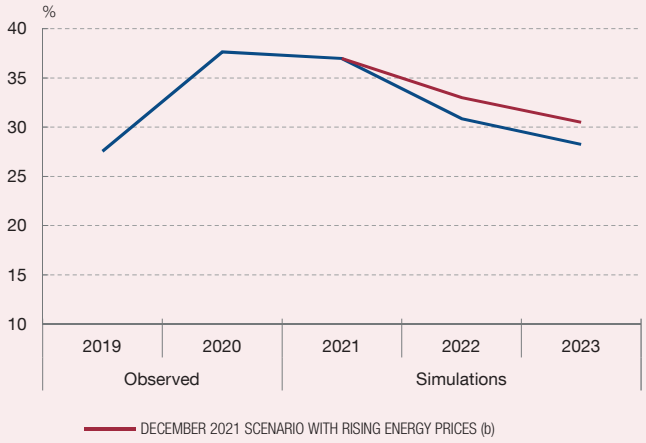


Chart 4
FIRMS WITH NEGATIVE PROFITABILITY IN 2023. CHANGE IN THEIR SHARE IN THE TOTAL GROSS DEBT DUE TO RISING ENERGY PRICES. SECTORS WITH THE LARGEST INCREASE (a) (b)

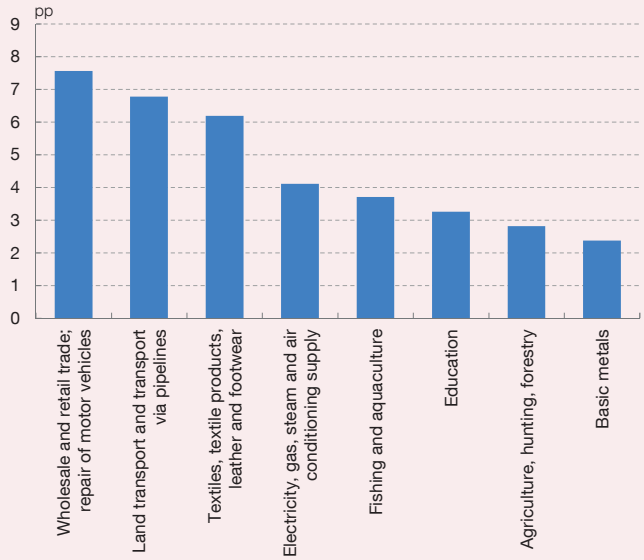
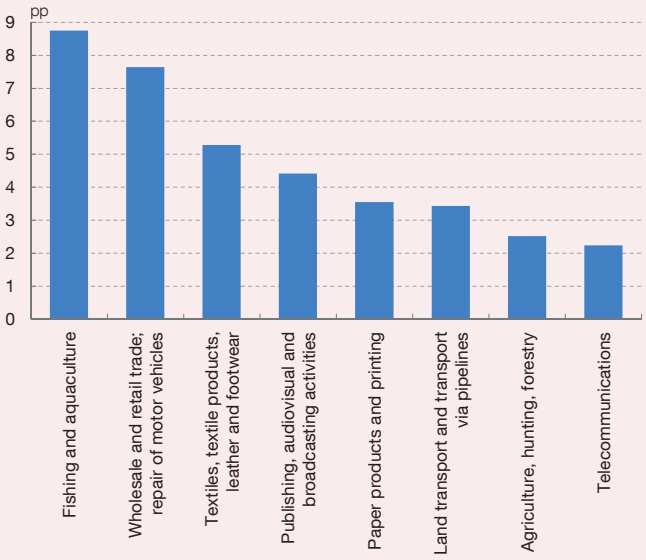


Chart 5
HIGHLY INDEBTED FIRMS IN 2023. CHANGE IN THEIR SHARE IN THE TOTAL GROSS DEBT DUE TO RISING ENERGY PRICES. SECTORS WITH THE LARGEST INCREASE (b) (c)



SOURCE: Banco de España.

a Profitability is defined as (ordinary net profit + financial costs) / assets net of non-interest-bearing borrowing.
b A 22% rise in energy prices has been assumed for 2022, with an additional 3% in 2023.
c Highly indebted firms are defined as those whose net financial debt / (gross operating profit + financial revenue) ratio is greater than 10 or which have positive net financial debt and zero or negative earnings. Net financial debt is defined as interest-bearing borrowing minus liquid assets and short-term financial investments.

2

RISKS TO THE FINANCIAL SECTOR AND ITS RESILIENCE

The moderation of bank lending in Spain observed in 2021 H1 continued in H2. The subdued growth in lending to firms last year, essentially explained by demand-side factors, offset more expansive developments in loans to households, driven by stronger momentum in loans for house purchase. The profitability of Spanish banks recovered notably in 2021 across the main countries where they operate, supported by a positive change in extraordinary items and lower provisioning. The banking sector's common equity tier 1 ratio (CET1) held relatively stable last year, after increasing in 2020. Despite this positive performance, latent credit risks persist, associated in particular with a higher proportion of Stage 2 loans, concentrated in the sectors hardest hit by the COVID-19 pandemic. Spanish financial intermediaries' direct credit exposures to Russia are very limited, but the deteriorating macroeconomic outlook, as a consequence of Russia's invasion of Ukraine, and the inflation dynamics, are likely to increase the probability of these risks materialising and their impact on the banking sector. The results of the stress tests show the banking sector to have satisfactory aggregate resilience in terms of solvency. However, a high degree of materialisation of the macrofinancial risks identified would entail a reduction in the average CET1 ratio, mainly owing to credit quality impairment in scenarios of both rising interest rates and slowing economic activity.

2.1 Deposit institutions

2.1.1 Balance sheet structure, risks and vulnerabilities

Credit risk

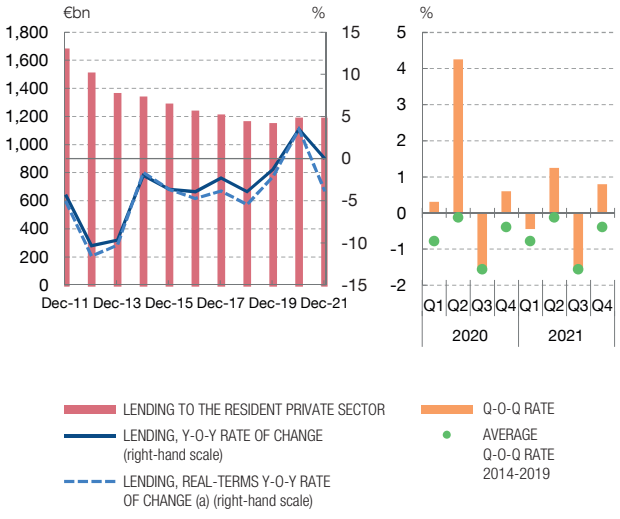
The outstanding stock of loans extended by deposit institutions in Spain to the resident private sector declined slightly in 2021, with a year-on-year nominal fall of 0.1%. This performance contrasts with the robust growth recorded in 2020, fostered in part by the policies implemented to mitigate the effects of the pandemic. Given that inflation in Spain rose significantly in 2021, there was a sharp decline in credit in real terms (-4% year-on-year). This high inflation could affect the decisions of lenders and borrowers and lead to a redistribution of the real cost of debt among them. The stability of the nominal stock of loans was bolstered by the reduction in new lending observed in 2021 as compared with 2020 (see Chart 2.1.2). The bulk of this decline came in new loans to non-financial corporations (NFCs) and sole proprietors, which more than offset the increase in new loans to households. As

Chart 2.1

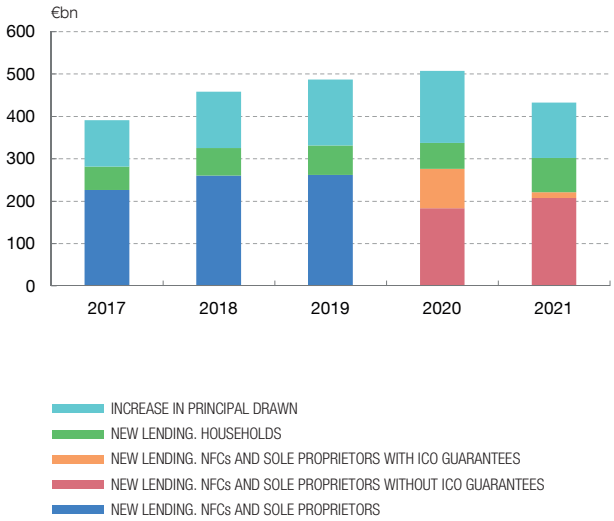
LENDING TO THE RESIDENT PRIVATE SECTOR DECLINED SLIGHTLY IN 2021, SINCE THE MODERATION IN NEW LENDING TO NFCs AND SOLE PROPRIETORS OFFSET THE MORE EXPANSIVE PERFORMANCE OF LENDING TO HOUSEHOLDS

Lending to the resident private sector, which had grown in the first year of the pandemic, fell slightly in 2021. Contributing to this was the decline in new State-backed loans to NFCs and sole proprietors, which offset the increase in new loans to households. Owing to the sharp increase in prices observed last year, credit developments were negative real terms (-3.9% year-on-year).

1 VOLUME OF LENDING AND YEAR-ON-YEAR RATE OF CHANGE
Business in Spain, ID



2 VOLUME OF NEW LENDING IN THE YEAR.
HOUSEHOLDS, NFCs AND SOLE PROPRIETORS
Business in Spain, ID



SOURCES: Instituto de Crédito Oficial and Banco de España.

a The "lending, real-terms rate of change" series is obtained taking into account its composition, deflating the portion of lending extended to households using CPI and other credit (NFCs, financial corporations and sole proprietors) using the GDP deflator.

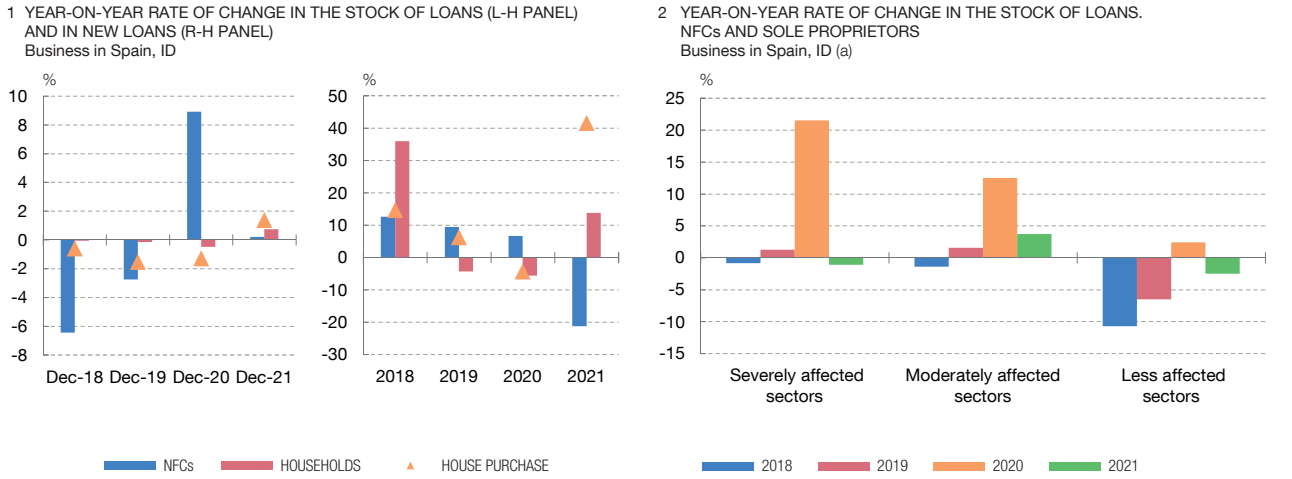
the ICO guarantee programme roll-out neared its end there was a substantial reduction in new guaranteed loans. However, the programme launched at the end of March 2022, associated with the armed conflict in Ukraine, could reverse that trend. The growth in principal drawn down on existing transactions also eased as compared with the previous year.

The stock of loans to households increased moderately in 2021, driven by strong growth in new lending for house purchase, while the stock of loans to NFCs and sole proprietors stabilised at the previous year's levels. In 2021, the stock of loans for house purchase grew 1.2% year-on-year, which prompted a positive change for households as a whole (0.6%) for the first time in recent years (see Chart 2.2.1). New lending for house purchase showed robust growth of 41.5% on 2020, while also standing 35.2% higher than in 2019. New loans to NFCs and sole proprietors as a whole declined by 21.6% as compared with a year earlier. Loans to NFCs and sole proprietors grew only in the sectors moderately affected by

Chart 2.2

THERE WAS A SIGNIFICANT INCREASE IN NEW LENDING FOR HOUSE PURCHASE IN 2021, PAVING THE WAY FOR A MODERATE INCREASE IN THE STOCK OF LOANS TO HOUSEHOLDS, WHILE CORPORATE LENDING HELD RELATIVELY STABLE ACROSS THE DIFFERENT SECTORS

The stock of loans to households showed slight year-on-year growth for the first time in recent years, owing to the performance of loans for house purchase. This was observed more robustly in new lending. The stock of loans to NFCs and sole proprietors held stable in 2021, growing only to some extent only in the sectors moderately affected by the pandemic and declining in the rest.



SOURCE: Banco de España.

a Lending to the more severely affected sectors is proxied by that corresponding to sectors with a fall in turnover of more than 15% in 2020 and that can be identified in the FI-130 regulatory return. Specifically, lending to the more severely affected sectors includes hospitality, manufacture of refined petroleum products, social services and entertainment, transportation and storage, and manufacture of transport equipment. Lending to moderately affected sectors is proxied using the following sectorisation in the FI-130 regulatory return: metallurgy, manufacture of machinery, other manufacturing activities, professional services, mining and quarrying, wholesale and retail trade, and repair of vehicles. Other productive activities are in the largely unaffected sectors.

the pandemic[1] (see Chart 2.2.2). Part of the decline in the most severely affected sectors can be explained by lower financing needs in the year and the build-up of liquidity reserves in 2020, when they were the primary objective of public policies geared towards maintaining the flow of credit in the economy.[2] In this regard, it should be noted that ICO-backed loans were extended under highly advantageous maturity conditions for firms, which will reduce their refinancing requirements in the years ahead. In any event, more cautious lending policies with these sectors may also have contributed to these developments.

1 Lending to the hardest-hit sectors is proxied by that corresponding to the sectors with a fall in turnover of more than 15% in 2020 and that can be identified in the FI-130 regulatory return. Specifically, lending to the most severely affected sectors includes hospitality, manufacture of refined petroleum products, social services and entertainment, transportation and storage, and manufacture of transport equipment. Lending to the moderately affected sectors is proxied using the following sectorisation in the FI-130 regulatory return: metallurgy, manufacture of machinery, other manufacturing, professional services, mining and quarrying, wholesale and retail trade, and repair of vehicles. All other productive activities make up the largely unaffected sectors.

2 See R. Barreira, S. Mayordomo, I. Roibás and Manuel Ruiz-García (2022), "Recent developments in lending to non-financial corporations: supply and demand factors", Analytical Article, *Economic Bulletin* 1/2022, Banco de España.

Non-performing loans (NPLs) continued to decrease in 2021 and at a faster pace than observed in 2020, while the NPL ratio likewise remained in decline. In the last year, NPLs to the resident private sector stood at €49.3 billion, down 5.4% on the previous year[3] (see Chart 2.3.1). This meant more intense balance sheet restructuring than in 2020, although the reduction remained far smaller than in the years leading up to the COVID-19 pandemic. In any event, the data confirm a singular NPL performance as compared with previous crises in the Spanish economy, given that the severe macroeconomic deterioration has not triggered aggregate NPL increases. The economic policy measures implemented during the current crisis have proven crucial in maintaining the ability to repay of households and, in particular, of NFCs and sole proprietors. Against this background, the NPL ratio for credit to the resident private sector stood at 4.2% in December 2021, down 0.2 pp on the previous year, although the pace of decline in this ratio has been easing in recent years, mainly due to the slowing reduction in NPLs. In 2021, the stability in the volume of credit also contributed to curb the decline in the ratio, in contrast to 2020 when the credit expansion tended to drive down the ratio. The reduction in NPL volume and NPL ratios in 2021 was recorded both for households and for NFCs and sole proprietors, but was more moderate for households due to a worse performance from the consumer credit segment.

Despite the good aggregate performance of NPLs, certain signs of impairment may presage an increase in troubled assets going forward. Stage 2 loans, which have a higher probability of default than performing loans,[4] continued to rise at elevated rates (14% year-on-year in December 2021), although notably below those of previous quarters (see Chart 2.3.2). In December 2021, Stage 2 loans accounted for 8% of the total loan portfolio, up 2.2 pp on pre-pandemic levels. The volume of forborne loans (likewise typically associated with possible repayment difficulties for borrowers), more than half of which are classified as non-performing, grew 14.3% year-on-year, compared with the decline of 9% observed in December 2020. This growth in forborne credit came exclusively in the NFCs and sole proprietors sector (30.6%), while a moderate decline was observed in the households sector (-3.4%).[5] In aggregate terms, forborne exposures accounted for 5% of total outstanding loans, the same percentage as prior to the pandemic.

The sectors most severely affected by the COVID-19 crisis continue to show the strongest signs of deterioration, which are particularly evident in Stage 2

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3 The application since 1 January 2021 of EBA guidelines (EBA/GL/2016/07) relating to the new definition of default pursuant to Article 178 of (EU) Regulation No 575/2013, has given rise to some differences in the amounts classified as "NPLs for accounting purposes" (accounting definition contained in Banco de España Circular 4/2017) and "NPLs for prudential purposes" (according to the above-mentioned EBA guidelines). Specifically, on data to December 2021, "NPLs for prudential purposes" were around 12% higher than "NPLs for accounting purposes", which in absolute terms amount to an increase of approximately €6 billion.

4 Pursuant to Circular 4/2017, a loan is classified as a Stage 2 exposure when credit risk has increased significantly since initial recognition, but no event of default has occurred.

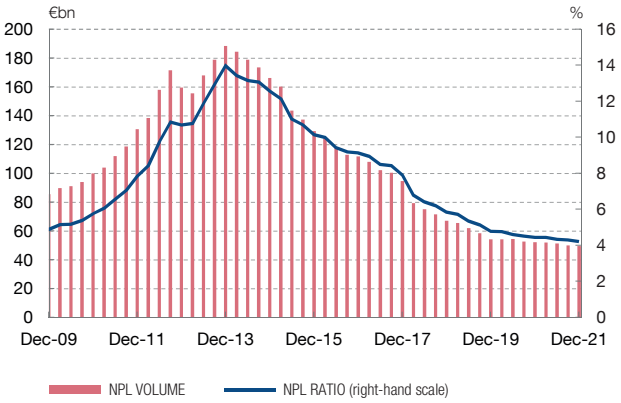
5 The increase in forborne loans largely corresponds to ICO-backed loans with term extensions pursuant to the provisions of Royal Decree-Law 34/2020.

Chart 2.3

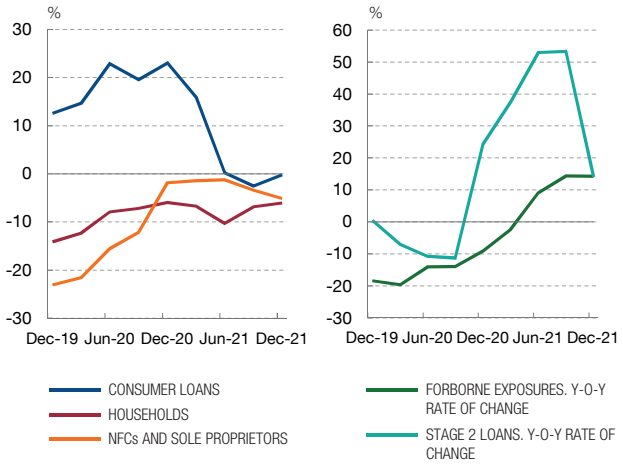
NPLS CONTINUED TO DECLINE IN 2021, ALTHOUGH AT A SLOWER PACE THAN IN THE YEARS PRECEDING THE PANDEMIC, AND EARLY SIGNS OF IMPAIRMENT PERSIST

NPLs to other resident sectors declined more quickly in 2021 than in 2020, although far more slowly than in the years leading up to the pandemic. The NPL ratio likewise declined, albeit more moderately than in recent years. Growth in forborne exposures stabilised, while that in Stage 2 assets moderated notably in 2021. However, the ratio of Stage 2 loans continued to rise, particularly in the sectors severely affected by the pandemic, where the NPL ratio also increased slightly. The credit quality of loans linked to expired moratoria deteriorated over 2021, both for those with and without mortgage collateral. In December 2021, 94% of the moratoria linked to loans to households had expired.

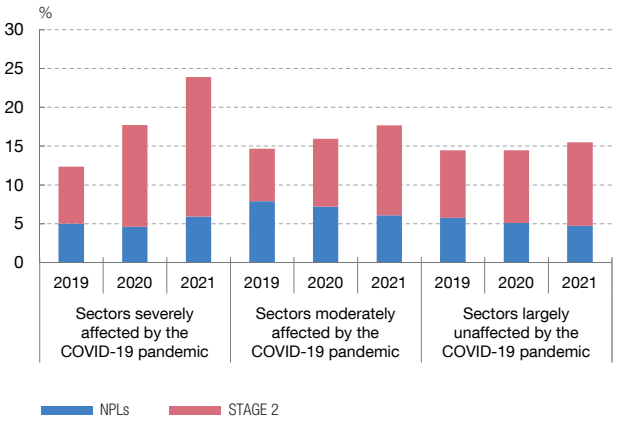
1 NPLs AND NPL RATIO OF THE RESIDENT PRIVATE SECTOR
Business in Spain, ID



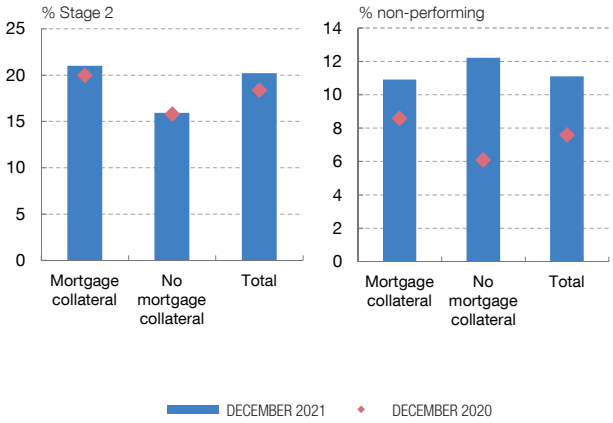
2 YEAR-ON-YEAR RATES OF CHANGE IN NPLs (L-H PANEL) AND SIGNS OF EARLY IMPAIRMENT IN LENDING TO THE RESIDENT PRIVATE SECTOR (R-H PANEL)
Business in Spain, ID



3 SHARE OF NON-PERFORMING AND STAGE 2 LOANS. NFCs AND SOLE PROPRIETORS
Business in Spain, ID (a)



4 STATUS OF LOANS WITH EXPIRED COVID-19 MORATORIA (b)
ID



SOURCE: Banco de España.

a Lending to the more severely affected sectors is proxied by that corresponding to sectors with a fall in turnover of more than 15% in 2020, which can be identified in the FI-130 regulatory return. Specifically, lending to the more severely affected sectors includes hospitality, manufacture of refined petroleum products, social services and entertainment, transportation and storage, and manufacture of transport equipment. Lending to moderately affected sectors is proxied using the following sectorisation in the FI-130 regulatory return: metallurgy, manufacture of machinery, other manufacturing activities, professional services, mining and quarrying, wholesale and retail trade, and repair of vehicles. Other productive activities are in the largely unaffected sectors.

b Includes at each date loans with expired moratoria under the different programmes implemented since April 2020 to mitigate the effect of the COVID-19 pandemic. Stage 2 loans present a significant increase in credit risk since origination, but without a default having occurred or any strong indication that a default will occur, in which case they would be classified as non-performing. These loans are both to households and NFCs, although the latter represent a small fraction of the total.

loans. In the hardest-hit sectors, NPLs increased as a proportion of total exposure as compared with the onset of the crisis (from 5% to 5.9%), whereas they declined in the other sectors (see Chart 2.3.3). However, the differences are more significant in Stage 2 loans, despite these growing across all sectors. The combined share of NPLs and Stage 2 loans in the sectors most severely affected by the pandemic reached 23.9% in December 2021, compared with 17.7% in the moderately affected sectors and 15.5% in the less affected sectors.

The credit quality of outstanding loans linked to expired moratoria deteriorated in 2021. The percentage of outstanding loans arising from expired or cancelled moratoria that are non-performing (see Chart 2.3.4) stood at 11.1% at end-2021 compared with 7.6% in 2020. Stage 2 loans increased from 18.4% to 20.2% in the same period. Despite this sharper deterioration, it should be noted that the total volume of loans that have benefited from some type of moratorium account for a low percentage of institutions' balance sheets.[6] Moreover, by December 2021, the moratoria had already expired for 94% of these loans and, therefore, there is very little scope for further impairment triggered by an increase in expired moratoria. In addition, confidence in this loan group's ability to pay without government support has grown over time since the moratoria expired, given that NPLs have remained in check. However, it should be noted that borrowers benefiting from this programme tend to be more vulnerable and may be especially affected by the materialisation of macroeconomic risks, in particular those arising from the conflict in Ukraine. The approval, at the end of March 2022, of measures to mitigate the economic effects of the conflict could limit the potential impact of such risks on these more vulnerable borrowers.

ICO-backed loans extended to firms and sole proprietors deteriorated further in 2021 H2. Specifically, the proportion drawn classified as Stage 2 (see Chart 2.4.1) increased to 20.2% in December 2021 (up 3.9 pp on June 2021), while the NPL ratio reached 3.5% (up 1.4 pp on June 2021). In the sectors hardest hit by the COVID-19 crisis and which may also be severely affected by the rising energy and food prices, the percentages of Stage 2 loans observed (e.g. 35.5% and 22.7% in hospitality and transport, respectively, in December 2021) are higher than for ICO loans overall; this is also true of NPLs (e.g. 6.5% and 4.5% in hospitality and transport, respectively, in December 2021). The percentages of ICO loans linked to customers whose bank loans as a whole show some sign of impairment (non-performing or Stage 2) are higher (see Chart 2.4.1), which could indicate financial weaknesses predating the COVID-19 crisis in some of these customers.

Firms that have opted for ICO loans and show signs of vulnerability may also find their credit quality further impaired by the effects of the armed conflict in

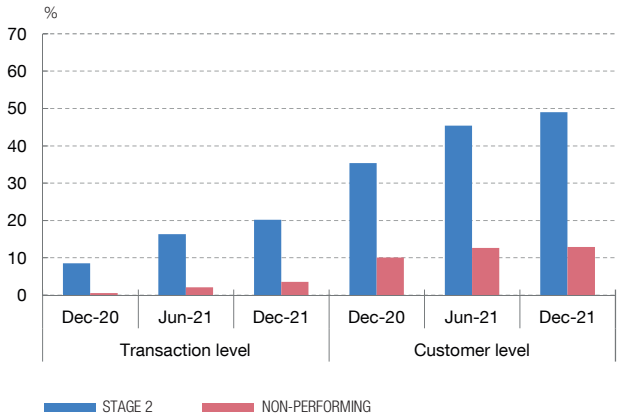
6 Loans subject to moratoria at any time following the onset of the pandemic amounted to €60.5 billion (somewhat less than 9% of all loans eligible for moratoria and around 5% of total loans to the non-financial private sector in December 2020).

Chart 2.4

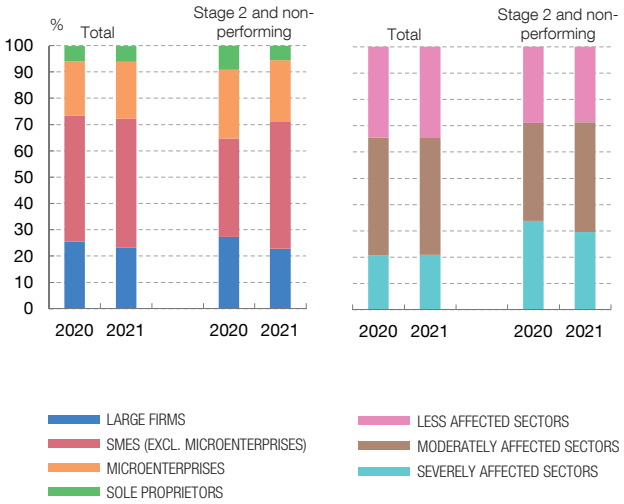
THE IMPAIRMENT OF THE ICO LOANS PORTFOLIO CONTINUED IN 2021 H2, ALBEIT AT A SLOWER PACE, WITH A HIGHER PROPORTION OF LOANS TO SMEs AND THE MODERATELY AFFECTED SECTORS CLASSIFIED AS NON-PERFORMING AND STAGE 2

The credit quality of ICO-backed loans continued to deteriorate, albeit at a slower pace than observed in the previous half-year period. The Stage 2 category continues to account for the bulk of the impairment. The pace of this impairment is uneven across portfolios, with a larger proportion concentrated in SMEs and in sectors moderately affected by the pandemic as compared with end-2020.

1 CREDIT QUALITY OF THE STOCK OF ICO-BACKED LOANS (a)



2 STAGE 2 AND NON-PERFORMING ICO LOANS. COMPOSITION BY SIZE (L-H PANEL) AND SECTOR (R-H PANEL) (b)



SOURCE: Banco de España.

a In the transaction-level analysis, the proportional volume of ICO-backed loans to firms and sole proprietors in non-performing or Stage 2 status is measured. The customer-level analysis assesses for each firm and sole proprietor with an ICO-backed loan their total drawn exposure in all financial transactions reported to the CCR, with any system institution. If any of the customer's transactions are troubled (Stage 2 or non-performing) above a minimal materiality threshold, they are flagged as impaired. Subsequently, the proportion is calculated of the volume of ICO-backed loans associated with customers that have any such flag for their credit transactions taken as a whole. In both the customer-level and the transaction-level approach, the proportion classified as either Stage 2 or non-performing is measured using the amount drawn in the terms described in each of the approaches.

b Lending to the more severely affected sectors is proxied by that corresponding to sectors with a fall in turnover of more than 15% in 2020 and that can be identified in the FI-130 regulatory return. Specifically, lending to the more severely affected sectors includes hospitality, manufacture of refined petroleum products, social services and entertainment, transportation and storage, and manufacture of transport equipment. Lending to moderately affected sectors is proxied using the following sectorisation in the FI-130 regulatory return: metallurgy, manufacture of machinery, other manufacturing activities, professional services, mining and quarrying, wholesale and retail trade, and repair of vehicles. Other productive activities are in the largely unaffected sectors.

Ukraine and by rising inflation, particularly in the sectors hardest hit by the latest crisis. However, the increase in the proportion of ICO loans linked to customers with some sign of impairment had moderated significantly by December 2021 compared with the previous half-year period (3.6 pp and 0.3 pp for Stage 2 loans and NPLs, respectively), showing a slower pace of impairment than at transaction level (see Chart 2.4.1). The relative share of total Stage 2 and non-performing ICO loans accounted for by SMEs and firms in sectors moderately affected by the pandemic grew over the course of 2021 (see Chart 2.4.2).

A factor that could increase the risk of credit impairment in ICO loans is the end of the interest-only period that a large portion of these loans have enjoyed.

Around 35% of ICO loans (in terms of volume of exposure) still benefit from interest-only periods which will come to an end, in most cases, in 2022 H2. It should also be noted that, at December 2021, an additional 22% of ICO loans are structured with a bullet payment at maturity, which notably reduces their debt burden until that date. On data to December 2021, recourse to the provisions envisaged in the code of good practice for the debt renegotiation framework provided for in Royal Decree-Law 5/2021 for customers with guaranteed loans has been fairly limited. Maturity extensions have been arranged for around 3,000 loans, representing somewhat less than €500 million.

Some of the measures adopted to mitigate the negative economic effects of the war in Ukraine will alleviate, in particular, the financial pressure to which firms with ICO financing are subject. The resolution adopted by the Council of Ministers on 29 March 2022 modified the framework of good practices of Royal Decree-Law 5/2021, establishing the following: (i) to maintain, at least until 30 September 2022, the limits on and conditions of the working capital facilities granted, (ii) to eliminate the requirement that turnover must have declined by at least 30% between 2019 and 2020 to be eligible for the term extensions envisaged in the code of good practice, and (iii) to offer the possibility in new loan applications, should the borrower so request, of a temporary six-month suspension of principal repayments by extending the interest-only period or introducing an additional one. The provisions of (iii) apply to the self-employed and small and medium-sized firms belonging to the agricultural, livestock, fishing, and road transport sectors. The changes to the code of good practice may facilitate, in particular, the servicing of ICO loans to vulnerable borrowers, although some of them may also affect, more generally, other lending to firms.

Further analysis of bank loans as a whole shows that the marked increase in the volume of Stage 2 loans owes to larger inflows from performing status. In 2020 and 2021, reclassifications to Stage 2 from performing status represented approximately 60% and 46% of Stage 2 loans at the beginning of the respective years, figures well above those of 2019 (see Chart 2.5.1). By contrast, Stage 2 inflows from non-performing status were far lower and declined during the crisis. Reclassifications out of Stage 2 were not significantly affected by the pandemic, and nor were they a driving factor behind the change in the stock of Stage 2 credit. This performance appears to be consistent with the impairment prompted by a worsening macroeconomic situation and suggests the persistence of latent risks, given that inflows to Stage 2 may presage a subsequent credit quality impairment that is yet to materialise.

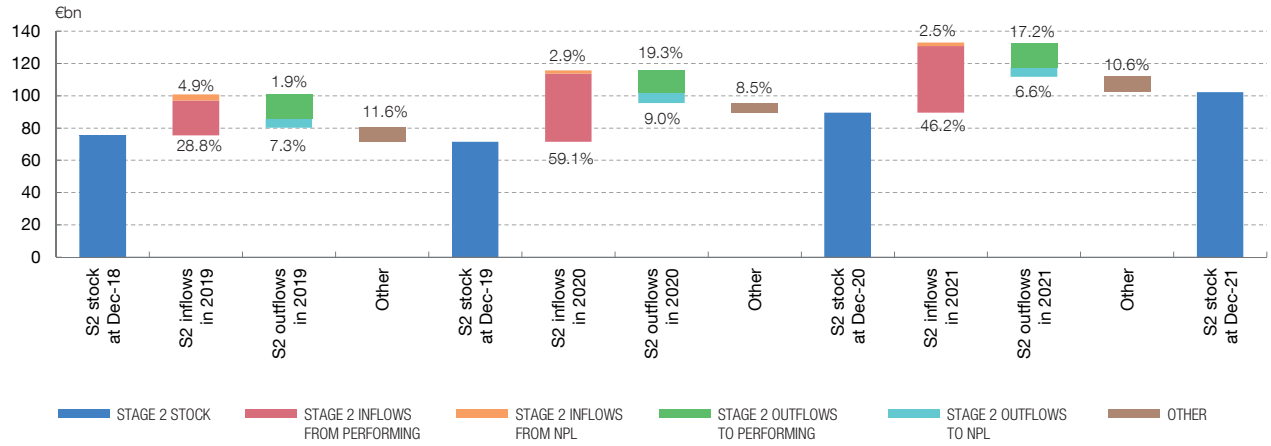
The easing pace of the reduction in NPLs following the pandemic owed to the slowdown in outflows, while the volume of NPL inflows held at similar levels. Inflows as a proportion of the existing stock of NPLs have increased since the onset of the pandemic, albeit moderately. Overall, the absolute value of these inflows has

Chart 2.5

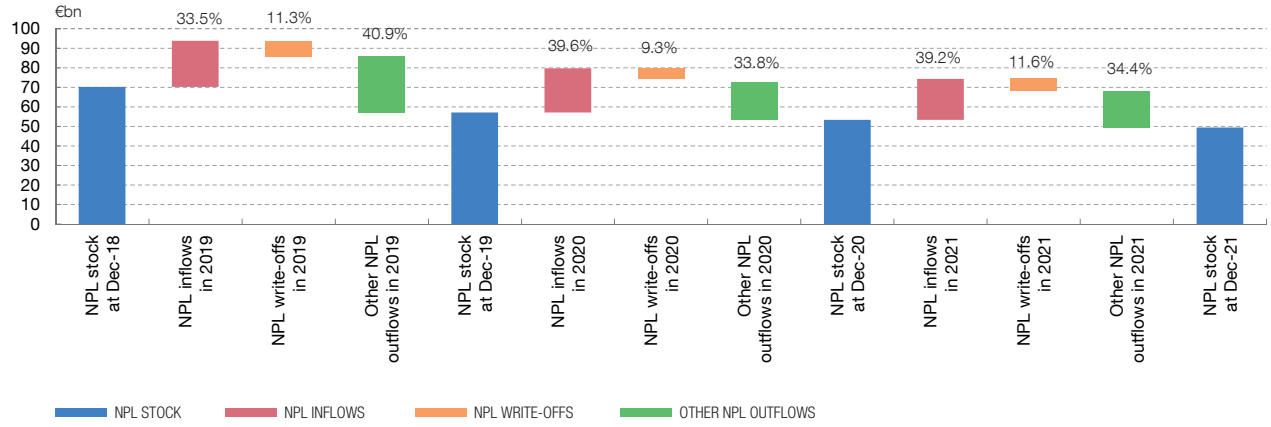
STAGE 2 LOANS HAVE INCREASED SIGNIFICANTLY IN THE LAST TWO YEARS OWING TO HIGHER INFLOWS, WHILE THE DECLINE IN THE STOCK OF NPLs HAS MODERATED DUE TO A SLOWER PACE OF OUTFLOWS

Stage 2 loans and advances in banking operations in Spain increased in the last two years, essentially due to a more robust inflow of loans from performing status, implying a degree of latent impairment in these exposures. Meanwhile, the slowdown in the reduction of NPLs owed mostly to more sluggish NPL outflows, with negligible changes in inflows from other credit classifications.

1 INFLOWS AND OUTFLOWS OF STAGE 2 LOANS AND ADVANCES (a)
Business in Spain. ID



2 INFLOWS AND OUTFLOWS OF NON-PERFORMING LOANS AND ADVANCES (b)
Business in Spain. ID



SOURCE: Banco de España.

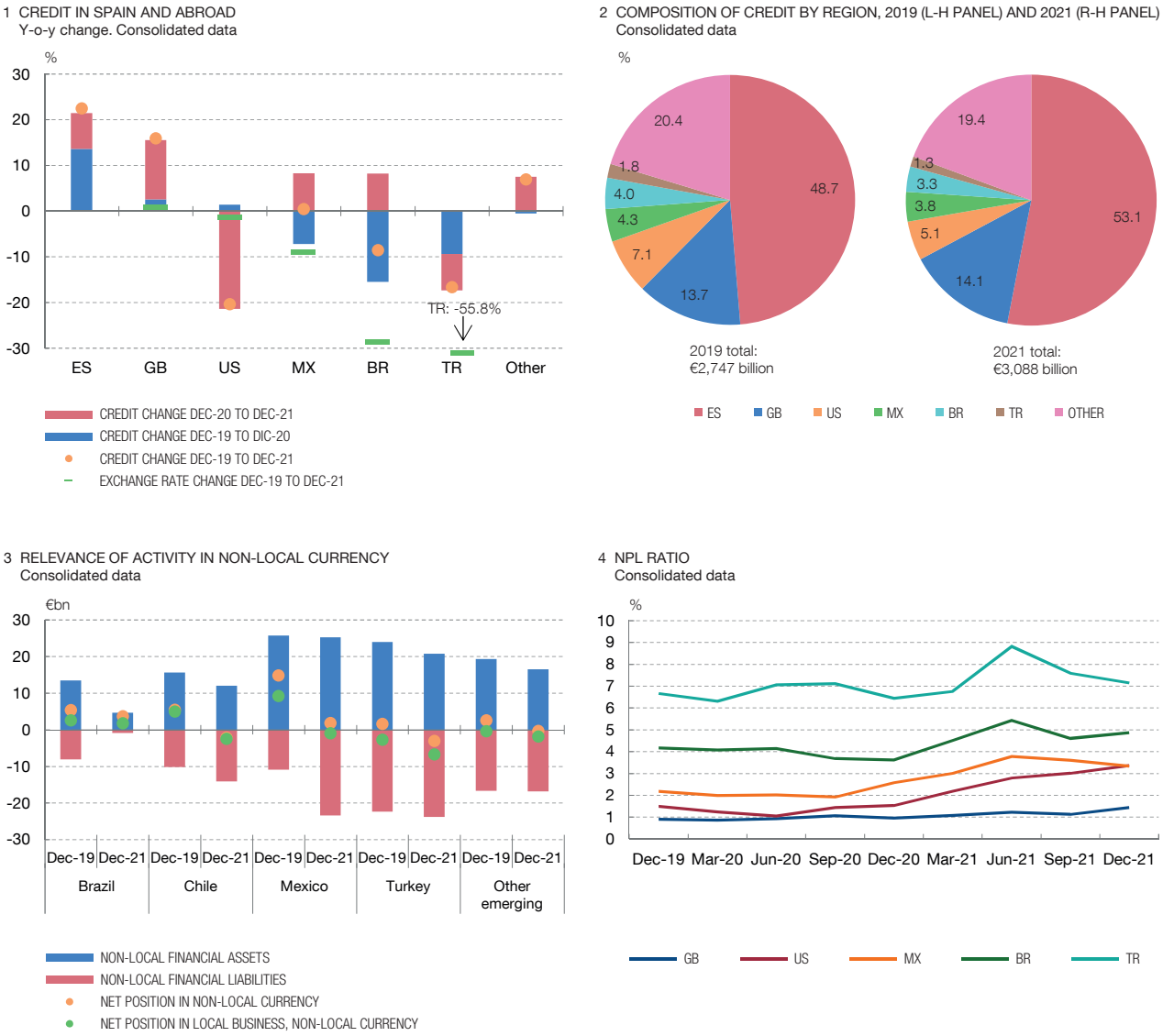
a The volume of Stage 2 loans is measured using the gross carrying amount on the institutions' individual balance sheet. To be included as inflows and outflows, loans must end the year at a different stage of value impairment than at the start of the year or at the time of initial balance sheet recognition, if later. The percentages above the bars of the different Stage 2 inflows and outflows show their proportion in the stock of Stage 2 loans on balance sheets as at December of the previous year. The "Other" bar includes loans that, having been Stage 2 at the previous year-end, are repaid or sold over the year under way.

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

Chart 2.6

CREDIT EXPOSURE ABROAD INCREASED IN 2021, ALTHOUGH ITS PROPORTION OF TOTAL CONSOLIDATED CREDIT HAS DECLINED SINCE THE PANDEMIC BEGAN, OWING TO THE DIVESTMENT IN THE UNITED STATES AND THE EXCHANGE RATE DEVELOPMENTS OF SOME CURRENCIES AGAINST THE EURO

Banks' credit exposure abroad as a proportion of the total has declined since the pandemic broke, despite the increase observed in 2021. By country, there has been a notable drop in the United States, due to a divestment conducted by a bank, and likewise in Turkey and Brazil, owing to exchange rate developments. It should be noted that the exchange rate risk borne by Spanish banks in these markets is relatively low since, with the exception of Turkey, net positions in non-local currency are positive or only slightly negative. NPL ratios declined in the second half of the year, particularly in Turkey.



SOURCE: Banco de España.

been quite stable (see Chart 2.5.2). For their part, NPL write-offs held steady. The most pronounced change following the pandemic was recorded in other outflows (including asset foreclosures, portfolio sales and securitisations), which moderated notably, representing the main brake on the reduction in the stock of NPLs.

The volume Spanish deposit institutions' credit abroad increased by 4.5% in 2021, contrasting with the performance observed a year earlier (down by 1.5%). By country, there were notable cumulative declines in the United States, owing to a divestment made in the country by a Spanish institution,[7] and in Turkey and Brazil, largely due to adverse exchange rate developments for their currencies against the euro (see Chart 2.6.1). Since the onset of the COVID-19 crisis, the share of business abroad has declined slightly to below 50% of the total. Of the countries where Spanish institutions have most exposure, only the United Kingdom has gained share in the last two years (see Chart 2.6.2). It should be noted that Spanish institutions' net non-local currency position in the emerging economies where they operate is generally low, owing to similar balances of assets and liabilities in those currencies (see Chart 2.6.3). This mitigates the risks associated with the exchange rate depreciation recorded during the pandemic. Lastly, NPL ratios, which had risen in some countries in 2021 Q2, moderated during the subsequent six months, particularly in Turkey and Mexico (see Chart 2.6.4).

Liquidity and financing conditions

The Eurosystem's balance sheet continued to expand due to the purchase programmes, although the amount of the refinancing operations declined, leading to a net increase in the liquidity provided to institutions. Specifically, since the last Report the volume of the purchase programmes increased by €218 billion (albeit at a slower pace than noted in previous Reports) to €4.8 trillion. By contrast, the balance of TLTRO-III declined by €8 billion, owing to early redemptions by institutions at year-end outstripping their participation in the last TLTRO-III.

Money market interest rates held at very low levels, particularly in the secured segment (repo). The latter decreased markedly and across the board in the last few months of the year as a result of the collateral shortage and excess liquidity. Indeed, the monetary policy measures (purchase programmes and liquidity provision) have reduced the availability of, and driven up demand for, assets eligible for use as collateral, which are needed to access refinancing operations and to satisfy regulatory requirements for high-quality liquid assets (HQLA). As tends to be the case, these factors were accentuated at the end of the year, although the downward trend had already been observed across the different countries in the months leading up to December 2021. This decline in repo rates was larger than that observed in preceding years, also extending to transactions conducted on the sovereign debt of

7 Although this divestment took place in 2020, it was not concluded until 2021 Q2. In the chart it is recorded in 2021, since the asset amount was initially recognised in non-current assets held for sale until completion of the transaction. This accounting treatment differs from that used in previous Financial Stability Reports (FSRs), in which non-current assets held for sale were not taken into account to calculate the exposure in each country.

countries such as Spain and Italy (see Chart 2.7.1). By contrast, the interest rate on unsecured transactions (€STR)[8] curbed the downward trend observed up to end-2021. For its part, the higher expectations of interest rate increases observed since early February 2022[9] have exerted upward pressure on interest rates negotiated on the interbank market (3-month EURIBOR) and on risk-free rates (overnight indexed swap; OIS).

Spanish banks' wholesale market funding costs[10] have been driven up in the last month by expectations of less accommodative monetary policy and the uncertainty prompted by the Ukraine crisis. Expectations of interest rate increases have fed through to wholesale market interest rates on longer-term bank debt (a measure of funding costs) more robustly than to the OIS. Thus, banks' credit risk spread[11] has widened, suggesting greater risk perception in the market, which has accentuated since the invasion of Ukraine began. Moreover, the potential withdrawal of stimuli by central banks could lead to an additional increase in the cost of bank bond issuances going forward (see Chart 2.7.2).

Given the current maturity structure of wholesale bank debt, the risk of an increase in banks' funding costs may grow over time, depending on the scenario in terms of future interest rate increases. Banks' wholesale debt maturity schedule shows that a significant portion of the outstanding balance matures before 2024. The need for institutions to make new issuances to replace redemptions of their debt will adversely affect wholesale funding costs under a scenario of rate increases. In particular, assuming an increase in interest rates similar to that projected for the EURIBOR (around 1.5 pp in 2022-2027),[12] such funding costs could rise by 0.7 pp by 2024 (see Chart 2.7.3).

There were mixed developments in the cost of new issuances in 2021 across instrument types and issuers, with a very significant increase in the volume of unsecured debt issuances. Institutions stepped up their debt issuances to comply with prudential and resolution requirements, including issuances of Tier 2 instruments and contingent convertible bonds (CoCos). A higher number of institutions made such issuances in 2021 than in 2020, giving rise to greater cost diversity. The rising costs of Tier 2 debt owed at least in part to smaller institutions issuing these instruments to comply with MREL resolution requirements. This factor may have had a relevant impact, given that MREL requirements are binding

8 This represents the unsecured overnight borrowing costs of institutions located in the euro area. Both the interest rate and trading volume are calculated and published each business day by the ECB based on the information provided by the 48 euro area institutions subject to Money Market Statistical Reporting (MMSR).

9 Following the ECB Governing Council monetary policy meeting of 3 February 2022.

10 The cost of unsecured debt issued by Santander, BBVA, CaixaBank and Sabadell, calculated as the weighted average (by volume) of the interest rate negotiated in the secondary market for issues outstanding at January 2022.

11 Understood as the difference between the funding cost and the risk-free rate.

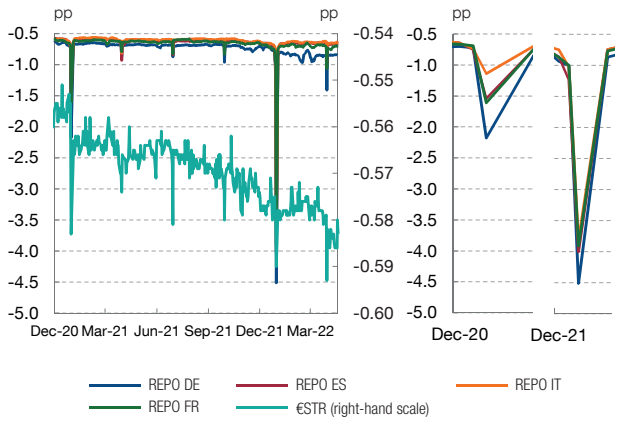
12 EURIBOR projection based on the 3-month EURIBOR forward curve.

Chart 2.7

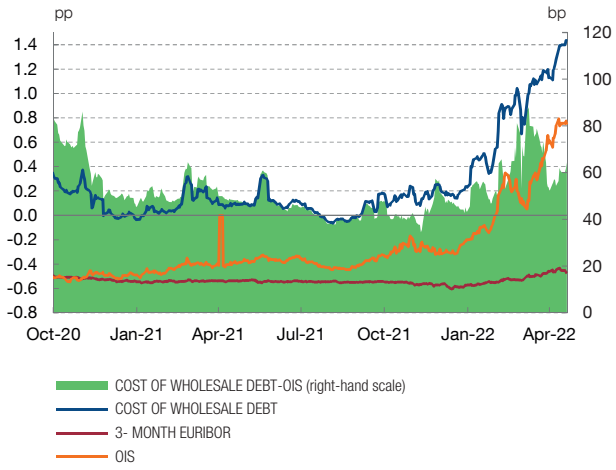
MONEY MARKET INTEREST RATES STAND AT HISTORICALLY LOW LEVELS. HOWEVER, THE POTENTIAL TIGHTENING OF MONETARY POLICY COULD DRIVE UP FUNDING COSTS, PARTICULARLY IN THE WHOLESALE FUNDING MARKET

In the money markets, secured interest rates stand at historically low levels due to excess liquidity and the shortage of eligible collateral assets. Interbank costs climbed slightly in 2021 and expectations of interest rate increases could translate into more expensive wholesale funding. Lastly, the crisis in Ukraine could be an additional conditioning factor for developments vis-à-vis bank credit risk perception in the

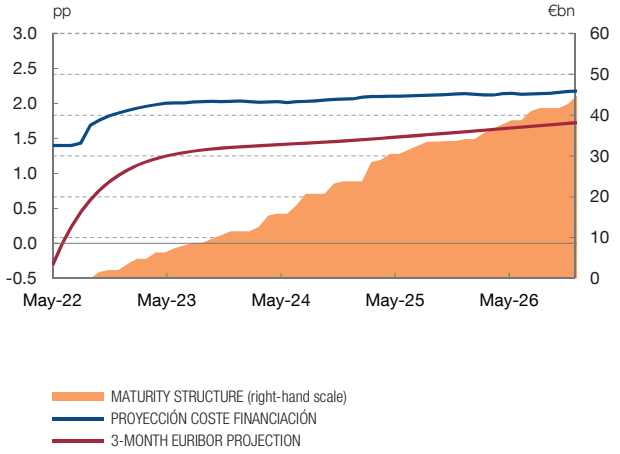
1 MONEY MARKET RATES (a)



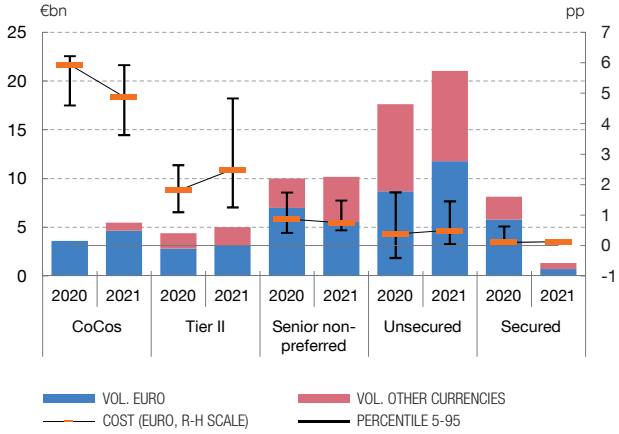
2 INTERBANK FUNDING SPREAD AND CREDIT RISK (b)



3 MATURITY STRUCTURE AND PROJECTION OF WHOLESALE DEBT FUNDING COSTS (c)



4 VOLUME OF ISSUANCES AND COST BY INSTRUMENT TYPE: 2020 VS 2021 (d)



SOURCES: Bloomberg, Thomson Reuters and Banco de España.

a Repo rate: the overnight rate on transactions conducted with other financial institutions by banks reporting to the MMSR and using debt issued by Spanish (ES), German (DE), Italian (IT) and French (FR) Government entities as collateral.

b The credit risk spread is calculated for unsecured bonds issued in euro by Spanish banks (Santander, BBVA, CaixaBank and Sabadell). The cost of funding is obtained as the average interest rate negotiated on the secondary market for these bonds and the spread is calculated on the riskfree interest rate (OIS) with the same maturity. Shown is the OIS for the same term as the average debt maturity.

c Shown is the expected 3-month EURIBOR performance using the implicit forward rate obtained from forward rate agreements (FRAs) for terms of up to one year and from interest rate swaps (IRS) for terms of between one and 30 years. To project future funding costs, the combined performance of the 3-month EURIBOR and the cost of wholesale funding is analysed and the average observed spread between the two series in the last year is obtained. The average cost of funding comprises both current outstanding debt over the projection horizon and new issuances, which are assumed to match the volume of, and to maintain the same maturity as, the current portfolio, but obtained at the future cost of funding, found as the forward of the 3-month EURIBOR plus the average observed spread. In this case, it is assumed that rates follow a similar trajectory to the 3-month EURIBOR and that risk premiums would not increase. The maturity structure of the debt shows the cumulative amount of the bonds matured.

d Shown is the cost of the issues on the primary market for bonds in euro. Only one secured debt issuance took place in 2021 in this currency (covered bonds).

from 1 January 2022 and institutions must reach the required levels of such instruments. There was also a broad-based increase in unsecured debt issuances, particularly in the last few months of the year, which came at a slightly higher cost than in 2020. This against the backdrop of rising expectations of interest rate increases, which could prompt institutions to bring forward issuances (see Chart 2.7.4).

Deposits at Spanish banks continued to increase in 2021, albeit at slower rates than in the previous year. The balance of bank deposits held by the resident private sector in Spain rose by 4.1% in 2021, compared with growth of 8.9% in 2020. This decrease in the growth of deposits (-4.8 pp) seems attributable, at least in part, to the fall in precautionary saving once the uncertainty over the course of the pandemic and its economic consequences gradually abated. By institutional sector, NFCs increased their deposits more than households in 2021, but in both cases the growth was more subdued than in 2020. The loan-to-deposit ratio for business in Spain continued the downward trajectory recorded since the end of the global financial crisis, declining last year by 3.5 pp to 82.6%. On the consolidated balance sheet, the share of private sector deposits as a proportion of total assets increased, following 5.9% growth in 2021.

2.1.2 Profitability and solvency

Profitability

In 2021, the Spanish banking sector as a whole recorded consolidated net profit of €26 billion, up significantly (by €34 billion) on the losses recorded in 2020. This translates into a return on assets (ROA) of 0.67% (up nearly 0.9 pp from -0.21% in 2020) and a return on equity (ROE) of 10.5% (up 13.6 pp from -3.1% in 2020).[13] Ordinary profit improved significantly in 2021 as compared with 2020, but extraordinary results (negative in 2020 and positive in 2021) had the largest impact on the year-on-year profitability improvement.[14] Excluding these extraordinary items the Spanish banking sector's ROA would have stood at 0.57%, an increase of 37 bp on 2020 (see Chart 2.8.1), while ROE without extraordinary items would have reached 9% (more than 6 pp higher than in 2020).

The main driver of the improvement in ordinary profit was the reduction in impairment losses on financial assets. At consolidated level, impairment losses

13 In the case of ROE, the year-on-year change also increased due to the 4.1% decline in average equity in 2021. By contrast, the year-on-year change in ROA declined owing to the 3.8% increase in average total assets in 2021.

14 In 2021 extraordinary gains were recognised as a result of two mergers (€4.2 billion), the spin-off of an insurance company (€0.9 billion) and restructuring costs at the two main institutions (-€1.2 billion). In 2020 the extraordinary items included the negative adjustments to goodwill of the two banks with the largest international presence (-€12.2 billion), the adjustment for deferred tax assets (-€2.5 billion), the restructuring of a bank (-€1.2 billion) and capital gains on the sale of business lines (€0.6 billion).

Chart 2.8

IN 2021, THE PROFITABILITY OF THE SPANISH BANKING SYSTEM NOTABLY IMPROVED WITH RESPECT TO 2020; THE MAIN DRIVERS OF THIS IMPROVEMENT WERE EXTRAORDINARY GAINS AND THE DECLINE IN IMPAIRMENT LOSSES

Profit in the Spanish banking sector improved substantially following the losses recorded in 2020. Extraordinary results, which were negative in 2020 and positive in 2021, had a significant bearing on this improvement. Ordinary profit also improved notably, owing mainly to the reduction in impairment losses, which stood slightly below levels recorded in pre-pandemic years. Net fees and commissions also made a positive contribution to results, albeit to a far smaller extent.

SOURCE: Banco de España.

a The red (green) colour of the bars denotes a negative (positive) contribution of the corresponding item to the change in consolidated profit in December 2021 compared with December 2020. The black diamonds denote the ROA excluding extraordinary items. Specifically, in December 2020: adjustments to goodwill (-€12.2 billion), the adjustment for deferred tax assets (-€2.5 billion), restructuring costs (-€1.2 billion) and capital gains from the sale of business (€0.6 billion); and in December 2021: an extraordinary net gain as a result of two mergers (€4.2 billion), the spin-off of an insurance company (€0.9 billion) and extraordinary restructuring costs (-€1.2 billion).
b Including, among other items, the extraordinary gains referred to in the above note.

on financial assets declined by 43.5% in 2021 compared with 2020, representing a drop in absolute amounts of €11 billion (from €25.3 billion in 2020 to €14.3 billion in 2021). This amount and its share in net operating income (28.2%) are similar to, but somewhat lower than, the two years prior to the pandemic (see Chart 2.8.2). The reduction in impairment losses for business in Spain in 2021 was of a similar magnitude (47.7%), with both the amount and its share in net operating income remaining higher than in the two years leading up to the pandemic.

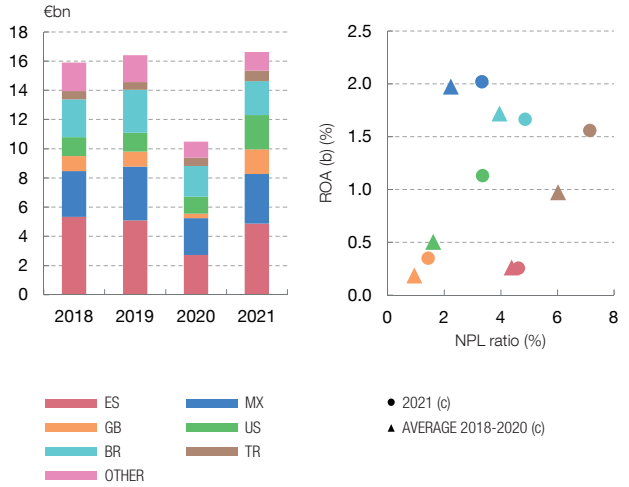
The improvement in ordinary profit in 2021 was widespread across the main countries where Spanish banks conduct significant international business. In 2021, profit (and the structure thereof) in those countries marked a return to levels similar to those recorded before the health crisis (see Chart 2.9.1, left-hand panel). Mexico, Brazil and the United States are the largest contributors to profit after Spain. The right-hand panel of Chart 2.9.1 shows that profitability is generally associated with a higher level of credit risk, although this does not apply to business in Spain. Profitability is higher in the main emerging countries where Spanish institutions operate (Mexico, Brazil and Turkey) than in the advanced countries (the

Chart 2.9

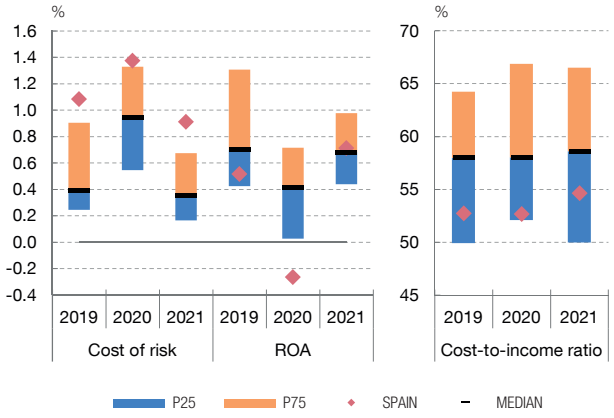
THE 2021 PROFITABILITY IMPROVEMENT WAS BROAD-BASED ACROSS THE COUNTRIES WHERE SPANISH BANKS HAVE SIGNIFICANT BUSINESS, AS WELL AS IN THE BANKING SECTORS OF THE MAIN EUROPEAN COUNTRIES

The profit of Spanish banks has improved markedly in the main countries where they operate, with profitability generally associated with a higher risk level in terms of NPL ratios. Profitability likewise improved in the banking sectors of the main European countries, returning to levels similar to those observed pre-health crisis, with the reduction in cost of risk contributing to these developments. Spanish banks have a lower (better) cost-to-income ratio than their European peers.

1 GEOGRAPHICAL DISTRIBUTION OF THE PROFIT ATTRIBUTABLE TO THE PARENT EXCLUDING EXTRAORDINARY ITEMS OF BANKS WITH SIGNIFICANT INTERNATIONAL ACTIVITY (a), AND THE RELATIONSHIP BETWEEN ROA AND NPL RATIO



2 THE MAIN PROFITABILITY VARIABLES: A EUROPEAN COMPARISON (d)



SOURCES: EBA, Banco de España and CNMV.

a Four banks with significant international activity are included in this chart and non-recurring items in the period 2018-2021 are excluded.
b ROA is calculated as the profit of Spanish banks in each country divided by their total financial assets in each country.
c For each country (denoted by a different colour), the values of the 2021 ratio (circle) and the 2018-2020 average (triangle) are shown.
d Percentiles calculated based on the aggregate financial ratios published by the EBA for each of the EU banking systems. Cost of risk is defined as impairment loss charges divided by gross lending. The cost-to-income ratio is defined as operating expenses divided by gross income; therefore, lower values indicate greater efficiency.

United States,[15] Spain and the United Kingdom). This was true both in 2021 and in previous years.

In 2021, profitability also improved at European level, following the notable decline of the previous year, and returned to close to pre-pandemic levels. As in Spain, the significant decline in impairment provisioning led to improved profitability. Conversely, the cost-to-income ratio[16] was less affected by the health crisis and held relatively stable in Europe (see Chart 2.9.2). The cost-to-income ratio of Spanish institutions is lower (better) than that of its European peers.

15 Despite the divestment of a bank in the United States, profit in the country increased considerably in 2021 as compared with 2020, owing to profit improving markedly at another Spanish bank with US operations due to a significant reduction in its impairment losses. The high profitability of certain business segments in the United States should also be noted, outstripping the average profitability of operations in emerging countries.

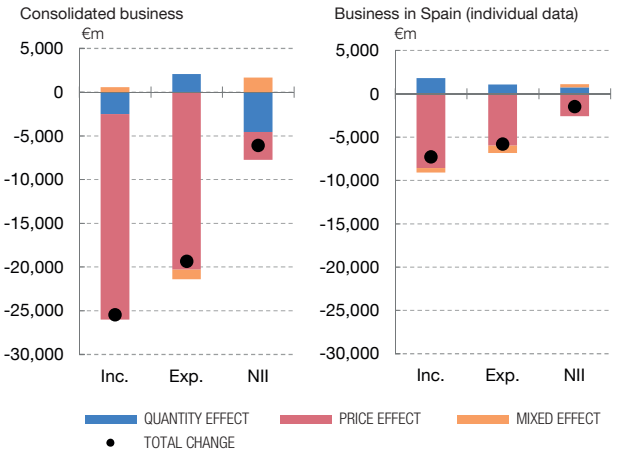
16 The cost-to-income ratio is defined as the ratio of operating expenses to gross income, such that higher (lower) values refer to lower (higher) efficiency.

Chart 2.10

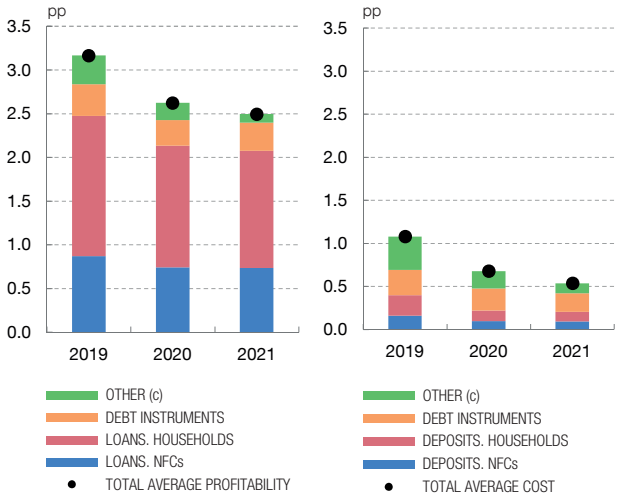
IN 2020-2021, THE QUANTITY EFFECT WAS NEGATIVE FOR NET INTEREST INCOME AT CONSOLIDATED LEVEL AND SLIGHTLY POSITIVE FOR BUSINESS IN SPAIN, WHILE THE PRICE EFFECT WAS NEGATIVE FOR BOTH PERIMETERS, IN A CONTEXT OF A DECLINING IMPLICIT PROFITABILITY OF ASSETS

The fall in consolidated net interest income in the last two years, concentrated in 2020, owed to a lower interest rate spread (price effect) and a drop in the volume of assets in parallel with an increase in the funding volume (quantity effect). This latter factor represents an important difference as compared with business in Spain, where the quantity effect partially offset the likewise negative price effect.

1 COMPOSITION OF THE CHANGE IN NET INTEREST INCOME AND IN INTEREST INCOME AND EXPENSES BETWEEN 2019 AND 2021 (a) (b)



2 IMPLICIT INTEREST RATES ON ASSETS (L-H PANEL) AND LIABILITIES (R-H PANEL). CONTRIBUTION IN PP BY INSTRUMENT TYPE AND COUNTERPARTY
Consolidated data



SOURCE: Banco de España.

a The quantity effect is calculated as the product of the change in investment (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 investment (income) or funding (expenses) held stable at 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 NII are calculated as the difference between the effects on interest income and interest expense.
b Income and expenses are net of interest expenses on the asset side and interest income on the liabilities side, respectively.
c This category includes, first, the results of transactions (assets or liabilities) with the central bank, credit institutions, other financial institutions and general government, and, second, income and expenses net of derivatives, hedging instruments and others.

Gross income grew by close to 3%, driven by the timid improvement in net interest income,[17] and, above all, by the 10.4% increase in net fees and commissions,[18] which more than offset the marked drop in gains and losses on financial assets and liabilities (see Annex 2). In any case, in 2021 net interest income remained lower than in 2019. This decline is explained by the larger fall in interest income than in interest expenses (see Chart 2.10.1). The quantity effect[19]

17 However, since the year-on-year increase in net interest income (1.4%) in 2021 was lower than the increase in average total assets (3.8%, see footnote 13), its contribution to the change in ROA in 2021 was negative, as shown in Chart 2.8.1.

18 Net fees and commissions accounted for 41% of net interest income.

19 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) by the investments (income) or funding (expenses) held stable at 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.

contributes negatively to income, largely due to the divestment in the United States and exchange rate depreciation (see Chart 2.6), and, conversely, leads to an increase in expenses. The price effect is negative, with the resulting decrease in income exceeding the reduction in expenses. For business in Spain, the price effect is again negative, but the quantity effect, unlike at consolidated level, is positive for interest income, which can be explained by the expansion of the balance sheet in Spain.[20] It should be noted that the implied rates on assets and liabilities remained on a declining path in 2021 (see Chart 2.10.2). A potential rise in interest rates could have a positive impact on institutions' net interest income, through the improved profitability of instruments and a widening of net interest margins. However, the net impact on bank profitability of a rate rise also depends on the set of variables of the macroeconomic scenario in which the rate rise occurs, and thus requires a specific assessment. Box 2.1 examines the impact on the banking sector of potentially adverse scenarios in which different risks to financial stability, including significant interest rate hikes, materialise forcefully. In such adverse scenarios, bank profitability and solvency are negatively affected despite interest rates rising.

Fee and commission income has increased in recent years, in a process of convergence towards average values for European countries, with payment services as the main source of such income. At consolidated level, gross fee and commission income amounts to €31,406 million, mostly accounted for by payment services (€12,676; 40.4% of the total), as shown in Chart 2.11. The second most important source of income are customer resources distributed but not managed (mainly income from the marketing of funds or insurance), amounting to €5,600 million (17.8% of the total). For business in Spain, the total volume of gross income accounts for approximately 45% of the consolidated total (€14,329 million), and the payment and distributed resources categories are again the most significant, albeit with a far more similar relative weight. Payment services thus account for €4,472 million (31.2% of the total) and distributed customer resources for €4,028 million (28.1% of the total). The large share accounted for by payment services may potentially be a significant and stable source of income, owing to the strong and recurring demand for such services. However, it is also one of the segments facing increasing competition from new technological competitors, which will force banks to add value to their services and improve their technology infrastructure to preserve their market share. Compared with their main European peers, Spanish banks have lower fee and commission income, although it has risen in recent years as part of a convergence towards more homogeneous business models (as shown in Chart 2.11.2). Since 2015, net fee and commission income as a percentage of total assets has increased from 0.41% to 0.45%.

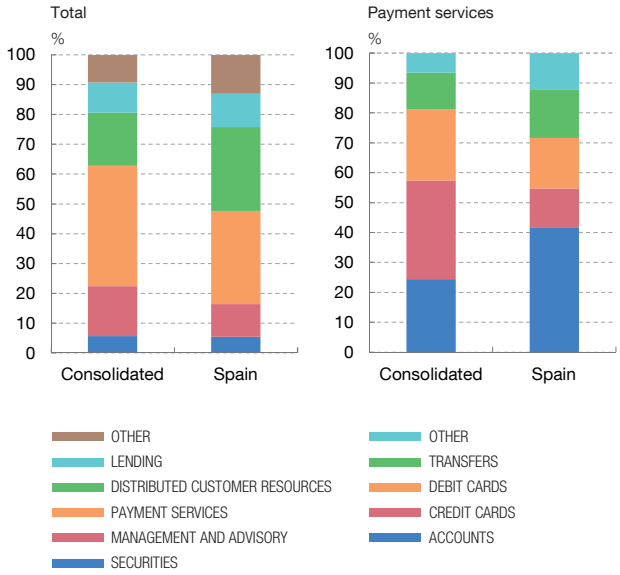
20 For a more detailed analysis, see P. Alves, J. Cebrián and E. Pérez Asenjo (2021), "Recent developments in financing and bank lending to the non-financial private sector. 3rd quarter of 2021", Analytical Articles, *Economic Bulletin,* Banco de España.

Chart 2.11

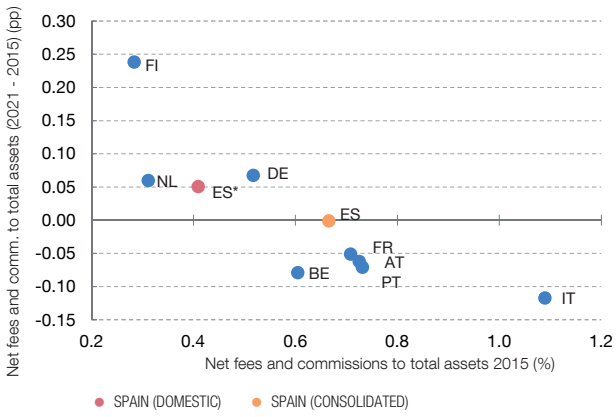
INCOME FROM PAYMENT SERVICES, MORE SUSCEPTIBLE TO COMPETITION FROM TECHNOLOGY FIRMS, IS THE MAIN SOURCE OF FEE AND COMMISSION INCOME FOR SPANISH BANKS, WHILE NET FEE AND COMMISSION INCOME OVERALL IS CONVERGING TOWARDS THE VALUES OF OTHER EUROPEAN COUNTRIES

The main source of fee and commission income are payment services, with credit and debit cards as the main income category at the consolidated level and payment accounts at the level of business in Spain. Payment services provide a potentially stable flow of income owing to bank customers' recurring demand, although they may also be potentially more susceptible than other services to the competition of new digital operators and the emergence of new means of payment. Overall, fees and commissions in Spain have grown as a source of income since 2015, in line with the process of convergence towards the average levels for the euro area.

1 DISTRIBUTION OF GROSS FEES AND COMMISSIONS, BY TYPE (a)
Consolidated and individual data, December 2021



2 CONVERGENCE OF THE NET FEES AND COMMISSIONS TO TOTAL ASSETS RATIO IN THE EURO AREA (b)
Consolidated data, December 2021



SOURCES: ECB and Banco de España.

a These categories broadly include: "Securities": securities management; "Management and advisory": custody and advisory services; "Payment services"; "Distributed customer resources": customer resources distributed but not managed (mainly marketing of funds and insurance); "Lending": services linked to lending, and "Other": other services, e.g. those linked to currencies or commodities.

b Each dot represents a country, for a sample of the main euro area countries. Information is shown at the consolidated level, except for Spain, where it is shown both at the consolidated level (orange dot) and for business in Spain (red dot). The vertical axis shows the difference between the 2021 value less that of 2015.

The operating capacity of the Spanish banking system has also converged towards average European values, against a backdrop of branch closures and staff adjustments in the main European countries following the global financial crisis. In December 2020, the number of branches per 100,000 inhabitants in Spain was 47, a figure similar to that of the French banking system and close to that of the Italian one,[21] although Spain has a lower population density. Between 2008 and 2020, the number of branches fell by more than 50% (almost three-quarters of this decline occurred between 2008 and 2016, while in other European countries the decline was less marked in this period). The staff adjustment has been lower, although also significant (close to 40%

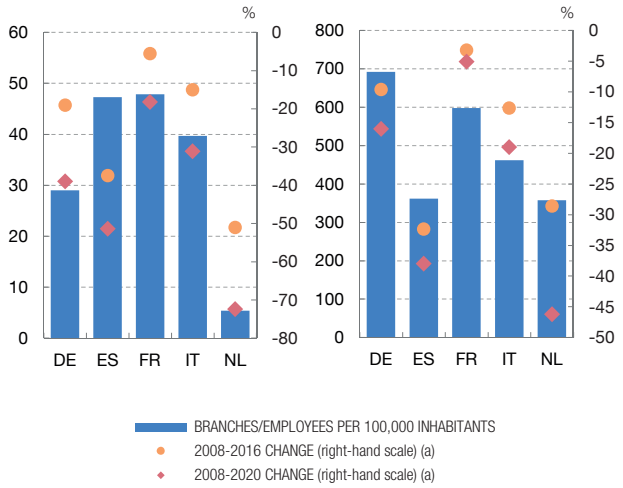
21 In 2008, the number of branches per 100,000 inhabitants in Spain was 100, compared with around 60 in France and Italy. Data as at December 2020 are presented, since this is the latest available date with comparable ECB information for different European countries.

Chart 2.12

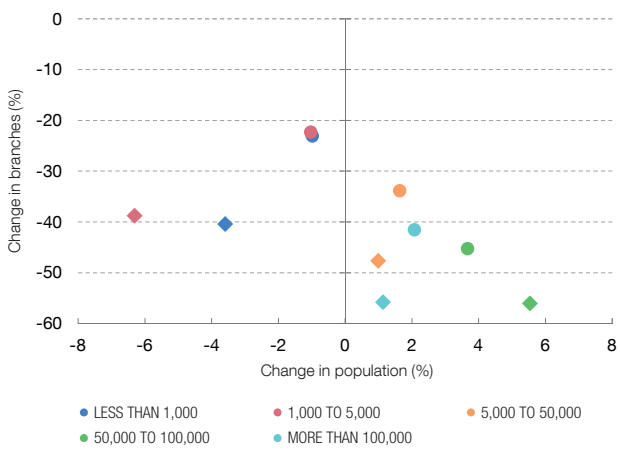
THE REDUCTION IN THE NUMBER OF BRANCHES IN SPAIN SINCE 2008 HAS BEEN CONCENTRATED IN HIGHER POPULATION AREAS AND HAS EXCEEDED THAT OF MOST EUROPEAN COUNTRIES, COMPARED WITH WHICH IT HAS RELATIVELY HIGH (LOW) RATIOS OF BRANCHES (EMPLOYEES) PER INHABITANT

In 2020 (latest date with comparable data at European level), the number of branches per 100,000 inhabitants in Spain was similar to that of France and close to that of Italy, their absolute number having been reduced by more than 50% since 2008, surpassed only by the Netherlands among the main European countries. The staff adjustment has also been significant, although lower than the reduction of branches, with Spain having the second-lowest ratio of employees per 100,000 inhabitants in these countries. Most of the branch and staff adjustments in Spain took place in the period 2008-2016. The reduction in the number of branches has been widespread across municipalities of all sizes, and more pronounced in larger cities.

1 BRANCHES (L-H PANEL) AND EMPLOYEES (R-H PANEL)
December 2020



2 CHANGES IN POPULATION AND NUMBER OF BRANCHES, BY MUNICIPALITY SIZE. 2008-2016 (CIRCLE) 2008-2020 (DIAMOND)



SOURCES: ECB, Banco de España, Eurostat and INE.

a The changes refer to the total number of employees and branches (not to employees and branches per 100,000 inhabitants).

since 2008). In both cases, Spain has had the second highest declines among the main European countries, only behind those of the Netherlands (see Chart 2.12.1).

The reduction in the number of branches has been widespread across municipalities of different sizes, and more pronounced in larger cities. Since 2008, a relationship between a municipality's size and branch closures has been observed, with a more pronounced reduction of branches in larger municipalities (around 56% for municipalities with more than 50,000 inhabitants). By contrast, the least intense branch closures came in smaller municipalities with fewer than 5,000 inhabitants (around 40%; see Chart 2.12.2).

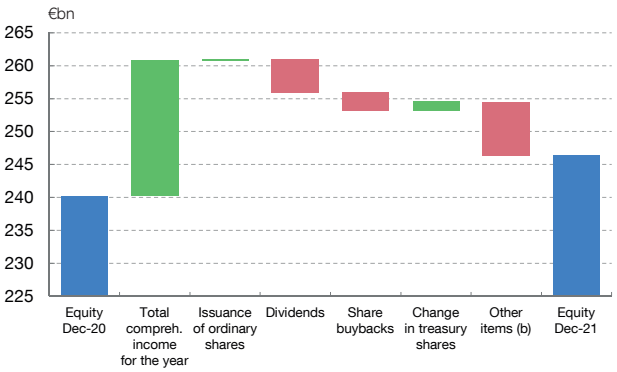
The return to profitability has also contributed to the increase in the equity of the Spanish banking system in 2021, in contrast with the notable decline in 2020 resulting from the losses recorded. As mentioned in previous FSRs, these losses did not lead to lower prudential solvency in the banking sector, largely because the significant negative extraordinary items (e.g. goodwill impairment) affect balance sheet items that are not counted towards banks' prudential capital. In 2021, equity

Chart 2.13

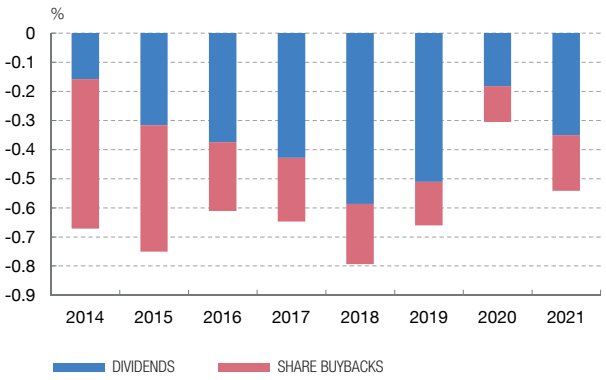
THE EQUITY OF THE SPANISH BANKING SECTOR INCREASED SLIGHTLY IN 2021, WHILE THE DISTRIBUTION OF PROFITS TO SHAREHOLDERS RECOVERED, BUT STILL FELL SHORT OF PRE-PANDEMIC LEVELS

The return to profitability was the main driver behind the increase in the equity of the Spanish banking sector in 2021, of more than €6 billion (2.6%). Last year, dividends reduced equity by nearly €5.2 billion and share buybacks, by €2.8 billion. The withdrawal of the restrictive regulatory recommendations led to a notable increase with respect to 2020 in these distributions as a percentage of RWAs (0.24 bp increase). However, they remained below average pre-pandemic levels, mainly due to the behaviour of dividends, since shareholder remuneration in the form of share buybacks did recover to pre-pandemic levels.

1 BREAKDOWN OF THE CHANGE IN EQUITY IN 2021 (a)
Consolidated data



2 DIVIDENDS AND SHARE BUYBACKS AS A PERCENTAGE OF RWAs
Consolidated data



SOURCE: Banco de España.

a The red (green) bars indicate the negative (positive) contribution of the corresponding item to the change in equity.
b Includes, among other items, the net adjustments for recognition at fair value arising from the mergers of CaixaBank-Bankia and Unicaja-Liberbank, the effects of corrections of errors and of changes in accounting policies, the issuance of preference shares and equity instruments other than ordinary shares, the exercise or expiration of other equity instruments issued, the conversion of debt to equity, capital reduction, the entry of new institutions into the system, the reclassification of financial instruments from equity to liability and vice versa, share-based payments and the equity increase or decrease resulting from business combinations.

recovered slightly, increasing by more than €6,000 million (2.6%, see Chart 2.13.1). The main reason for this improvement is the return to profitability, which more than offsets the negative adjustments for recognition at fair value arising from the two mergers which were completed during the year. Dividends reduced equity by nearly €5,200 million, equal to 0.35% of risk-weighted assets (RWAs), and share buybacks by €2,800 million, equal to 0.19% of RWAs. Overall, the distribution of profits to shareholders, including dividends and share buybacks, recovered following the period of distribution restrictions, but was still short of pre-pandemic levels (see Chart 2.13.2). The main reason was the partial recovery in dividend payouts compared with 2020, since shareholder remuneration in the form of share buybacks rebounded to levels similar to those of the years immediately preceding the pandemic.

Solvency

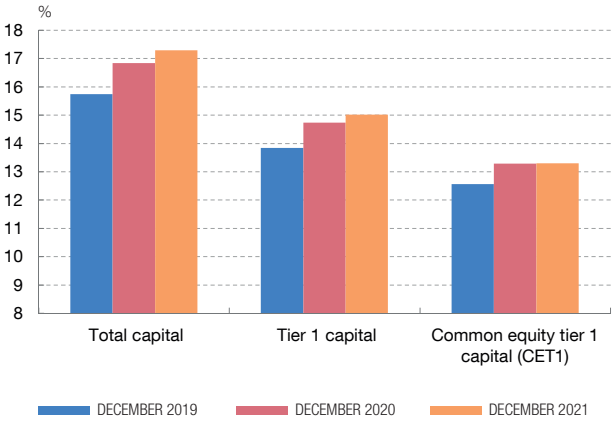
The common equity tier 1 (CET1) ratio of Spanish banks held relatively stable in 2021, having increased in 2020. In 2021, both CET1 and RWAs experienced

Chart 2.14

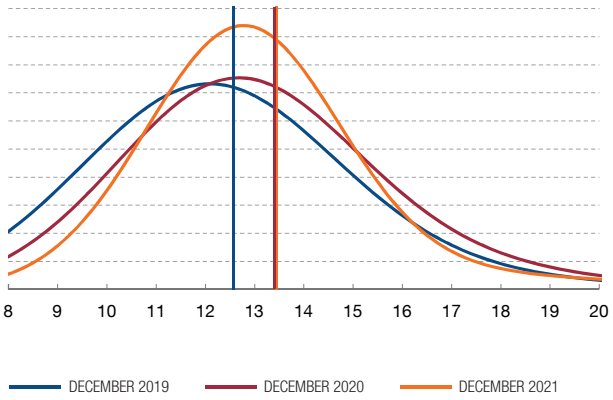
THE AVERAGE CET1 RATIO HELD RELATIVELY STABLE IN 2021, DUE TO SLIGHT DECLINES OF A SIMILAR MAGNITUDE IN THE VOLUME OF CET1 AND IN RWAs, WHILE INSTITUTIONS' DISPERSION DECREASED IN TERMS OF THIS SOLVENCY METRIC

In 2021, CET1 decreased by 0.9% and RWAs by 1.1%, with the CET1 ratio up 2 bp. In addition, the distribution of this ratio among institutions evened out and a greater convergence of institutions towards the central values of the distribution was observed. Tier 1 capital and total capital ratios increased slightly in 2021.

1 CAPITAL RATIOS
Consolidated data



2 DISTRIBUTION OF THE CET1 RATIO (a)
Consolidated data



SOURCE: Banco de España.

a The chart depicts the CET1 ratio density function for Spanish deposit institutions, weighted by the amount of RWAs. The density function is estimated using a kernel estimator, which enables non-parametric estimation and provides a continuous, smoothed graphic representation of the function. The vertical line denotes the CET1 ratio for the Spanish banking system as a whole in December 2019 (blue line), December 2020 (red line) and December 2021 (orange line).

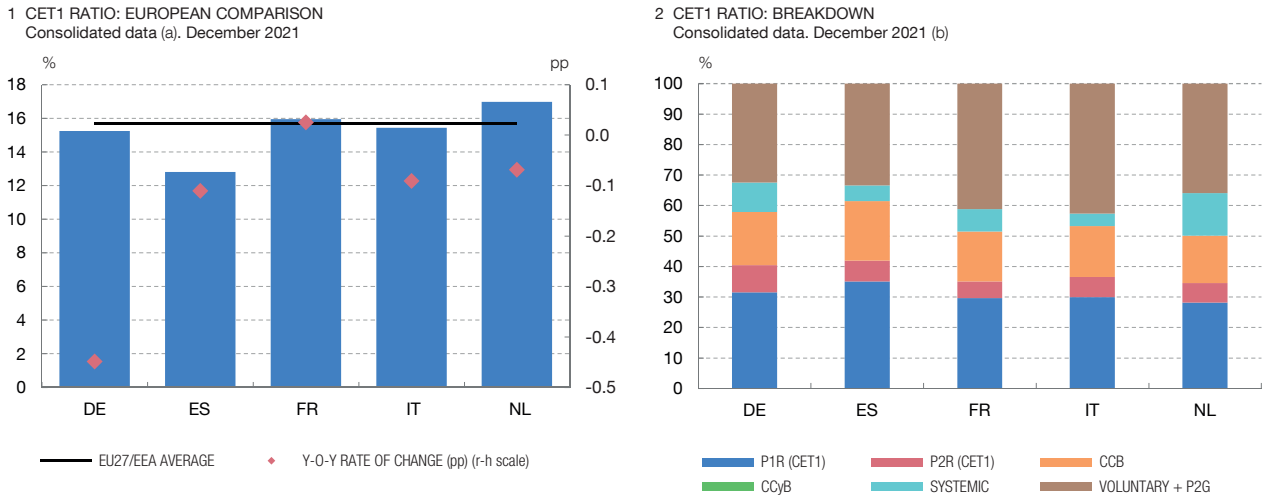
similar declines (0.9% in the case of CET1 and 1.1% in the case of RWAs), with the CET1 ratio remaining relatively stable (up 2 bp). Total capital and tier 1 capital increased slightly (1.6% and 0.8%, respectively). This, along with the aforementioned decline in RWAs, led to a moderate increase in the total capital and tier 1 capital ratios, bringing them to 17.3% and 15%, respectively, at end-2021 (see Chart 2.14.1). The shift to the right in the distribution of the CET1 ratio since 2019 (see Chart 2.14.2) evidences a widespread increase in the ratio among institutions between 2019 and 2020. The distribution of the CET1 ratio in 2021 shows a convergence towards the central values of the distribution: the solvency of institutions with lower levels increased and that of those with higher levels decreased.

The CET1 ratio of the banks of the main European countries held relatively stable last year. Following the across-the-board increase in the CET1 ratio in 2020, the banks of the major European countries held relatively stable (see Chart 2.15.1). Consequently, the solvency gap between the Spanish banking system and the main European countries has shown no significant change and Spain continues to rank last. As mentioned in previous FSRs, this difference owes largely to the higher asset density of Spanish institutions, influenced by structural factors such as the greater

Chart 2.15

THE CET1 RATIO DID NOT CHANGE SIGNIFICANTLY LAST YEAR IN THE MAIN EURO AREA BANKING SYSTEMS. A LOWER RELATIVE WEIGHT OF THE VOLUNTARY BUFFER (INCLUDING P2G) WAS ALSO OBSERVED AT SPANISH AND GERMAN BANKS

The CET1 ratio of Spanish banks remained below that of the banks of the main euro area countries, and below the EU average, although the gap held reasonably stable last year. Spanish banks have a smaller proportion (33.5%) of voluntary buffers (including P2G) than the banks of the main European countries, with the exception of German banks, which is slightly lower (32.5%).



SOURCES: EBA, ECB, ESRB and S&P Global Market Intelligence.

a Data for the samples of the main banks in each country, in line with reporting to the Risk Dashboard of the European Banking Authority.
b Approximation to the requirements and buffer structure using 2021 Q4 data. "P1R": Pillar 1 requirement; "P2R": Pillar 2 requirement; "CCB": capital conservation buffer; "CCyB": countercyclical capital buffer; "Systemic": the highest out of the systemic risk buffer, global systemically important institution buffer and other systemically important institution buffer; "Voluntary + P2G": P2G capital guidance and buffer in addition to regulatory buffers held voluntarily by management. The P2R data are obtained from the ECB's supervisory review and evaluation process (SREP). Buffer data are obtained from the ESRB. In both cases, the data for individual banks are aggregated, weighting by the RWAs of each bank taken from SNL, which includes information for each country's main banks (the sample includes a large percentage of total RWAs in each country's system: 23%, 92%, 70%, 77% and 55% for Germany, Spain, France, Italy and the Netherlands, respectively, on 2021 Q3 data). For 11 banks (six in Germany, three in Spain and two in Italy), RWA data for 2021 Q3 were used.

use of the standardised approach to calculate risk weights for their assets. Indeed, in December 2021, the leverage ratio of Spain's significant institutions (5.7%) was only slightly below the European average (6%).

The voluntary buffers (including P2G) of Spanish banks represent a relatively small proportion of total CET1, compared with the banks of the main European countries. In December 2021, the voluntary buffers (including the Pillar 2 Guidance, known as "P2G"), in country-level aggregate terms, represented 33.5% of CET1 in the case of Spain, a level only exceeding, and by very little, that of German banks (32.5%), and clearly below that of the other major European banking systems (see Chart 2.15.2).[22] The relatively smaller proportion of voluntary capital buffers, along

22 See also P. Alves, J. Galán, L. Fernández Lafuerza and E. Pérez Asenjo (2021), Box 1: "Recent developments in financing and bank lending to the non-financial private sector. First half of 2021", Analytical Articles, *Economic Bulletin,* Banco de España.

with the lower absolute level of the CET1 ratio, pose a certain risk to Spanish banks in sustaining the flow of credit in the event of adverse shocks, since there is a lower amount of usable voluntary capital buffers to absorb losses before breaching requirements, and there is evidence[23] that a shorter distance from the CET1 ratio to these requirements make deleveraging decisions by banks more likely.

2.1.3 Deposit institutions' operational risk

Gross operational risk losses in 2021 (0.13% of total consolidated assets) have remained at levels similar to those of the last three years. Misconduct and inappropriate business practices have continued to represent the biggest operational risk concern, not significantly diminished by the rising impact of system interruptions and failures since 2020 (0.09% of total consolidated assets). However, the magnitude and contribution of the different operational risk categories may change quickly in the future with the growing importance and scope of cyber risks. There are factors suggesting that these risks may increase in the coming years, despite the current difficulties in measuring them accurately. These factors notably include growing digitalisation and, in particular, the current geopolitical context, which could lead to an increase in fraud or service interruptions owing to cyber incidents, including server issues, ransomware and denial-of-service attacks.

2.2 Non-banking financial sector and systemic interconnections

2.2.1 Non-banking financial sector

Specialised lending institutions

The stock of credit extended by specialised lending institutions (SLIs) grew in 2021, but so did NPLs, while profits declined. The credit extended by SLIs grew by 3.6% in 2021, after the year-on-year decline of 6.4% recorded in 2020,[24] thus resuming the growth path of pre-pandemic years (see Chart 2.16.1). The recovery was driven by consumer credit (a segment in which SLIs specialise), which grew by 11.5%, compared with the fall of 6.1% in the previous year. NPLs rose by 9.7% year-on-year, increasing the NPL ratio to 6.9% (from 6.5% in 2020), mainly owing to the behaviour of lending for house purchase. Conversely, non-performing consumer credit decreased by 8.2% year-on-year, reducing the NPL ratio in this segment to 3.6% (from 4.3% in 2020). Lastly, profit after tax fell by 19% last year, a similar fall to that recorded in 2020 (see

23 See C. Couaillier, M. Lo Duca, A. Reghezza and C. Rodriguez d'Acri (2022). "Caution: do not cross! Capital buffers and lending in Covid-19 times". ECB *Working Paper Series* No 2644.

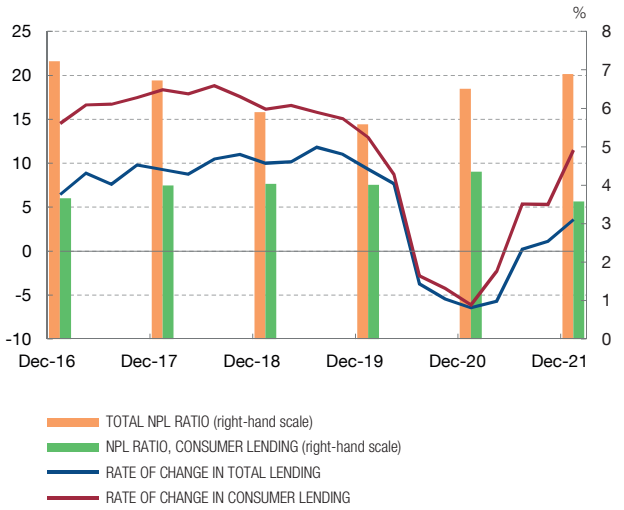
24 The 2020 rate of change excludes the impact of corporate transactions, in particular, that of a significant institution which was absorbed by a deposit institution, substantially reducing the overall size of SLIs.

Chart 2.16

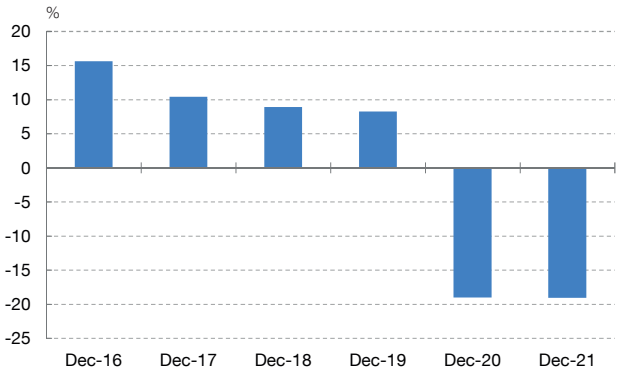
THE STOCK OF CREDIT EXTENDED BY SPECIALISED LENDING INSTITUTIONS GREW IN 2021, PARTICULARLY IN THE CONSUMER SEGMENT, WHILE PROFITABILITY AGAIN DECLINED (a)

The outstanding stock of loans extended by specialised lending institutions (SLIs) increased last year, especially in the consumer segment, which has a large weight in these institutions' portfolios. The NPL ratio behaved unevenly, declining in the consumer segment but increasing in other segments, mainly in lending for house purchase. Profits posted a fall, due to lower net interest income and the worse performance of other items, which clearly offset the improvement resulting from lower loan loss provisions.

1 RATE OF CHANGE IN LENDING AND NPL RATIO AT SLIs (b)



2 RATE OF CHANGE IN PROFITS AFTER TAX OF SLIs



SOURCE: Banco de España.

a The analysis was performed with the group of SLIs existing in December 2021 and thus excluded the effects of corporate transactions carried out in recent years.
b The total NPL ratio is higher than the NPL ratio for the consumer segment because of one larger-sized SLI specialising in high-risk mortgage loans.

Chart 2.16.2), despite the lower loan loss provisions, due to lower net interest income and the worse performance of other items.[25] As a result, ROA stood at 1.7% in December 2021, down 31 bp on end-2020. A possible deterioration in macroeconomic conditions could impact this segment of the financial sector more than deposit institutions, since it focuses on higher-risk operations, such as consumer credit.

Investment funds

Euro area investment funds recorded notable capital inflows in 2021. However, these inflows performed less favourably in the early months of 2022. Net subscriptions of investment funds increased again in 2021 H2 in some of the countries in which such funds are more prevalent, such as Luxembourg and Ireland.

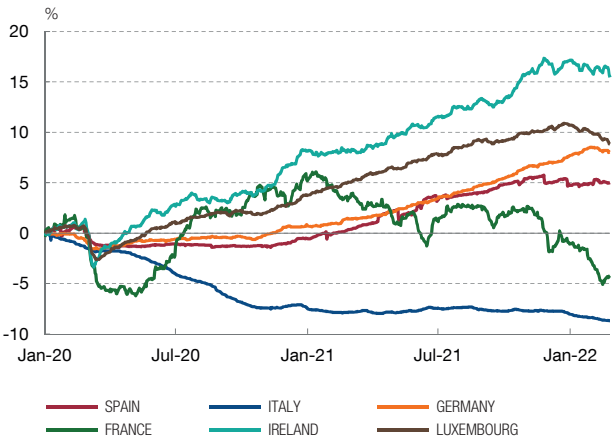
25 2020 saw an extraordinary increase in aggregate impairment losses (57.6%), owing in part to one bank revising its loss models. This explains the drop in provisioning in 2021 as compared with 2020.

Chart 2.17

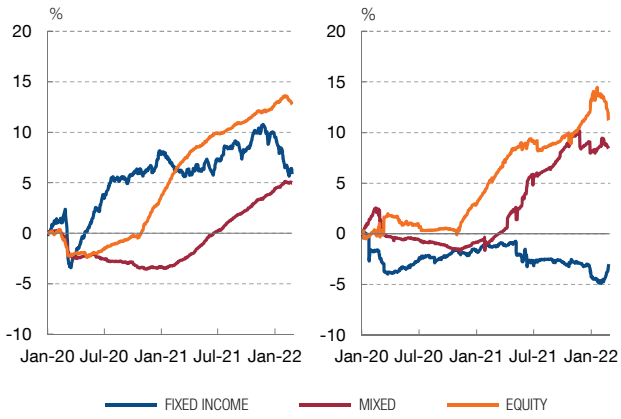
CAPITAL INFLOWS INTO EURO AREA INVESTMENT FUNDS INCREASED, OVERALL, IN 2021 H2. THE EARLY MONTHS OF 2022, HOWEVER, SAW A SLOWDOWN IN INFLOWS AND CAPITAL OUTFLOWS IN SOME SEGMENTS

Capital inflows into investment funds generally held on an upward path in 2021 H2, and were particularly pronounced in funds domiciled in Ireland and Luxembourg, where a significant portion of euro area funds are concentrated. In the early months of 2022 a slowdown in capital inflows was observed, and even capital outflows in some segments.

1 INVESTMENT FUND FLOWS (a)



2 INVESTMENT FUND FLOWS IN THE EURO AREA (EXC. SPAIN) (L-H PANEL) AND IN SPAIN (R-H PANEL) (a) (b)



SOURCES: Banco de España and Refinitiv.

a Cumulative change in investment fund net capital inflows and outflows, as a percentage of the total net assets of the funds of each country or region on 15 January 2020, drawing on a representative sample of funds domiciled in euro area countries. The data for days with atypical flow values are omitted. Data up to 11 March 2022.

b The left-hand panel of Chart 2 includes information on the funds domiciled in Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands and Portugal. The category of fixed-income funds also includes vehicles that invest in the money market. The mixed funds category invests in both fixed income and equity.

In Spain, capital inflows also rose last year, albeit at a slower pace (see Chart 2.17.1). A slowdown in capital inflows was observed during the initial weeks of the war in Ukraine, and even some capital outflows in equity vehicles and, with the exception of Spain, in fixed-income vehicles (see 2.17.2), which appears to owe to the increased uncertainty prompted by the outbreak of the conflict and expectations for the monetary policy cycle. Recent capital outflows from equity funds in Spain have been offset by the moderate capital inflows to fixed-income funds and the stability of mixed investment funds (which invest both in fixed income and equity). According to the latest available Refinitiv data, fixed-income funds account for just under a third of assets in vehicles domiciled in Spain (within the analysed categories), whereas mixed funds represent around half of all assets, and equity funds the remaining portion (approximately 20%).

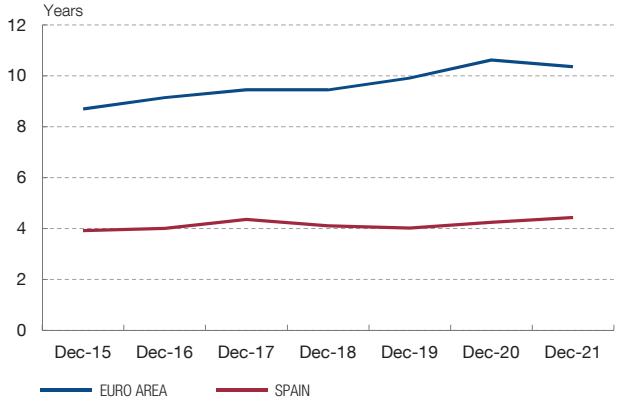
The maturity structure of fixed-income portfolios of funds domiciled in the euro area has lengthened, and their risk profile increased, since 2015, meaning that they would be more vulnerable to a rise in interest rates. The average maturity of fixed-income portfolios of euro area funds increased by two years

Chart 2.18

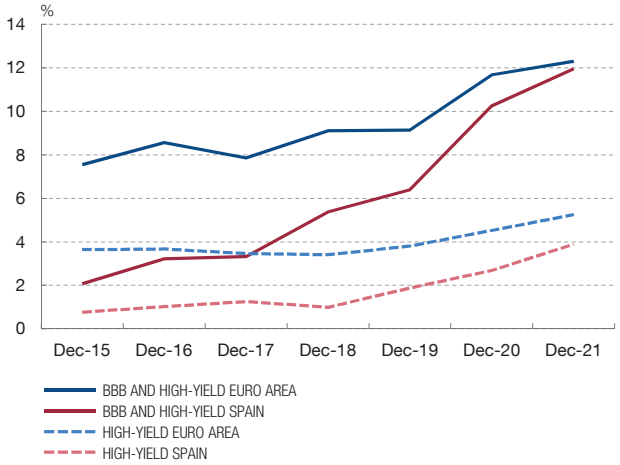
SINCE 2015, THE AVERAGE MATURITY OF THE FIXED-INCOME PORTFOLIOS AND BOND HOLDINGS ON THE CUSP OR BELOW INVESTMENT GRADE HAS INCREASED IN EURO AREA INVESTMENT FUNDS, AND TO A LESSER DEGREE IN FUNDS DOMICILED IN SPAIN

In recent years, euro area investment funds, but not those domiciled in Spain, moderately increased the average maturity of their fixed-income portfolios, as a result of which the value of their assets could be more sensitive to changes in interest rates. Both in the euro area as a whole and particularly in Spain, high-yield bond holdings have also increased, although they represent a relatively small proportion of the total fixed-income portfolio. However, if bonds on the cusp of investment grade are also taken into account, a clearer upward trend and a higher degree of materiality in the total portfolio can be observed.

1 AVERAGE MATURITY OF FIXED-INCOME HOLDINGS (a)



2 PROPORTION OF BONDS ISSUED BY NFCs AND RATED HIGH-YIELD AND ON THE CUSP OF INVESTMENT GRADE IN THE FIXED-INCOME PORTFOLIO (b)



SOURCES: Securities Holdings Statistics by Sector and Refinitiv.

a Average maturity refers to the weighted average of the residual maturity of fixed-income instruments in investment fund portfolios (the weightings are the volume of holdings), comprising bonds of all issuers. All euro area countries are included.

b This chart shows the percentages of the total fixed-income portfolio represented by high-yield bond holdings and with ratings on the cusp of investment grade issued by non-financial corporations. High-yield bonds refer to instruments with a rating below investment grade (below BBB-, according to the Standard and Poor's rating scale), while BBB-rated bonds are considered to be on the cusp of investment grade. These percentages are calculated using the market value of the total fixed-income holdings at each date. The calculation includes all the funds of all euro area countries. The percentage of corporate fixed income without a credit rating may be significant in some segments, standing at around 4% of the total fixed-income portfolio in Spain and at 6% in the euro area.

compared with 2015 and was around 10.5 years at end-2021, exposing these funds to greater market risk in the event of an interest rate rise (see Chart 2.18.1). No clear upward trend was observed for Spanish funds, with the average maturity remaining stable at around four years, lower than that of funds in the euro area as a whole. The weight of securities holdings with a credit rating below investment grade has risen significantly since 2018, both in the euro area overall and in Spain. Last year, this increase was higher for funds domiciled in Spain (see Chart 2.18.2). These holdings represent a relatively small proportion of the fixed-income portfolio (5% and 4% in the euro area and Spain, respectively). However, their increasing weight in recent years denotes a higher credit risk exposure of these vehicles. If securities holdings on the cusp of investment grade (BBB on the Standard & Poor's rating scale) are also taken into account, a clearer upward trend can be observed, particularly in Spain, along with a higher degree of materiality (up to 12% of investment funds' fixed-income portfolios) both in Spain and in the euro area as a whole.

Pension funds

The returns and total assets of pension funds increased in 2021, despite the decline in contributions. Gross contributions to pension funds fell by more than 30% in 2021, standing below the level of pension benefits. Despite the drop in gross contributions, the returns and total assets of pension schemes increased, the latter by 8% in 2021 compared with the previous year. This increase reflects pension funds' high annual average returns, which climbed by 783 bp since December 2020 to stand at 8.5% in December 2021. For their part, long-term returns (25 years) held at around 3.3% in 2021.

Insurance companies

The profitability of the insurance sector experienced a moderate decline last year, but its solvency was not adversely affected. In 2021, Spanish insurance companies had a ROE of 12.4% and a solvency ratio of 240.7%. Profitability was down 2.5 pp on 2020, while the solvency ratio rose by 2.9 pp. Net profit in 2021 was €479 billion, representing a drop of 12.5% compared with the previous year. The decline in net profit is mainly explained by the withdrawal of the restrictions on mobility, which had led to a substantial reduction in the volume of claims in most insurance sectors and to an extraordinary increase in net profit in 2020. The ratio of claims to earned premiums was 35.2% in 2021, compared with 37.1% in 2019 and 32.4% in 2020.

The volume of savings managed by insurance companies was €257 billion in December 2021, an increase of 6.4% year-on-year. This volume includes €195 billion of life insurance technical provisions (0.8% higher than a year earlier) and €61 billion of pension fund assets managed by insurance companies (up 28.1% on the previous year).

2.2.2 Systemic interconnections

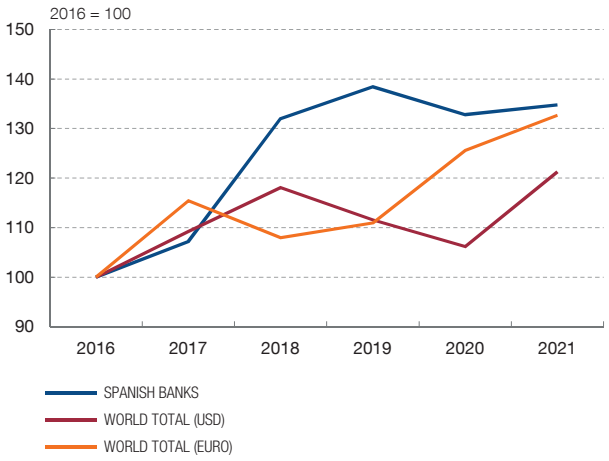
The Spanish banking system's total assets and liabilities vis-à-vis other sectors remained unchanged on the whole in 2021 H2. In December 2021, the value of the resident banking sector's assets and liabilities (at non-consolidated level) vis-à-vis other resident and non-resident sectors was close to 195% and 191% of GDP, respectively. The distribution of the assets reveals relatively uniform exposures to households (55% of GDP) and to NFCs (44% of GDP), and smaller exposures to general government (24% of GDP). However, on the liability side, exposures to households predominate (83% of GDP). The banking sector's assets vis-à-vis those of other Spanish financial sectors amount to 19% of GDP, and in the case of liabilities, to around 21% of GDP.

Chart 2.19

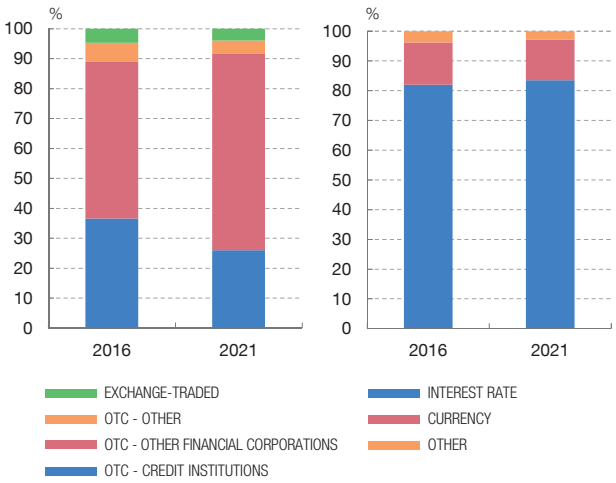
THE NOTIONAL VOLUME OF THE BANKING SECTOR'S INTEREST RATE DERIVATIVES HAS TENDED TO INCREASE IN RECENT YEARS IN SPAIN, WITH NON-BANK FINANCIAL INSTITUTIONS AS THE MAIN COUNTERPARTIES

In recent years, the total notional value of interest rate derivatives has increased in Spain, in line with the trend observed, with some fluctuations in other jurisdictions. Non-bank financial institutions are the main counterparties.

1 INTEREST RATE DERIVATIVES. NOTIONAL (a)



2 BREAKDOWN BY COUNTERPARTY (L-H PANEL) AND UNDERLYING ASSET (R-H PANEL). NOTIONAL (b)



SOURCES: Banco de España and BIS.

a In Chart 1, "World total" refers to the global trading of derivatives in the currencies considered. Data for 2021 refer to the end of 2021 H1, except for Spanish banks, where data refer to year-end exposure, according to FINREP regulatory returns (consolidated data).
b Exposure relating to exchange-traded derivatives is calculated as the difference between total exposure to derivatives and exposure to OTC (bilateral agreements) counterparties. Consolidated data.

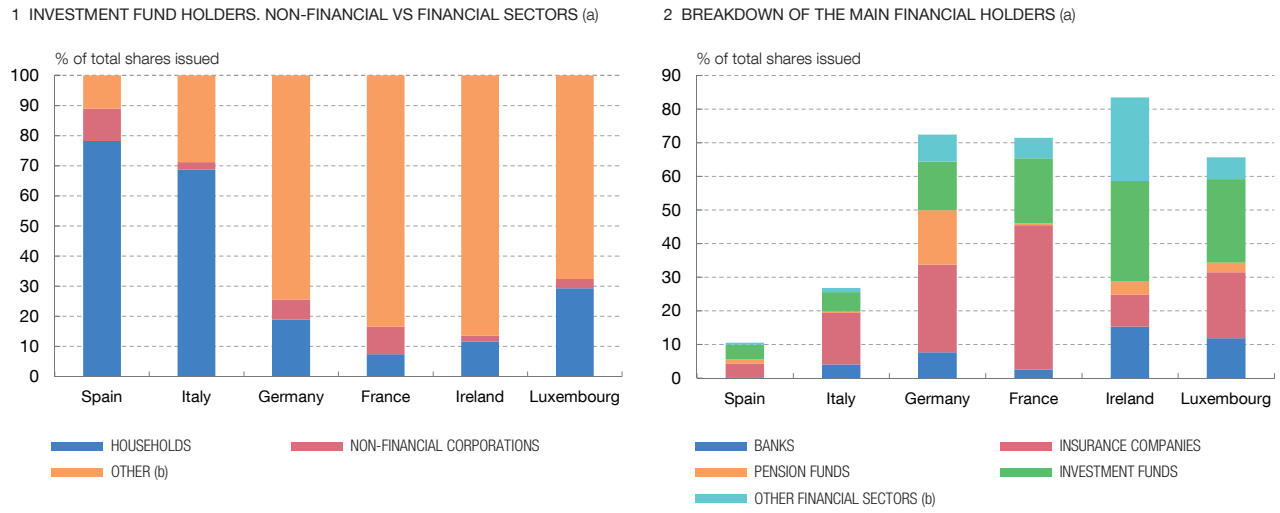
The banking sector's derivatives market activity is a major source of interconnectedness with the rest of the financial system, where its main counterparties for such transactions can be found. In recent years, the notional amounts traded by Spanish banks in interest rate derivatives (see Chart 2.19.1) have increased. These amounts represent the volume of underlying assets linked to the contracts and do not directly reflect the exposure to the market or counterparty risk associated with these instruments. This increase has run parallel to the growth of this type of derivatives traded in euro in other jurisdictions. Most of Spanish banks' derivatives contracts are classified in the trading portfolio (98% at end-2021), and are therefore, in accordance with accounting standards, not used for hedging economic risks. Non-bank financial institutions (including central clearing houses)[26] are the main counterparties, and their weight has tended to increase since 2016 (see Chart 2.19.2, left-hand panel). Interest rate derivatives account for the bulk of banks' activity in the derivatives market, surpassing currency derivatives (see Chart 2.19.2, right-hand panel). Spanish banks' direct exposure to the commodity

26 Overall, the trend towards central clearing of derivatives has been more pronounced for interest rate derivatives, driven by regulatory requirements. See Aramonte and Huang (2019).

Chart 2.20

THE STRUCTURE OF INVESTMENT FUND HOLDINGS IS UNEVEN ACROSS THE EURO AREA, WITH A GREATER WEIGHT OF RETAIL INVESTORS FOR FUNDS DOMICILED IN SPAIN

Households are the main holders of investment funds domiciled in Spain and Italy, whereas in countries like Germany, France, Ireland and Luxembourg, other financial sectors hold the largest proportion of shares issued by investment funds. Holders that are financial intermediaries notably include insurance companies, particularly in Germany and France, and also investment funds (the so-called "funds of funds"), especially in Ireland and Luxembourg, which act as European financial centres for these types of vehicles.



SOURCE: Securities Holdings Statistics by Sector.

a Data refer to December 2021 and are presented as a percentage of the total shares issued by each country's funds.
b The "Other" category includes insurance companies, pension funds, banks, other financial intermediaries and public-sector entities (the latter represent a small percentage, except in France, where public-sector holdings exceed 10%). Thus, the total percentage of holdings under "Other" in Chart 1 exceeds that of the sum of financial intermediaries' holdings in Chart 2, owing to the presence of public-sector entities in the "Other" category.
c This category includes sectors such as financial auxiliaries, captive financial institutions and money lenders and other financial intermediaries with a small share of holdings.

derivatives market, which has experienced increased volatility as a result of the war in Ukraine, is very low.[27]

The structure of investment fund holders is highly uneven across the euro area and this could influence the behaviour of these funds in crisis situations. Households are the main holders of investment funds domiciled in certain countries such as Spain or Italy, where they own more than 70% of the shares issued (see Chart 2.20.1). In countries like Germany, France, Ireland or Luxembourg, the financial sector holds a comparatively much higher proportion, essentially owing to non-bank financial institutions (see Chart 2.20.2). The structure of

27 The volume of commodity derivatives held for trading by Spanish banks, according to their notional value, is equal to €5 billion (this category includes commodities related to fossil fuels and also products of mineral, vegetable or animal origin). However, tensions in the derivatives markets could pose indirect risks for the banking sector. Thus, the spike in commodity price volatility has increased the size of margin calls in this market, and in the event that participants suffer significant losses, risks could arise for banks with credit exposures to affected counterparties.

shareholders may affect the stability of the net inflows received by investment funds at times of crisis. For example, the holdings of households may be more stable than those of financial institutions during episodes of financial stress. Indeed, during such episodes, financial institutions may be forced to reduce their holdings, to meet capital requirements if the funds' credit quality is impaired, or if they have liquidity needs.[28] Holders in Spain, Italy and Germany own practically all the shares issued by the funds domiciled in their respective countries. In France, the percentage is close to 85%. By contrast, the weight of domestic shareholders is notably lower in Luxembourg (16%) and Ireland (12%), suggesting that they channel part of savings from the rest of the world, particularly those of other euro area countries.

The direct credit exposure to Russia of Spanish financial intermediaries is very low, although there may be a higher degree of indirect exposure through holdings in investment funds domiciled outside the European Union. The armed conflict initiated by Russia and the sanctions imposed in response by various countries (see Chapter 1) heighten the financial risks related to exposures to Russian counterparties. According to information from the Bank for International Settlements (BIS), the EU banking sector's total exposure to Russia amounted to €70 billion in 2021 Q3. The relative weight of Spanish banks' exposure in total EU exposures is lower than 1% (see Chart 2.21.1), the equivalent of close to 0.05% of the Spanish banking system's RWAs. The possible direct holdings of fixed-income securities issued by NFCs, financial intermediaries and the public sector in Russia constitute a second source of exposure, which is also low for non-bank financial sectors domiciled in the EU. These holdings were estimated at €25 billion in 2021 Q4 (see Chart 2.21.2). In Europe, investment funds are the main holders of such securities. In turn, the total holdings of non bank financial intermediaries resident in Spain are very small (0.4% of total holdings in the EU). Indirect exposure could be higher since, according to BIS data, Russian institutions have issued bonds amounting to €175 billion to raise international financing. Of these, 85% would be found in the portfolios of financial intermediaries domiciled outside the EU, and intermediaries in Spain and other European countries could be exposed to them through their holdings in these intermediaries (e.g. in funds of funds).

Spanish banks' activity in the leveraged loan market increased in 2021, standing close to pre-pandemic levels, while the volume structured in such loans worldwide marked a new record.[29] According to Refinitiv data, Spanish banks acted as bookrunner to structure €21 billion in leveraged loans, less than 1% of

28 To determine whether such interconnections favour the transmission of tensions or generate vulnerabilities for the financial system, a systematic analysis is required. However, recent developments provide some evidence that this is the case. For example, at the height of the health crisis, several euro area funds were affected by sudden withdrawals associated with insurance companies' liquidity needs. For further information, see Rousová et al. (2020). See also, Mayordomo et al. (2020) or Cella et al. (2013).

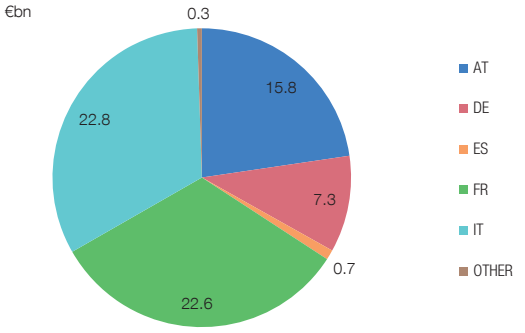
29 Given the high level of activity in this market, the ECB has issued a supervisory opinion warning of the possible build-up of risks and the need to monitor this credit segment.

Chart 2.21

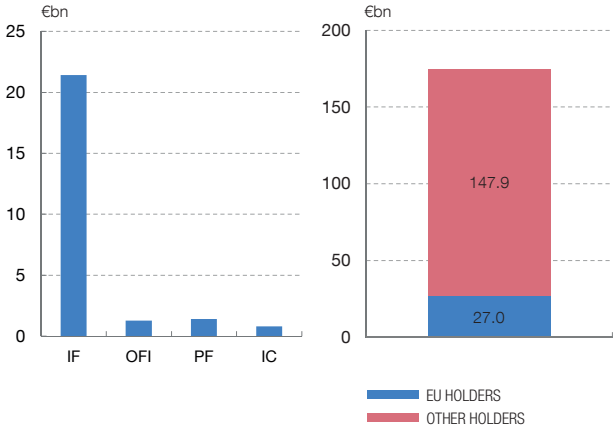
THE DIRECT CREDIT EXPOSURE OF EU-RESIDENT FINANCIAL INTERMEDIARIES TO RUSSIAN NATIONALS IS LIMITED

The exposure of the EU-resident banking sector to Russian nationals is mainly concentrated in Austria, Germany, France and Italy. Non-bank financial intermediaries notably include investment funds (IF) as the main holders of fixed-income securities issued by Russian nationals. The indirect exposure to these issuers could also be significant, materialising through investments in other intermediaries with direct exposure.

1 EXPOSURE OF THE EU BANKING SECTOR TO RUSSIAN NATIONALS (a) 2021 Q3



2 BREAKDOWN OF NON-BANK FINANCIAL HOLDERS RESIDENT IN THE EU (2021 Q4) AND BREAKDOWN BY EU VS NON-EU HOLDERS OF FIXED-INCOME SECURITIES ISSUED BY RUSSIAN NATIONALS (2021 Q3) (b) (c)



SOURCES: BIS, Securities Holdings Statistics by Sector (SHSS) and Refinitiv.

a Exposures include loans and bond holdings vis-à-vis all Russian nationals, regardless of their country of residence.
b Holders resident in the European Union are shown according to the information on direct holders available in the SHSS database at December 2021. It has not been possible to identify other holders based on the available information. The total amount corresponds to the information provided by the BIS on the nominal amount of international issues of Russian nationals in force at December 2021.
c A breakdown is provided of the holdings of non-bank financial sectors in Spain and in the five countries with the highest volume of holdings. The abbreviations refer to investment funds (IF), other financial intermediaries (OFI), pension funds (PF) and insurance companies (IC).

the total in 2021 (€2.6 trillion).[30] The activity of Spanish banks in this market increased by 20% on 2020, thus standing close to pre-pandemic levels. Spanish banks also have exposures to this segment through loans originated in previous years or acquired in the secondary market; accordingly, developments will have to be monitored closely. Leveraged loans generate important interconnections with other banks participating in these exposures and drive up exposure to global financial conditions.

30 This volume includes total leveraged loans, covering both term loans and credit lines, regardless of whether they have been used.

Box 2.1

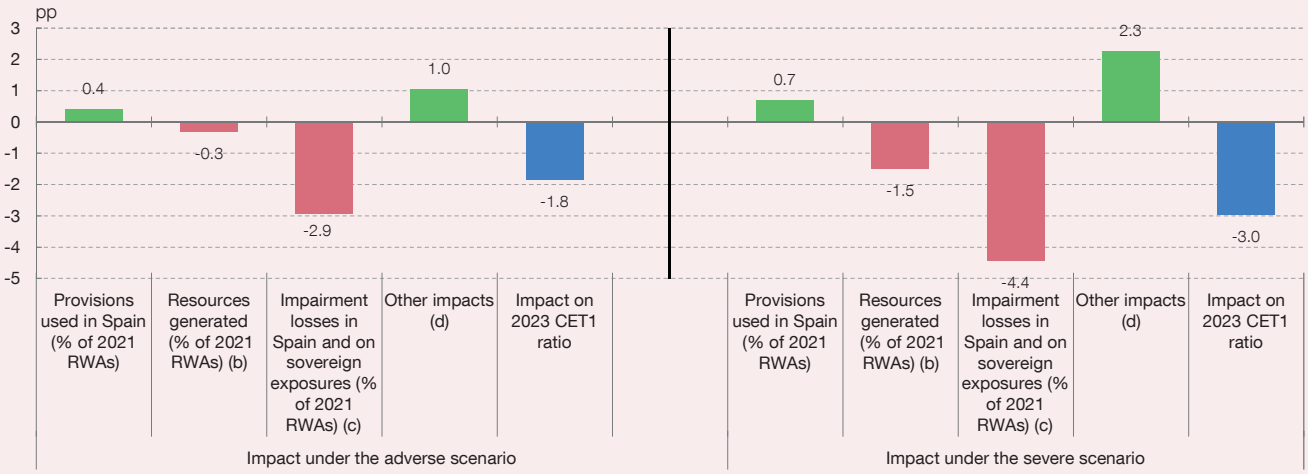
IMPACT ON THE SPANISH BANKING SECTOR IF THE FINANCIAL STABILITY RISKS IDENTIFIED FOLLOWING THE OUTBREAK OF WAR IN UKRAINE WERE TO MATERIALISE

The Banco de España has assessed the risks that could arise for the banking sector as a result of the armed conflict in Ukraine. To this end, it has applied a stress testing methodological framework known as the Forward-Looking Exercise on Spanish Banks (FLESB).[1] In this exercise, the hypothetical macro-financial scenarios (described in Box 1.3) envisage the macro-financial risks materialising to a high degree over the 2022-2023 horizon.

Chart 1 shows, for the adverse and severe scenarios, the corresponding impacts on the aggregate CET1 ratio of the group of Spanish banks.[2] The impacts on macro-financial conditions envisaged under the scenarios (e.g. lower GDP growth and higher interest rates) would translate into negative changes in expected bank profitability and solvency for the period 2022-2023 (e.g. lower profit generation). In particular, the adverse scenario would entail a reduction of 1.8 pp in the aggregate CET1 ratio expected at end-2023, while the effect under the severe scenario would be more negative still (up to 3 pp). These capital ratio impacts would stem from extreme events far removed from the baseline outlook. In any event, the estimated capital charge indicates that the aggregate resilience of the Spanish banking sector as a whole is adequate.

The elements prompting this capital depletion would include, first, a lower generation of funds with which to address the potential impairment in operations in Spain and in sovereign exposures, with reductions of 0.3 pp and 1.5 pp (relative to RWAs in 2021) under the adverse and severe scenarios.

Chart 1
IMPACT OF THE RISK MATERIALISATION SCENARIOS ON BANK SOLVENCY (a)
CONSOLIDATED BUSINESS



SOURCE: Banco de España.

a The impacts are defined as the expected changes in the CET1 ratio in 2023 and in different financial flows in 2022-2023 (e.g. generation of funds) stemming from the materialisation of adverse changes in macro-financial conditions envisaged in the scenarios described in Box 1.3.
b The generation of loss-absorbing resources is determined by net operating income in Spain, which also includes the net profit generated abroad for banks with significant international activity.
c Impairment losses on loans and foreclosed assets in operations in Spain, along with the impact on capital of the potential deterioration of sovereign exposures at consolidated level.
d Other consolidated gains and losses, tax effects, exchange rate differences, dividend distribution, coverage of Government losses linked to ICO-backed loans and changes in RWAs.

1 The FLESB is a top-down methodology developed internally by the Banco de España, which applies the same scenarios, assumptions and models consistently across all of the banks analysed. The data sources available are highly granular, reaching down to the level of individual transactions and foreclosed assets in operations in Spain. The main features of this framework are outlined in the November 2013 FSR. Over the succeeding years, the Financial Stability Report has described the main improvements and new developments included in the model, since it is a dynamic framework under continuous development.

2 The analysis covers both significant institutions and a broad sample comprising 45 less significant institutions (LSIs, according to the SSM's supervisory classification), which includes savings banks and credit cooperatives, as well as other less significant institutions (OLSIs).

Second, the CET1 ratio would be adversely affected by increased impairment losses in operations in Spain and in sovereign exposures, whose adverse effects rise by 2.9 pp and 4.4 pp (as compared with 2021 RWAs) under the adverse and severe scenarios. These losses are affected both by the worsening credit quality of loans to the private sector (which would increase provisioning), and by a value adjustment to banks' sovereign bond holdings, given that the scenarios envisage an interest rate hike. The greater use of existing provisions considered in the scenarios would partly offset the need for new provisioning, with a positive impact of between 0.4 pp and 0.7 pp (relative to 2021 RWAs) under the adverse and severe scenarios, respectively.

Lastly, the changes in other impacts mitigate the reduction in the expected CET1 ratio for 2023 (by 1 pp and 2.3 pp relative to 2021 RWAs, depending on the severity). These essentially capture the banks' deleveraging, which reduces the solvency ratio denominator, and the increased enforcement of guarantees to cover the expected credit loss associated with ICO-backed loans.[3] These guarantees, which have so far not been enforced to any significant degree, represent important loss-absorbing resources in the face of this new, exogenous crisis. This estimate may represent a lower bound for the total mitigating effects, since this exercise does not include the measures approved by the Government[4] in late March, allowing the extension of grace periods and maturities for existing ICO-backed loans to certain industries, as well as establishing a new €10 billion ICO facility.

Deeper analysis of the credit risk impairment losses for operations in Spain reveals notable differences across the banks and the sectors of exposure. In particular, loans to NFCs and sole proprietors show significant heterogeneity (by firm size and sector of activity) in the impact of the adverse scenarios on probability of default (PD) (see Chart 2). The larger differential impact for smaller-sized firms reflects their lower capacity to absorb shocks, given that their sources of revenue and financing are less diversified. The cross-sector differences are explained in part by the energy price increase affecting each sector differently, as envisaged under the scenarios, but also by the varying sensitivity of their servicing capacity to the general macroeconomic downturn and by differences in their initial financial positions.

When characterising credit loss, loans to individuals are also particularly relevant, as they account for over half of the total credit portfolio of operations in Spain, with household mortgages in particular representing 44% of that total. The expected loss rates in the mortgage portfolio continue to be limited, thanks to the nature of the loans and their associated collateral, and the scenarios therefore envisage a smaller impact for this business.

As a result of these various factors, the final impact on impairment provisions[5] in operations in Spain also differs across banks (see Chart 3). While the median impact ranges between 1.9 pp (relative to 2021 RWAs) under the adverse scenario and 3.5 pp under the severe scenario, there are cross-bank differences attributable to factors such as ex ante heterogeneity in the quality of their loans to the private sector and the differing sectoral composition of the portfolios.

Another relevant impact channel considered in the scenarios is the impairment of the sovereign bond portfolio. This reflects one of the main elements included in the scenarios: an interest rate rise associated with inflationary pressures (prompting a tightening of monetary policy in various jurisdictions) and with increased risk aversion among investors. The higher interest rates at which sovereign exposures is discounted, in both the short and especially the long term, lead to the value of such exposures deteriorating (see Chart 4). The median impacts on the associated losses (relative to 2021 RWAs) stand at 0.6 pp and 0.5 pp under the adverse and severe scenarios, respectively.

---

3 The analysis modelled the effect of the economic policy measures to mitigate the impact of COVID-19, particularly taking into account the provision of ICO guarantees. The first programme (for a total of €100 billion in guarantees) was approved in March 2020 (Royal Decree-Law 8/2020) and was extended for a further €40 billion in July (Royal Decree-Law 25/2020). In the analysis, the banks recover the guaranteed percentage of the estimated expected loss for these ICO-backed loans. This explains why losses are cushioned to a greater extent under the severe scenario.

4 See the Council of Ministers announcement of 29 March 2022 (available in Spanish only).

5 The impact on impairment provisions is determined by how gross credit losses are affected (which depends on developments in PD, together with other parameters, such as collateral values, the NPL recovery rates, etc.) and the use of existing provisions to cover them.

IMPACT ON THE SPANISH BANKING SECTOR IF THE FINANCIAL STABILITY RISKS IDENTIFIED FOLLOWING THE OUTBREAK OF WAR IN UKRAINE WERE TO MATERIALISE (cont'd)

Chart 2
DISTRIBUTION BY SECTOR AND FIRM SIZE OF THE IMPACT ON THE PROBABILITY OF DEFAULT OF FIRMS AND SOLE PROPRIETORS (a). OPERATIONS IN SPAIN

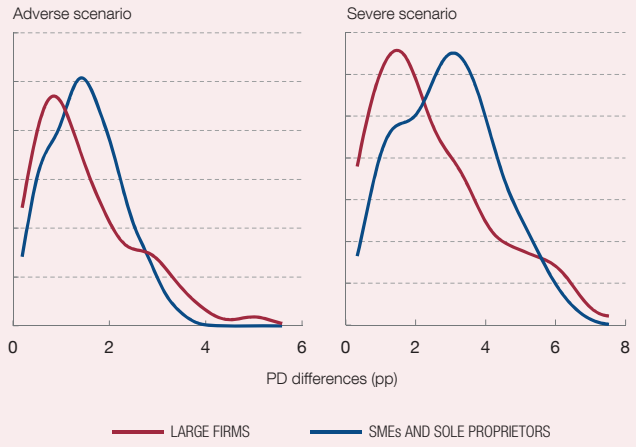
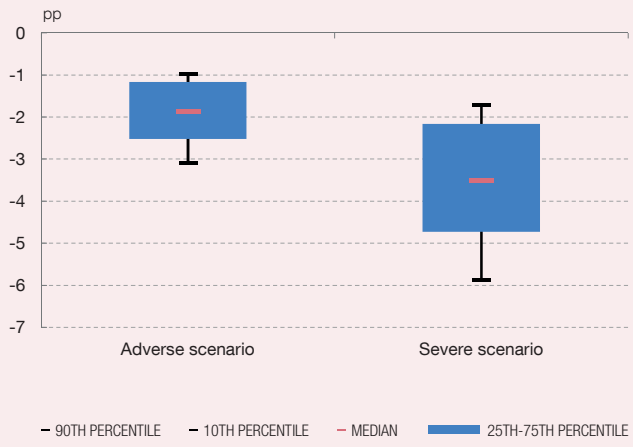


Chart 3
DISTRIBUTION AMONG BANKS OF IMPACTS ON LOAN IMPAIRMENT PROVISIONS RELATIVE TO 2021 RWAs (b). OPERATIONS IN SPAIN



SOURCE: Banco de España.

a Probability of default (PD) is defined as the probability of reclassification from performing to non-performing status in a 12-month period. This probability is estimated using a model that links observed PD to macroeconomic variables and firms' financial ratios. The chart shows the density function of the average impact of the adverse and severe scenarios on the estimated PD for each sector in 2022-2023 (in pp). This is estimated for each bank, but the weighted average for each sector is shown. Weighting is by number of borrowers. This density function is proxied by means of a kernel estimator, which enables non-parametric estimation and provides a continuous, smoothed graphic representation of the function.
b Shown is the distribution among banks of the impact of the adverse and severe scenarios on 2022-2023 impairment provisions for loans to the private sector in Spain (relative to 2021 RWAs in Spain). The bars represent the values between the 25th and 75th percentiles, while the lines show the 10th, 50th (median) and 90th percentiles. The 15 largest banks by RWAs are considered.

The cross-bank dispersion of sovereign losses is explained by factors such as the portfolio's geographical composition, the maturity structure and the accounting classification of the exposures. In the case of some emerging countries, rising interest rates entail high discounts on holdings of their debt, although this deterioration in banks' equity is limited by the depreciation of these countries' currencies against the euro. Given that a significant proportion of banks' sovereign portfolio is classified as at amortised cost (53.7% for the group of banks), on the basis of their intention to hold such debt on the balance sheet until maturity, the deterioration of its market value is only partially passed through to the balance sheet. This is an important factor mitigating the impact of the crisis. Also, considering the sovereign bond holdings classified as at fair value, those banks whose portfolios have shorter terms to maturity are less affected than those with longer-dated maturities. In the case of Spanish banks, 70% of sovereign bonds in the fair value portfolio have a remaining term of over one year, while bonds with a maturity of more than 10 years account for 7%.

The rise in interest rates envisaged in the scenarios also adds a further mitigating element, by improving net interest income. This is because the rise favourably affects the net interest margin on loans to the private sector and makes investing in debt securities more profitable, whereas the cost of deposits responds more moderately. These positive effects predominate over the decline in the stock of performing loans generating interest income prompted by higher interest rates and worsening economic activity, which lower the total growth and quality of credit.

The modelling used bears out the improvement in net interest income of operations in Spain under the adverse and severe scenarios (see Chart 5). In terms of median impacts (relative to 2021 RWAs), increases of 1.1 pp and 0.3 pp are observed in net interest income in Spain under the adverse and severe scenarios, respectively. The cross-bank dispersion in the results is associated with differences in the composition of loans to the private sector, in the weight of fixed-income securities in total assets and in private sector deposits as a share of total funding.

Box 2.1

IMPACT ON THE SPANISH BANKING SECTOR IF THE FINANCIAL STABILITY RISKS IDENTIFIED FOLLOWING THE OUTBREAK OF WAR IN UKRAINE WERE TO MATERIALISE (cont'd)

Chart 4
DISTRIBUTION AMONG BANKS OF IMPACTS IN TERMS OF LOSSES IN VALUE IN SOVEREIGN EXPOSURES (a). CONSOLIDATED BUSINESS

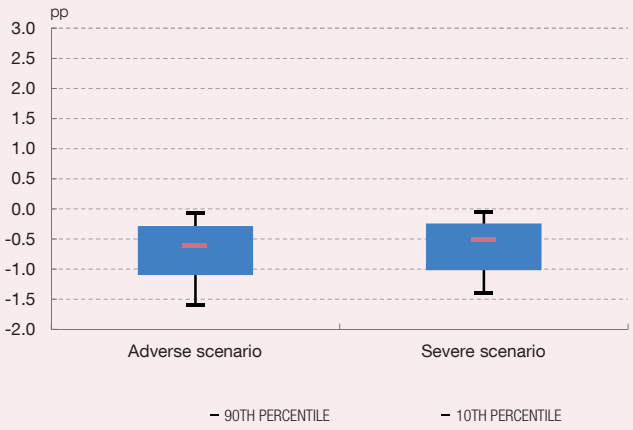
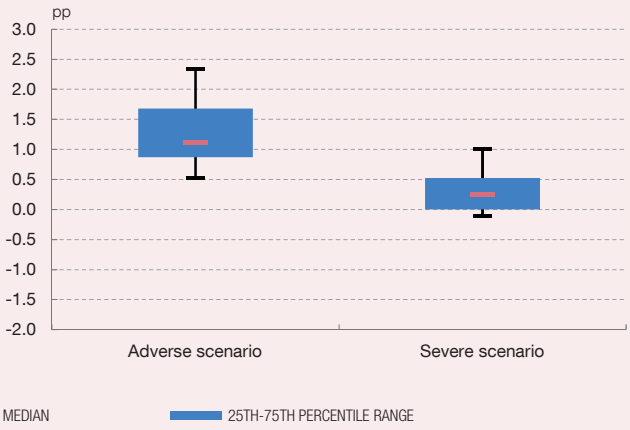


Chart 5
DISTRIBUTION AMONG BANKS OF IMPACTS ON NET INTEREST INCOME (b). OPERATIONS IN SPAIN



SOURCE: Banco de España.

a Shown is the distribution among banks of the impact of the adverse and severe scenarios on the cumulative losses on consolidated sovereign exposures in 2022-2023 (relative to RWAs in 2021). The bars represent the values between the 25th and 75th percentiles, while the lines show the 10th, 50th (median) and 90th percentiles. The 15 largest banks by RWAs are considered.
b Shown is the distribution among banks of the impact of the adverse and severe scenarios on cumulative net interest income in 2022-2023, relative to RWAs in 2021. The bars represent the values between the 25th and 75th percentiles, while the lines show the 10th, 50th (median) and 90th percentiles. The 15 largest banks by RWAs are considered.

In sum, the stress tests conducted suggest that the Spanish banking system's CET1 ratios would be lower if the risks envisaged in these scenarios were to materialise to a high degree.[6] However, the results also suggest that, given the current levels of these solvency ratios, the aggregate resilience would suffice to absorb the impact of the crisis. In any event, the armed conflict adds uncertainty over the impact and source of the macro-financial risk factors that are relevant for assessing banks' solvency. Thus, as this crisis episode unfolds, the analysis assumptions will need to be reassessed, so that any risks and vulnerabilities that may arise or intensify can be detected early on.

6 When comparing, in terms of severity, the results with those of other exercises performed with the FLESB tool and published in the Financial Stability Reports, it should be specified that the time horizon in this exercise is shorter: two years, rather than three. Accordingly, a decline in CET1 over the two-year horizon comparable to that envisaged in previous exercises would indicate a more severe impact were an additional crisis year added to the scenario. Conversely, if the additional year were one of recovery, the severity would likely be lesser than in other exercises.

3

SYSTEMIC RISK AND PRUDENTIAL POLICY

In 2021 H2, thanks in large part to the upturn in economic activity, the systemic risk indicators, which inform decisions on the countercyclical capital buffer (CCyB), continued to correct from their high levels in 2020. Nonetheless, such indicators still diverge significantly from their pre-COVID-19 levels, making it crucial to monitor developments in the coming quarters in order to assess any potential warning signs. With this in mind, in view of the new macroprudential tools set in place under the recent Circular 5/2021, the Banco de España has developed a framework for monitoring sectoral imbalances in order to strengthen its periodic risk assessments. Meanwhile, the contemporaneous indicators of systemic financial stress remain at low levels, despite the spikes seen in recent months, linked to the emergence of the COVID-19 Omicron variant and the Russian invasion of Ukraine. This last event has considerably heightened uncertainty over macro-financial developments, increasing the likelihood of more negative economic growth scenarios and financial conditions, while confirming the advisability of holding the CCyB rate at 0%. On the regulatory front, work has continued in recent months on various international and European initiatives, a case in point being the work on reviewing the EU's macroprudential framework for the banking sector.

3.1 Analysis of risk indicators and systemic vulnerabilities

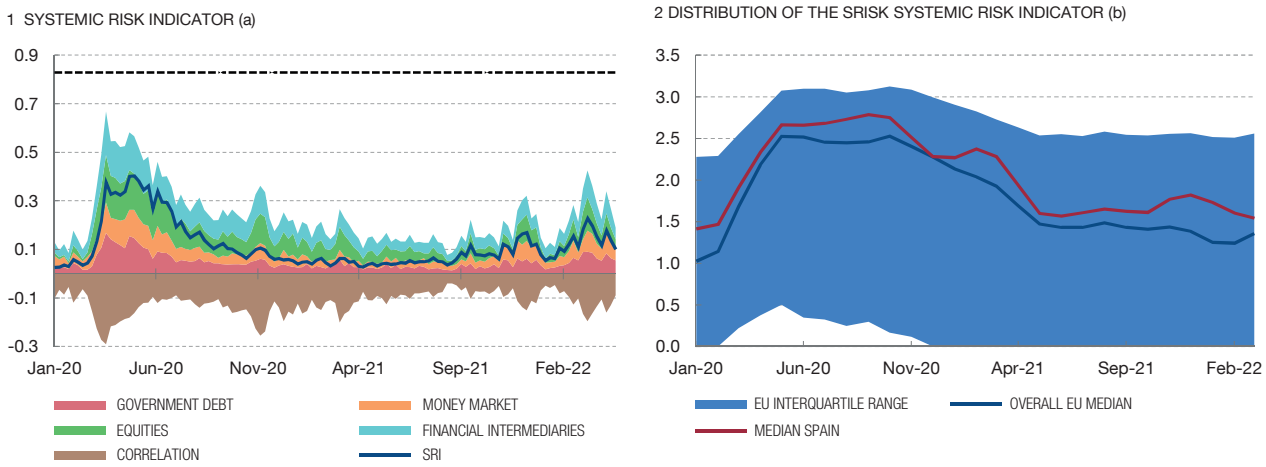
Rising uncertainty on financial markets since mid-2021 has brought with it episodes of heightened systemic stress, in particular after the Russian invasion of Ukraine. The Banco de España's systemic risk indicator (SRI)[1] had settled at a low level since 2020 H2 (see Chart 3.1.1). However, starting in August 2021, the SRI again began to rise somewhat, lasting through to end-2021, reflecting an all-round increase in stress in the four financial segments captured by the indicator, above all in the equities segment. While the SRI continued to reflect considerable stock market volatility as 2022 began, lower inter-market correlation had set it on a downward path, which was then cut short by growing geopolitical tensions. Other factors causing the indicator to rise include the sudden emergence of the Omicron variant and inflationary pressures, driven in particular by surging energy prices and persistent global supply problems. Such developments are not unique to Spain and had already brought forward market expectations of a change in monetary policy stance on the part of the ECB by the start of 2022. The war between Russia and Ukraine has introduced further uncertainty, making markets increasingly

1 This indicator comprises information on the four most representative segments of Spain's financial markets (the money, government debt, equity and bank funding markets), 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.

Chart 3.1

THE SRI REMAINS AT LOW LEVELS, DESPITE THE SPIKES RECORDED SINCE AUTUMN 2021, WHILE THE SYSTEMIC RISK INDICATORS REMAIN STABLE AND CLOSE TO PRE-PANDEMIC LEVELS

Starting in August 2021, the SRI began to rise somewhat due to the all-round increase in stress in the four financial market segments captured by the indicator, above all in the equities segment. The rise in the SRI coincides with the emergence of new COVID-19 variants, heightened geopolitical tensions and persistent inflationary pressures. Nonetheless, in early 2022, the SRI remains at levels well below those reached in 2020 following the outbreak of the pandemic, albeit rising in the wake of the Russian invasion of Ukraine. Meanwhile, the systemic risk contribution of banks measured by the SRISK indicator is close to pre-pandemic levels, both for the European Union as a whole and for Spain. The armed conflict in Ukraine has not yet had an appreciably significant impact on this indicator.



SOURCES: Datastream, SNL Financial, INE and Banco de España.

a The systemic risk indicator (SRI) aggregates 12 individual stress indicators (volatilities, interest rate spreads, maximum historical losses, etc.) from four segments of the Spanish financial system. In calculating the SRI, the effect of cross-correlations is taken into account, whereby the SRI registers higher values if the correlation between the four markets is high, and lower values where there is less or negative correlation. For a detailed explanation of this indicator, see Box 1.1 of the May 2013 *Financial Stability Report.* The dotted line represents the SRI's historical maximum. Data updated as at 20 April 2022.

b The SRISK indicator is expressed as a percentage of each institution'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; see C. Brownlees and R. Engle (2017), "SRISK: A conditional capital shortfall measure of systemic risk", *The Review of Financial Studies,* Vol. 30. for further details. The SRISK indicator for the months of 2022 Q1 is calculated from the values of assets and liabilities of 2021 Q4 with 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 first and third quartiles of the SRISK distribution for EU banks. Data updated as at 31 March 2022.

volatile and altering the balance of risks, with potential implications for monetary policy decisions. All of these factors have meant that the SRI is currently fluctuating around values that point to a greater level of systemic stress than in 2021 H1, albeit still well below that observed following the outbreak of the pandemic in March 2020. Indeed, the increase in the SRI after the invasion has largely corrected in recent weeks.

Changes in the SRISK indicator since mid-2020 have pointed to the growing resilience of Europe's banks to adverse systemic shocks, although the outbreak of war in Ukraine led to a slight rise in this indicator for the European Union as a whole, which has not fed through to Spanish banks. The SRISK indicator[2] for

2 See Brownlees and Engle (2017). 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 thus constitutes a systemic risk metric, since the high cost of making up a capital shortfall for the banking sector could distort financial intermediation.

the euro area banking sector had fallen gradually since 2020, approaching pre-pandemic levels before the Russian invasion of Ukraine (see Chart 3.1.2). This would suggest euro area banks were contributing less to systemic risk. The median SRISK indicator for Spain's eight listed banks performed in parallel with, albeit above, that for European banks overall and the upturn seen in spring 2020 was all but corrected. However, improvements in this indicator have slowed down since July 2021. In March 2022, following the Russian invasion of Ukraine, a slight change in trend in the indicator was observed for European banks, which did not affect Spanish ones, reflecting their different levels of direct exposure to the regions at war. As a result, the distance separating Spanish banks from their European peers in this connection has shortened considerably.

While the credit-to-GDP gap has continued to correct following the rise recorded at the onset of the pandemic, it remains very wide. As mentioned in previous FSRs, in the context of the crisis prompted by the COVID-19 pandemic, this widening of the credit-to-GDP gap should not be interpreted as an early warning of the emergence of a new cyclical imbalance indicating that the CCyB should be activated. Rather, it is the consequence of the sharp drop in GDP (the denominator in the credit-to-GDP ratio) in 2020 and of the measures to support the flow of credit to the economy, which enabled robust growth in lending that year.

The credit-to-GDP gap has narrowed significantly since 2021 Q2, in tandem with the start of the economic recovery and the moderation of lending (see Chart 3.2.1). This narrowing credit-to-GDP gap is taken as a positive sign, as the distortions caused to this indicator by the pandemic are corrected. Despite this correction, which continued throughout the rest of 2021, the credit-to-GDP gap remained appreciably above the 2 pp reference threshold, above which signs of imbalances in the credit cycle are thought to exist.[3] With this in mind, it remains important to continue monitoring how this indicator corrects itself in the coming quarters so as to assess its capacity to indicate warning signs.

GDP growth has also contributed to the favourable performance of other macroeconomic indicators. In particular, the output gap has continued the upward trend observed since late 2020. Nevertheless, it remains at significantly negative values that fall far short of pre-pandemic levels (see Chart 3.2.1).[4] These values again confirm that the economic damage wrought by the COVID-19 health crisis has yet to be fully reversed. As regards other complementary indicators that inform the decision on the CCyB, such as credit intensity and the debt service ratio, levels that might point to warning signs have not been observed (see Chart 3.2.2).

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3 In line with the statistical specification used by the Banco de España to calculate the credit-to-GDP gap, adjusted to the historically observed average duration of the credit cycle in Spain. By contrast, while the Basel gap has varied along similar lines, it remains at negative levels.

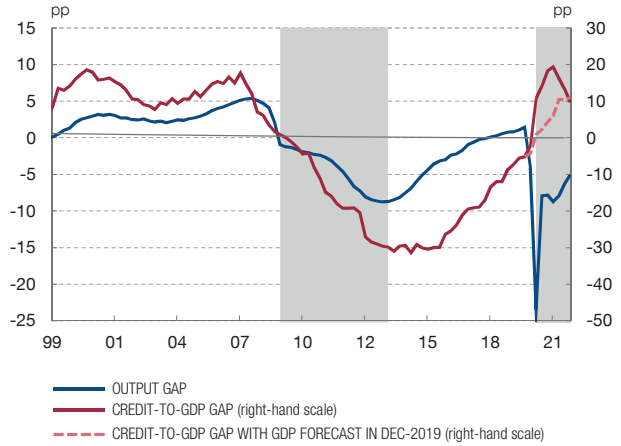
4 The output gap calculation methodology has recently undergone certain changes that have somewhat modified the quarterly variations, without affecting the upward trend recorded in recent quarters.

Chart 3.2

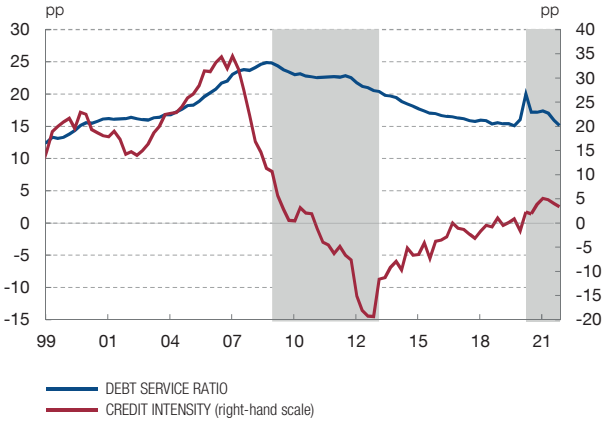
THE CREDIT-TO-GDP AND OUTPUT GAPS HAVE CONTINUED TO CORRECT, ALBEIT NOT YET IN FULL, WHILE COMPLEMENTARY INDICATORS INFORMING DECISIONS ON THE CCyB, SUCH AS CREDIT INTENSITY AND THE DEBT SERVICE RATIO, DO NOT POINT TO WARNING SIGNS

The credit-to-GDP gap narrowed in December 2021 for the third quarter running, though it remains above the 2 pp reference threshold. The output gap remains in negative territory, albeit recovering rapidly. Credit intensity and the debt service ratio (indicators that complement the credit-to-GDP gap when assessing whether to activate the CCyB) are at moderate levels and show no warning signs.

1 CREDIT-TO-GDP GAP AND OUTPUT GAP (a) (b)



2 CREDIT INTENSITY AND DEBT SERVICE RATIO (a) (c)



SOURCES: INE and Banco de España.

a The areas shaded in grey represent the periods of the two financial crises in Spain since 2009: the systemic banking crisis (2009 Q1-2013 Q4) and the crisis triggered by the COVID-19 pandemic (2020 Q1-2021 Q4).

b The output gap is the percentage difference between observed GDP and potential quarterly GDP. Values calculated at constant 2010 prices. See P. Cuadrado and E. Moral-Benito (2016) "Potential growth of the Spanish economy", *Occasional Paper* No 1603, Banco de España. The credit-to-GDP gap is calculated as the difference, in percentage points, between the observed ratio and the long-term trend calculated using a statistical one-sided Hodrick-Prescott filter with a smoothing parameter equal to 25,000. This parameter is calibrated to the financial cycles historically observed in Spain. See J. E. Galán (2019) "Measuring credit-to-GDP gaps. The Hodrick-Prescott filter revisited", *Occasional Paper* No 1906, Banco de España. Data available up to December 2021. The broken line represents a counterfactual credit-to-GDP gap, constructed using the Banco de España's GDP projections at December 2019 for the following two years.

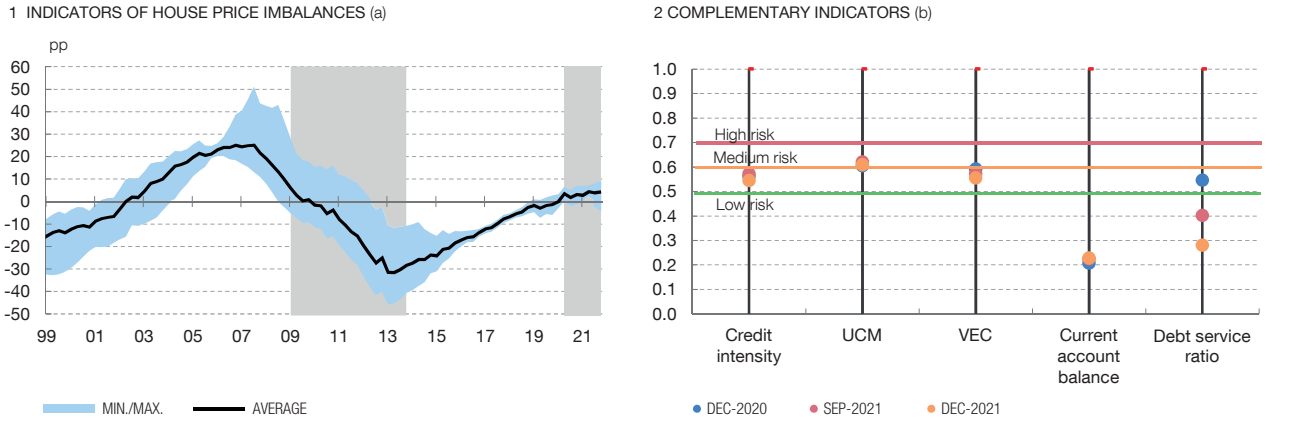
c The debt service ratio is defined as interest payments and debt repayments divided by aggregate disposable income, and therefore measures the effort entailed by servicing debt with respect to available income. This indicator is constructed using a standard formula for calculating the present value of a term loan (using the aggregate stock of credit together with an average interest rate and term) divided by disposable income. See M. Drehmann and M. Juselius (2012), "Do Debt Service Costs Affect Macroeconomic and Financial Stability?", *Quarterly Review,* Bank for International Settlements. The "credit intensity" indicator is calculated as the annual change in credit to the non-financial private sector divided by cumulative GDP for the last four quarters. Data updated as at December 2021.

The other indicators typically used to identify cyclical risks also point to the absence of warning signs although house prices are showing early signs of overvaluation. Indeed, the indicators on real estate market imbalances have shown occasional minor signs of overvaluation since the start of 2020, which increased slightly in 2021. While they remain close to equilibrium levels (see Chart 3.3.1), close monitoring of this market is required, as it could be impacted in opposite directions by the war, given the real erosion of agents' income by higher inflation and the possible tightening of financing conditions, but also because it is a safe haven in the face of financial asset price corrections. There have been no significant increases in the other complementary indicators guiding the decision on the CCyB, such as the alternative estimations of credit imbalances or the current account balance (see Chart 3.3.2).

Chart 3.3

THE INDICATORS OF REAL ESTATE MARKET IMBALANCES REMAIN OUTSIDE ALERT LEVELS, AS DO THE COMPLEMENTARY INDICATORS INFORMING DECISIONS ON THE CCyB

The indicators of real estate market imbalances have remained at positive values since 2020, albeit very close to the equilibrium level. Meanwhile, the complementary indicators for assessing whether to activate the CCyB are at moderate risk levels and show no warning signs.



SOURCES: INE and Banco de España.

a The blue shaded area the minimum and maximum values of the four indicators of imbalances in house prices. The indicators are: i) the real house price gap; ii) the house prices to household disposable income ratio gap; iii) the ordinary least squares model which estimates house prices based on long-term trends in household disposable income and mortgage interest rates; and iv) the error correction model which estimates house prices based on household disposable income, mortgage interest rates and fiscal effects. The long-term trends are calculated in all cases using a statistical one-sided Hodrick-Prescott filter with a smoothing parameter equal to 400,000. The areas shaded in grey represent the periods of the two financial crises in Spain since 2009: the systemic banking crisis (2009 Q1-2013 Q4) and the crisis triggered by the COVID-19 pandemic (2020 Q1-2021 Q4). Data updated as at December 2021.

b The vertical axis represents the percentiles of the historical distribution for each indicator. The horizontal broken lines depict the risk thresholds associated with the percentiles of the distribution, where the 50th percentile (green line) represents the low risk threshold, the 60th percentile (orange line) represents the medium risk threshold and the 70th percentile (red line) represents the high risk threshold. These thresholds are calculated in real time. The indicators, save for those already representing gaps, are standardised by subtracting the median and dividing by the standard deviation. Included alongside the standard indicators of imbalances are metrics based on a semi-structural unobserved components model (UCM) and a vector error correction (VEC) model, which seek to quantify the total credit to the non-financial private sector-to-GDP gap with respect to fundamental macro-financial variables (GDP, interest rates and house prices). See J. E. Galán and J. Mencía (2018), "Empirical assessment of alternative structural methods for identifying cyclical systemic risk in Europe", *Working Paper* No 1825, Banco de España. Data updated as at December 2021.

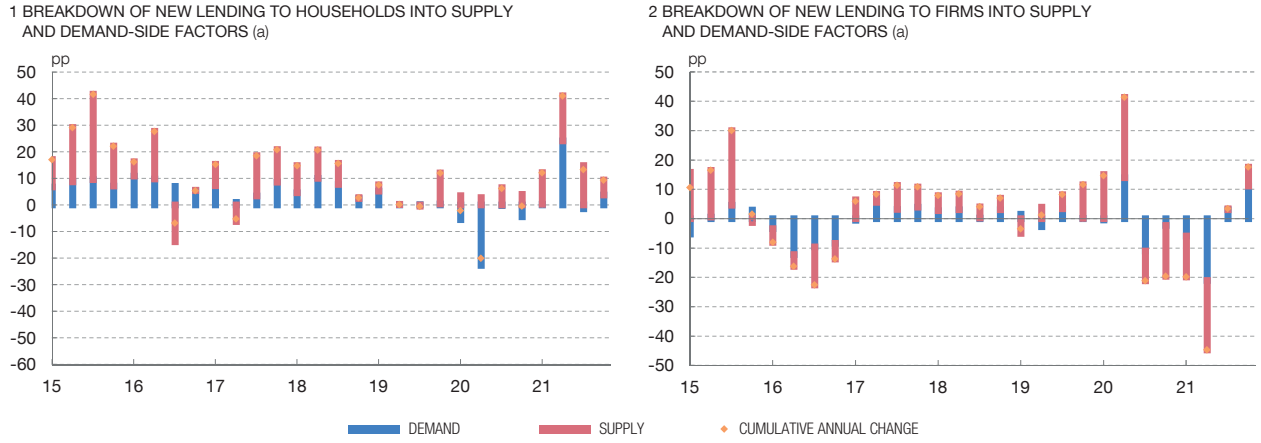
In 2021 H2, the growth in new loans to households could essentially be explained by supply-side factors, whereas the upturn in lending to firms was in large part due to demand-side ones. The econometric model estimates show that, following the contraction seen in 2020, new loans to households grew significantly in 2021, particularly in H1, driven more by supply-side factors than by demand-side ones (see Chart 3.4.1). The fall in business loans recorded since 2020 H2 was reversed in the second half of 2021, whereupon the numbers began to rise gradually. Unlike in the case of loans to households, demand-side factors had a greater role to play in this growth. The Bank Lending Survey for 2022 Q1 in Spain points to rising demand for loans from households and firms, alongside a slight tightening of credit standards in both segments.[5]

5 See A. Menéndez and M. Mulino (2021). "April 2022 Bank Lending Survey in Spain", Analytical Articles, *Economic Bulletin* 2/2022, Banco de España.

Chart 3.4

GROWTH IN NEW LOANS TO HOUSEHOLDS AND FIRMS IN 2021 H2 WAS DRIVEN BY SUPPLY-SIDE AND (IN THE CASE OF FIRMS) DEMAND-SIDE FACTORS

New lending to households and firms grew in 2021 H2, reversing the contraction in loans to firms that began in 2020 Q3. The growth in new loans to households continued, sustained by positive supply-side factors, albeit at a slower pace than in the first half of the year. The growth in new lending to firms was driven above all by demand-side factors, which had a particularly key role to play in Q4.



SOURCE: Banco de España.

a Cumulative annual change. Breakdown of the supply and demand-side effects obtained using a structural vectoral autoregression (S-VAR) model through which the short-term relationships between credit and interest rate spreads are estimated, allowing for simultaneous shocks between the two variables. The models are estimated separately for lending to households and to firms. Data on new lending in euro area countries are used. New lending excludes renegotiations, overdrafts and credit card balances. For further details, see Box 1 in P. Alves, F. Arrizabalaga, J. Delgado, J. Galán, E. Pérez-Asenjo, C. Pérez Montes and C. Trucharte (2021), "Recent developments in financing and bank lending to the non-financial private sector", Analytical Articles, *Economic Bulletin* 1/2021, Banco de España.

Based on this set of macro-financial indicators and the overall systemic risk assessment, the Banco de España has held the CCyB rate at the minimum level of 0%, and there are no plans to raise it while the output gap remains negative. As it has regularly announced since March 2020,[6] the Banco de España continues to consider it appropriate to maintain the CCyB rate applicable to credit exposures in Spain at 0% to make it easier for banks to sustain the flow of credit and thus help the economy recover until the output gap has been closed. Holding the CCyB rate is consistent with the guidance on the flexible application of prudential requirements in response to this crisis advocated by the ECB and other supra-national bodies.[7] Insofar as the economic recovery takes hold, the CCyB rate (no longer in a context of crisis) will be conditional on the need to create macroprudential space with which to

6 In 2021, the Banco de España adapted its statements on CCyB decisions on account of the amendments set out in Directive (EU) 2019/878 (CRD V) simplifying the framework for notifying CCyB measures in those quarters when the rate for this tool is not recalibrated. Specifically, the Banco de España's quarterly press releases on the CCyB that were released until March 2021 have been replaced by the dissemination of an Excel file with updated quantitative information (available in the CCyB section of the Banco de España's website).

7 Additionally, each year the Banco de España identifies a list of third countries (i.e. outside of the European Economic Area) that are materially significant to the Spanish banking system for CCyB purposes, based on the volume of Spanish banks' international exposures. This exercise is conducted pursuant to the ESRB's methodological recommendations. In 2021 the Banco de España identified the following eight material countries (in alphabetical order): Brazil, Chile, Colombia, Mexico, Peru, Turkey, the United Kingdom and the United States.

address potential future adverse shocks, and on the possible emergence of systemic imbalances that can be addressed with this macroprudential instrument. Russia's invasion of Ukraine has heightened the uncertainty over the macro-financial environment, representing an additional reason, consistent with holding the CCyB rate at 0%, for not adopting measures that tighten financing conditions in the economy, at least until the extent of the new scenario can be ascertained more clearly.

Following the recent publication of Circular 5/2021, implementing new macroprudential tools, the Banco de España is broadening and deepening its analysis of systemic sectoral vulnerabilities. The new sectoral instruments (the sectoral CCyB and the limits on sectoral concentration) will target potential risks emerging in specific sectors for which the aggregate macroprudential tools (which apply simultaneously to all sectors across the board) would prove less effective. These instruments come on top of the recent amendment to the EU legislation on the systemic risk buffer, enabling buffers to be established for specific portfolios or groups of institutions where risks not covered by the CCyB arise. Circular 5/2021 sets out a series of sectoral indicators to inform the potential deployment of these tools (see also Section 3.2.1). The recent performance of some of these metrics with the capacity to act as early warnings of sectoral imbalances in Spain is detailed in Box 3.1. The analysis based on such indicators suggests the absence of warning signs, and there is therefore no need to activate these new sectoral tools as things stand.

Various European countries have decided to raise their CCyB rates in recent months. The build-up of cyclical systemic imbalances in some European economies is an indication that they are now in an upward phase of their credit cycle. Other European economies are aiming to create macroprudential space with which to be able to adjust to other types of shocks that may have an adverse impact on their banking sectors. To this end, various authorities have already notified measures to raise their CCyB rates. Specifically, since the last FSR, eleven national authorities in the EU/EEA have notified decisions to activate or upwardly revise their CCyB rates, as shown in Table 3.1.[8] The Netherlands is among the jurisdictions that have most recently modified their framework for calibrating the CCyB, which will now be activated where the economic conditions so allow so as to create macroprudential space with which to address unspecified risks, without the need to first identify credit cycle imbalances.

The situation of the real estate market in the rest of Europe varies considerably, with significant imbalances in some countries calling for macroprudential measures to be set in place. There is some concern that real estate market imbalances may be building up in some EU Member States. With this

8 In Germany, the CCyB measure has been supplemented with a sectoral systemic risk buffer for exposures to the residential real estate sector. See the German Financial Stability Committee press release "German Financial Stability Committee welcomes the Federal Financial Supervisory Authority's announced package of macroprudential measures", 12 January 2022.

Table 3.1
RECENT CCyB INCREASES IN EUROPEAN COUNTRIES

Country	Current CCyB (%)	Latest CCyB announced (%)	Implementation date (a)
Bulgaria	1.00	1.50	01/01/2023
Croatia	0.00	0.50	31/03/2023
Czech Republic	1.50	2.00	01/01/2023
Denmark	1.00	2.00	31/12/2022
Estonia	0.00	1.00	07/12/2022
France	0.00	0.50	01/04/2023
Germany	0.00	0.75	01/02/2023
Iceland	0.00	2.00	29/09/2022
Norway	1.50	2.00	31/12/2022
Romania	0.00	0.50	17/10/2022
United Kingdom	0.00	1.00	13/12/2022

SOURCES: ESRB, BIS and national authorities.

a Increases to CCyB rates generally apply 12 months after they are announced.

in mind, on 11 February the ESRB updated its list of countries with housing market-related warnings or recommendations.[9] In general, the ESRB notes that certain risks have increased in these countries (which do not include Spain), thus requiring them to reinforce or activate the policy instruments required to contain them, such as macroprudential tools.[10] In this regard, Box 3.2 describes the situation in the European housing markets in which the ESRB has identified systemic imbalances, comparing them with the situation in Spain and other countries that have not received such warnings or recommendations. The box also describes the macroprudential measures adopted by the countries in which imbalances have been detected. With respect to such actions, it is worth noting that Circular 5/2021 provides for the possibility of setting limits on credit terms and conditions and, in particular, on mortgages and loans for the construction and real estate sectors. For the time being, sufficient signs of risk that might justify these measures have not yet been observed in Spain.

In December 2021, the Banco de España announced the designation of Banco Santander, S.A. as a global systemically important institution (G-SII) in 2023.[11]

9 The ESRB has sent new recommendations to Austria and Germany. Moreover, warnings were sent to Bulgaria, Croatia, Hungary, Liechtenstein and Slovakia. The key difference between these two policy actions is that recommendations set out specific measures (and are therefore subject to the "act or explain" principle) and have a timetable for implementation. Meanwhile, warnings simply point to the housing market risks, noting that the policy response of the country's authorities should be reconsidered (in general). For further information, see "ESRB issues new warnings and recommendations on medium-term residential real estate vulnerabilities", ESRB press release, 11 February 2022.

10 In 2019, the ESRB sent recommendations to the authorities in Belgium, Denmark, Finland, Luxembourg, the Netherlands and Sweden. Moreover, that same year, the ESRB sent warnings to the following countries: the Czech Republic, France, Germany, Iceland and Norway.

11 See "The Banco de España designates a Global Systemically Important Institution and establishes its macroprudential capital buffer rate for 2023", press release, 20 December 2021.

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.[12] The G-SII buffer, which helps shore up the institution's loss-absorbing capacity, has been conceived with the precautionary goal of mitigating the adverse systemic impact that institutions of this nature (due to their size, level of interconnectedness, complexity and cross-border activity, and the substitutability of the services they provide) could potentially have on the financial system.

3.2 Regulatory and supervisory developments relevant to financial stability

3.2.1 Regulatory developments in Spain

As mentioned above, in December 2021 the Banco de España approved Circular 5/2021, implementing its new macroprudential tools.[13] The Circular details the technical specification of three types of macroprudential tools incorporated into the Spanish legislation governing credit institutions via Royal Decree-Law 22/2018 and Royal Decree-Law 102/2019 ahead of their potential use by the Banco de España to address risks to financial stability: i) a sectoral countercyclical capital buffer (SCCyB); ii) sectoral limits on credit concentration; and iii) limits and conditions on loan origination and other transactions. The SCCyB complements the CCyB and is consistent with the Basel Committee's principles for the operationalisation of this tool.[14] The possible limits on lending include, among others, the loan-to-value ratio, the debt-service-to-income ratio, the debt-to-income ratio and the maturity of the loan. With this important legislative development, the Banco de España has matched those EU national bank authorities (NBAs) that have a more comprehensive macroprudential toolkit.

Royal Decree 970/2021, of 8 November 2021, and Banco de España Circular 3/2022, of 30 March 2022, have completed the transposition of Directive (EU) 2019/878 (CRD V), on banking solvency. The legislative changes in CRD V promote appropriate risk management by credit institutions to ensure their solvency and strengthen banks' resilience to systemic risks. On the macroprudential front, the main changes refer to: i) the sectoral application of the systemic risk buffer; ii) methodological adjustments for setting systemically important institutions' capital buffers; and iii) the simplification of the system whereby national authorities notify European bodies of proposed macroprudential measures.

12 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). See "2021 List of Global Systemically Important Banks (G-SIBs)", FSB press release, 23 November 2021.

13 See the Banco de España press release and the presentation by the Director General Financial Stability, Regulation and Resolution "El marco de política macroprudencial del Banco de España" (only the Spanish-language version is available), both dated 23 December 2021.

14 See *Guiding principles for the operationalisation of a sectoral countercyclical capital buffer* published in 2019.

The Banco de España has also approved Circular 1/2022, of 24 January 2022, on specialised lending institutions (SLIs). In addition to solvency and shareholder-structure reporting requirements, the Circular introduces a liquidity buffer requirement for SLIs so that they can withstand liquidity outflows during times of market stress. It also requires them to maintain an appropriate structure of funding sources and of asset and liability maturities so as to avoid potential liquidity strains or imbalances that could jeopardise their financial position. These requirements take their lead from those established for credit institutions. However, they are tailored to SLIs' particular characteristics and, specifically, to the fact that their sources of funding do not include either customer deposits or the central bank.

With regard to the application of accounting standards, some of the flexibility measures adopted by the Banco de España during the early stages of the pandemic[15] have ceased to apply due to the improved macroeconomic environment. For instance, among others, there was no need to extend the legislative moratoria on loans established during the pandemic. However, changes as regards the credit-risk classification of forborne exposures remain in force. This has afforded greater flexibility in applying expert judgement to classify them. Restructured and forborne exposures do not necessarily need to be classified as Stage 2 exposures where their classification as non-performing is not appropriate if institutions believe that there has not been a significant increase in credit risk.

3.2.2 Developments in Europe and around the world

The legislative process related to the European Commission's proposal to implement the final Basel III reforms in EU banking legislation has continued. The proposal to amend the Capital Requirements Regulation and Directive (CRR/CRD, respectively) was published in October 2021 and aims to make EU banks more resilient without significantly increasing capital requirements. In March the ECB issued an opinion[16] on the proposed legislative amendments in CRR III, stressing that it was desirable not to deviate from the global regulatory standards, in particular vis-à-vis the specific details on the introduction of an output floor for the own funds required of institutions authorised to use internal models to calculate capital requirements.

In February 2022 the Supervisory Board of the ECB decided[17] not to extend the capital and leverage relief for banks that had been introduced at the onset of

15 See "The Banco de España makes two sets of amendments to Circular 4/2017 to credit institutions on financial reporting rules", press release, 16 June 2020.

16 See "ECB Opinion on a proposal for amendments to Regulation (EU) No 575/2013 as regards requirements for credit risk, credit valuation adjustment risk, operational risk, market risk and the output floor" (CON/2022/11).

17 "ECB will not extend capital and leverage relief for banks ", press release, 10 February 2022.

the pandemic. The ECB saw no need to allow banks to operate below the level of capital defined by their Pillar 2 Guidance beyond December 2022, or to extend beyond March 2022 the supervisory measure allowing them to exclude central bank exposures from their leverage ratios. The ECB communicated this path back to normality, while acknowledging that although there was still some uncertainty regarding the impact of the pandemic, banks had ample headroom above their capital requirements and above the leverage ratio requirement. Following the usual practice, the Banco de España applied this measure to the credit institutions it supervises directly.[18]

The temporary regulatory measures included in the amendments to European banking regulation in response to COVID-19 (CRR quick fix) are also coming to an end.[19] 2022 is the last year when institutions can apply the prudential filter established for changes in the fair value of sovereign debt instruments measured at fair value through other comprehensive income, to temporarily and partially (40%) neutralise their impact on CET1. Turning to the option of CET1 being affected gradually by the higher credit losses estimated as a result of using the expected credit loss model under IFRS 9 as opposed to the incurred loss model, the applicable deferral in 2022 is 75% (100% a year earlier). The discretionary powers granted to supervisors vis-à-vis the adjustment to banks' internal model-based calculations of market risk requirements expired in December 2021.

In 2021 the European Commission began the groundwork for the review of the EU macroprudential framework for the banking sector, calling for advice from the ECB, the ESRB and the EBA, and launching a public consultation.[20] The three European authorities' advisory reports – in whose preparation the NCBs and the national supervisory authorities were involved – mainly analyse matters relating to the design and functioning of the frameworks for capital buffers and other macroprudential instruments. With a notable degree of consensus (see Table 3.2) the ECB and the ESRB propose[21] to: relax the use and activation of the CCyB; press forward with standardising the O-SII buffer; review the framework for releasing capital buffers; refrain from introducing powers to impose restrictions on capital distributions at systemic level; and recast the legal provisions on the tightening of risk weights for mortgage exposures. In addition, they advocate considering the macroprudential policy to deal with systemic cyber risks and climate-related risks,

18 "El Banco de España pone fin a la exclusión temporal de determinadas exposiciones frente a los bancos centrales del Eurosistema en el cálculo de la ratio de apalancamiento de las entidades de crédito menos significativas", press release, 28 February 2022 (only available in Spanish).

19 For a description of the quick fix see Box 3.3 of the Autumn 2020 Financial Stability Report.

20 Call for Advice - Review of the EU Macroprudential Framework, 8 July 2021, and "Targeted consultation on improving the EU's macroprudential framework for the banking sector", 30 November 2021.

21 See "ECB response to the European Commission's call for advice on the review of the EU macroprudential framework" and "ESRB Concept Note on the Review of the EU Macroprudential Framework for the Banking Sector", both dated 31 March 2022. At the cut-off date for this FSR, the EBA's advisory report had not been published.

and developing the non-bank regulatory framework. The ECB and ESRB advisory reports and the feedback received from other stakeholders via the public consultation (which ended on 18 March) will serve as the basis for the European Commission's legislative proposal for amendments to the CRR/CRD planned for the end of 2022.

The Basel Committee on Banking Supervision (BCBS) has announced[22] that it intends to review the implications of developments related to the banking union for the global systemically important banks assessment methodology. To acknowledge and reflect appropriately the particularities of the banking union (as a supranational jurisdiction equipped with a Single Supervisory Mechanism and a Single Resolution Mechanism), the BCBS has started to study possible adjustments to the treatment of cross-border exposures in its G-SIB methodology. The BCBS has also decided to replace the existing three-year review cycle of the methodology with a process of ongoing monitoring and review (without a pre-determined frequency).

The BCBS has continued its work on climate-related financial risks, disclosure standards and crypto-assets.[23] It launched a public consultation on a set of principles for the effective management and supervision of climate-related financial risks. It also revised its disclosure requirements to reflect changes to the minimum capital requirements for market risk published in January 2019 and proposed three voluntary disclosures for sovereign exposures.[24] The BCBS also reviewed the feedback received regarding its consultation on the prudential treatment of banks' crypto-asset exposures and reiterated the importance of developing a conservative risk-based global minimum standard to mitigate prospective risks from crypto-assets to the banking system. In this connection, it should be noted that the G20 has raised the warning level as regards the risks from crypto-assets, pending the development of appropriate regulation. The special chapter of this report discusses in more detail the risks associated with these instruments and the related regulatory developments.

The European Securities and Markets Authority (ESMA) published in December the results of its (post-Brexit) assessment of the systemic importance of two central counterparties (CCPs) established in the United Kingdom.[25] After consulting with the ESRB and the EU central banks, ESMA concluded that the interest rate derivatives clearing services of LCH Ltd and the credit default swaps and short-term interest rate derivatives clearing services of ICE Clear Europe Ltd were of "substantial systemic importance" to the EU's financial stability and posed

22 See the BIS press release, 9 November 2021.

23 See "Basel Committee consults on principles for the effective management and supervision of climate-related financial risks", press release, 16 November 2021.

24 See "Basel Committee finalises revisions to market risk disclosure requirements and voluntary disclosure of sovereign exposures", press release, 11 November 2021.

25 For further details, see "ESMA publishes results of its assessment of systemically important UK Central Counterparties", press release, 17 December 2021.

Table 3.2

COMPARISON OF ISSUES ADDRESSED IN THE ECB AND ESRB ADVISORY REPORTS IN RESPONSE TO THE CALL FOR ADVICE FROM THE EUROPEAN COMMISSION

	ECB	ESRB
Make the operationalisation of the CCyB more flexible	■	■
Review the methodology for identifying and setting O-SII buffers	■	■
Increase releasable buffers	■	■
Refrain from introducing leverage ratio buffers for O-SIIs	■	
Refrain from introducing powers to place restrictions on capital distributions at systemic level	■	■
Authorise the introduction of lending limits and conditions		■
Maintain the voluntary reciprocity framework for the measures under Article 458 of the CRR	■	
Recast the powers to tighten the risk weights for mortgage exposures	■	■
Strengthen the macroprudential policy to deal with systemic cyber risks and climate-related risks	■	■
Strengthen the non-bank regulatory framework	■	■

SOURCE: Banco de España.

risks that might not be sufficiently mitigated under the current regulatory framework. However, it concluded that the costs for, and risks to, the EU's financial system were the European Commission to potentially derecognise the UK CCPs would outweigh the benefits, particularly in stress events.

Based on this prior analysis, in February the European Commission adopted the decision[26] to extend equivalence for UK CCPs for three years until 30 June 2025. This decision (whose proposal had been announced in November)[27] aims to avoid potential short-term financial market disruptions and, in the medium term, provide enough time to implement reforms that increase EU CCPs' clearing capacity. Therefore, between February and March the European Commission launched a public consultation and a call for evidence to prepare a package of specific measures – scheduled for the second half of 2022 – geared, from a financial stability perspective, to reducing the EU's dependence on systemic third-country CCPs and to enhancing the regulatory and supervisory framework.

The ESRB issued Recommendation ESRB/2021/9[28] on reform of money market funds (MMFs). This recommendation was for the European Commission and was part of the review, scheduled for this year, of the EU Regulation on MMFs. In 2020 the pandemic threw into relief the vulnerabilities of this type of investment vehicle, some of which experienced liquidity strains when faced with a high level of

26 "Capital Markets Union: Commission extends time-limited equivalence for UK central counterparties and launches consultation to expand central clearing activities in the EU", press release, 8 February 2022.

27 "Commissioner McGuinness announces proposed way forward for central clearing", statement, 10 November 2021.

28 "ESRB recommends increasing the resilience of money market funds", ESRB press release, 25 January 2022.

redemptions by investors combined with a lack of liquidity in private debt money markets, with the consequent risk of spill-over to other sectors of the financial system. In order to increase MMFs' shock-absorbing capacity, among other proposals made to the European Commission, the ESRB recommended that MMFs be made to diversify their assets and boost their liquidity by requiring them to hold public debt assets issued by a diversified set of bodies,[29] along with improvements in stress testing.

In January it also published Recommendation ESRB/2021/17[30] on a pan-European systemic cyber incident coordination framework for relevant authorities. Major cyber incidents can erode confidence in the financial system and pose a systemic risk for which it is essential that financial authorities be properly prepared and coordinated. The proposed framework aims to strengthen both coordination among EU authorities and interaction with other global authorities. The report accompanying the Recommendation analysed the current macroprudential framework's capacity to contend with risks and vulnerabilities stemming from systemic cyber risk and concludes that it would be advisable to develop the mandate of, and macroprudential tools available to, the authorities to encompass cyber resilience goals.

In September 2021 the European Commission published a legislative proposal[31] for the review of EU insurance rules (known as "Solvency II"). The aim of the review is to enable insurance companies to scale up long-term investment in Europe's recovery from the COVID-19 pandemic and to make the insurance sector more resilient so that it can weather future crises and better protect policyholders. Solvency II does not currently establish specific macroprudential tools to address the build-up of systemic risks; in this setting, the current review incorporates new legal provisions (previously suggested by the ESRB) on liquidity instruments, the provision of critical services, the recovery and resolution framework, and the role of the ESRB in declaring exceptionally adverse situations.[32]

29 For more details on this proposal, see also the ECB Macroprudential Bulletin, Issue 16, 21 January 2022.

30 "ESRB recommends establishing a systemic cyber incident coordination framework", ESRB press release and Mitigating systemic cyber risk, ESRB report, both dated 27 January 2022.

31 See European Commission press release "Reviewing EU insurance rules: encouraging insurers to invest in Europe's future", 22 September 2021.

32 For further details on the macroprudential elements included in the legislative proposal, see the letter "Solvency II review", from the Head of the ESRB Secretariat to several members of the European Parlament, on 2nd February 2022.

Box 3.1

SECTORAL INDICATORS FOR APPLYING THE BANCO DE ESPAÑA'S NEW MACROPRUDENTIAL TOOLS

Banco de España Circular 5/2021 implements two new sectoral macroprudential tools: a sectoral component of the countercyclical capital buffer (CCyB) and limits on sectoral concentration.[1] These tools make it possible to address situations where systemic risks are confined to, or are relatively higher in, specific sectors, as happened with the real estate sector in Spain during the financial crisis. In such cases, applying sectoral macroprudential measures early or more forcefully may be more effective in controlling the build-up of risks than activating aggregate macroprudential tools on credit exposures as a whole.[2]

The Circular also describes a series of sectoral indicators that must be regularly analysed by the Banco de España when assessing sectoral systemic vulnerabilities and, where appropriate, when considering the activation of sectoral macroprudential measures. This box sets out some of these indicators, which have already been incorporated into the Banco de España's framework for monitoring financial stability risks. The indicators refer to four main sectors: i) loans to non-financial corporations (NFCs) engaged in construction and real estate activities; ii) loans to other NFCs; iii) loans for house purchase and renovation; and iv) other loans to households (primarily consumer loans).

In this respect, the methodology for analysing sectoral credit cycles is similar to that used for the total credit cycle of the Spanish economy in CCyB decisions.[3] It is basically used to calculate each sector's credit gaps, which measure the difference between several sectoral debt indicators and their equilibrium values, estimated as long-term trends by means of statistical procedures.[4] The rationale behind these indicators is based on the fact that deviations from their long-term behaviour tend to be reversed and that, the greater and more persistent the deviation, the more likely and sharper such correction will be. Consequently, credit booms that push the credit gap above its long-term trend are a sign of imbalance.

While the basic debt indicator for the total economy is the credit-to-GDP ratio, in the case of specific sectors, in addition to GDP, a series of measures more closely connected to the sector's activity, or to households' ability to pay, are considered as denominators. In the case of firms, for example, the ratios of sectoral credit to the sector's gross value added (GVA) or gross fixed capital formation (GFCF) are considered. For households, disposable income is used as the denominator. When assessing macroprudential policy, these indicators are complemented by others relating to credit standards and also by real estate asset price developments, which are particularly relevant in the case of loans for house purchase.[5]

As with the general CCyB, in addition to the estimated credit gaps, other indicators are also calculated. Included here is sectoral credit intensity, which is determined as the ratio of the annual change in each sector's credit (as the numerator) to the annual cumulative GVA, disposable income or GFCF (as the denominator). This indicator seeks to proxy the flow of credit granted in a specific period of time with the sectoral activity generated in that period, as a sign of the gradual build-up of imbalances.[6]

As in the case of the credit gap used to set the general CCyB, sectoral credit gaps have widened significantly since the outbreak of the COVID-19 health crisis, except for the consumer loan gap (see Chart 1). This widening is mainly due to the decline in the ratios' denominators (GVA and disposable income) and, to a lesser extent, to the support measures for the economy (State guarantees for loans, moratoria, etc.) which have underpinned lending, particularly to NFCs. Thus, these developments in the gaps should not be construed as an early warning, as no

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1 Circular 5/2021 also provides for the possibility of imposing limits and conditions on loan origination. The full text of the Circular is available here (available in Spanish only).

2 Aggregate macroprudential tools would be less efficient if applied to all sectors equally and could even shift lending towards sectors with more systemic risk, with potentially counter-productive effects. For more details on the rationale behind the new sectoral tools, see C. Trucharte (2021), "Nuevas herramientas macroprudenciales para las entidades de crédito", and C. Castro and A. Estrada (2021), "Function and application of the new macroprudential tools available to the Banco de España", *Financial Stability Review* No 40, Banco de España.

3 See BCBS (2010), *Guidance for national authorities operating the countercyclical capital buffer,* and BCBS (2019), *Guiding principles for the operationalisation of a sectoral countercyclical capital buffer.*

4 See J. E. Galán (2019), "Measuring credit-to-GDP gaps. The Hodrick-Prescott filter revisited", *Occasional Paper* No 1906, Banco de España.

5 These credit standards indicators and house and other real estate asset prices are not covered in this box. For information on their current situation, see Chapter 1 of this FSR; for a more in-depth analysis of their relationship with credit quality, see J. E. Galán and M. Lamas (2019), "Beyond the LTV ratio: new macroprudential lessons from Spain", *Working Paper* No 1931, Banco de España.

6 Several papers relate credit growth to subsequent financial crises. See, for example, M. Schularick and A. Taylor (2012), "Credit booms gone bust: Monetary policy, leverage cycles, and financial crises, 1870-2008".

Chart 1
CREDIT-TO-GVA GAP (FIRMS) AND CREDIT-TO-DISPOSABLE INCOME GAP (HOUSEHOLDS) (a)

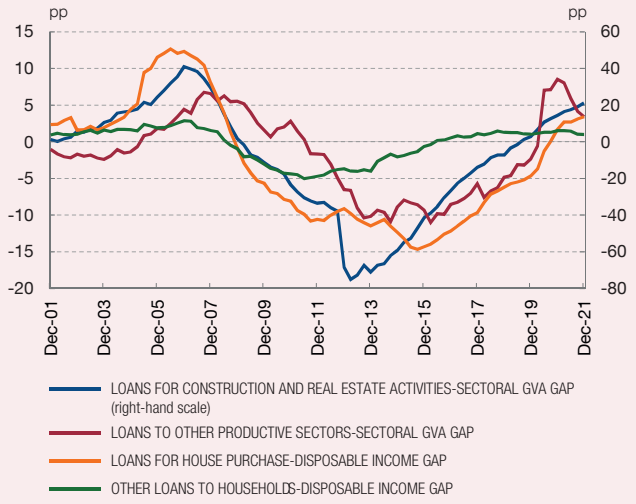


Chart 2
CREDIT INTENSITY OF FIRMS AND HOUSEHOLDS WITH RESPECT TO GVA AND DISPOSABLE INCOME, RESPECTIVELY (a)

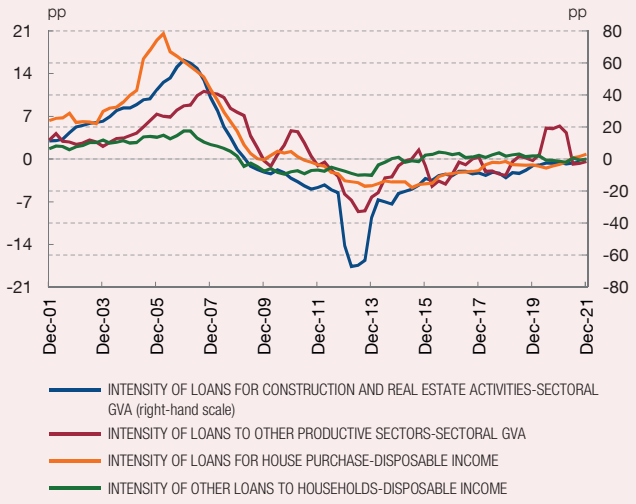


Chart 3
PREDICTIVE POWER OF THE TOTAL CREDIT GAP AND SECTORAL CREDIT GAPS (b)

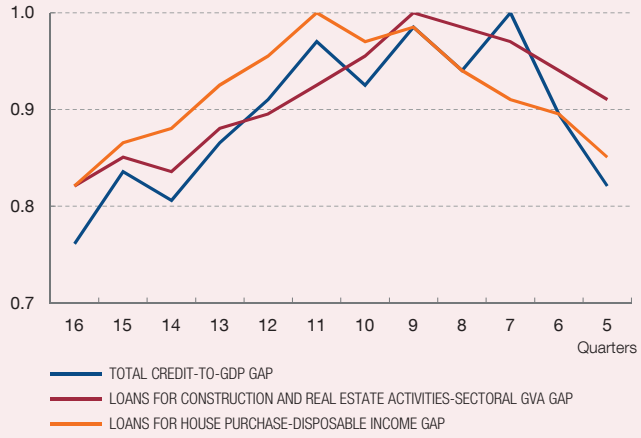
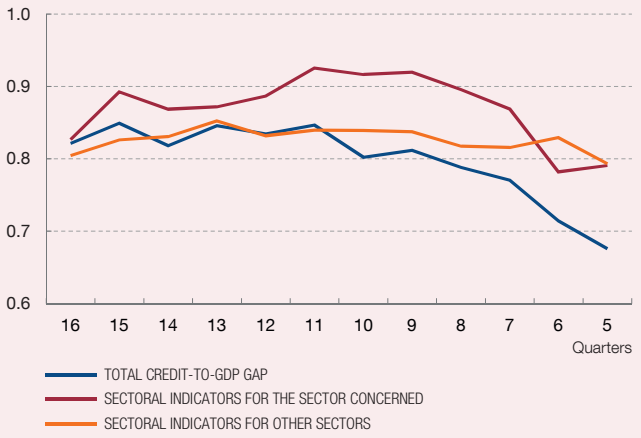


Chart 4
PREDICTIVE POWER OF EACH SECTOR'S SECTORAL INDICATORS VIS-À-VIS OTHER SECTORS (b) (c)



SOURCES: Banco de España and INE.

a Data available up to December 2021.
b Predictive power is measured by means of the AUROC. This measure represents the relationship between the false positive rate and the true positive rate for all possible binary classification thresholds of a logit model. An AUROC equal to 1 would indicate perfect predictions from the indicator. The horizontal axis represents the number of quarters before the crisis occurs. The range of between 16 and 5 quarters is considered appropriate for the purposes of setting macroprudential policy, in order to thus assess whether measures could be activated sufficiently in advance.
c A distinction is made between the sectoral gaps' capacity to predict an increase in the default rate with respect to its historical average in the same sector (red line) and the capacity to anticipate an increase in the default rate in other sectors (orange line). These measures are obtained from the average AUROC values of sectoral gaps, which assess the predictive power of the default rates in the related sectors – in the specific sector and in other sectors, respectively –. The credit-to-GDP gap's capacity to anticipate the sectoral default rate (blue line) is also considered. This is calculated as the average AUROC values that measure the power of this aggregate gap to predict an increase in each sector's default rate.

excessively large credit build-ups can be seen in any of the sectors.

The absence of warnings is clearer when observing the changes in sectoral credit intensity, where the four series remain close to zero, and generally in negative values (see Chart 2). The only relevant exception is the temporary rise in the credit intensity series for loans to other NFCs (those not engaged in construction and real estate activities). This temporary surge reflects the higher impact of the pandemic on some of these activities, and also the credit support measures for these segments, specifically the State

guarantees for loans. Accordingly, despite the widening gaps, the developments in credit intensity suggest the absence of warning signals, and it is therefore not considered that any of the new sectoral macroprudential tools requires activating at present.

Lastly, these indicators' capacity to anticipate systemic crises is assessed. In particular, the explanatory power of sectoral gaps is analysed using the so-called "AUROC" methodology.[7] This method, which has been widely used in the literature to assess early warning indicators,[8] makes it possible to analyse the sectoral gaps' capacity to anticipate the outbreak of the global financial crisis in 2009. Specifically, the capacity of the credit-to-GDP gap and that of the sectoral gaps to warn of a systemic crisis 16 to 5 quarters in advance were compared. A historical sample was used, spanning from December 2001 to September 2017,[9] which includes, as the sole systemic event, the 2009 global financial crisis.[10] The results show that, for this specific episode, the credit-to-GDP gap is less able to anticipate crises than sectoral gaps over much of the projection horizon (see Chart 3). Therefore, monitoring the new sectoral indicators might help identify new systemic imbalances earlier than when monitoring the overall credit cycle of the economy. Nevertheless, it should be noted that this exercise is only based on one crisis event and, accordingly, these results require confirmation as more experience is gained or more data are analysed.

Additionally, it is important to study whether the sectoral indicators are also useful for identifying imbalances in the specific sector and whether they provide leading information on losses materialising in the future. For this purpose, instead of analysing the power to predict systemic events (such as the beginning of the global financial crisis), the assessment focuses on each indicator's capacity to predict an increase in the sectoral default rate with respect to its historical average. The results indicate that the sectoral gaps show a greater power to predict the future materialisation of defaults in the sector concerned than in other sectors (see Chart 4), confirming the importance and usefulness of closely monitoring the different sectoral credit cycles. Furthermore, these sectoral gaps are also more appropriate for anticipating an increase in the specific sector's default rate than aggregate measures such as the credit-to-GDP gap.

7 The Area Under the Receiver Operating Characteristics Curve (AUROC) assesses the relationship between the false positive rate and the true positive rate for each probability threshold of a logit model. As such, it provides a measure of the probability that the model predictions are correct. The AUROC takes values of between zero and one. A value of 1 would indicate perfect predictions, while a value of 0.5 would suggest that the indicator has no capacity to inform on the probability of a crisis occurring.

8 See, for example, C. Castro, A. Estrada and J. Martínez (2016), "The countercyclical capital buffer in Spain: an analysis of the key guiding indicators", *Working Paper* No 1601, Banco de España.

9 In view of the forward-looking nature of the AUROC, the last 16 quarters (from 2017 Q4 to 2021 Q3) are excluded from the analysis.

10 In Spain, the global financial crisis entailed a systemic banking crisis between 2009 Q1 and 2013 Q4. Although the COVID-19 pandemic can also be deemed to have triggered a systemic crisis, the methodology used in this exercise cannot predict this type of exogenous event that originates outside the financial system.

Box 3.2

EURO AREA HOUSING MARKETS. MAIN INDICATORS, COMMON FACTORS AND MACROPRUDENTIAL MEASURES ADOPTED TO ADDRESS SYSTEMIC IMBALANCES

In the years leading up to the COVID-19 pandemic, systemic imbalances in the residential real estate markets of several European countries were on the rise. In 2016 the European Systemic Risk Board (ESRB) responded to this situation by issuing warnings to the countries concerned. In 2019 the ESRB issued warnings to other countries and specific recommendations to those which had previously received warnings.[1] Since then, the imbalances in these countries' residential real estate markets have not corrected, and in some cases they have increased, despite the outbreak of COVID-19. As a result, at end-2021 the ESRB once again revised and updated its recommendations for, and warnings to, countries with residential real estate market imbalances.[2] It should be noted that Spain has not received any warnings or recommendations from the ESRB.

This box analyses the situation in the euro area housing markets, grouping the countries on the basis of the vulnerabilities in the residential real estate sector. Specifically, two groups of countries are considered: those that have received a warning or recommendation from the ESRB[3] and those that have not. The metrics analysed are price developments, mortgage lending and household debt linked to the residential real estate market, which the ESRB also evaluates as part of its vulnerability assessment. A principal component analysis was also conducted to assess the possible presence of common factors conditioning euro area house price developments. Logically, these common factors might also affect the Spanish residential real estate market, but, for the time being, they are being countered by specific factors.

Despite the sharp economic contraction triggered by the pandemic, house prices continued to grow in the euro area in 2020, doing so even more vigorously in 2021 (see Chart 1). While the upward trend in house prices is somewhat steeper in the set of countries that received warnings and recommendations, in 2021 H2 the pace of the price growth quickened in the other economies, including Spain.

Mortgage lending, measured as the annual flow of new mortgages as a percentage of GDP, also rose slightly compared with the years immediately preceding the pandemic for the two groups of countries analysed (see Chart 2). Even so, the countries with residential real estate market imbalances show new mortgage lending flows that double those of the rest of the euro area, including Spain. New mortgage loan growth in Spain was particularly significant in 2021, with year-on-year credit growth rates exceeding 40% in the final stretch of the year. However, due to its low starting level, the ratio of the annual flow of new lending to GDP remained in line with that of the other euro area countries in which the ESRB had not found systemic residential real estate imbalances.

Turning to total mortgage debt, most countries have seen slight increases in the ratio of total mortgage lending to GDP since the onset of the pandemic (see Chart 3). Among them, a distinction should be drawn between the countries whose ratio has risen as a result of the accumulation of debt, and those where the increase is mainly due to the decline in GDP triggered by the pandemic, as is Spain's case.[4] However, higher indebtedness is a vulnerability in both cases, as it may hinder mortgage repayments in the event of a negative shock, particularly in the countries which already had a high level of debt before the pandemic broke.

The above-mentioned descriptive evidence suggests that, while there are marked differences between the countries with greater vulnerabilities and the others, euro area housing market developments are somewhat synchronised. To dive deeper into this aspect, a principal component analysis was conducted on the year-on-year rates of change of house prices in each economy from 2011 Q1 to 2021 Q3.[5] The aim of this analysis was to identify whether a few factors or components are capable of explaining a significant portion of the price variability, which would suggest that the behaviour of house prices is subject to

1 See the ESRB's 2016 and 2019 reports on vulnerabilities in the EU residential real estate sector.

2 Following its 2021 review, the ESRB sent recommendations to Germany and Austria for the first time. It also sent warnings to Bulgaria, Croatia, Hungary, Lichtenstein and Slovakia, as the ESRB assessment covers all European Economic Area countries.

3 The euro area countries that have received recommendations or warnings in either the current or previous ESRB vulnerability assessments are Austria, Belgium, Finland, France, Germany, Luxembourg, the Netherlands and Slovakia.

4 In 2021 Q4 (latest available figure) Spain's nominal GDP was 3.2% below its 2019 level, and outstanding mortgage debt also fell over the same period (0.1%).

5 This method means the annual changes in prices can be broken down into several uncorrelated indicators or components, ranked by their relative share of, or importance to, the variance of the data.

Box 3.2

EURO AREA HOUSING MARKETS. MAIN INDICATORS, COMMON FACTORS AND MACROPRUDENTIAL MEASURES ADOPTED TO ADDRESS SYSTEMIC IMBALANCES (cont'd)

Chart 1
HOUSE PRICES. YEAR-ON-YEAR RATE OF CHANGE (a)

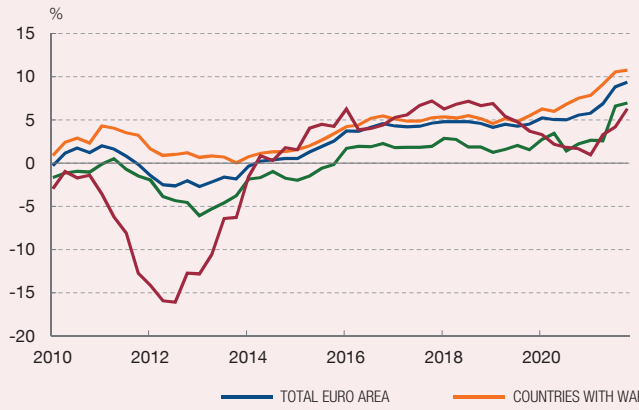


Chart 2
NEW MORTGAGE LENDING/GDP (a) (b)

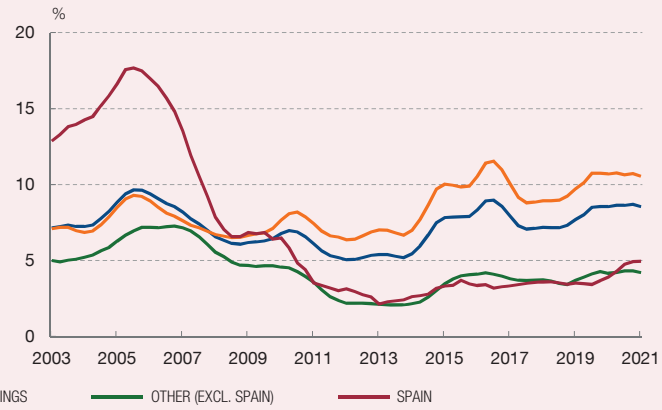


Chart 3
OUTSTANDING MORTGAGE LOANS/GDP (2021 VS 2019)

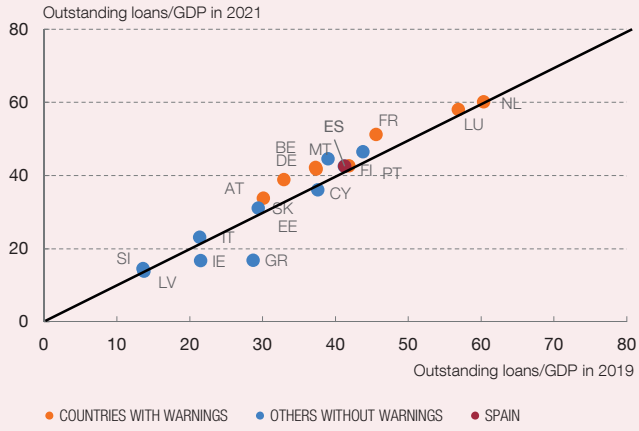
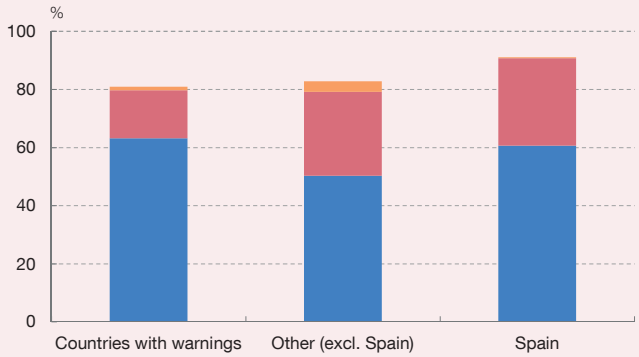


Chart 4
SHARE OF THE FIRST THREE PRINCIPAL COMPONENTS IN THE CHANGES IN HOUSE PRICES IN THE PERIOD 2011-2021 (c)



SOURCES: Banco de España, Eurostat and Statistical Data Warehouse (ECB).

a The weight of the countries in each group is determined by each country's GDP.
b Each group's ratio of new mortgage lending to GDP is calculated as the ratio of new mortgage lending for the set of countries comprising each group (cumulative 12-month figure) to GDP at current prices for that group of countries (cumulative 12-month figure).
c The chart depicts the proportion of the variance in the year-on-year changes in house prices between 2011 Q1 and 2021 Q3 that is attributable to the first three principal components. Aggregate results for each group of countries, weighted by each country's GDP.

common conditioning factors. In principle, the regulation of the residential real estate market or the persisting effects of the global financial crisis are unlikely to be the determinants of this common factor, given their cross-country heterogeneity. By contrast, there is greater synchronicity in the cyclical position and, above all, the loose financing conditions in a low interest rate environment.

The principal component analysis shows that the first common component is responsible for 50%-60% of the changes in house prices. This first common factor becomes more important when explaining house price developments in the countries that have received warnings. However, this first component also explains a very high percentage of the variability of house prices in Spain (around 60%, a higher proportion than the other euro area countries with smaller vulnerabilities). Therefore, the presence of a common cycle is more pronounced in the economies with greater imbalances, but it is also present in the other economies and, particularly, in Spain. The second component lies behind 15%-30% of the changes and is

EURO AREA HOUSING MARKETS. MAIN INDICATORS, COMMON FACTORS AND MACROPRUDENTIAL MEASURES ADOPTED TO ADDRESS SYSTEMIC IMBALANCES (cont'd)

Table 1
MACROPRUDENTIAL MEASURES ADOPTED BY EURO AREA COUNTRIES THAT HAVE RECEIVED WARNINGS OR RECOMMENDATIONS FROM THE ESRB (a)

Country	Capital measures (b)	Borrower-based measures (c)	Other measures
Germany	— CCyB: announcement in January 2022 of its reactivation at 0.75% (effective in February 2023). — SRB: announcement in January 2022 of the establishment a sectoral systemic risk buffer of 2% for loans secured by residential real estate (effective in February 2023).		Enactment of legislation enabling the periodic gathering of information on real estate loan terms and conditions. Under the General Administrative Act, which was passed in September 2021, the first data are expected to be received in 2023
Austria		Supervisory recommendations/guidance on limits on the LTV ratio (80%), the DSTI ratio (30%-40%) and loan maturities (35 years), effective since September 2018	Setting of minimum risk management standards for foreign currency-denominated lending for which "repayment vehicles" are used. Recasting of prior legislation in force since June 2017
Belgium	5 pp risk weight add-on for residential and non-residential mortgages at IRB banks. Additionally, the weights are increased on the basis of the mortgage portfolio's risk profile	Supervisory guidance/recommendations in force since January 2020 relating to LTV ratio limits (80% for buy-to-let loans, 90% for first-time homebuyer mortgages, with exceptions). This measure is complemented by limits on the DSTI and DTI ratios	
Slovakia	CCyB: announcement in January 2021 of an increase to 1% (effective from 1 February 2022)	Limits on the LTV, DSTI and DTI ratios and on loan maturities, among others	Measures aimed at diversifying the pool of intermediaries in the mortgage market and at not creating pressure to loosen credit standards
Finland		Measures that began in 2010 and that have gradually been completed and extended, including limits on the loan-to-collateral ratio for residential mortgage loans other than those taken for main residence purchases. In addition, a recommendation on stress tests to assess borrowers' debt service capacity	
France	CCyB: announcement in March 2022 of its reactivation at 0.5% (effective in April 2023).	Measures related to the DSTI ratio (35%) and maturity (25 years) of new mortgage loans, in force from 2019 (amended in 2021, increasing the initially established limits)	
Luxembourg	— The CCyB rate was raised to 0.5% in December 2019, effective from January 2021, and it has not been lowered during the pandemic — Since July 2013, IRB banks must ensure that their regulatory capital adequacy is subject to a stress test. The stress test on the retail exposures secured by residential property requires an increase of a minimum 50% of the PDs and a minimum 20% of the LGDs — In force since January 2017, minimum risk weight floor of 15% for IRB banks, applied to exposures secured by residential property located in Luxembourg	Measures related to limits on the LTV ratio that vary by loan type (first-house purchases and other purposes)	
Netherlands	— Floor for calculating risk weights applicable to the mortgage portfolios of IRB banks. Measure in force since January 2022	Measure related to LTV limits (100%) in force since 2018; in tandem, legislation on repayment schedules entitling borrowers to tax deductions for interest on mortgage loans (since 2013)	

SOURCES: ESRB and devised by authors.

a Measures that are in force implemented by the countries are selected. Measures not intended to contain real estate market risks are excluded.
b CCyB = countercyclical capital buffer and SRB = systemic risk buffer.
c LTV = loan-to-value, DSTI = debt-service-to-income and DTI = debt-to-income.

more important in Spain and the other euro area countries that have not received warnings than in those countries in which the ESRB has detected residential real estate market vulnerabilities (see Chart 4). This component generates a distinct common dynamic for the countries that have not received warnings. The subsequent components do not explain a material fraction of the total changes.

Recent Spanish residential real estate market developments do not, for the time being, reflect signs of pronounced imbalances (see also the section on real estate in Chapter 1); however, the still sizeable relative share of Spanish banks' exposures linked to the residential real estate sector, and the existence of shared factors explaining house price developments in the euro area, signal the need to closely monitor this market in Spain. As stated in Chapter 1 of this Financial Stability Report, there are no signs of loose credit standards being applied, but the possibility of some transmission of the effects of residential real estate market imbalances within the euro area is a significant source of risk to the Spanish banking sector, and the availability of sufficient loss-absorbing buffers must be carefully assessed.

The countries that have received warnings have adopted a series of measures to reduce residential real estate market imbalances (see Table 1). Some have adopted sectoral capital measures to strengthen banks' resilience based on their residential real estate market exposures. In some cases (Germany and Slovakia), they have decided to activate the countercyclical capital buffer, which is a further capital requirement applicable to all credit exposures, as they have identified that the credit cycle imbalances are not confined to residential real estate market exposures. Several countries have also tightened credit standards to limit the credit risk from the flow of new mortgage lending.

Despite these measures, residential real estate market imbalances have continued to grow in some of these economies. This could be due to several reasons. First, the measures chosen by these countries could be suitable for addressing the risks, but insufficient in terms of their strength (determined by their calibration). Second, certain countries have implemented supervisory guidance or recommendations on loan-to-value ratio limits, rather than binding measures, due, among other reasons, to the limitations of their national legal framework. However, it should be borne in mind that macroprudential policy measures do not typically have immediate effects, yielding the desired effects over time, particularly in the case of capital buffers. Nevertheless, this should not impede the tightening of existing measures, or the implementation of new ones, in the face of growing vulnerabilities.

Special

CRYPTO-ASSETS

S CRYPTO-ASSETS

The rapid expansion of crypto-assets (digital representations of value and rights based on distributed ledger technology (DLT)[1]), their potential use, in some cases, as a means of payment and the virtual absence of regulation of these activities pose potential risks to financial stability that call for analysis and close monitoring of these assets.

Crypto-asset technology is creating new financial assets and new forms of intermediation. The underlying technologies could potentially improve the financial system's efficiency and resilience via lower transaction costs, greater interoperability in the payment system or increased competition between the different players. However, these benefits can only be achieved if crypto-assets are developed securely, in conjunction with regulatory frameworks that mitigate risk and maintain confidence in the financial system.

Market and liquidity risks associated with crypto-assets may be high, particularly for those not backed by traditional financial assets. Additionally, these instruments may be used for illicit activities, particularly money laundering. Their reliance on innovative technologies also poses operational risks, including in the legal and reputational dimension, and raises questions as to their operational transparency and the high energy consumption they entail, with a possible impact on climate risk. If crypto-asset markets and their interconnectedness with traditional financial assets and institutions were to scale up, these risks could become systemic.

In this setting, crypto-asset activities in Spain are not currently regulated, except for certain disclosure requirements set by the CNMV, and are therefore not subject to vetted access. In particular, the Banco de España has no regulatory powers, or powers to authorise or supervise crypto-asset service providers, although it monitors developments in this market as part of its financial stability-related responsibilities. A number of jurisdictions are addressing different regulatory aspects of these assets. However, given the global dimension of these activities, it seems urgent to develop international – and particularly European – initiatives, to establish uniform rules to avoid regulatory arbitrage between jurisdictions and correct the shortcomings in the information available on this market, which are significant and need to be rapidly remedied. This will provide legal certainty in crypto-asset operations and will enable appropriate prudential regulation and supervision, allowing the technological possibilities associated with these instruments to be harnessed while avoiding an excessive build-up of risk.

1 The term DLT is broad and refers to decentralised databases that are managed by several users and employ various technical resources (e.g. cryptography) to implement the desired features, such as levels of transparency and security. Crypto-assets rely on distributed ledger technology or others with analogous functions.

S.1 Crypto-assets, technology and the financial system

The digitalisation of society is being reflected in the emergence of many far-reaching innovations in the provision of financial services, which include most notably crypto-assets and, more generally, innovations affecting payment services. This is probably because that is where there are relatively more immediate gains yet to be exploited (gross fees and commissions for payment services account for approximately one-third of Spanish banks' fee income from their business in Spain) and where network economies[2] have the greatest potential. In this respect, empirical evidence shows that, in the past, innovations in the financial sector have generally boosted the economy's potential growth. However, they have also entailed processes of financial fragility and increased the risks to the financial system, particularly in the adoption phase, even leading in some cases to banking crises.[3] This suggests the need to assess the risk that these innovations may pose and to put in place appropriate regulatory policies to steer their adoption and functioning.

Money fulfils three basic functions, acting as a unit of account, a medium of exchange and a store of value. It comes mainly in two forms: physical cash and electronic balances (see Table S.1). One of the differences between them is that, while cash does not require advanced payment technology to act as a medium of exchange, electronic balances do, through an intensive use of IT and telecommunications networks. For example, to be able to use the balance on a current account or a prepaid card to buy a product, the buyer uses an instrument (e.g. a card) that interacts, via a payment network, with the vendor's point of sale terminal (e.g. a dataphone). After conducting the appropriate checks, the network puts the banks that provided the respective payment and collection instruments in contact with each other for them to settle the transaction via the central bank.[4] The transaction needs to be verified and recorded owing to what is dubbed the "double-spending" problem. Unlike cash, the transfer of electronic balances does not in itself prevent their original holder from using such balances again in another transaction, by duplicating or manipulating them. Trust in the intermediary operating the payment infrastructure in a centralised manner[5] and in its regulation makes it possible for all the participants to reach a consensus as to the authenticity of that transaction, thus preventing double spending.[6]

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2 Network economies increase the value of a product or service as more people use it. The most common example are platforms for exchanging products or information.

3 See, for example, T. Beck (2013), "Financial Innovation: The Bright and the Dark Sides".

4 See, for example, A. Fatas (2021), "Market Structure, Regulation and the Fintech Revolution".

5 The functions of the intermediary that contribute to building trust in it include verification of the identity of the agents operating in the infrastructure and adoption of measures to prevent fraud and ensure compliance with regulations.

6 See J. Abadi and M. Brunnermeier (2021), Blockchain Economics.

Table S.1
CHARACTERISTICS OF TRADITIONAL MONETARY INSTRUMENTS AND CRYPTO-ASSETS (a)

	Cash	Bank deposits	Unbacked crypto-assets	Stablecoins
Electronic format	✗	✓	✓	✓
Programmable	✗	✓	✓	✓
Means of payment	✓	✓	✓	✓
Unit of account	✓	✓	✓	✓
Store of value	✓	✓	✓	✓
Peer-to-peer use (b)	✓	✗	✓	✓
Backed by a central bank	✓	✓	✗	✗
Backed by a deposit guarantee scheme	✗	✓	✗	✗
Backed by collateral (c)	✓	✓	✗	✓
No price volatility (d)	✓	✓	✗	✓

SOURCE: Banco de España.

a The extent to which a traditional monetary instrument or crypto-asset (columns) has a certain characteristic or function (rows) is denoted by the following signs and colours: red cross (not a significant characteristic), orange tick (not a generally applicable characteristic or function, but one that it may potentially possess) and green tick (a generally applicable characteristic or function).
b Can be used in transactions without the need for involvement of a traditional financial intermediary.
c In general, the collateral may include other financial instruments, physical assets or, in the case of legal tender money (for example, cash), the right to use it as a means of payment to acquire any good or service.
d Low short-term market risk, but not excluding the existence of other financial risks (liquidity credit, etc.).

Crypto-assets rely on a technology that allows for decentralised (peer-to-peer) trading, potentially eliminating the need for intermediation. This chapter focuses on those crypto-assets that aspire to perform the basic functions of money by applying this technology. Crypto-assets are digital representations of value and rights that may be stored and transferred electronically using distributed ledger (DLT) or similar technology. Validation is performed using systems akin to a collective decision-making process, implemented through incentive mechanisms and the use of cryptography, and other permissioned systems, which seek to prevent double spending. The two most widely used incentive-based mechanisms are proof of work (PoW) and proof of stake (PoS).[7] In the case of PoW, validators check and determine the transaction sequence whose validation[8] entailed the most computational effort, making the high cost in terms of computational capacity and energy to run the computers key to preventing fraudulent transactions. In PoS protocols, validators are selected in proportion to their holdings in the associated crypto-asset. Thus, to be able to perform a double-spending transaction, it would be necessary to acquire a high percentage

7 These consensus incentive-based mechanisms are primarily applied in public networks, which are the focus of this chapter. There are also private networks which are often permissioned, where the validation is managed by the network owners. In this case, consensus mechanisms are either simpler or absent, and decentralisation is, naturally, much lower or even non-existent.

8 Validators compete to solve a mathematical problem using algorithms, making it computationally costly. The first to solve the problem shares it on the network and the rest verify that it is correct.

of the holdings beforehand.[9] Blockchain, which is a specific type of DLT, is the ledger technology used by most crypto-assets. This innovation, applicable to many other fields, broadly consists of recording sets of crypto-asset transactions by blocks.[10] These blocks have a header and a marker pointing to the preceding block. This makes it possible, at any point in time, to trace the entire trajectory followed by each crypto-asset unit since its creation.

Crypto-assets have another technological advantage over traditional monetary instruments: they are programmable. Indeed, some of these digital assets may include sets of instructions in the form of computer code. This allows them to support so-called "smart contracts" that make it possible to automatically run specific operations under certain previously specified circumstances.[11] Applying such programs to a specific crypto-asset would change its overall financial characteristics, effectively generating new classes of crypto-assets (e.g. a stablecoin-denominated loan to be used as a means of payment), which may have various purposes (e.g. monetary, covering investment and savings needs, etc.) different from those of the original crypto-asset.

Although crypto-assets designed to be used as means of payment are developing and some of their characteristics closely resemble those of money there is still a long way to go. An essential feature of money is the principle of universal acceptance, also referred to as the "no questions asked" (NQA) principle,[12] whereby it must be accepted in any economic or financial transaction without any party questioning whether its face value coincides with its real value. This depends primarily on its backing. In the case of cash and bank deposits, the main factors underpinning their acceptance are their status as legal tender,[13] the backing of the central bank (which is committed to keeping the value of the currency stable and acts as lender of last resort) and the existence of a deposit guarantee scheme.[14] Crypto-assets are classified economically precisely according to their different degree of backing.

In this analysis, a distinction must be drawn between unbacked crypto-assets and those that are backed by some kind of asset or mechanism, such as stablecoins. Bitcoin, which was the first cryptocurrency to be put in circulation

9 In the world of crypto-assets a democratic mechanism where each person has a vote is not feasible, as these systems do not identify people but rather the IP addresses of participants, and it is impossible to monitor how many addresses a single person has.

10 See C. Conesa (2019) "Bitcoin: a solution for payment systems or a solution in search of a problem?" for further details on the technological characteristics of crypto-assets.

11 See A. Lee (2021), "Programmable Money".

12 See G. B. Gorton and J. Y. Zhang (2021), "Taming Wildcat Stablecoins".

13 Crypto-assets are currently not generally considered legal tender, except in some countries (e.g. El Salvador).

14 Various central banks have considered the possibility of issuing their own central bank digital currency. These digital currencies are generally still under discussion, or in preliminary pilot programmes, focused on ensuring that financial stability will not be compromised by their introduction. For the specific case of Europe, see Box 2.3, "An initial analysis of the possible introduction of a digital euro", FSR Spring 2021, and ECB (2020), "Report on a digital euro".

(in 2009),[15] is the most well-known example of an unbacked crypto-asset. Although the exact determinants of these unbacked assets' market value are uncertain, it is mainly based on a collective consensus, which can be fragile, regarding the services they can provide to their holders and the value the technological innovation they represent can bring to some users.[16] Thus, their price tends to fluctuate considerably over time, since the swings in demand, which largely depend on the expectations of agents who tend to behave very gregariously, cannot be accommodated by a supply which is generally inflexible. This has largely prevented them from being used as a means of payment or unit of account, and they are currently more akin to an investment product. Conversely, stablecoins (among which tether currently has the largest market share) are backed by assets and have automatic value stabilisation mechanisms.[17] The underlying assets can be traditional assets or unbacked crypto-assets. In practice, the stablecoins with less price volatility and that have gained greater market share are those backed by traditional assets, particularly by highly liquid and secure ones. The latter are the focus of this chapter's analysis of these instruments.

To keep the value of stablecoins steady, issuers and other holders of cryptocurrencies must adapt supply to fluctuations in demand. In some cases this requires their primary issuer[18] to actively intervene in the markets for this instrument and for its underlying assets. Thus, ideally, if their price rises above par, issuers would react by supplying more stablecoins, which would be sold in the market, thus reducing their relative price, and the proceeds would be used to increase their holdings of the underlying assets. Conversely, if their price falls below par, issuers would buy stablecoins with the proceeds obtained from the sale of underlying assets, taking them out of circulation and thus increasing their relative price. Empirical evidence shows that the arbitrage mechanisms that would be triggered when the primary issuer announces that it is always willing to buy stablecoins at par would have great stabilisation potential. This could eventually confer on stablecoins characteristics more similar to those of bank deposits, reinforcing their potential role as a means of payment and store of value and increasing their interconnectedness with, and impact on, the financial system. However, for the time being, stablecoins cannot yet be used in all types of transactions across the entire financial system and pose specific risks analysed in detail in Section 2 of this chapter. Stablecoins are currently being used mainly as a means of payment in purchases and sales of

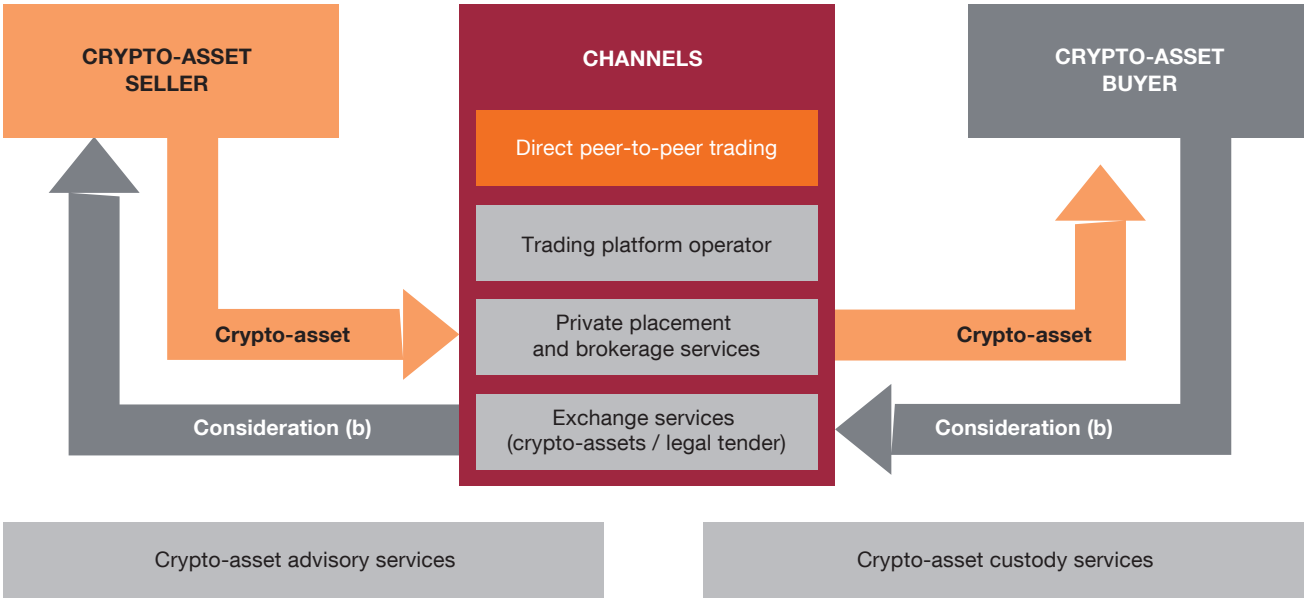
15 See S. Nakamoto (2009), "Bitcoin: a peer-to-peer electronic cash system".

16 More generally, empirical research identifies multiple factors that affect the valuation of such instruments in complex ways. See J. M. Carbó and S. Gorjón (2021), "Application of machine learning models and interpretability techniques to identify the determinants of the price of bitcoin", forthcoming in the Banco de España Working Paper series.

17 See C. Catalini and A. de Gortari (2021), "On the Economic Design of Stablecoins".

18 A crypto-asset issuer is, broadly speaking, a legal person that offers to the public a certain amount of such assets. The primary issuer of stablecoins is the issuer that first places a new quantity of this crypto-asset on the market and that operates the mechanism for stabilising its value.

Figure S.1
AGENTS PARTICIPATING IN CRYPTO-ASSET MARKETS (a)



SOURCE: Devised by authors.

a Drawing on the classification of crypto-asset service providers in Article 3 of the European Commission's Proposal for a Regulation on Markets in Crypto-assets (MiCA). Service providers in the grey boxes, direct trading in the orange box.
b Consideration for the purchase of crypto-assets may be legal tender, other traditional financial assets, or other types of securities or rights established by the counterparties, including other types of crypto-assets (for instance, exchange of a stablecoin for an unbacked crypto-asset). This last example would strictly be an exchange between two sellers of crypto-assets. In the MiCA terminology, legal persons who offer crypto-assets to the public are formally designated issuers of crypto-assets. Sellers of crypto-assets include issuers and other agents offering these assets for sale.

unbacked crypto-assets and there is evidence they could be considered a safe-haven asset in crypto-asset transactions.[19]

Technological and financial characteristics associated with crypto-assets can lead to their being considered legal tender to a certain degree by some states. So far, only El Salvador has decided to adopt a crypto-asset – specifically bitcoin – as legal tender, even though it is not backed by traditional financial assets and is beyond the control of the national authorities. To facilitate this payment system, the government of El Salvador has developed its own wallet app and has invested funds and technology in encouraging widespread adoption of the instrument.[20] The main motives behind this initiative are to encourage financial inclusion in this emerging economy and to cut bank charges on foreign currency remittances received from Salvadorans working abroad. This novel initiative has attracted considerable attention, but there may be some reluctance to use bitcoin among some of the country's firms and households[21] and the technical implementation

19 See R. K. Lyons and G. Viswanath-Natraj (2020), "What Keeps Stablecoins Stable?".
20 See the news report "Why Bitcoin Is Losing Its Shine in El Salvador".
21 See press release of the Salvadoran Chamber of Commerce, "Dudas y preocupación entre empresarios y consumidores ante circulación del Bitcoin en el país" (Spanish version only).

continues to pose challenges, such as the need to overcome knowledge barriers in certain segments of the population. There is also concern regarding its impact on financial stability, and in fact the IMF has urged El Salvador to remove bitcoin's legal tender status, based on considerations that include risks for financial stability.[22]

Although crypto-assets do not require traditional financial intermediaries in basic transactions, their expansion has led to the appearance of a series of agents, in addition to the issuers, that provide financial services related to these instruments. According to the European regulation on crypto-assets, MiCA,[23] approval of which is currently under way, there may be up to eight types of different crypto-asset activities (see Figure S.1). One of them would be the placing of these assets on behalf of the issuers. In addition, potential buyers and sellers of these assets could require advisory, custodial, portfolio management and brokerage services for the transmission and execution of orders. Lastly, these holders can also operate on trading platforms for crypto-assets and use services for exchanging crypto-assets for other crypto-assets or for fiat currency that is legal tender. From a regulatory standpoint, these crypto-asset service providers may have a very important role to play, since, as is well known, crypto-assets can be generated without an identified issuer (a legal or natural person) to which the regulation can be applied, which can be supervised or on which sanctions can be imposed in the event of non-compliance.

Crypto-asset service providers have expanded, as have decentralised finance systems related to these instruments. In general, the Decentralised Finance (DeFi) framework is an alternative financial infrastructure to the banking system, based on the use of smart contracts in decentralised networks, primarily using the unbacked crypto-asset ethereum, with the aim of replicating the functioning of financial products such as debt contracts, derivatives and asset management without the formal contractual framework of traditional finance.[24]

S.2 Financial risks associated with crypto-assets

S.2.1 Inherent risks

The dependence of the current value of crypto-assets on the expectations of buyers and sellers as to their value in future transactions creates significant market and liquidity risks. These risks are more marked in the case of unbacked

22 See IMF (2022), "Press release No. 22/13".

23 See Regulation of the European Parliament and of the Council on Markets in Crypto-assets and amending Directive (EU) 2019/1937.

24 See F. Schär (2021), "Decentralized Finance: On Blockchain- and Smart Contract-Based Financial Markets" for a positive assessment of DeFi's potential to increase efficiency and transparency in financial markets. In contrast, S. Aramonte et al. (2021), "DeFi risks and the decentralisation illusion" focuses on the risks to financial stability stemming from the leverage, liquidity mismatches and interconnectedness associated with DeFi.

crypto-assets, where fluctuations in expectations quickly pass through to their market value in the absence of a stabilisation mechanism. However, these risks are not completely absent in stablecoins, since a deterioration in the trust in their issuers' capacity to convert these instruments into their underlying asset at par may likewise generate liquidity crises or abrupt corrections in their market value. Indeed, such risks have already materialised in their most radical form in episodes related to stablecoins backed by crypto-assets or based purely on price stabilisation algorithms.[25] They have also affected stablecoins backed by traditional assets, particularly when the information on the composition of the portfolio backing them was considered insufficient.[26]

The opacity and lack of user protection in broad segments of the crypto-asset markets, the absence of regulation and technological uncertainty may also generate credit and fraud risk in crypto-asset transactions. In particular, participation in increasingly complex financial contracts through DeFi may step up agents' leverage and increase the probability of default.

The innovative technologies on which crypto-assets are based also pose operational risks that may undermine trust in them in future transactions, and may thus be closely associated with market risks. The underlying decentralised ledger technology has certain intrinsic operational risks (forgotten or stolen access codes, programming failures, use of its decentralised nature for fraudulent purposes, etc.). It also relies on the general telecommunications structure, with the potential for cyber attacks to hinder or prevent transactions. Cyber risks also affect the traditional financial system, but it has a number of safety nets, such as the possibility in an extreme case of operating, at least partially, through physical channels and closed networks. This technology involves a trade-off between security and transaction speed, which could limit its scope in the absence of additional technological developments. Should agents' expectations about the technological possibilities of expanding the market turn pessimistic, the ensuing valuation adjustment could exacerbate market risks.

Operational risks associated with crypto-assets also have legal, regulatory and market design dimensions. Despite their decentralised nature and a certain degree of anonymity built into certain technological developments, they are not fully

25 The most recent example of a crypto-asset-backed stablecoin collapsing was on 16 June 2021. A stablecoin called IRON, which was partially backed by the crypto-asset TITAN, had to suspend its convertibility after TITAN crashed, losing 100% of its value within 24 hours. For a more comprehensive description, see, for example, Chapter 2 "The Crypto Ecosystem and Financial Stability Challenges" of the IMF's October 2021 Global Financial Stability Report.

26 On 11 October 2018 tether was the target of a speculative attack that made it lose much of its value after the Bitfinex exchange announced the temporary suspension of its convertibility to dollar deposits. Bitfinex is responsible for investing most of the dollar deposits of tether's underlying assets. This raised doubts as to the level of collateralisation of this stablecoin.

anonymous. The question therefore arises as to the management of the information flow generated in crypto-asset markets and the protection of participants' data, especially in the case of retail investors. The participation of agents with illicit intentions (particularly money laundering) may create legal risks for other participants in these markets. There is also uncertainty over the potentially high costs and the complexity of the interoperability of transactions with different crypto-asset and traditional financial asset ecosystems. The absence of regulations and the possible ban on the use of crypto-assets in certain jurisdictions are also important and limit the participation of some agents in these markets.

Crypto-assets also pose physical and transition climate-related risks due to the high energy consumption of certain operations. The computational cost of certain verification protocols entails a high energy cost,[27] which could contribute to climate change (physical risk) if the use of these instruments becomes more widespread, or could limit this expansion due to the imposition of fiscal or regulatory measures (transition risk).

S.2.2 Risks to financial stability

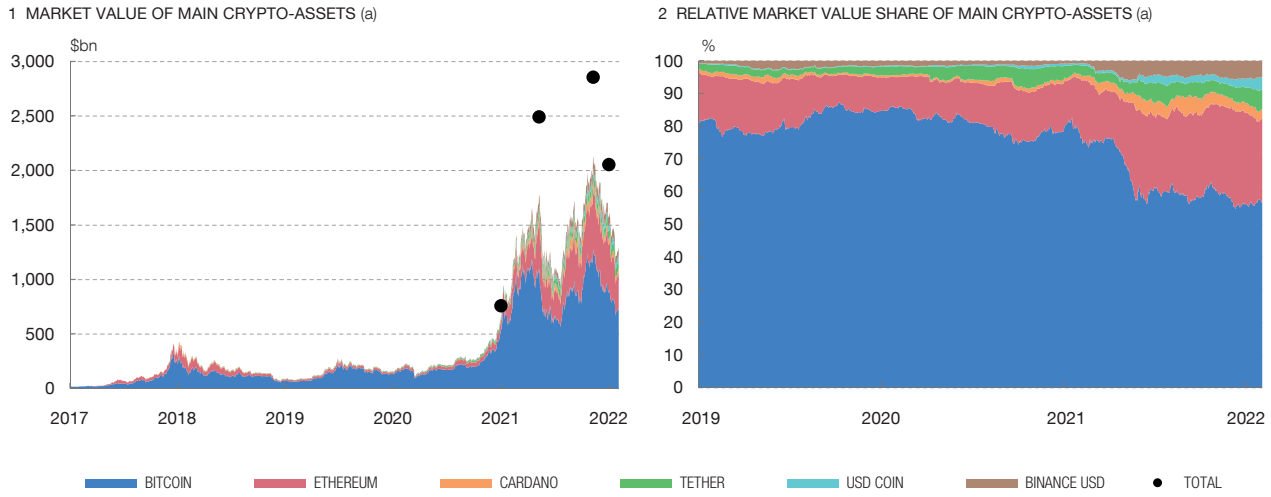
The global market value of crypto-assets is still limited, but it has risen exponentially since late 2020 and most of the trading is concentrated in unbacked crypto-assets, signalling a growing risk to financial stability. However, the risks taken by individual crypto-asset holders, while potentially very high, do not necessarily represent a systemic risk. This would require these markets to gain critical mass in terms of volume or number of interconnections which could, in the event of difficulties, destabilise the financial system. The high growth of trading in the main crypto-assets, whose market value increased by a factor of 13.4 from the beginning of 2020 to its peak in November 2021, and by a factor of 7.8 to February 2022, points to their growing systemic importance (see Chart S.1.1). This is also underlined by the significant correlation between the various crypto-assets, as the chart shows, and suggests that a correction in the value of one such asset could spread to the others in a scenario where there is little differentiation between these assets by most market participants. Moreover, crypto-assets that are not backed by traditional financial instruments, such as bitcoin or ethereum, accounted for more than 80% of the market value of the main crypto-assets at the beginning of 2022, although lately the share by value of stablecoins has grown (see Chart S.1.2). The market capitalisation of the crypto-asset market overall peaked in 2021 at $2.8 trillion, approximately 1% of global financial

27 In particular, the PoW protocol is computationally and resource intensive. The development of protocols with less energy consumption, such as PoS, opens the door to mitigating these climate risks. For more details, see Box 1 of FSB (2022).

Chart S.1

THE MARKET VALUE OF CRYPTO-ASSETS HAS INCREASED MARKEDLY SINCE 2020 H1, WITH HIGH FLUCTUATIONS

From early 2020 to November 2021, the market value of the main crypto-assets increased more than thirteenfold, although it has recently suffered sharp corrections leading to a 41% decline from peak levels. The preponderance of crypto-assets not backed by traditional financial assets (which account for around 84% of the main crypto-assets' market value, according to the available data) contributes to this high volatility.



SOURCES: CoinMarketCap, CryptoCompare and FSB.

a Bitcoin, ethereum and cardano are unbacked crypto-assets, while the others are stablecoins. The total corresponds to the market value of all crypto-assets, not just those included in the chart.

assets. This represents growth to a higher order of magnitude compared with a date as recent as end-2018, when the market accounted for just 0.02% of global financial assets.[28]

The growth and volatility of the global market value of crypto-assets are mainly explained by the prices of unbacked instruments, and are evidence of the relevance and scale of the market risk inherent to these instruments. The supply (number of units) of the main unbacked crypto-assets (bitcoin and ethereum) has held relatively stable since 2017. In particular, from end-2020 to February 2022, supply increased by around just 5%, compared with high growth and volatility in market value (see Chart S.2.1). By contrast, the main stablecoins (tether and USD coin) have based their market value growth on the issuance of new units (see Chart S.2.2), with their unit price holding relatively stable, in keeping with their design and the absence of any widespread crises of confidence in the period.

Unbacked crypto-asset markets have higher volatility than equity markets, but the correlation with the latter has risen since 2020. This could potentially increase market risk beyond the crypto-asset sub-segment. The dispersion of crypto-assets' market returns is significantly higher than that of the S&P 500 index; outliers, both positive and negative, are also more frequent (see Chart S.3.1). There

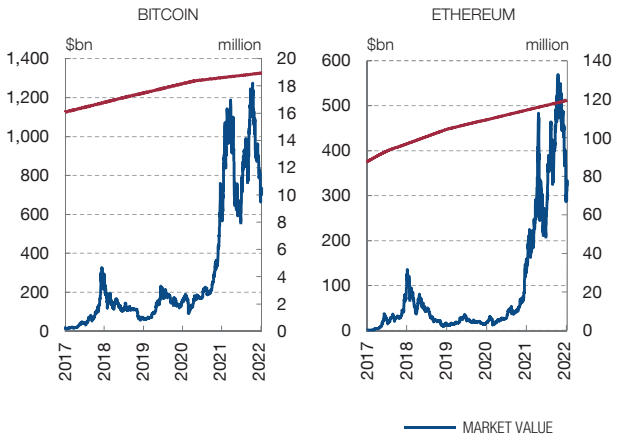
28 See FSB (2020), "Global Monitoring Report on Non-Bank Financial Intermediation 2019" and FSB (2022), "Assessment of Risks to Financial Stability from Crypto-assets".

Chart S.2

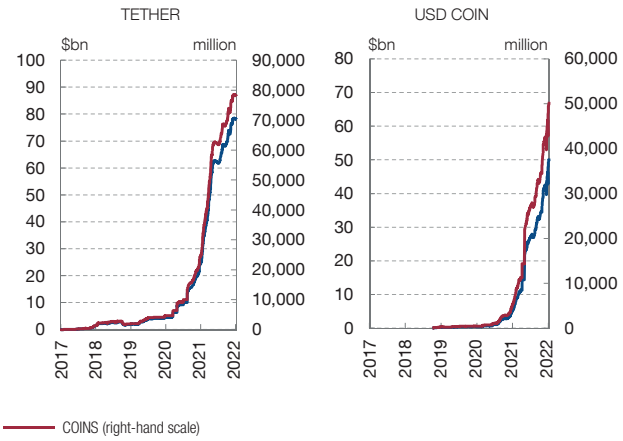
THE GROWTH IN THE MARKET VALUE OF UNBACKED CRYPTO-ASSETS HAS BEEN DRIVEN BY INCREASES IN THEIR UNIT PRICE, WHILE IN THE CASE OF STABLECOINS IT HAS BEEN MAINLY AS A RESULT OF THE GROWTH IN SUPPLY

The number of units of the two main unbacked crypto-assets (bitcoin and ethereum) has risen by approximately 3% and 7%, respectively, since mid-2020, while their trading volume has grown sevenfold and twentyfold, respectively, reaching all-time highs in November 2021. This confirms the significance of the price effect. In the case of the two main stablecoins (tether and USD coin), whose price is stable by design, their market value has risen as a result of the increased supply.

1 SUPPLY AND MARKET VALUE OF MAIN CRYPTO-ASSETS NOT BACKED BY TRADITIONAL FINANCIAL ASSETS



2 SUPPLY AND MARKET VALUE OF MAIN STABLECOINS



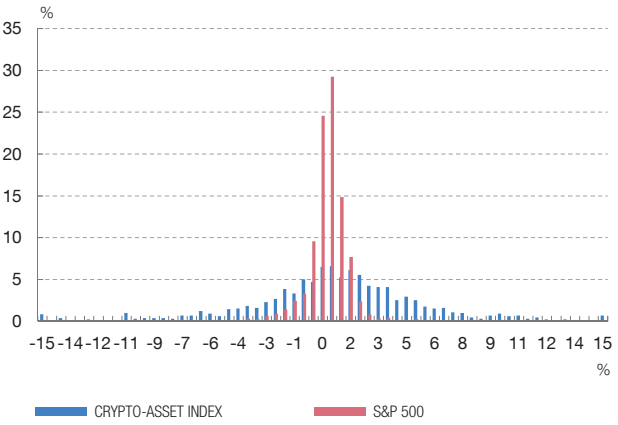
SOURCES: CoinMarketCap and CryptoCompare.

Chart S.3

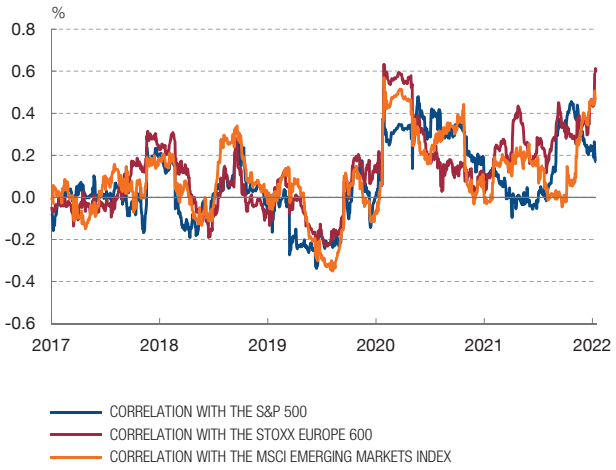
CRYPTO-ASSET MARKET RETURNS ARE MORE VOLATILE THAN EQUITY MARKET RETURNS, WITH WHICH THERE HAS BEEN A GROWING CORRELATION SINCE 2020

The upper and lower tails of the distribution of the market returns on crypto-assets are substantially higher than the returns on the main equity market indices such as the US S&P 500. The correlation between crypto-asset and equity market returns has turned more positive and has risen since 2020, in both advanced and emerging economies, where it was particularly high in 2021.

1 DAILY RETURNS ON A CRYPTO-ASSET INDEX AND THE US S&P 500 INDEX (a)



2 CORRELATION BETWEEN DAILY RETURNS ON A CRYPTO-ASSET INDEX AND EQUITY MARKET INDICES (EUROPE, UNITED STATES AND EMERGING ECONOMIES) (a)



SOURCES: Refinitiv and MVIS Investable Indices.

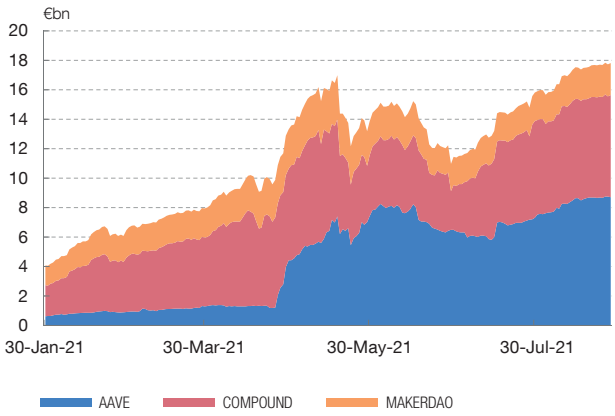
a The MVIS CryptoCompare Digital Assets 100 Index comprises the largest 100 crypto-assets (asset-backed and unbacked) by market value.

Chart S.4

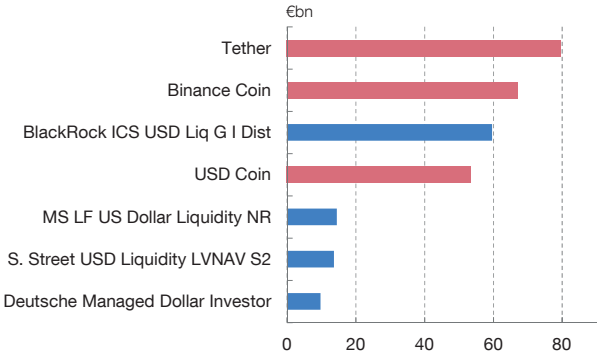
THE GROWTH OF DeFi, WHICH COULD FACILITATE LEVERAGING WITH CRYPTO-ASSETS, AND THE INCREASE IN THE VOLUME OF STABLECOINS TRADED, COULD POSE RISKS TO FINANCIAL STABILITY

The volume of loans on the main DeFi platforms has increased fourfold since the start of 2021; if this trend continues, the systemic importance of this infrastructure will rapidly increase. Some stablecoins are already larger in size than some major European money market funds, evidencing their strong growth and their capacity to affect financing conditions on the traditional money markets.

1 LOANS ON DeFi PLATFORMS



2 COMPARISON BETWEEN MMFs AND STABLECOINS (a)



SOURCES: BIS and Refinitiv.

a The blue bars denote funds and the red bars stablecoins.

is ample evidence in the economic literature of how shocks resulting in a reduction in agents' income and wealth can increase their risk aversion, leading them to shed other financial assets whose value would also experience a correction, negatively affecting consumption and investment.[29] The high volatility of crypto-assets may contribute to these dynamics, with corrections in these assets driving a more general correction in financial asset prices. In this respect, the growing correlation between this market and that of other risky assets, such as equities, both in advanced and emerging economies (see Chart S.3.2) increases this risk of indirect contagion.[30] It should also be borne in mind that an albeit small but high-risk segment can give rise to widespread market corrections, particularly if highly leveraged agents are exposed to it.[31] The growing volume of crypto-asset loan agreements could make it easier for traders in this sub-segment to become more leveraged and drive up these correction risks (see Chart S.4.1). The fact that these instruments are available to retail investors

29 See for example J. Y. Campbell and J. H. Cochrane (1999), "By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behavior", and J. H. Cochrane (2017), "Macro-Finance".

30 T. Adrian et al. (2022), "Crypto Prices Move More in Sync With Stocks, Posing New Risks" highlights the importance of this growing positive correlation.

31 E. Pinto (2008), "Sizing Total Exposure to Subprime and Alt-A Loans in U.S. First Mortgage Market" documents that in 2008 the US subprime mortgage market was worth $1.2 trillion, less than the current global crypto-asset market even after adjusting for inflation.

with limited understanding of their financial characteristics[32] could also exacerbate this accelerating expansion and the risk of abrupt price corrections, as they are unable to properly assess the positive and negative news flow.

Meanwhile, the growth in the supply of stablecoins implies that issuers must also increase their holdings of the underlying assets, thus increasing interconnectedness with the traditional financial market. For their value to hold stable, stablecoins often need to be backed by liquid assets, such as highly rated commercial paper and sovereign debt with short maturities or bank deposits, which increases demand for these assets and affects their price. This implies that stablecoins drive up demand for safe assets. When such assets are scarce, this may put additional downward pressure on equilibrium real interest rates.[33] Moreover, increased pressure to convert stablecoin holdings into legal tender could lead to a hasty sell-off of positions in these products and generate liquidity stress.[34] The larger the stablecoin segment, the greater the liquidity risks would be. In this respect, there is already evidence that the main stablecoins are now comparable in size to some major European money market funds (see Chart S.4.2). In addition, the role that stablecoins currently play in making it easier to trade in unbacked crypto-assets creates substantial interconnectedness that increases these instruments' risk profile. The volatility of unbacked assets can feed through to all crypto-asset trading and increase the above-mentioned liquidity and market risks, putting pressure on the issuer's ability to convert them at par value at times of stress, since they act as a safe-haven asset within crypto-asset trading. Retail and institutional investors that have become more reliant on these instruments would be more affected by these volatility episodes (see Figure S.2).

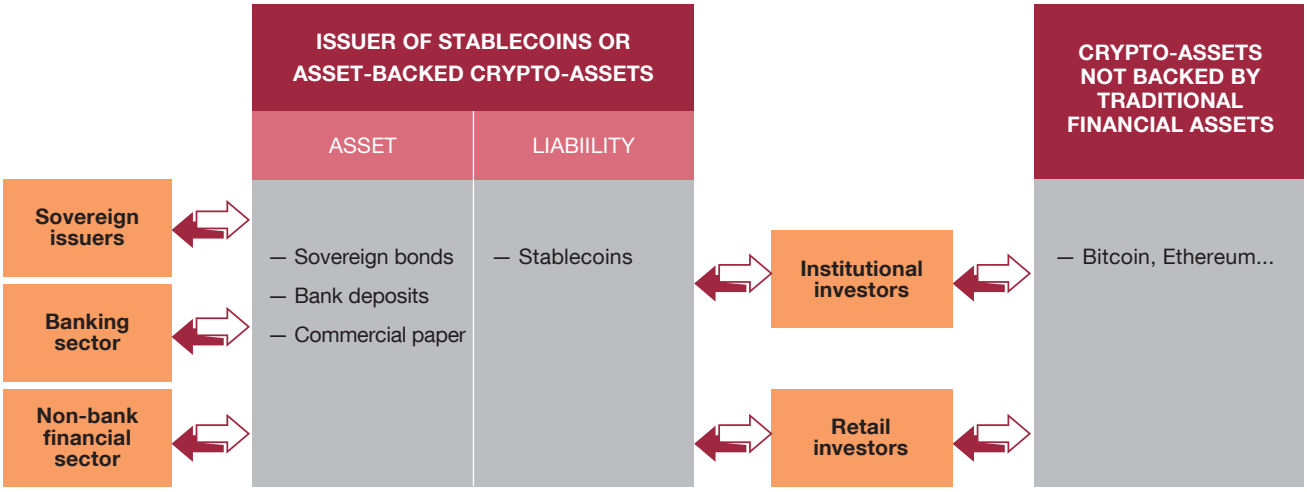
Lastly, a more widespread use of stablecoins could entail medium-term structural risks to financial stability through the erosion of the banking sector's deposit-taking capacity. This could potentially alter the effects of monetary policy and affect capital flows. The possible substitution of stablecoins for bank deposits would reduce the banking sector's ability to raise low-cost funding, as well as its engagement with and knowledge of traditional segments of bank customers. This would result, all else being equal, in a lower financial intermediation capacity. This could lead the banking sector to seek alternative sources of financing which would possibly require a greater use of collateral in secured transactions, thus increasing the banking sector's demand for certain classes of liquid assets. The net effect of these dynamics on banks' financing costs would plausibly also feed through to the interest rates charged on bank loans and to banks' risk-taking, which could

32 See the address given by the Governor of the Banco de España, "Financial Stability and Crypto-assets", on 21 February 2022 at the "Observatorio de las Finanzas" symposium organised by the newspaper El Español.

33 See, for example, R. Caballero et al. (2016), "Safe Asset Scarcity and Aggregate Demand".

34 See, for example, J. Barthélemy et al. (2021), "Crypto-assets and financial stability: are there any contagion risks?".

Figure S.2
INTERCONNECTIONS GENERATED THROUGH STABLECOIN HOLDINGS



SOURCE: Banco de España.

increase. These different impacts (bank loans and deposits, higher demand for liquid assets, possible increased recourse to central banks or wholesale markets) would affect both monetary policy interest rate and bank lending channels. In emerging countries, crypto-assets may allow residents to access a store of value that affords them greater protection from domestic inflation. This would have significant implications for capital flows and would also reduce the effectiveness of both monetary and macroprudential policy, leaving these countries more exposed to the global financial cycle.[35]

S.3 Regulation of crypto-assets

S.3.1 Challenges posed by the regulation of crypto-asset markets worldwide and in Spain

Regulating crypto-assets poses novel challenges just as crypto-assets entail novel risks. Moreover, international coordination is essential in a market segment such as this one, susceptible to regulatory arbitrage. However, applying the principle of "same activity, same risk, same regulation" to crypto-assets is less straightforward than for other financial activities subject to digitalisation processes, since their novel features hamper comparisons with traditional services. In addition, the diversity of agents that make up the ecosystem of crypto-asset

35 See IMF (2021), The Crypto Ecosystem and Financial Stability Challenges.

issuers and service providers complicates the regulatory approach to be followed and, in any event, advises adopting a sufficiently broad approach to enable all the relevant aspects of these ecosystems to be captured. This is an urgent task, considering the speed at which crypto-assets are expanding and the current almost total lack of regulation of crypto-asset-related activities.

There are no specific Spanish regulations on crypto-assets, and only recently has the CNMV issued a circular on advertising of crypto-assets intended for financial investment. The circular aims to ensure that the advertising content is accurate, easily understandable and not misleading, and that it clearly includes mention of the associated risks. To that end, the circular lays down rules on the content and format of crypto-asset advertising campaign messages. It also envisages a procedure for prior notification to the CNMV of mass advertising campaigns targeting 100,000 persons or more. The circular establishes the tools and procedures for effective supervision of crypto-asset advertising, but it does not regulate either crypto-assets, their issuance or crypto-asset-related services.

In this setting, with no specific national crypto-asset regulations, the Banco de España does not currently have the power to regulate, authorise or supervise the functioning of crypto-asset markets or their participants. At present, it is only responsible for managing the register of providers engaged in exchange services between virtual currency and fiat currencies and custodian wallet providers, but it has no regulatory or supervisory powers over crypto-asset markets. In particular, the Banco de España does not have the power to regulate authorisation of the provision of crypto-asset services. Naturally, however, despite the scant information available, it does analyse and monitor these services, as in this report, in view of the potential relevance of crypto-assets for the stability of the financial system and their impact on economic activity.

Various supranational initiatives are under way for the regulation and supervision of crypto-assets, which are key given the possibilities these instruments offer for international transactions. The European Union has developed a comprehensive response to the challenge of regulating crypto-assets in a new regulatory framework, rather than simply adapting existing structures, developing the Markets in Crypto-assets Regulation (MiCA) mentioned earlier. In the international sphere, several initiatives are under way – in particular at the FSB, the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions (CPMI-IOSCO), the Basel Committee on Banking Supervision (BCBS) and the Financial Action Task Force (FATF) – that will introduce regulations on different aspects of operations with crypto-assets, in particular relating to prudential requirements at banks.

The regulatory initiatives largely stem from a growing consensus among regulators as to the scale of the potential risks associated with this market

segment. At the European Union level, the European Banking Authority (EBA), European Securities and Markets Authority (ESMA) and European Insurance and Occupational Pensions Authority (EIOPA) recently issued a joint warning to consumers of the financial risks of crypto-assets.[36] In Spain, the Banco de España, the CNMV and the Directorate General of Insurance and Pension Funds (DGSFP) subsequently issued a joint message of caution,[37] also warning that the regulations in place to date cover only a very limited part of activity in crypto-assets and are, therefore, insufficient to adequately contain the associated risks.

S.3.2 Proposed EU Markets in Crypto-assets Regulation (MiCA)

The European institutions are currently negotiating a proposal for a regulation on crypto-asset markets (Markets in Crypto-assets, MiCA). The proposal was submitted by the European Commission in September 2020. The Council of the European Union reached an agreement on the text in late November 2021 and negotiations are now ongoing between the European Parliament and the Council to secure a final agreement. In February 2022, the Economic and Monetary Affairs Committee of the European Parliament adopted its negotiating position on the new rules on crypto-assets (MiCA).[38]

The proposed MiCA regulation considers a set of common rules within the European Union, focused on providing crypto-asset users with legal certainty and adequate legal protection and applicable to both crypto-asset issuers and service providers.[39] This framework will replace all national crypto-asset regulations other than those covered by European Union financial services legislation. Among the largest European countries, Germany, France and Italy already have crypto-asset legislation, albeit with varied scope. The proposal does not apply to non-fungible crypto-assets,[40] or to crypto-assets that may be classed as financial instruments, deposits, funds, securitisation positions or pension products, inter alia, which will be governed by the existing legislation for each corresponding type of financial instrument. But the proposal does apply to stablecoins, understood as those crypto-assets that aim to preserve a stable value relative to an official currency or other securities or rights, or a combination of

36 See the joint EBA, ESMA and EIOPA document, "EU financial regulators warn consumers on the risks of crypto-assets".

37 See the joint Banco de España, CNMV and DGSFP document, "Joint press statement by the Banco de España, CNMV and DG de Seguros on the warning by European financial regulators regarding the risks of crypto-assets".

38 See the European Parliament press release of 14 March 2022, "Cryptocurrencies in the EU: new rules to boost benefits and curb threats". A priori, this position does not impose a ban on the use of PoW protocols, despite their environmental impact.

39 Crypto-asset issuers and service providers are defined in the first section of this chapter.

40 Essentially, crypto-assets with unique characteristics or functions that cannot be immediately exchanged with other crypto-assets and whose value cannot be determined relative to an existing market or other equivalent assets.

both. As explained below, if stablecoins satisfy certain conditions they will also be considered electronic money.

The proposal distinguishes between the following classes of crypto-assets: first, those classifiable as stablecoins, identified as electronic money (emoney) tokens and asset-referenced tokens, and second, all other crypto-assets. Specifically:

- **Electronic money tokens** are a kind of crypto-asset that may be used as a medium of exchange and that aim to preserve a stable value relative to a country's official currency. They are considered electronic money.[41] The issuers of these tokens must be credit institutions or electronic money institutions.

- **Asset-referenced tokens** are a different kind of crypto-asset that aim to preserve a stable value relative to any other securities or rights, or a combination of both, including one or several official currencies of a country. Issuers of asset-referenced tokens must constitute and maintain a reserve of assets at all times. This reserve is created in the interest of the holders of these tokens and must, therefore, be segregated from the issuers' own assets. The reserve assets may only be invested in highly liquid financial instruments with minimal concentration, credit and market risk. Lastly, the proposed MiCA regulation requires that the reserve be managed in such a manner as to ensure that the liquidity risks associated with holders redeeming their tokens can be met, and that the risks associated with the assets to which the tokens are referenced are covered.

- All **crypto-assets** other than those described above, included in the sphere of the proposal.

- Electronic money tokens and asset-referenced tokens may, in addition, be **significant** if they satisfy certain criteria or cross certain thresholds, as to the client base, the value of the tokens issued or the number and value of the transactions concerned.

The proposal regulates other aspects of crypto-asset issuers' and service providers' activities. For crypto-asset issuers, it introduces rules on their authorisation, on how to draft the "white paper", which is an informative document on the issuance of crypto-assets, and on their organisation, governance and supervision. Crypto-asset service providers may provide a range of services (see

41 Electronic money is a financial instrument that may be used to make payments and transfers by means of an electronic device that stores a country's official currency.

Figure S.1 in Section 1) and the proposal includes rules for each such service, relating to organisational and prudential (own funds, insurance policies) aspects, customer information, safeguarding of funds, conflicts of interest and outsourcing. Credit institutions may be both crypto-asset issuers and service providers. In neither case will they need to obtain authorisation to pursue this activity. However, they may be subject to other provisions of the proposed MiCA regulation.

Regulation of crypto-asset service providers may ensure that this market expands at an appropriate pace and prevent an excessive build-up of risk. Despite the possibilities of peer-to-peer crypto-asset transactions, the role of intermediaries may be important to scale up the crypto-asset market, harnessing efficiency gains and reducing data asymmetry. If the regulations ensure an appropriate degree of transparency and prudency in intermediaries' operations, the build-up of risks associated with crypto-assets could be effectively controlled, in particular as regards the information required by the regulator and the number of agents whose compliance with the regulations would need to be supervised. In any event, the supervisory challenges are considerable, not least in view of the technological complexity involved.

Lastly, the proposal regulates the crypto-asset supervisory architecture. Essentially, authorisation of the issuer, the white paper which the latter must present and the authorisation to provide crypto-asset services fall within the remit of the national competent authorities (NCAs). These authorities are also responsible for supervising the issuers, unless the e-money and asset-referenced tokens issued are significant, in which case this responsibility will be assumed by a European-level supervisor in conjunction with a college of supervisors. Supervision of crypto-asset service providers falls within the remit of the NCAs.

S.3.3 Advances at the global level

At the global level, the main regulatory challenge is to formulate consistent rules across the different frameworks, preventing gaps or overlaps between the different approaches. The main international coordination efforts as regards regulation of crypto-asset-related activities and banking sector exposure are concentrated at the FSB, BCBS, CPMI-IOSCO and FATF.

The FSB operates as a forum for cross-border and cross-sectoral coordination. Initially, it agreed to regularly monitor and report to the G20 developments in these markets, to identify possible global systemic risks. The FSB also agreed to establish a series of high-level recommendations[42] to address the regulatory and supervisory

42 FSB (2020), "Regulation, Supervision and Oversight of "Global Stablecoin" Arrangements".

challenges posed by global stablecoins. These recommendations establish minimum criteria for the regulation and supervision of global stablecoins, from a flexible, international and multi-sectoral approach. The FSB is currently working to identify possible gaps and overlaps in the regulatory standards for which other international bodies – the standard-setting bodies – are responsible. Moreover, and as a result of this analysis and monitoring of the development of crypto-assets, the FSB has concluded that, parallel to the above-mentioned work on stablecoins, regulatory and supervisory questions relating to unbacked crypto-assets must begin to be examined, warranted by the growth and potential risks to financial stability (albeit contained to date) of these assets and by the FSB's own analysis.

In recent years the BCBS, as the body responsible for international prudential standards for banks, has worked on the development of the prudential treatment for banking exposures to crypto-assets.[43] Specifically it has analysed whether the prudential regulatory framework, which links the risk of different exposures to a defined level of bank capital requirements, should be modified in any way to correctly capture the risks associated with crypto-assets. Thus, in June 2021 the BCBS published a first consultative document (to be followed in 2022 by a second one).[44] The proposed approach classifies crypto-assets into two groups, according to the specific classification conditions they fulfil:[45]

— **Group 1 includes stablecoins** that have effective stabilisation mechanisms at all times.[46] These conditions would be set in accordance with the risk of fluctuation or loss of value of the underlying assets and the risk that the redeemer may not honour its commitments.[47]

— **Group 2 includes unbacked cryptocurrencies and stablecoins that do not have a stabilisation mechanism that complies with the test established.** It also includes other crypto-assets whose technology does not satisfy the conditions, or traditional tokenised assets that do not satisfy the conditions, for classification in Group 1. The prudential treatment proposed for Group 2 crypto-assets establishes a 1250% risk weight of exposure to these crypto-assets, irrespective of whether they are classified

43 BCBS (2021), "Prudential treatment of cryptoasset exposures", consultative document.

44 The document includes all kind of crypto-assets, with the exception of central bank digital currencies (CBDCs).

45 A value stabilisation mechanism, clearly defined and legally enforceable legal rights that ensure that the crypto-assets may be redeemed at any time, secure networks and regulation of network agents delivering critical functions.

46 The initially proposed mechanism consists of monitoring daily the difference between the value of the crypto-asset and the underlying assets. The difference in value must not exceed 10 bp of the value of the underlying asset more than three times over a one-year period.

47 In any event, Group 1 is broader, as it also includes tokenised traditional assets, i.e. assets which confer the same legal rights as their traditional version and which, therefore, will receive the same prudential treatment. In this case, the technology permits a more efficient transfer of traditional assets, but these maintain their financial characteristics and are not specified as a new instrument.

in the banking or the trading book. Crypto-asset exposures cannot be part of any hedging set.

— **The prudential treatment differences between the two groups** are confined, so far, to the credit and market risk frameworks. All other requirements would be applied in the same way to both groups. In any event, the possibility of including a capital add-on for technological reasons for all crypto-assets is to be assessed, should it be considered that their operational characteristics entail additional risks.

CPMI-IOSCO has concentrated on the operational side of crypto-assets. It has published a consultation report, confirming that the Principles for Financial Market Infrastructures (PFMI) apply to systemically important stablecoin arrangements and proposing additional guidance on how certain aspects of the PFMI may affect the features of these arrangements.

The potential illicit uses of crypto-assets have also prompted a global regulatory response. In October 2021 the FATF, the global money laundering and terrorist financing watchdog, updated its 2019 Guidance for a risk-based approach to virtual assets and virtual asset service providers (VASPs) which provides, inter alia, additional guidance for the public and private sectors on implementation of the "travel rule"[48] envisaged in its Recommendation 16. Precisely to include the "travel rule" in European legislation, the European Commission has revised its Regulation (EU) 2015/847, extending the obligation on payment service providers to accompany transfers of funds with information on the payer and the payee to include crypto-asset service providers.

S.4 Exploratory analysis of crypto-assets in Spain and Europe

In 2021 Spain was the fifth economy by crypto-asset transaction volume in Europe, which is the region that receives the largest volume of crypto-assets worldwide.[49] Over the last year, crypto-asset transaction volume in Europe amounted to almost €845 billion[50] (4.9% of GDP, 0.9% of total financial assets), 25% of the global total, ahead of North America which accounted for 18% and which is also its main counterparty in crypto-asset transactions. Within Europe, Spain ranked fifth in terms of transaction volume in 2021, with almost €60 billion (4.8% of GDP,

48 In general, the "travel rule" refers to the need to record identification and transactional data on transactions over certain minimum thresholds.

49 This section mainly draws on data from Chainalysis (2021), "The 2021 Geography of Cryptocurrency Report". When assessing these data it must be borne in mind that they are not official statistics (there are none currently available), but are based on the data processing capacity of this private data provider.

50 The original dollar estimates have been converted to euro at the average 2021 exchange rate. The ratios to GDP and total financial assets are based on 2019 values, to obtain a comparison not affected by the impact of the pandemic.

2.7% of total financial assets), behind the United Kingdom, France, Germany and the Netherlands and ahead of Switzerland and Italy.

Analysis by geographical area can be broken down by type of crypto-asset, investor and service associated with the transaction; even the incidence of illicit activity can be proxied. Information on the transaction volume and service type associated with each transaction can be obtained from on-chain data,[51] while the investor type can be proxied by the transaction amount, and the incidence of illicit activity thanks to collaboration with government authorities.

Over the last year the volume of trading in crypto-assets in Europe increased, with institutional investors playing a larger role, although there is no evidence of a significant degree of banks' involvement in this segment. On Chainalysis data, crypto-asset transaction volume in 2021 H1 (the latest data available) was more than ten times the volume traded during the same period of 2020 (see Chart S.5.1.A). In principle, this increase is due to the greater number of transactions, but also to the appreciation of the main unbacked crypto-assets (such as bitcoin), and to the higher supply of stablecoins (such as tether) in the period considered. By transaction type, larger transactions (over $10 million) have gained prominence over time, which suggests an increased involvement of institutional investors in crypto-asset transactions.[52] Certain data constraints hamper measurement of the banking sector's exposure to crypto-assets, but the preliminary studies available do not detect a significant volume of exposure, either for Spanish banks or at a global level.[53]

Within the euro area, Spain's share of trading in crypto-assets by volume is commensurate with its GDP. Thus, Spain accounted for some 10% of total euro area transactions between July 2020 and June 2021 (see Chart S.5.1.B), similar to its relative economic weight in the region. In general, the larger a country's economy, the greater its involvement, although some countries (for example, the Netherlands and Portugal) have a somewhat higher volume of transactions than their GDP would warrant.

Transactions in unbacked crypto-assets account for the bulk of the total and are mainly non-intermediated transactions. In the period considered, most trading (see Chart S.5.2) was in unbacked crypto-assets (approximately 75% of the total in Spain and in the rest of the euro area) whose prices are more volatile. Transactions in Ethereum network currencies (including ether and all other tokens on

51 On-chain data are data that can be extracted from the public ledgers of crypto-assets backed by blockchain technology.

52 On the assumption that retail investors' transactions are smaller than those of institutional investors.

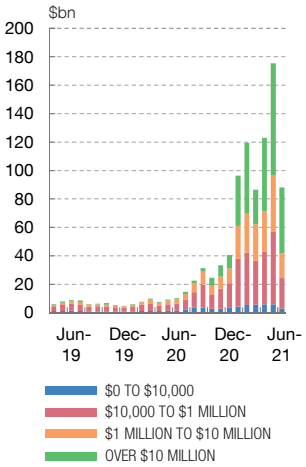
53 Investment in crypto-assets amounts to less than 1% of CET1 capital for the vast majority of the international banks that have most focus on these kind of assets; see BIS (2021) "International banking and financial market developments".

Chart S.5

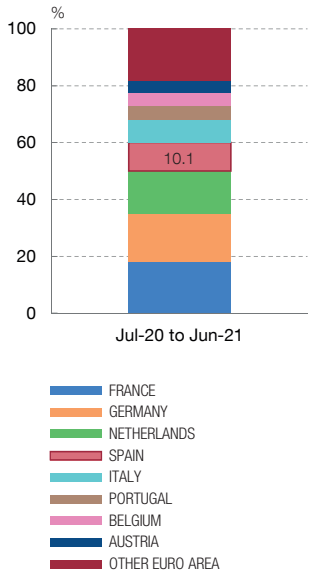
TRADING IN CRYPTO-ASSETS INCREASED IN 2021 IN SPAIN AND IN THE REST OF EUROPE, MAINLY WITH UNBACKED ASSETS AND THROUGH DECENTRALISED TRANSACTIONS

During the first half of 2021 (the latest data available), trading in crypto-assets increased, essentially driven by large transactions. The bulk of the transactions were in unbacked crypto-assets and decentralised services. Among the illicit activities with crypto-assets, on the data available from police investigations, the majority are scams and stolen funds.

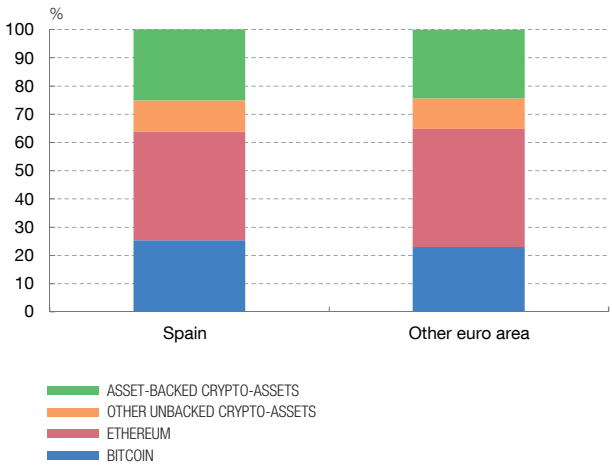
1.A CRYPTO-ASSET TRANSACTION VOLUME IN EUROPE, BY SIZE (a) (b)



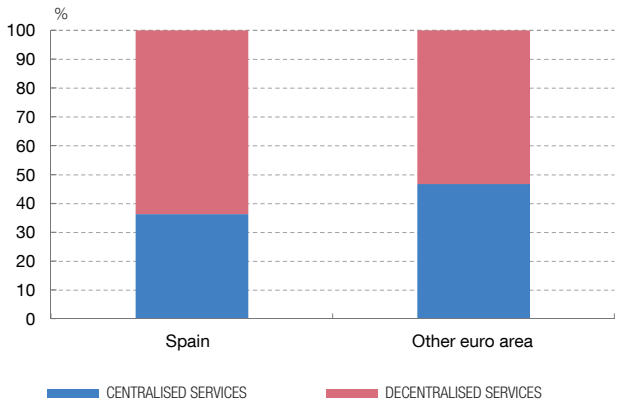
1.B SHARE OF EURO AREA TRANSACTIONS BY COUNTRY (c)



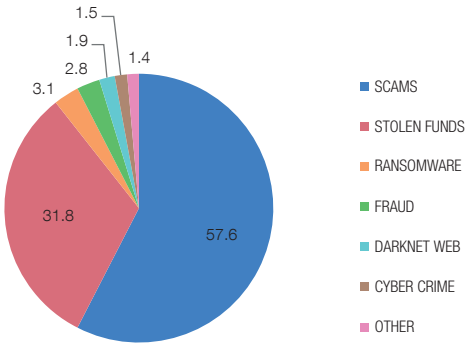
2 TRADING IN DIFFERENT CRYPTO-ASSETS (c)



3 TRADING IN CRYPTO-ASSETS BY SERVICE TYPE (d)



4 BREAKDOWN OF ILLICIT ACTIVITIES ASSOCIATED WITH CRYPTO-ASSET TRANSACTIONS IN EUROPE (AS %) (b) (e)



SOURCES: Banco de España and Chainalysis.

a Monthly transactions, expressed in US dollars.
b Includes all European countries according to the Chainalysis classification, both euro area and non-euro area countries. The latter include the United Kingdom, Switzerland, Norway, Sweden, Denmark, Hungary, Croatia, Albania, North Macedonia, Bosnia and Herzegovina, Monaco, Montenegro and Iceland.
c Stablecoins or asset-backed crypto-assets, such as tether, enjoy some kind of guarantee associated with their value. Bitcoin and ethereum are two of the most important unbacked crypto-assets.
d Centralised services imply the existence of a trading intermediary (such as a cryptocurrency exchange), while decentralised protocols operate without intermediaries.

that network) were particularly significant (39% of the total in Spain, 42% in the other euro area countries). By protocol type, decentralised services account for a higher share (64% of the total in Spain, 53% in the other euro area economies) than centralised alternatives or those requiring trading intermediaries, such as cryptocurrency exchanges (see Chart S.5.3). However, in some countries[54] intermediation services are growing rapidly, possibly in response to various factors, such as fewer formal requirements for execution of transactions and the inclusion of liquidity requirements for participation in centralised platforms.[55]

A certain proportion of cryptocurrency transactions are for illicit activities, and only an estimate of the lower bound of their share of the total is available. In Spain, it is estimated that they accounted for approximately 1% between July 2020 and June 2021. This percentage is low but it could be the lower bound, as agents involved in illicit activity, by its own nature, seek to hide it.[56] Chart S.5.4 provides a breakdown of the main categories of illicit activity associated with crypto-assets for Europe overall (for where such a breakdown is possible). It shows that scams (57.6% of the total) and stolen funds (31.8%) account for the bulk of illicit crypto-asset transactions detected in Europe.

The surveys available on holdings of crypto-assets confirm that their adoption in Spain is fairly high. Finder, which conducts a regular survey on cryptocurrency adoption rates in 27 countries,[57] estimates that 12% of adults in Spain hold crypto-assets, with a slight difference between men (13%) and women (10%) and a higher proportion among young people (highest among the 18 to 24 age group). Likewise, according to a similar survey conducted by Statista, 10% of respondents in Spain declared that they used or owned crypto-assets.[58] These figures are close to, and in some cases higher than, those observed in the same surveys for other developed countries.

The – albeit limited – information available points to a significant presence of crypto-assets in both Spain and Europe. The growth in the use and holding of crypto-assets in Spain, and the possible associated risks, advise that they be considered and monitored from a financial stability standpoint. Accordingly, more and better information is needed on the crypto-assets traded and held by different economic agents. In addition to the possibilities offered by on-chain approximations, other sources such as future official statistics or surveys on usage habits may also

54 See, for example, J. Cunliffe (2021), "Is 'crypto' a financial stability risk?".

55 For instance, the presence of agents or operators providing liquidity in liquidity pools in exchange for a consideration, or the development of "smart contracts" for transactions.

56 In S. Foley et al. (2019), "Sex, Drugs, and Bitcoin: How Much Illegal Activity Is Financed through Cryptocurrencies?", it is estimated that almost half of all bitcoin transactions are financing illegal activity.

57 The Finder Crypto Report on Cryptocurrency adoption rates, whose results were published on 23 August 2021, draws on 42,000 surveys of internet users across 27 countries, including 1,511 respondents in Spain.

58 The Statista Global Consumer Survey, an online survey conducted from January to June 2021 with samples of between 1,000 and 5,000 adults (18 to 64 years of age) by country.

be helpful, especially to identify factors that could determine a higher or lower level of adoption[59] (for instance, level of education, age, risk aversion, familiarity with technology and even gender). These characteristics are also essential to determine the level of risk crypto-assets pose for the population, especially from the conduct standpoint and for the financial system overall.

59 Surveys of this kind can be found, for example, in the United States (Survey of Consumer Payment Choice), Canada (the Bank of Canada's Bitcoin Omnibus Survey (BTCOS)) and Austria.

Annex 1

CONSOLIDATED BALANCE SHEET (a)
DEPOSIT INSTITUTIONS

Assets	Dec-21	Change Dec-21/Dec-20	Relative weight Dec-20	Relative weight Dec-21
	€m	%	%	%
Cash and balances with central banks	555,637	36.9	10.5	14.0
Loans and advances to credit institutions	218,562	9.1	5.2	5.5
General government	103,351	5.6	2.5	2.6
Other private sectors	2.185,484	3.6	54.8	55.2
Debt securities	490,278	-6.4	13.6	12.4
Other equity instruments	46,980	27.0	1.0	1.2
Investments	24,182	-5.3	0.7	0.6
Derivatives	122,490	-18.7	3.9	3.1
Tangible assets	58,419	-3.0	1.6	1.5
Other	151,384	-36.1	6.2	3.8
TOTAL ASSETS	**3,956,767**	**2.8**	**100.0**	**100.0**
Memorandum items				
Financing to private sector	2,232,516	0.6	57.7	56.4
Financing to general government	507,321	-0.3	13.2	12.8
Total NPLs	89,284	5.4	2.2	2.3
Total NPL ratio	2.6	5(c)		

Liabilities and equity	Dec-21	Change Dec-21/Dec-20	Relative weight Dec-20	Relative weight Dec-21
	€m	%	%	%
Balances from central banks	394,089	15.5	8.9	10.0
Deposits from credit institutions	210,597	-5.7	5.8	5.3
General government	123,175	19.3	2.7	3.1
Other private sectors	2,280,281	5.9	56.0	57.6
Marketable debt securities	409,085	1.3	10.5	10.3
Derivatives	120,410	-16.0	3.7	3.0
Provisions for pensions, tax and other	27,073	4.2	0.7	0.7
Other	140,870	-32.8	5.5	3.6
TOTAL LIABILITIES	**3,705,581**	**2.8**	**93.7**	**93.7**
Memorandum items				
Eurosystem net lending (b)	289,545	10.9	6.8	7.3
Own funds	286,732	4.9	7.1	7.2
Minority interests	15,110	-17.5	0.5	0.4
Valuation adjustments relating to total equity	-50,656	6.2	-1.2	-1.3
TOTAL EQUITY	**251,186**	**3.0**	**6.3**	**6.3**
TOTAL LIABILITIES AND EQUITY	**3,956,767**	**2.8**	**100.0**	**100.0**

SOURCE: Banco de España.

a The figures for total assets, total liabilities and net equity, and for the components thereof, correspond directly to the consolidated accounting information reported to the Banco de España in confidential returns. As a result of a merger operation, the assets and liabilities of a significant institution in December 2020 were reclassified in the consolidated information to the assets and liabilities of disposable groups classified as held for sale, which would be included in other assets and liabilities. In this annex, the specific assets and liabilities items (e.g. other private sectors) are adjusted on that date using subconsolidated information in order to reverse this reclassification. These adjustments allow the changes in each specific balance-sheet item since 2020 to be measured, without the distortions arising from the accounting requirements for this specific corporate operation.
b Difference between funds received in liquidity-providing operations and funds delivered in liquidity-absorbing operations. December 2021 data.
c Difference calculated in basis points.

Annex 2

CONSOLIDATED INCOME STATEMENT DEPOSIT INSTITUTIONS (a)

	Dec-21		Dec-20	Dec-21
	€m	% Change Dec-21/Dec-20	% ATA	% ATA
Financial revenue	91,022	-1.8	2.46	2.33
Financial costs	24,201	-9.6	0.71	0.62
Net interest income	66,821	1.4	1.75	1.71
Return from capital instruments	1,199	24.1	0.03	0.03
Net financial income	68,020	1.7	1.78	1.74
Share of profit or loss of entities accounted for using the equity method	3,071	9.7	0.07	0.08
Net commissions	27,380	10.4	0.66	0.70
Gains and losses on financial assets and liabilities	4,924	-14.0	0.15	0.13
Other operating income (net)	-91	—	0.01	0.00
Gross income	103,304	2.8	2.67	2.65
Operating expenses	52,516	6.7	1.31	1.35
Net operating income	50,788	-0.9	1.36	1.30
Asset impairment losses (specific and general provisions)	14,310	-43.5	0.67	0.37
Provisioning expense (net)	5,825	41.3	0.11	0.15
Income from disposals (net)	3,598	—	-0.58	0.09
Profit before tax (including discontinued operations)	34,251	—	-0.01	0.88
Net income	26,095	—	-0.21	0.67
Memorandum item				
Income attributable to the controlling entity	23,592	—	-0.21	0.60

SOURCE: Banco de España.

a The consolidated income statement includes pro-forma information pertaining to the months of activity of two significant institutions absorbed in 2021 through merger processes.

BANCO DE ESPAÑA PUBLICATIONS

The Banco de España publishes various types of documents providing information on its activity (economic reports, statistics, research papers, etc.), which can be consulted in the Institutional Repository at https://repositorio.bde.es/.

Most of these documents are available in PDF format and can be downloaded free of charge from the Banco de España website at http://www.bde.es/webbde/en/secciones/informes/.

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SYMBOLS AND ABBREVIATIONS

ATA	Average total assets
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
bn	Billion
bp	Basis points
CBQ	Banco de España Central Balance Sheet Data Office Quarterly Survey
CCB	Capital conservation buffer
CCP	Central counterparty
CCR	Banco de España Central Credit Register
CCyB	Countercyclical capital buffer
CET1	Common Equity Tier 1
CNMV	Comisión Nacional del Mercado de Valores (National Securities Market Commission)
CoCo	Contingent convertible bond
COVID-19	Coronavirus disease 2019
CPI	Consumer Price Index
CPMI	Committee on Payments and Market Infrastructures
IOSCO	International Organization of Securities Commissions
CRD	Capital Requirements Directive
CRR	Capital Requirements Regulation
DeFi	Decentralised Finance
DFR	Deposit facility rate
DI	Deposit institution
DLT	Distributed ledger technology
EBA	European Banking Authority
EBAE	Encuesta del Banco de España sobre la Actividad Empresarial (Banco de España Business Activity Survey)
ECB	European Central Bank
EDIS	European Deposit Insurance Scheme
EEA	European Economic Area
EFF	Encuesta Financiera de las Familias (Spanish Survey of Household Finances)
EIOPA	European Insurance and Occupational Pensions Authority
EPA	Encuesta de población activa (Labour Force Survey)
ERTE	Expediente de regulación temporal de empleo (furlough schemes)
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
€STR	Euro short-term rate
EU	European Union
EURIBOR	Euro Interbank Offered Rate
EV	Enterprise Value
FATF	Financial Action Task Force
FLESB	Forward-looking exercise on Spanish banks
FSB	Financial Stability Board
FSR	Financial Stability Report
G-SIB	Global systemically important bank
GDI	Gross disposable income
GDP	Gross domestic product
G-SII	Global systemically important institution
GVA	Gross value added
H	Half-year
HQLA	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
INE	Instituto Nacional de Estadística (National Statistics Institute)
IOSCO	International Organization of Securities Commissions
IRS	Interest-rate swap
LSI	Less significant institution
LTI	Loan-to-income ratio
LTP	Loan-to-price ratio
LTV	Loan-to-value ratio
m	million
MiCA	Markets in Crypto-assets Regulation
MMF	Money market fund
MMSR	Money Market Statistical Reporting
MOVE	Merrill Lynch Option Volatility Estimate
MPE	ECB staff Macroeconomic Projection Exercise
MREL	Minimum Requirement for own funds and Eligible Liabilities
NBER	National Bureau of Economic Research
NFC	Non-financial corporation
NGEU	Next Generation EU
NPL	Non-performing loan
OIS	Overnight Interest Swap
O-SII	Other systemically important institution
PD	Probability of default
PER	Price-to-earnings ratio
PMI	Purchasing Managers' Index
pp	percentage points
Q	quarter
q-o-q	Quarter-on-quarter
RDL	Royal Decree-Law
ROA	Return on assets
ROE	Return on equity
RTRP	Recovery, Transformation and Resilience Plan
RWA	Risk-weighted asset
Sareb	Sociedad de Gestión de Activos Procedentes de la Reestructuración Bancaria (Spanish asset management company)
SCCyB	Sectoral countercyclical capital buffer
SGP	Stability and Growth Pact
SI	Significant institution
SLI	Specialised lending institution
SME	Small and medium-sized enterprise
SREP	Supervisory review and evaluation process
SRI	Systemic risk indicator
SSM	Single Supervisory Mechanism
TLAC	Total loss-absorbing capacity
TLTRO	Targeted longer-term refinancing operations
VAR	Vector autoregression
y-o-y	Year-on-year

ISO COUNTRY CODES

AT	Austria	DE	Germany	IE	Ireland	NL	Netherlands
AU	Australia	DK	Denmark	IT	Italy	NO	Norway
BE	Belgium	EE	Estonia	JP	Japan	PL	Poland
BG	Bulgaria	ES	Spain	KR	South Korea	PT	Portugal
BR	Brazil	FI	Finland	KY	Cayman Islands	RO	Romania
CA	Canada	FR	Francia	LT	Lithuania	SE	Sweden
CH	Switzerland	GB	United Kingdom	LU	Luxembourg	SI	Slovenia
CL	Chile	GR	Greece	LV	Latvia	SK	Slovakia
CN	China	HR	Croatia	MT	Malta	TR	Turkey
CY	Cyprus	HU	Hungary	MX	Mexico	US	United States
CZ	Czech Republic						