Box 2.2

FORWARD-LOOKING ASSESSMENT OF THE SPANISH BANKING SYSTEM'S RESILIENCE

The Banco de España has applied its own methodological framework, known as FLESB (Forward Looking Exercise on Spanish Banks),[1] to conduct the regular assessment of the Spanish banking system's solvency, which, on this occasion, takes place in an environment of significant macroeconomic uncertainty. A baseline scenario, which closely reflects the economic forecasts,[2] and an extreme but plausible adverse scenario, of worsening macro-financial conditions, covering the time horizon 2022-2024 have been analysed. Following the usual practice, this exercise is carried out under the dynamic balance sheet assumption, and banks' total assets therefore also change in line with the macroeconomic scenarios.

The adverse scenario assumes a high degree of materialisation of the risks identified in this report; specifically, it envisages higher and more persistent inflation, accompanied by a significant tightening of financial conditions and a sharp slowdown of GDP growth. This represents a major qualitative change from the scenarios in the Autumn 2021 FSR, in which the predominant risks related to activity and the erosion of confidence and were linked to the course of the health crisis, albeit still within an environment of low interest rates.

Description of the scenarios

Under the baseline scenario, the Spanish economy continues the recovery that began in 2021, reflected in a favourable path of real growth, and posts cumulative growth of 9.8% over the projection horizon (see Chart 1). By contrast, the adverse scenario envisages a cumulative contraction of 1.3% in the economy over the same horizon. One of the determinants of this lower growth is the assumption of a 20.6 percentage point (pp) increase in cumulative CPI-based inflation in the period 2022-2024 – largely associated with the increase in energy and food prices –, which is passed through to household and business costs. Moreover, this also results in much stricter financial conditions, owing to the monetary policy tightening and to a slight increase in risk premia, reducing agents' consumption and investment levels.

Indeed, the average levels of 12-month EURIBOR and of Spanish 10-year government bonds in 2022-2024 are

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

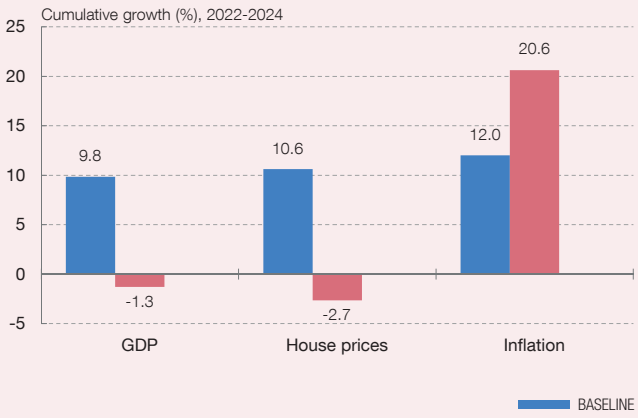
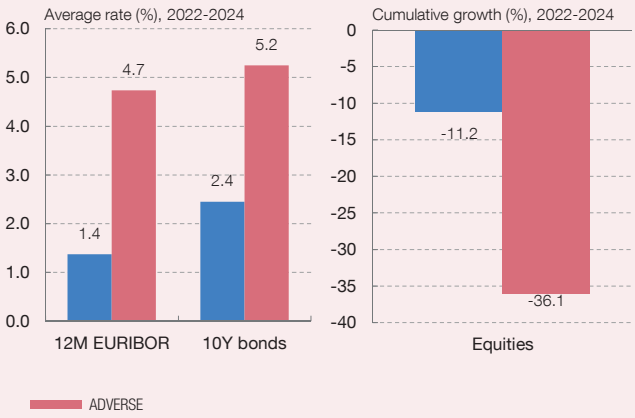


Chart 2
BASELINE AND ADVERSE SCENARIOS FOR SPAIN. IMPACT ON FINANCIAL ENVIRONMENT (b)



SOURCE: Banco de España.

a Inflation is calculated using the harmonised index of consumer prices (HICP).
b Changes in the valuations of equities are calculated drawing on the Madrid Stock Market General Index.

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 FSR has described the main improvements and new developments included in the model, since it is a dynamic framework under continuous development.

2 Growth under the baseline scenario is in line with the forecasts in the June 2022 EU-wide exercise for Spain and the other countries relevant to Spanish banks.

around 300 basis points higher in the adverse scenario than in the baseline scenario, reaching 4.7% and 5.2%, respectively (see Chart 2). This also affects stock market prices, with the Madrid stock market falling by 36.1% in cumulative terms up to 2024, compared with a decline of 11.2% under the baseline scenario.

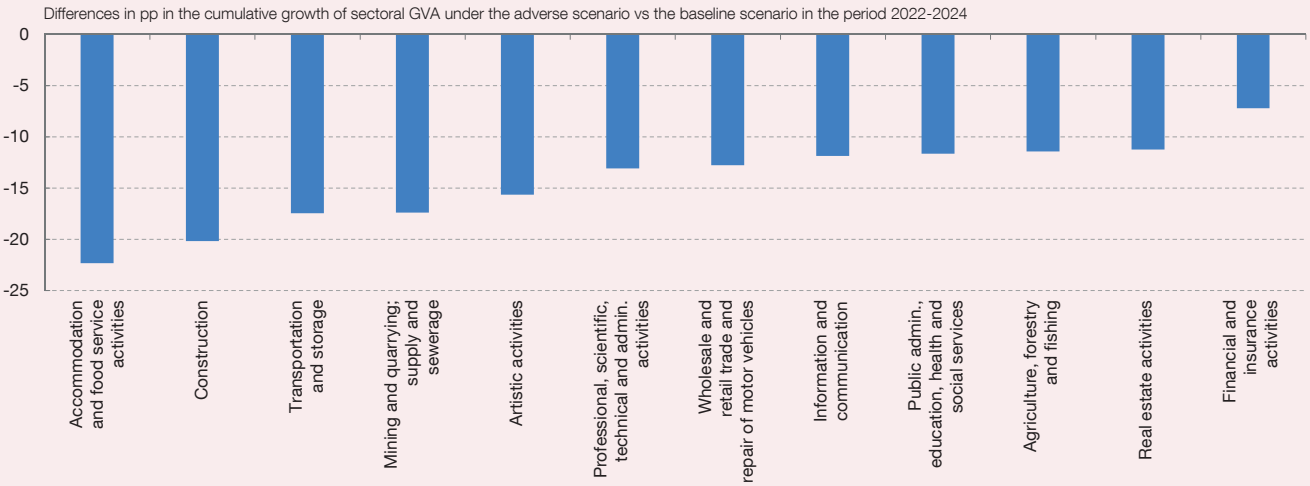
As a result of the differences in sectoral sensitivity to the higher energy and other commodity prices and to the fall in demand on account of the contraction in private sector real incomes, the impact of the adverse scenario on growth in each sector of activity varies (see Chart 3). The sector hardest hit is accommodation and food service activities, affected by the additional increase in transport and food prices and the reduction in household income, along with others (such as construction, transport and industry) that are intense users of energy and other commodities that become more expensive in the scenarios. Less energy-intensive activities, such as real estate and financial activities, feel less of a sectoral impact.

The scenarios for the other countries where Spanish banks have a significant presence are consistent with those used for Spain. Thus, Chart 4 shows the distribution by country of the cumulative growth in real GDP and prices, with the adverse scenario envisaging a situation of widespread stagflation (slow growth and high inflation), consistent with the significant deterioration in global supply conditions within the risk narrative. Turkey presents substantially higher inflation than the other countries, which is also reflected in its baseline scenario.

Chart 5 shows the average long and short-term interest rates for 2022-2024 under the baseline and adverse scenarios. A general upward transition can be seen for both rates, consistent with a global tightening of financial conditions. Under both scenarios, rates rise particularly in countries facing high inflation, such as Brazil and Turkey. In keeping with the interest rate rise in the advanced economies and the deteriorating macroeconomic situation of the emerging market economies, the adverse scenario also envisages an exchange rate depreciation against the euro in Mexico (10.5%), Brazil (6.7%) and, in particular, Turkey (77.1%) between 2021 and 2024.

The gradual deterioration of the macroeconomic projection scenarios over 2022 means that expectations have shifted to some extent towards the adverse scenario. However, the adjustments envisaged in these revised expectations are significantly smaller than the impacts of this adverse scenario, in particular as regards unemployment and GDP growth.[3] In the absence of further negative revisions to economic expectations, the effect of the macroeconomic factors on bank solvency would not be expected to deviate

Chart 3
EFFECT OF THE ADVERSE SCENARIO ON CUMULATIVE GROWTH OF THE NOMINAL GVA IN 12 SECTORS OF ACTIVITY IN THE PERIOD 2022-2024



SOURCE: Banco de España.

3 For example, in the case of Spain, the October 2022 macroeconomic projections revise inflation up and activity down vis-à-vis those drawn up in previous quarters.

greatly from the results obtained under the baseline scenario considered in this box. For instance, the available metrics of the FLESB model's sensitivity indicate that, due to the revisions made to the macroeconomic projections for Spain between June and October, the estimated CET1 ratio for 2024 would be expected to decrease by 33 basis points.[4]

It should also be borne in mind that the economic conditions are changing swiftly and that not all of their effective consequences can be measured concurrently. For instance, the effects of the upward revisions already made to inflation and interest rates would be expected to materialise over multiple quarters, despite not immediately impacting bank profitability.

Aggregate results of the exercise

Chart 6 summarises the aggregate results of the exercise, showing the CET1 ratio at the beginning and end of the time horizon, under the baseline and adverse scenarios. These results are broken down for three types of banks: (i) the Spanish banks supervised by the Single Supervisory Mechanism (SSM) that have significant international activity,[5] (ii) the other banks directly supervised by the SSM, and (iii) banks supervised directly by the Banco de España, which are smaller and have no significant international activity (Less Significant Institutions, or LSIs). The aim is to illustrate how the different business models of these groups affect the results.

The group of banks with an international presence initially has a CET1 ratio of 12.3% (lower than those of the other two groups), which increases to 12.6% at the end of the exercise under the baseline scenario, and decreases to 10% in the adverse scenario. The other banks supervised by the SSM have a CET1 ratio of 13.1% at the outset, which in the baseline scenario rises to 14% (increase in solvency), but decreases under the adverse scenario to 9.9% at the end of the exercise horizon. Lastly, the banks supervised directly by the Banco de España, which have a CET1 ratio of 19.1% in 2021, increase their solvency under both scenarios, and their CET1 ratio rises to 22.2% in the baseline scenario and to 20.6% in the adverse scenario. These results

Chart 4
DISTRIBUTION BY COUNTRY OF CUMULATIVE GROWTH IN REAL GDP AND INFLATION IN 2022-2024 UNDER BASELINE AND ADVERSE SCENARIOS (a) (b)

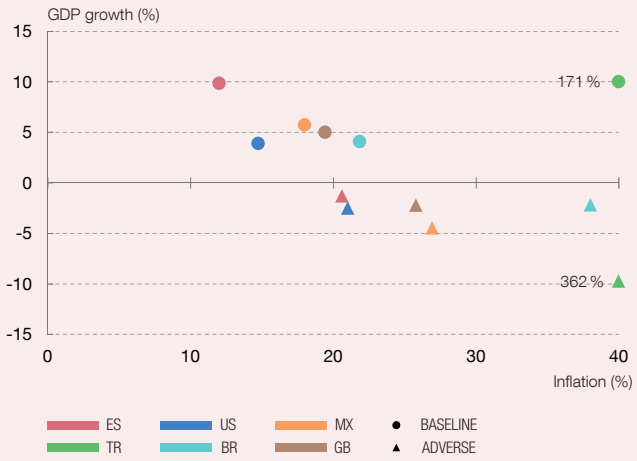
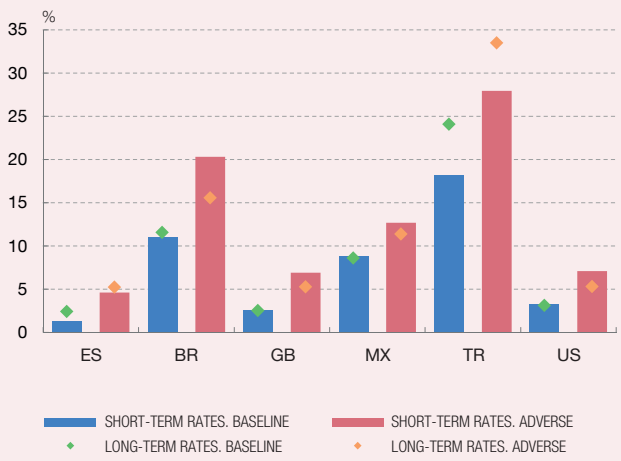


Chart 5
AVERAGE SHORT AND LONG-TERM RATES BY COUNTRY IN 2022-2024 UNDER BASELINE AND ADVERSE SCENARIOS



SOURCE: Banco de España.

a The range of the horizontal axis has been limited owing to the extreme values of cumulative inflation in Turkey (171% under the baseline scenario and 362% under the adverse scenario).
b Inflation is calculated using the harmonised index of consumer prices (HICP).

4 Compared with the June forecasts, the October 2022 projections envisage Spain's cumulative GDP growth being 0.8 pp lower in 2022-2024 and average benchmark rates in the euro area being around 100 basis points higher in the same period. The calculation of sensitivity to activity is underpinned by the analysis set out in Chapter 2 of the Spring 2019 FSR and the study of the model's sensitivity to interest rate rises.

5 Among the banks with significant international activity, this group includes the three in which such activity is more important and more extended in time.

show that Spanish deposit institutions' aggregate solvency would remain at satisfactory levels amid the high economic impact assumed in the adverse scenario. Nevertheless, there is heterogeneity across institutions, as discussed below in this box.

The main factors driving developments in the CET1 ratio over the time horizon are shown in Chart 7.[6] For Spanish banks with significant international activity, capital increases by 0.3 pp under the baseline scenario and is depleted by 2.3 pp under the adverse scenario. Under the baseline scenario, capital generation through net operating income in Spain and net profit/loss of foreign operations (6.7% of RWAs) and available provisions to cover impairment losses in Spain (2% of RWAs) offset the volume of impairment losses in operations in Spain and sovereign exposure valuation adjustments (5% of RWAs overall).[7] Operations outside of Spain make a particularly positive contribution to sustaining profitability and solvency in this scenario. However, other impacts make a negative contribution (-3.4% of RWAs), owing in part to taxes and to profit distributions, but also to the growth in business volume, which results in higher RWAs under this scenario.

Under the adverse scenario, impairment losses in Spain and losses on consolidated sovereign bond holdings rise to 10% of RWAs and are not offset by the use of provisions (2% of RWAs) and capital generation (6.1% of RWAs). The contribution of operations outside of Spain to net profit is positive, but smaller than under the

Chart 6
CET1 RATIO OBSERVED IN 2021 AND RESULTS IN 2024 OF BASELINE AND ADVERSE SCENARIOS

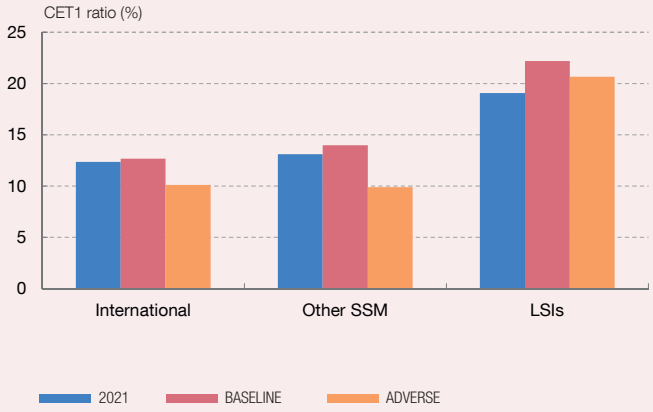
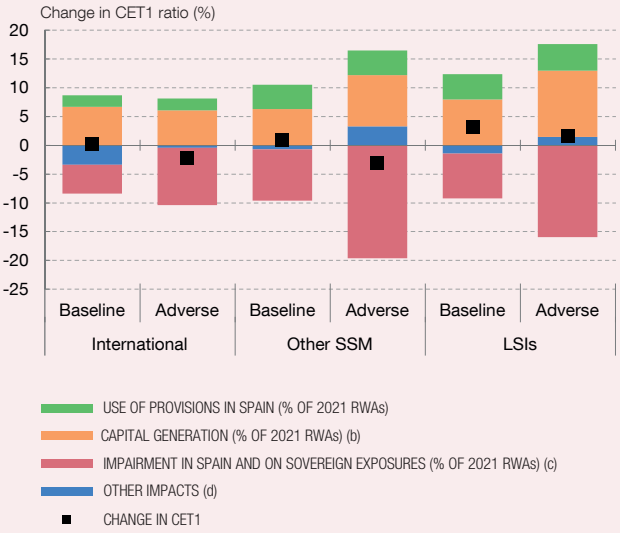


Chart 7
IMPACT OF THE RISK MATERIALISATION SCENARIOS ON BANK SOLVENCY (a)



SOURCE: Banco de España.

a The impacts are defined as the expected changes in the CET1 ratio in 2024 and in different financial flows in 2022-2024 (e.g. capital generation) stemming from the materialisation of the adverse changes in macro-financial conditions envisaged in the scenarios in this box.
b The generation of loss-absorbing capital is determined by net operating income in Spain, which also includes the net profit/loss generated abroad for banks with significant international activity.
c Impairment losses on loans and foreclosed assets in operations in Spain, and the impact on capital of the potential impairment on sovereign exposures at consolidated level.
d Other consolidated gains and losses, tax effects, exchange differences, profit distribution, coverage of Government losses linked to ICO-backed loans and changes in RWAs.

6 These include the effects of the estimated losses, specifically the impairment losses on loans and foreclosed assets and the impact on capital of a potential deterioration of sovereign exposures. Loss-absorbing items, namely the use of existing provisions and capital generation through net operating income, are also presented. Both the losses and the loss-absorbing items are presented as a percentage of the risk-weighted assets (RWAs) existing at December 2021. Also included are the other impacts, which reflect other items that affect CET1 capital (the numerator of the solvency ratio) such as other gains or losses and tax effects, and the change in RWAs (the denominator of the solvency ratio).

7 This group differs from the other two in two respects: first, it incorporates the net profit/loss of foreign operations in its capital generation (thus also capturing the higher impairment provisions outside of Spain under the adverse scenario) and, second, because of these banks' business model, the impairment losses, use of provisions and other effects in Spain have a lower relative weight in total RWAs.

baseline scenario, owing to the contraction in activity and also to the exchange rate depreciation in some emerging market economies. The less expansionary behaviour of RWAs compared with the baseline scenario prevents a greater decline in the CET1 ratio.

Turning to the other banks supervised by the SSM, their CET1 ratio increases by 0.9 pp in the baseline scenario and decreases by 3.2 pp under the adverse scenario. The use of provisions (4.3%) and capital generation (6.3%) more than suffice to absorb the impairment losses (8.9% of RWAs), and the contribution of the other impacts is negative but moderate (-0.8% of RWAs), evidencing a less expansionary business profile than that of the previous group. Under the adverse scenario, higher interest rates drive capital generation (8.9% of RWAs) through net operating income.

However, the sum of capital generation, the use of provisions (4.3%) and the other impacts (3.3%) – whose positive contribution is partly supported by a certain degree of deleveraging – does not suffice to offset the impairment losses (19.7% of RWAs). As with the other groups of banks, impairment losses increase substantially owing to the combination of lower economic activity and higher interest rates, which constrain households' and firms' ability to pay.

Lastly, as regards the banks directly supervised by the Banco de España, the CET1 ratio increases by 3.1 pp and 1.6 pp in the baseline and adverse scenarios, respectively, underpinned by a simpler business model and lower risk-taking. Under the baseline scenario, the generation of new loss-absorbing capital (8% of RWAs) and the use of provisions (4.4% of RWAs) more than offset the impairment losses (7.8% of RWAs) and other impacts (-1.5% of RWAs). In the adverse scenario, thanks to the increase in net interest income driven by the interest rate rise, new capital generation is highly positive (up to 11.5% of RWAs) and, together with the use of provisions (4.6% of RWAs), offsets the impairment losses (16% of RWAs), which also grow very notably, but to a somewhat lesser extent than for the other banks supervised by the SSM, due to the greater share of mortgages in their portfolios. The other impacts make a positive contribution (1.4% of RWAs) owing as well, in this case, to the greater deleveraging observed in the adverse scenario.

Analysis of the channels of impact

The aggregate results stem from various channels of impact that affect banks to differing extents, depending on their business model and the composition of their balance sheet.

One initial propagation channel, mitigating the risks, is through the improvement in net interest income, associated with the higher interest rates. The estimated median increase in net interest income of operations in Spain in the adverse scenario compared with the baseline scenario is 3.2 pp (see Chart 8). The cross-bank heterogeneity of the results depends on factors such as the weight of private sector deposits in each bank's sources of funds (as such deposits have a relatively lower cost than other sources of financing) and the composition of their loan portfolios, which have differing degrees of return relative to the cost of liabilities.

Another adjustment channel with respect to the baseline scenario, in this case negative, operates through sovereign bond valuation adjustments. The median additional loss on these exposures in the adverse scenario is 0.8 pp of RWAs (see Chart 8). Such losses are also uneven across banks and are higher for those which have a greater share of sovereign bonds that are classified at fair value,[8] that have longer terms to maturity and that are from countries facing higher discounts on their government debt.

Lastly, the negative effect of both the interest rate rise and the contraction in GDP on the quality of credit to firms and households[9] leads to a heterogeneous rise in impairment provisions among banks (see Chart 8). Taking into account the differences in loan quality at the outset, the varying composition of the exposures and the degree of coverage from the ICO guarantees, the estimated median increase in credit provisions in Spain is 7.4 pp of RWAs higher in the adverse scenario than in the baseline scenario. It is important to note that, in the transition to this adverse scenario, the negative effects on provisions outweigh the positive effects on net interest income.

8 Various bank investment portfolios are classified at fair value, and the value of such assets is recognised based on their realisable market value. They are classified as such as it is assumed there is a possibility that, as part of its investment strategy, the bank may sell these assets before maturity. Conversely, assets expected to be held to maturity, for example with the purpose of collecting interest payments, are measured at amortised cost, and their value reflects the unamortised unimpaired portion of their nominal amount.

9 Loans to firms account for 45.8% of loans within operations in Spain as a whole, while those to households account for 54.2%.

Additional sensitivity analyses

As on previous occasions, the exercise also factors in the effect of the ICO public guarantee scheme for business lending in response to the pandemic, to mitigate impairment losses and support Spanish banks' solvency. However, it should be borne in mind that the more impairment losses the scheme is able to absorb, the greater its budgetary cost. The estimates consider an impact range based on assumptions about the relative credit quality of the guaranteed loans (see Chart 9), since there is still uncertainty about their

Chart 8
DISTRIBUTION AMONG BANKS OF THE IMPACT OF THE ADVERSE SCENARIO ON THE INTEREST MARGIN, PROVISIONS AND THE SOVEREIGN EFFECT RELATIVE TO 2021 RWAs (a). SIs

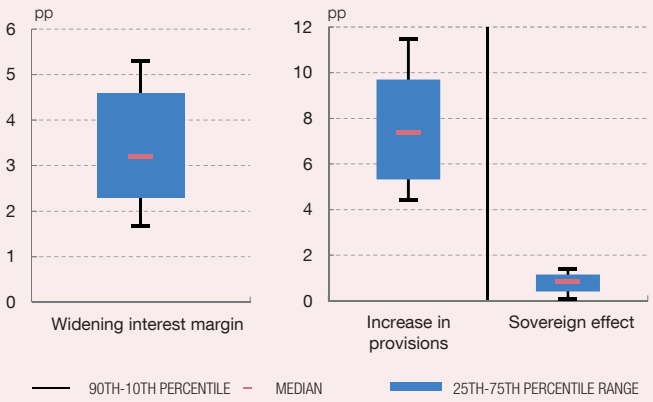


Chart 9
EFFECT OF THE ICO GUARANTEE SCHEME (b) (c)

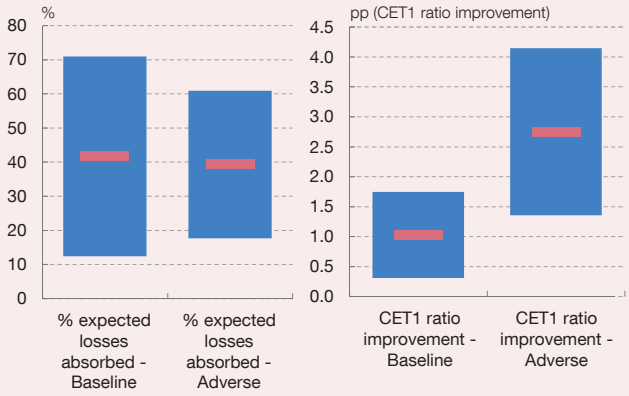
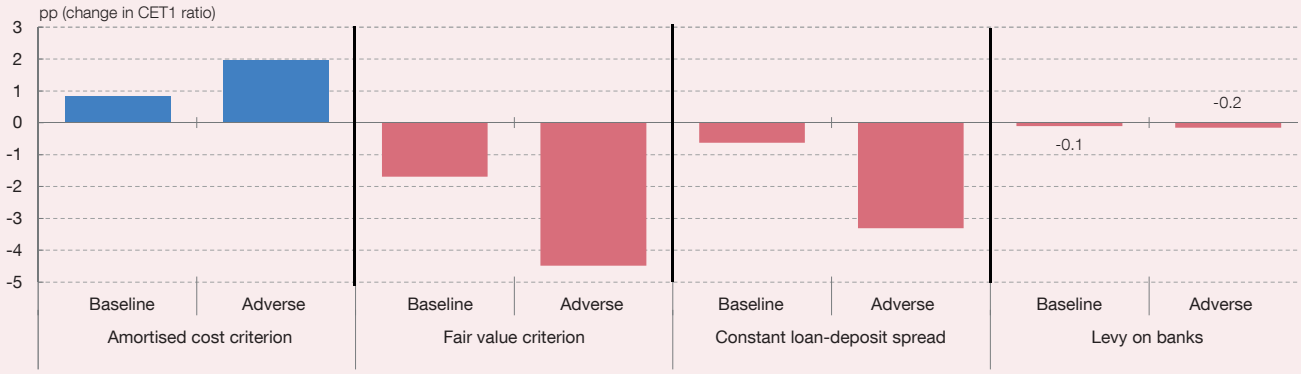


Chart 10
SENSITIVITIES TO OTHER MODELLING ASSUMPTIONS (d)



SOURCE: Banco de España.

a Shown is the distribution among banks of the differences between the adverse scenario and the baseline scenario in earnings due to the widening of the net interest margin in operations in Spain, in losses due to the higher provisions in operations in Spain and in the effect of sovereign exposures in consolidated operations. These measures are cumulative in the horizon 2022-2024 relative to 2021 RWAs for the baseline and adverse scenarios, and the institutions considered are SIs. The bars represent the values between the 25th and 75th percentiles, while the lines show the 10th, 50th (median) and 90th percentiles.
b The main analysis (the results of which are set out in Charts 6 and 7 of this box) incorporates an intermediate assumption about the effect of the guarantee scheme.
c Shown is the range of the measure's impact on the expected loss of the corporates portfolio (left-hand panel) and on the CET1 ratio (right-hand panel), depending on the assumptions regarding the credit quality of loans extended to firms and sole proprietors in Spain under the ICO guarantee scheme. The minimum effect assumes that the expected loss is equal to the average of the corporate lending portfolio, while the maximum effect assumes that NPL inflows are primarily concentrated among guaranteed loans. The red line denotes the mid-range effect.
d Shown are the differences in the average CET1 capital ratios of SIs and LSIs projected for 2024 in the sensitivity exercises compared with those projected for 2024 in the main solvency exercise. The sensitivity exercises consider the following impacts: i) the effect of reclassifying all sovereign bond exposures to amortised cost; ii) the effect of reclassifying all sovereign bond exposures to fair value; iii) the impact of keeping the loan-deposit spread constant; and iv) the impact of applying a levy of 4.8% on the net interest income and net fee and commission income of financial institutions where such income exceeded €800 million (gross) in 2019.

scope.[10] Under an intermediate assumption, by absorbing part of the losses, the public guarantee scheme would make a positive contribution of 1 pp and 2.7 pp to the CET1 ratio in the baseline and adverse scenarios, respectively.

In this exercise, sensitivity analyses have also been conducted with respect to other relevant modelling assumptions in the scenarios considered (see Chart 10). First, an assumption whereby banks classify all their (Spanish and foreign) public debt holdings at amortised cost has been assessed. In this hypothetical case, the CET1 ratio would be 0.8 pp and 2 pp higher in the baseline and adverse scenarios, respectively, than in the results of the main exercise, which considers the real weight of debt at amortised cost in banks' portfolios at end-2021. As a result, the banks would limit the short-term losses in value owing to the interest rate rises if they classified their entire sovereign bond portfolios at amortised cost. However, this would also mean keeping relatively low-yield instruments on their balance sheet for longer, an additional effect that has not been examined. At the opposite extreme, if the banks held all their sovereign bond holdings at fair value, the decline in value of public debt holdings would lead to the CET1 ratio being 1.7 pp and 4.5 pp, respectively, lower than in the main exercise. This analysis is intended to gain a better understanding of the functioning of the channels of impact and the mitigating elements and does not represent an extension of the adverse scenario or an additional source of tension, as the banks can continue to recognise these holdings at amortised cost.

Moreover, a study has been carried out of the effect of banks keeping the loan-deposit spread constant, in contrast to the approach taken in the exercise to estimate developments based on historical experience, which predicts a significant widening of net interest unit margins on account of the interest rate rise. In that case, solvency would decrease by 0.6 pp and 3.1 pp under the baseline and adverse scenarios, respectively. Margins may widen less than estimated in the exercise as a result of an insufficient pass-through of market rates to lending rates, along with concern about retaining deposits in a crisis environment, which would lead banks to remunerate deposits more than they would do under normal circumstances. In any event, this is an illustrative sensitivity analysis, and the existing empirical evidence points strongly to spreads widening in settings of interest rate rises.

Further, the impact of applying a levy of 4.8% on the net interest income and net fee and commission income of financial institutions where such income exceeded €800 million (gross) in 2019 has been assessed. This levy would reduce the aggregate CET1 ratio by 0.1 pp and 0.2 pp under the baseline and adverse scenarios, respectively. In the adverse scenario, the tax base is also increased by the growth in net interest income. The levy would thus lead to a larger relative burden, precisely when profitability and solvency are lower.

Conclusions

The analysis conducted shows that the materialisation of the main risks considered in this report could have a significant impact in capital charge terms, although the sector's loss-absorbing capacity would suffice to maintain a satisfactory aggregate solvency position. These results should be interpreted with special caution owing to the greater uncertainty faced in this year's exercise. In particular, the use of scenarios with marked interest rate rises represents a break from the stress tests of more recent years, which were primarily concerned with the risks of a contraction in demand on account of the pandemic. In these circumstances, numerous items on banks' balance sheets and income statements, such as net interest income and provisions, may be subject to marked adjustments, potentially of contrasting sign, and the range of possible outcomes is wider than in other settings. Idiosyncratic factors may also operate in the situation of individual banks, beyond the macroeconomic factors that are of particular importance to the analysis set out in this box.

All this calls for a cautious positioning by the sector when considering provisioning and capital plans and for close monitoring of macroeconomic developments, to enable a swift response should the risks envisaged ultimately materialise.

10 The bottom end of the range assumes that the expected loss on guaranteed loans is equal to the average for the corporate credit portfolio; the top end assumes that the guaranteed loans are concentrated among riskier debtors. The results presented in this box are based on the impact of the ICO guarantees standing at the midpoint of this range.