

Stress testing the UK banking system: 2022/23 results

We have announced the results of our 2022/23 stress test of the UK banking system.

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This document sets out the results of the 2022/23 annual cyclical scenario stress test of the UK banking system. It has been produced by Bank staff under the guidance of the Financial Policy Committee (FPC) and Prudential Regulation Committee (PRC). The annex, setting out the individual bank results, has been formally approved by the PRC. The sections and annex were finalised on 11 July 2023.

Executive summary

- The results of the 2022/23 annual cyclical scenario (ACS) stress test indicate that the major UK banks would be resilient to a severe stress scenario that incorporated persistently higher advanced-economy inflation, increasing global interest rates, deep and simultaneous recessions in the UK and global economies with materially higher unemployment, and sharp falls in asset prices.
- Reflecting resilience built up by banks in recent years, the results indicate the UK banking system would be able to withstand the severe macroeconomic scenario and has the capacity to support households and businesses throughout the stress.
- The scenario is more severe than the 2007–08 global financial crisis (GFC). It is also substantially more severe than the current macroeconomic outlook, as it combines increasing interest rates with considerably higher inflation than recent peaks, along with deep and simultaneous recessions in the UK and global economies with materially higher unemployment.
- The stress test scenario is not a forecast of macroeconomic and financial conditions in the UK or abroad. Rather, it is a coherent ‘tail-risk’ scenario designed to be severe and broad enough to assess the resilience of UK banks to a range of severe adverse shocks.
- Banks start the stress test with improved asset quality since the last cyclical stress test performed in 2019, following increases in residential property prices, more conservative lending standards and changes in the composition of banks’ balance sheets. This dampens the negative effect of the macroeconomic shocks included in this scenario.

- Banks also start the stress test with higher deposit balances than recent years, and net interest income (NII) increases as policy rates rise in response to higher inflation. This benefit is constrained by banks being required to assume that an increasing share of deposits are interest bearing, and that the interest paid increases by more than recent experience.
- Reflecting a combination of these factors, the aggregate capital drawdown is smaller than in the 2019 ACS, despite the overall severity of the scenario being broadly similar.
- The stress-test results indicate that in the scenario, all participating banks and building societies remain above their Common Equity Tier 1 (CET1) and Tier 1 leverage ratio hurdle rates^[1] on an IFRS 9 transitional basis in this test and no bank is required to strengthen its capital position as a result of the test.
- For the first time, the test assessed the ring-fenced subgroups (RFBs) of selected participating banks on a standalone basis, where these differ materially from the group. All four participating RFBs also remain above their CET1 and Tier 1 leverage ratio hurdle rates in the test.
- As in previous stress tests, banks' resilience relies in part on their ability in a stress to cut dividend payments, employee variable remuneration, and coupon payments on Additional Tier 1 instruments, as well as other management actions taken in response to the stress. The Financial Policy Committee (FPC) judges it important for investors to be aware that banks would take such actions as necessary if such a stress were to materialise.
- The results of the stress test support the FPC's judgement that the UK banking system has the capacity to support households and businesses through a period of higher interest rates, even if economic and financial conditions were to be substantially worse than expected.

1: Key elements of the 2022/23 annual cyclical scenario stress test

The 2022/23 ACS exercise is a countercyclical stress test of banks' capital resilience.

A key purpose of the annual cyclical scenario (ACS) is to measure the resilience of participating banks and building societies^[2] (hereafter referred to as 'banks') to a hypothetical, countercyclical scenario that includes a severe but plausible combination of adverse shocks. Banks are assessed as to whether they have sufficient resilience to continue supporting households and businesses in the face of such shocks so that they may take appropriate action to enhance their resilience if needed.

The 2022/23 ACS^[3] is the Bank's first stress test using a cyclical scenario since 2019, meaning the 2019 ACS is the previous stress test to which comparisons are most appropriate. In 2020, in place of a cyclical stress test, the Bank performed a 'reverse stress-test' exercise focused on risks presented by the Covid pandemic. In 2021, the Bank undertook a 'solvency stress test' (SST), to test the resilience of the UK banking system against a much more severe evolution of the pandemic and consequent economic shock.

The ACS is, by design, a stress test of banks' capital positions – individually and in aggregate – over a number of years following a severe macroeconomic and financial market shock. The test does not feature an additional liquidity stress as part of the scenario. However, as set out in Box A, a combination of regulation, supervision and banks' risk management means that the major UK banks have large liquid assets buffers which would be available to be drawn upon if a liquidity stress did occur alongside the scenario in the ACS.

1.1: Scenario for the stress test

The hypothetical scenario used in 2022/23 is severe in a historical context, with persistently higher advanced-economy inflation, increasing global interest rates, deep and simultaneous recessions in the UK and global economies, and sharp falls in asset prices.

As set out in the [2022 key elements](#) publication, the design of the ACS scenario is linked to the FPC's assessment of underlying vulnerabilities in the UK and global economies, taking into account the FPC's assessment of the downside risks facing the economy. The scenario is explicitly countercyclical to test banks' resilience to severe but plausible shocks. The stress test scenario is not a forecast of macroeconomic and financial conditions in the UK or abroad. Rather, as per previous ACS scenarios, it is a coherent 'tail-risk' scenario designed to be severe and broad enough to assess the resilience of UK banks to a range of severe adverse shocks.

In September 2022, the Bank [published](#) the hypothetical stress scenario to be used in the test. The chosen scenario for the 2022/23 ACS includes persistently higher inflation across advanced economies, increasing global interest rates, deep and simultaneous recessions in the UK and global economies, and sharp falls in asset prices. The scenario incorporated severe paths for economic and financial market variables, including GDP, property prices and unemployment.

A key difference to previous stress tests is the assumption of higher and persistent inflation across advanced economies. Annual UK CPI inflation averages around 11% over the first three years of the scenario, peaking at 17%. Rising prices put pressure on households' real incomes, which fall by around 13% in the stress.

In response to higher inflation, it is assumed UK monetary policy tightens, with Bank Rate assumed to rise from under 1% to 6% – a higher level than the 4% used in recent previous stress tests – in the first three quarters of the scenario.

Meanwhile, in the UK GDP contracts by 5.0%, unemployment more than doubles to 8.5% and residential property prices fall by 31%.

The UK's major trading partners also experience similar shocks in the scenario (Chart 2). Real GDP declines for all of the UK's main trading partners, with global output contracting by 2.5% over the first year of the scenario as economies around

the world experience severe and synchronised slowdowns, and global property prices fall commensurately. Unlike previous tests this scenario includes increasing global interest rates with peaks of 4.7% for the European Central Bank deposit facility rate and 6.5% for the US effective federal funds rate.

The overall severity of the UK stress scenario is broadly similar to that of the 2019 ACS, reflecting the FPC's judgement that while UK debt vulnerabilities had risen, overall they remained broadly in line with historical averages. Conversely, the declines in GDP in China and in Hong Kong are smaller than in the 2019 ACS, reflecting that risks associated with financial conditions were high in these jurisdictions but had started to crystallise, meaning the magnitude of remaining risks had diminished.

Similarly to in previous ACS tests, the 2022/23 stress test includes a financial market scenario to test trading risks that are aligned with the macroeconomic scenario. Stressed projections for misconduct costs related to known misconduct issues are also included.

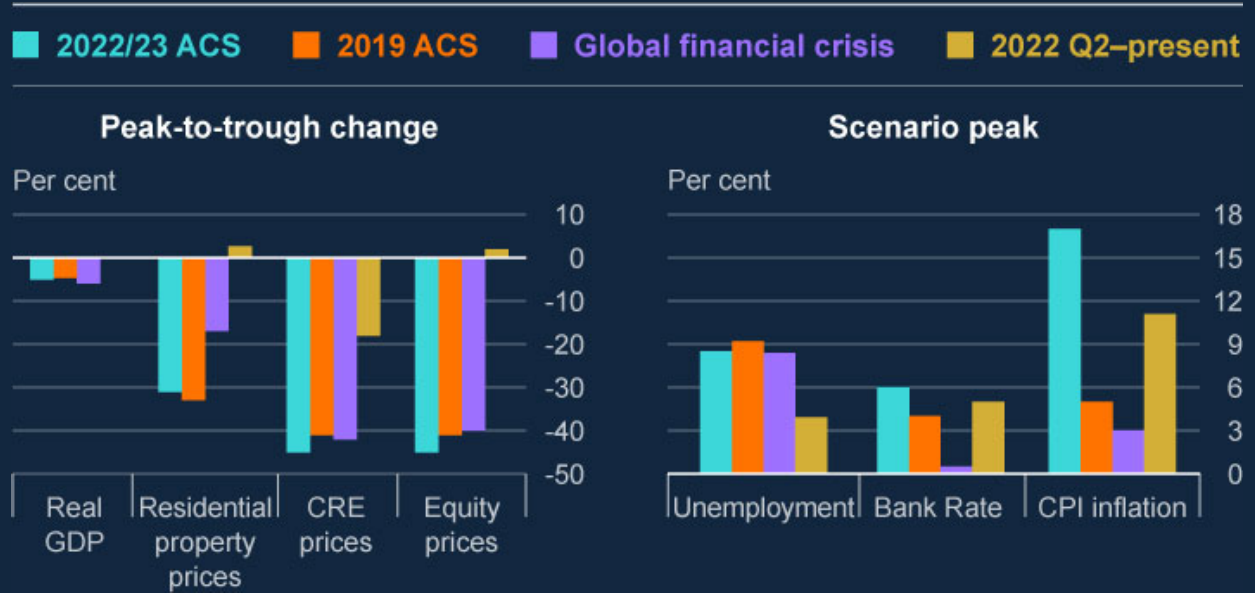
The scenario is considerably more severe than the current macroeconomic outlook.

Although Bank Rate has risen since the scenario was published in September 2022, rising to 5.0% in June 2023, the macroeconomic and asset price outcomes embodied in the scenario remain considerably more adverse than the current outlook (Charts 1 and 2).

In contrast to the test, since the start point of the scenario, GDP in the UK has risen a little, and independent forecasters^[4] expect subdued growth to continue. UK unemployment is expected by those independent forecasters to increase over the coming years, to around 4.4% by 2024 – significantly lower than the peak of 8.5% unemployment in the ACS. Residential property prices in the UK continued to increase for a period after mid-2022, but have since declined somewhat and are currently around the same level as the start point of the 2022/23 ACS.^[5] They are expected to decline by around 5% over the rest of the year, and a further 2% in 2024. UK commercial real estate (CRE) prices have declined reflecting cyclical and structural changes in the CRE market, such as higher interest rates, weaker growth, more hybrid working and climate transition costs. However, CRE prices are assumed to fall considerably further in the stress scenario.

Chart 1: The UK stress scenario is more severe than both the global financial crisis and recent outturns

Peak-to-trough changes to key UK variables in stress scenarios (a)

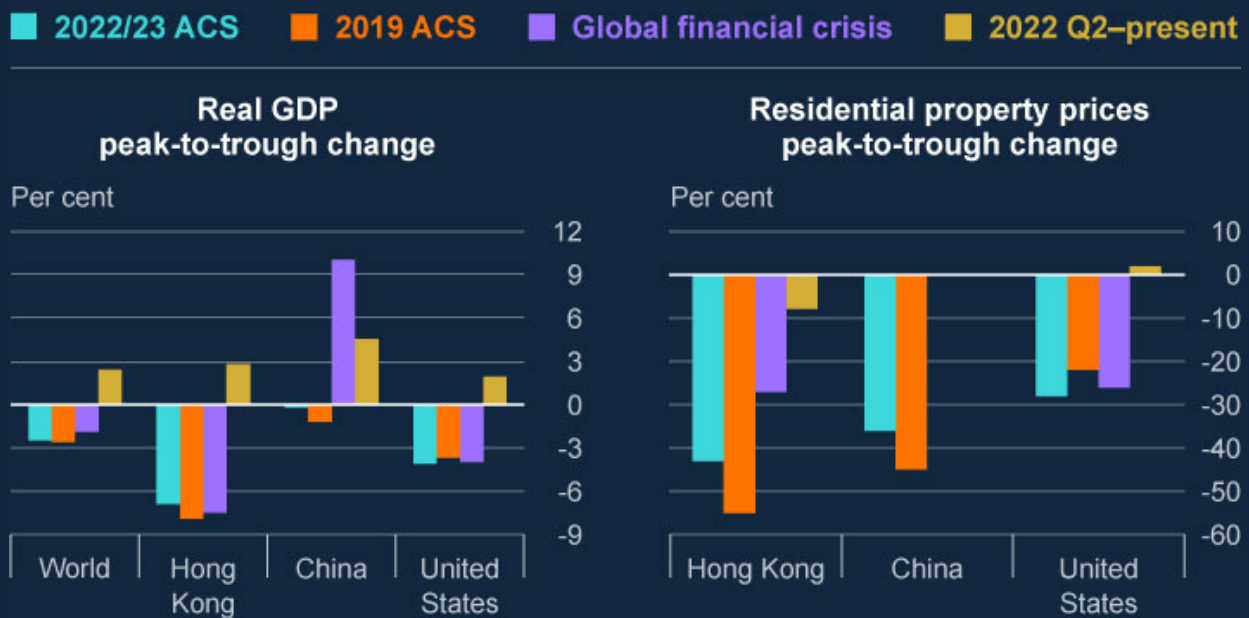


Sources: Bank of England, ONS, S&P Dow Jones Indices LLC and Bank calculations.

(a) Note that 2022 Q2-present values in the charts do not in all cases present changes from the minimum to maximum value over the respective period (or vice versa). Rather in some cases, whether there has been a continuous increase or decrease, the change presented is given relative to the starting point (2022 Q2).

Chart 2: The global stress scenario is also very severe in historical terms

Peak-to-trough changes to key non-UK variables in stress scenarios (a)



Sources: Census and Statistics Department Hong Kong, IMF World Economic Outlook (April 2023), National Bureau of Statistics of China, US Bureau of Economic Analysis and Bank calculations.

(a) Note that 2022 Q2–present values in the charts do not in all cases present changes from the minimum to maximum value over the respective period (or vice versa). Rather in some cases, whether there has been a continuous increase or decrease, the change presented is given relative to the starting point (2022 Q2).

1.2: Supporting households and businesses

As part of the test, the FPC assesses whether the banking system has the capacity to support households and businesses throughout the stress.

An important macroprudential goal of the stress test is to help the FPC assess whether the banking system is sufficiently well-capitalised not just to withstand the stress but also to have the capacity to support households and businesses in the face of severe adverse shocks.

With that in mind, banks must conduct the test on the basis that they meet the credit demand of creditworthy households and businesses in the stress. Although credit growth slows sharply reflecting lower credit demand in the stress, over the scenario as a whole, lending to the UK real economy is assumed to increase by more than 10%.

In addition, rising interest rates and the decline in real incomes are assumed in this stress to lead to greater competition for deposits. The share of deposits that are interest bearing is assumed to rise over the stress scenario, and the interest rate paid on those deposits is assumed to increase by more than recent experience and more than in banks' submitted projections, with the spread between the rate on household interest-bearing sight deposits and Bank Rate assumed to be around its 2000–07 average in the second year of the scenario. These assumptions resulted in some adjustments to banks' submitted projections.

A well-capitalised banking system is important to ensure banks are well placed to provide support to households and businesses. By meeting the demand for credit by creditworthy households and businesses, resilient banks can avoid worsening the situation for borrowers by. If banks cut lending primarily to defend their capital positions, this contraction in lending could itself worsen asset quality by causing a tightening in financial conditions that would not be commensurate with the changes in the macroeconomic outlook, thus creating the potential for a damaging feedback loop. Resilience also increases banks' ability to offer forbearance and limit the increase in repayments faced by borrowers, including by varying the terms of their loans.

1.3: Features of the stress test

| The Bank makes key judgements about what would happen in the stress.

The results of the stress incorporate a number of key judgements made by the Bank about what would happen if the stress were to materialise. These judgements informed adjustments made to the participating banks' submitted projections. For example, this included judgements to ensure that the results appropriately reflect the impact of increased cost of living in the scenario on mortgage and unsecured lending impairments (see Box F). The results of the stress test include adjustments made to reflect these judgements. Further detail on key judgements is provided in Box G.

As in previous tests and as per the stress-test [guidance](#), participating banks submit the management actions they consider they would undertake in the scenario, such as varying their dividend payments, reducing variable remuneration (such as bonuses) and reducing costs. The Bank considers each proposed

management action in the stress individually, including how realistic the action is in the context of the scenario, and whether it meets the criteria set out in the guidance. Unless otherwise specified, bank results are presented taking into account the application of these management actions judged acceptable by the Bank. See Box D for further detail on the Bank's approach to management actions and the bank-specific results for details on actions individual banks take in the stress.

Banks are assessed on the basis of IFRS 9 transitional arrangements, against an IFRS 9 adjusted hurdle rate framework.

As in previous stress tests, the 2022/23 test continues to reflect internationally agreed transitional arrangements for the IFRS 9 accounting standard. Banks are again assessed on a transitional basis in that they are allowed to 'add back' a proportion of capital losses associated with the earlier recognition of impairments under IFRS 9 relative to the previous accounting standard. This transitional relief was designed to allow banks to adapt to using IFRS 9 and will reduce to zero by 2025. The Bank also calculates and publishes capital losses on a non-transitional basis^[6] (see Annex) but does not assess participating banks on this basis

Each bank's performance in the test is assessed against 'hurdle rates' for their risk-weighted Common Equity Tier 1 (CET1) capital ratio^[7] and Tier 1 leverage ratio.^[8] These hurdle rates, the sum of banks' minimum capital requirements and systemic buffers, are adjusted to take into account the impact of the IFRS 9 accounting standard relative to the previous accounting standard following the approach first adopted in 2018. Adjustments to hurdle rates are subject to the constraint that no bank should have a hurdle rate after any adjustment that is below its minimum risk-weighted (Pillar 1 plus Pillar 2A) capital and leverage ratio requirements. The Bank has been engaging with ACS participant banks and continues to develop the approach to be taken in future stress tests.

Ring-fenced banks have been included in the test for the first time on a standalone basis.

For the first time, this stress test has assessed the ring-fenced subgroups (RFBs) of four participating banks on a standalone basis, for Barclays, HSBC, Lloyds Banking Group and NatWest Group. These are subgroups that have been established within participating bank groups to meet the requirements of the ring-

fencing regime. Santander UK and Virgin Money's ring-fenced subgroups are not included on the basis that they do not differ materially from the group. Standard Chartered (SCB) does not have a ring-fenced bank and the regime does not apply to Nationwide as a building society. See Box C for more information on the inclusion of RFBs in the test.

2: Overview of results of the test

| Banks begin the scenario from a position of relative strength.

Banks start the 2022/23 test with an aggregate^[9] CET1 capital ratio of 14.2% of risk-weighted assets (RWAs).^[10] As set out in Box B, banks' balance sheets changed in a number of important ways between the starting points for the 2019 ACS and the 2022/23 ACS. This includes an improvement in asset quality, higher deposit balances, and regulatory changes which better reflect the underlying risk of some assets in banks' starting capital positions.

2.1: Headline results

| The stress reduces capital positions significantly through a number of channels...

Credit impairments are the main driver of capital depletion in the stress. Key judgements by the Bank sought to ensure that the effects of the higher cost of living in the stress and of the increasing path for Bank Rate were appropriately reflected in impairment rates. Nevertheless, this upward pressure on impairments was offset by the improvements to balance sheets in recent years, reflecting improved asset quality and regulatory changes. Non-UK impairments are similarly reduced by changes to banks' balance sheets offsetting upwards pressures from, for example, higher global interest rates. Traded risk is another key driver of capital depletion in the stress. Despite trading revenues being supported by increased trading activity, increases in stress losses and RWAs result in traded risk depleting capital early in the stress for those banks with trading activity. These drivers of lower capital are somewhat offset by net interest income (NII) increasing in the stress, although the impact of this varies by bank. Section 3 sets out these and other drivers of the stress in more detail.

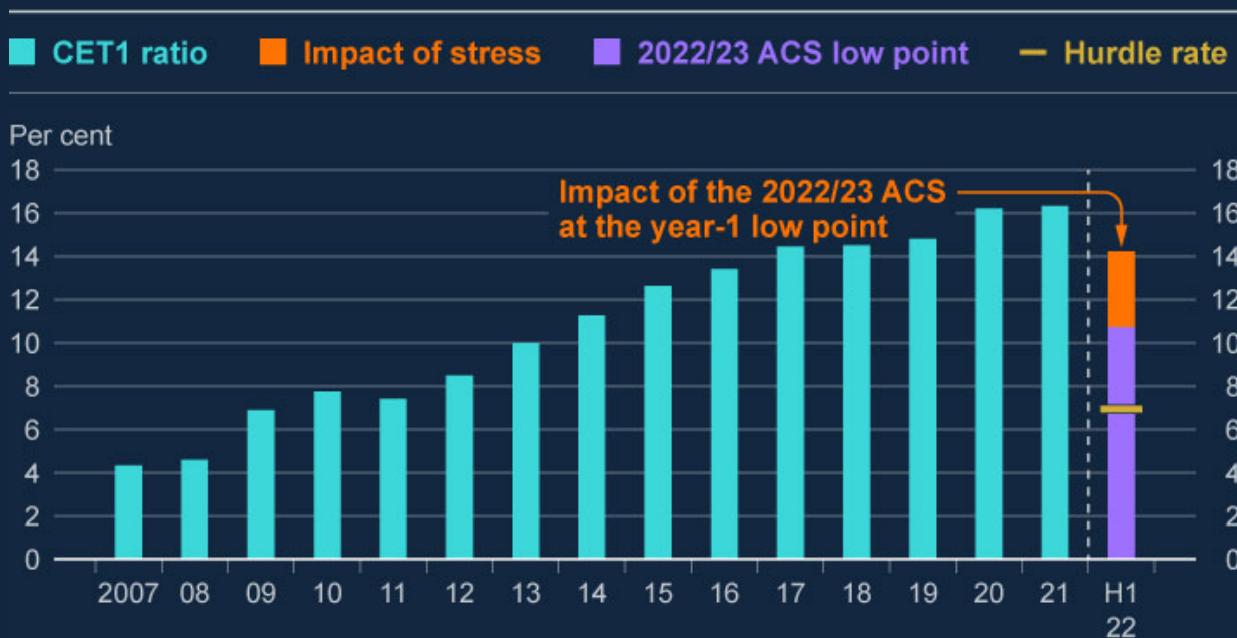
| ...but the system remains well above its aggregate hurdle rate.

In aggregate, banks' capital ratios remain well above the aggregate CET1 hurdle rate in the stress, falling from an aggregate start-point CET1 ratio of 14.2% to a low point of 10.8% in the first year of the stress, against an aggregate hurdle rate of 6.9% (Chart 3). The aggregate leverage ratio falls from a start point of 5.3% to a

low point of 4.7% against a hurdle rate of 3.5%. At the point where banks' CET1 ratios are lowest, the CET1 ratios of the eight banks are, in aggregate, more than twice the level before the 2007–08 global financial crisis (GFC).

Chart 3: Major UK banks start the stress test with a strong aggregate capital position, which remains well above the aggregate hurdle rate at the low point

Aggregate CET1 capital ratio of major UK banks and impact of the 2022/23 ACS scenario (a) (b) (c) (d)



Sources: Participating banks' Stress Test Data Framework (STDF) data submissions, Prudential Regulation Authority regulatory returns, published accounts, Bank analysis and calculations.

(a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of the total risk exposure amount (risk-weighted assets or RWAs), where CET1 capital and RWAs are determined in accordance with the Capital Requirements Regulation (CRR).

(b) Major UK banks are Barclays, HSBC, Lloyds Banking Group, Nationwide, NatWest Group, Santander UK, Standard Chartered and, from end-2020, Virgin Money UK. Prior to 2011, data are Bank estimates of banks' CET1 ratios. Capital figures are year-end except for 2022/23 ACS.

(c) During the pandemic, banks built up their CET1 capital ratios by reducing distributions to shareholders. The aggregate CET1 capital ratio has fallen back since 2021, in part as a result of a range of regulatory changes (such as hybrid models for mortgages and stricter treatment of intangible assets) and the resumption of distributions.

(d) To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario.

The reduction in banks' capital in the stress means that banks use their capital buffers as a response to the scenario, as has been the case in previous stress tests. This use of capital buffers accords fully with the expectations of the Bank, the FPC and PRA, that all elements of the capital buffers that have been built up by banks exist to be used as necessary to support households and businesses during stress.^[11] The existence of usable buffers allows banks to absorb losses without breaching minimum requirements, enabling them to meet the demand for credit from creditworthy households and businesses in the face of severe adverse shocks.

The UK banking sectors' aggregate CET1 capital and Tier 1 leverage ratios remain above aggregate hurdle rates by 3.8 percentage points and 1.2 percentage points respectively at the capital low points.

The stress test is based on banks' balance sheets as of June 2022. Since then, major UK banks' capital ratios have risen; the aggregate CET1 capital ratio was 14.6% in 2023 Q1.

| The aggregate drawdown is smaller than in the 2019 ACS.

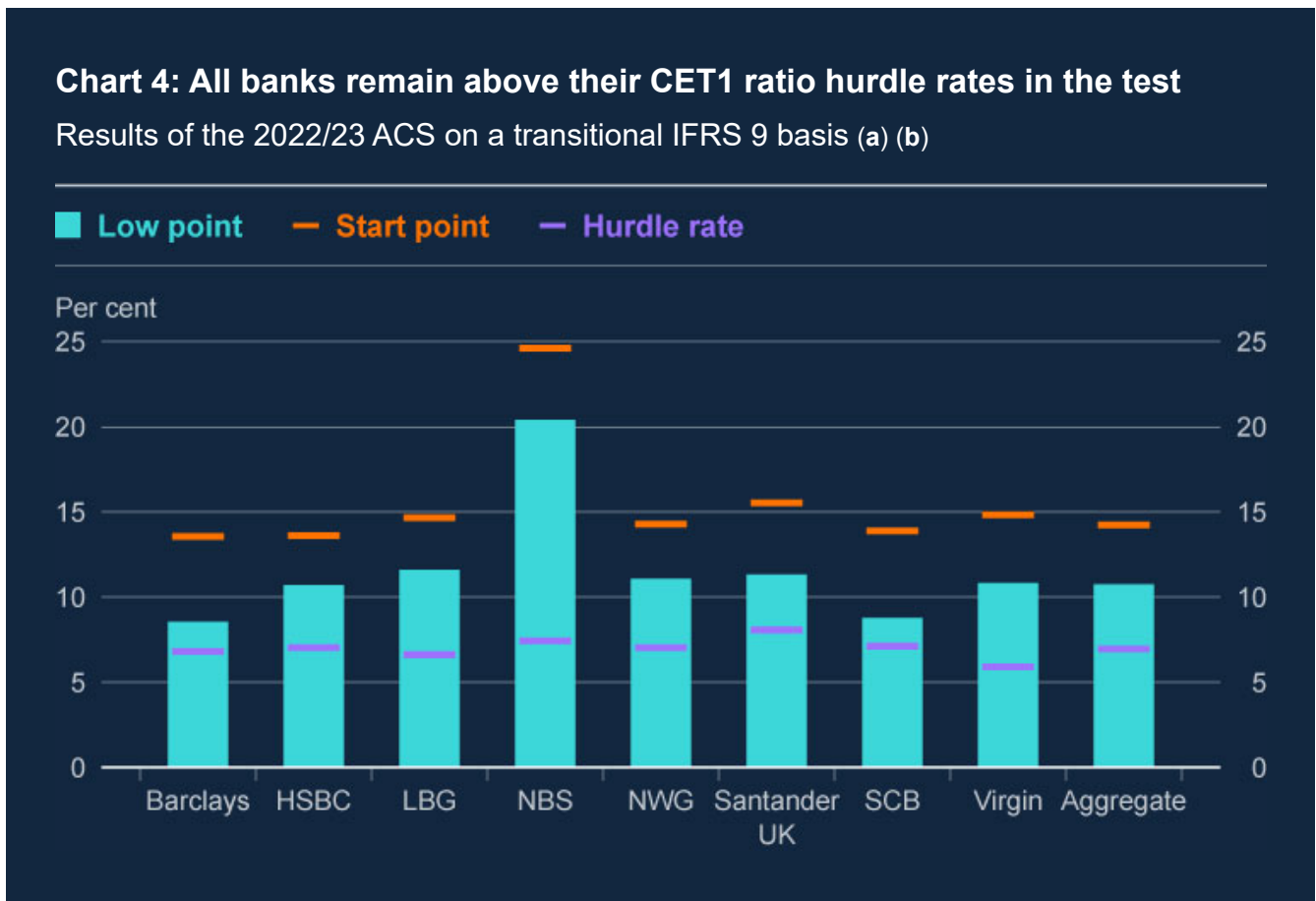
The aggregate capital drawdown of 3.5 percentage points is smaller than the 2019 ACS drawdown of 5.2 percentage points, despite the overall severity of the scenario being broadly similar. This reflects a combination of factors, including improvements in banks' balance sheets since the 2019 ACS, which more than offsets the impact on impairments of a higher cost of living and interest rates in the 2022/23 ACS. Banks also begin the stress test with higher deposit balances than recent years, leading to larger increases in NII as interest rates rise (and to a higher level than in the 2019 ACS) in response to higher inflation.

2.2: Individual bank results

| No individual bank is required to strengthen its capital position as a result of the test.

The results of the test indicate that no individual bank – at group or RFB level – would fall below its CET1 or Tier 1 leverage ratio hurdle rates on an IFRS 9 transitional basis after taking strategic management actions (Chart 4).

No bank is required to strengthen its capital position as a result of the test. This indicates that major UK banks would be able to withstand the severe macroeconomic stress in this scenario, whilst still having the capacity to support UK households and businesses throughout the stress.



Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

(a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of the total risk exposure amount (risk-weighted assets or RWAs), where CET1 capital and RWAs are determined in accordance with the CRR.

(b) To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario.

Table A: All banks remain above their CET1 capital and Tier 1 leverage ratio hurdle rates in the 2022/23 ACS

Results of the 2022/23 ACS on a transitional IFRS 9 basis (per cent) (a) (b) (c) (d) (e) (f) (g) (h)

Bank	CET1 capital			Tier 1 leverage		
	Start point	Low point (after strategic management actions)	Hurdle rate	Start point	Low point (after strategic management actions)	Hurdle rate
Barclays	13.6%	8.5%	6.8%	5.1%	3.7%	3.3%
HSBC	13.6%	10.7%	7.0%	5.5%	5.0%	3.6%
Lloyds	14.7%	11.6%	6.6%	5.3%	4.5%	3.5%
NatWest	14.3%	11.1%	7.0%	5.2%	5.2%	3.7%
Nationwide	24.6%	20.4%	7.4%	5.6%	5.6%	3.6%
San UK	15.5%	11.3%	8.1%	5.3%	4.5%	3.5%
SCB	13.9%	8.8%	7.1%	4.5%	4.3%	3.5%
Virgin Money	14.8%	10.8%	5.9%	5.0%	4.4%	3.3%
Aggregate	14.2%	10.8% (Year 1)	6.9%	5.3%	4.7% (Year 1)	3.5%
Barclays Bank UK	14.8%	9.6%	6.7%	5.3%	4.6%	3.3%
HSBC UK Bank	13.7%	10.1%	6.2%	5.8%	5.4%	3.3%
Lloyds Bank	15.2%	12.1%	7.2%	5.4%	4.8%	3.6%
NatWest Holdings	13.0%	9.7%	7.2%	5.3%	5.2%	3.8%

Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

(a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of RWAs, where CET1 capital and RWAs are determined in accordance with the CRR.

(b) Tier 1 capital is defined as the sum of CET1 capital and Additional Tier 1 capital determined in accordance with the CRR.

- (c) The Tier 1 leverage ratio is Tier 1 capital expressed as a percentage of the leverage exposure measure, as defined in Article 429(2) of the Leverage Ratio (CRR) part of the PRA Rulebook. If a firm does not have sufficient CET1 capital to meet 75% of the leverage ratio minimum requirement and 100% of its leverage ratio buffers (as required by PRA rules), Additional Tier 1 capital has been capped at 25% of the leverage ratio minimum requirement for the purpose of calculating the Tier 1 leverage ratio.
- (d) Minimum aggregate CET1 ratios are calculated by dividing aggregate CET1 capital by aggregate RWAs at the aggregate low point of the stress in 2023. Minimum aggregate Tier 1 leverage ratios are calculated by dividing aggregate Tier 1 capital by the aggregate leverage exposure measure at the aggregate low point of the stress in 2023.
- (e) The minimum CET1 ratios and leverage ratios shown in the table do not necessarily occur in the same year of the stress scenario for all banks. For individual banks, low-point years are based on their positions after any strategic management actions and automatic distribution restrictions.
- (f) For CET1 capital ratios, low points occur in year 1 for Barclays, HSBC, Lloyds Banking Group, Standard Chartered and the aggregate, year 2 for Barclays Bank UK, HSBC UK Bank, Lloyds Bank, Nationwide, NatWest Group and NatWest Holdings, year 3 for Virgin Money and year 5 for Santander UK. For Tier 1 leverage ratios, low points occur in year 0 for Nationwide and NatWest Group, year 1 for Barclays, Barclays Bank UK, HSBC, HSBC UK Bank, Lloyds Banking Group, Lloyds Bank, Standard Chartered and the aggregate, year 2 for NatWest Holdings and Virgin Money UK and year 4 for Santander UK.
- (g) The aggregate hurdle rate is calculated as a weighted average of hurdle rates in the aggregate low-point year.
- (h) To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario.

2.3: Factors driving the headline results

Banks' aggregate CET1 capital ratio falls substantially in the first year of the stress, and only returns to its starting level by the final year of the scenario.

The fall in banks' CET1 capital ratios (Chart 3) is driven by a number of factors, with other factors cushioning the impact of the stress. The key drivers of the capital drawdown are an increase in credit impairments and traded risk losses, which are only partially offset by higher NII in the first year of the stress.

Table B decomposes the change in the aggregate CET1 capital ratio and leverage ratio between the start point (end-June 2022) and the low point (the following year, or 'year 1') into each of its constituent components. Changes in capital ratios presented in Table B do not isolate the impact of the stress scenario relative to a counterfactual.^[12] Instead they reflect the combined impact of the stress along with any capital impacts that might have otherwise occurred over an equivalent non-stress period.

Table B: Credit impairments are key drivers of lower capital ratios in the stress

Contributions to the changes in the aggregate CET1 capital ratio and Tier 1 leverage ratio between the start and low points of the 2022/23 ACS (percentage points, unless otherwise stated) (a) (b) (c) (d) (e) (f) (g) (h) (i) (j)

Line item	CET1 capital ratio	Tier 1 leverage ratio
2022 Q2 (starting point)	14.2%	5.3%
Impairments	-4.1	-1.3
of which mortgages	-0.5	-0.2
of which consumer credit	-1.3	-0.4
of which lending to businesses (excluding CRE)	-1.8	-0.6
of which lending to businesses (CRE only)	-0.3	-0.1
of which other wholesale lending	-0.2	-0.1
IFRS 9 transitional relief	0.7	0.2
Traded risk losses	-1.5	-0.5
Risk-weighted assets/Leverage exposure	-0.3	0.5
Misconduct costs	-0.2	-0.1
Net interest income	4.6	1.4
Net fee and commission income	1.3	0.4
Discretionary distributions	-0.3	-0.1
of which dividends	0.0	0.0
of which variable remuneration	-0.1	0.0
of which AT1 coupons and other distributions	-0.2	0.0
Operating expenses and taxes	-4.0	-1.3
Other	0.4	0.0
Stress end low point	10.8%	4.7%

Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

(a) The CET1 ratio aggregate low point and Tier 1 leverage ratio aggregate low point are in year 1.

- (b) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of RWAs, where CET1 capital and RWAs are determined in accordance with the CRR.
- (c) Tier 1 capital is defined as the sum of CET1 capital and Additional Tier 1 capital determined in accordance with the CRR.
- (d) The Tier 1 leverage ratio is Tier 1 capital expressed as a percentage of the leverage exposure measure, as defined in Article 429(2) of the Leverage Ratio (CRR) part of the PRA Rulebook. If a firm does not have sufficient CET1 capital to meet 75% of the leverage ratio minimum requirement and 100% of its leverage ratio buffers (as required by PRA rules), Additional Tier 1 capital has been capped at 25% of the leverage ratio minimum requirement for the purpose of calculating the Tier 1 leverage ratio.
- (e) Throughout the publication, 'lending to businesses' includes lending to large corporates, small and medium-sized enterprises (SMEs), retail SMEs and CRE.
- (f) Trading operations comprises investment banking revenues net of costs, market risk losses, counterparty credit risk losses, losses arising from changes in banks' fair value adjustments, prudential valuation adjustments and losses on fair value positions not held for trading.
- (g) Changes in RWAs impact the CET1 ratio, whereas changes in the leverage exposure measure impact the Tier 1 leverage ratio.
- (h) To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario.
- (i) Expenses comprise administrative and staff expenses, excluding upfront variable remuneration which is included in discretionary distributions.
- (j) 'Other' comprises other profit and loss, operational risk, and other capital movements. Non-exhaustively, other profit and loss includes share of profit/loss of investment in associates and other income, and other capital movements include pension assets devaluation, prudential filters, accumulated other comprehensive income, internal ratings-based shortfall of credit risk adjustments to expected losses, and actuarial gain/loss from defined-benefit pension schemes.

Box A: The impact of increasing interest rates in the 2022/23 ACS

The 2022/23 ACS tests banks' resilience to increasing global interest rates alongside a severe global recession.

A key feature of the 2022/23 ACS is a rapid increase in global policy rates as monetary policy makers address the significant rise in inflation in the scenario across advanced economies. Bank Rate rises to a peak of 6%, the ECB deposit facility rate rises to a peak of 4.7% and the US effective federal funds rate rises to a peak of 6.5%. Longer-term market interest rates rise in the scenario: the 10-year UK gilt yield increases sharply by 3.3 percentage points, peaking at over 5.3%, while the 10-year US Treasury yield rises by 3.1 percentage points to peak at 6.1%. The test assesses banks' resilience to a rise in rates and a severe recessionary environment together. The scenario features deep and simultaneous recessions with materially higher unemployment in the UK and global economies, and sharp falls in asset prices.

There are a number of channels through which increasing interest rates affect banks in the 2022/23 ACS. This box sets out those channels, and highlights where key judgements have been made. The [July 2023 Financial Stability Report](#) sets out more detail on the resilience of the UK banking sector, and the UK financial system and real economy more broadly, to interest rate risk.

Increasing interest rates support net interest income...

Net interest income is the difference between what banks earn on their assets and what they pay on their funding. It is an important source of income for banks and a means through which they can rebuild capital resilience and their capacity to support households and businesses through a stress.

A rise in official interest rates can lead to higher net interest income for banks. This is driven by banks being financed in part by non interest bearing liabilities (such as zero-interest current account deposits and equity), while holding assets with increasing interest rates. Accordingly, banks can increase the spread between the rates paid on their liabilities and the yield they can earn on their assets.

Banks begin the 2022/23 ACS with large UK customer deposit balances in aggregate, and with the spread between the rate paid on these deposits and the yield they earn on their assets at historically low levels. So in aggregate they benefit from higher net interest income over the course of the stress. However, several judgements have been made by Bank staff to constrain this benefit as the effect of rising interest rates and the higher cost of living on households and businesses are assumed in the scenario to result in competitive pressure in deposit markets. These assumptions led to some adjustments to banks' submitted projections, which are reflected in the results.

First, it is assumed that many customers would move deposits from accounts that pay no interest to accounts that do pay interest. The share of non interest bearing current account balances in total UK deposit account balances is assumed to decline by 15 percentage points over the five years of the scenario.

Second, it is assumed that the interest paid on UK deposit accounts increases by more than recent experience and more than banks' submissions. In the second year of the scenario, the deposit spread – ie the spread between the effective rate on household interest bearing UK sight deposits and Bank Rate – is 220 basis points. That is lower than recent levels, and consistent with its average over 2000–07.

A large part of the increase in net interest income in the scenario derives from the fact that deposit spreads had been close to historical lows with Bank Rate having been near zero for over a decade. As Bank Rate increases in the stress scenario, deposit spreads widen and return closer to average

historical levels. This also means that further increases in Bank Rate would be likely to have a smaller impact on net interest income, as deposit spreads would have already recovered.

| ...but higher interest rates also push up on credit impairments.

Increasing interest rates can lead to higher impairments through a number of channels. First, there is a direct effect, as borrowers face higher loan repayments. For households, this can be an important component of mortgage repayments, and it can also affect consumer debt as consumer credit borrowers with mortgages are likely to prioritise their higher mortgage interest payments at the expense of servicing their consumer debt. On the corporate side, increasing interest rates also result in higher repayment costs, leading to higher corporate impairments.

Through these repayment channels, based on affordability analysis the higher path for Bank Rate was judged to increase UK losses by 15% for mortgages and 5% for unsecured lending, relative to the 2019 ACS. On the corporate side, 70% of the impairments that banks reported in this scenario were from sectors that they identified as vulnerable to the scenario, due to higher interest rates and more general inflation and supply-chain pressures (as set out in more detail in Box F).

The second channel through which higher interest rates contribute to higher impairments is through their effect on macroeconomic variables. Typically, the marginal impact of an increase in interest rates is to reduce GDP and asset prices and increase unemployment, thereby reducing inflation. The effect on impairments through this channel is likely to be larger than through the direct effect of higher loan repayments, as unemployment in particular is a key driver of credit losses, particularly for unsecured credit.

Alongside impairments, increasing interest rates push up on credit risk weights in the stress in recognition of loans being more likely to default. UK credit risk weights rise by from 34% to 44% in the first two years of the scenario, part of which would reflect the impact of higher interest rates on the likelihood of default through the channels set out above.

The combined impact of higher net interest income and higher credit impairments from changes in interest rates is likely to be negative for bank profitability in the 2022/23 ACS.

Assessing the combined impact of higher net interest income and credit impairments on bank profitability and CET1 ratios in the 2022/23 ACS requires an assessment of the relative importance of each of the different channels. To do this, Bank staff have undertaken an indicative exercise using a combination of banks' submitted results, internal models and judgement.

It suggests that the boost to net interest income from higher Bank Rate is larger than the impact on impairments arising solely from the first channel – the direct impact on higher loan repayments.

However, the overall impact depends importantly on what impact higher rates have on impairments through the second channel – their impact on the wider economy, including unemployment, property prices and GDP. That is not directly observable in the results of the 2022/23 ACS: the proportion of the change in macroeconomic variables that is attributable to changes in interest rates is not specified as part of the scenario design, and nor are banks requested to attribute impairments to changes in individual economic drivers.

Taking the impact of higher rates on impairments into account by assuming a typical relationship between changes in Bank Rate and other macroeconomic variables, and the impact of those variables on impairments, it is likely that the overall impact on credit impairments outweighs the boost to net interest income in the 2022/23 ACS. And that the impact of higher Bank Rate is negative for bank profitability and CET1 ratios in this scenario.

Increasing interest rates also impact the value of fair value assets held on the banking and trading book.

The sharp increase in interest rates also leads to losses on fair-valued trading and banking book assets, with banks making losses of around £19 billion on fair-value securities in their banking books in the 2022/23 ACS.

Most of this loss arises on banks' holdings of fair-valued bonds held in currencies other than sterling. The proportion of sterling bonds held by banks on this basis is small and typically hedged with interest rate swaps, such that

the impact of higher sterling interest rates on losses through this channel is also small.

| Liquidity risks are subject to robust regulation and supervision...

As part of the ACS, banks are asked to estimate any liquidity outflows as a result of the stress and to report their Liquidity Coverage Ratio (LCR)^[13] over the duration of the stress. Banks reported LCRs in excess of 100% throughout the stress horizon.

The 2022/23 ACS does not feature an additional liquidity stress as part of the scenario. It is, by design, a capital stress test over a five-year horizon. However, a combination of regulation, supervision and banks' risk management means that the major UK banks have large liquid assets buffers which would be available to be drawn upon if a liquidity stress did occur alongside the scenario in the ACS.

The UK's liquidity framework has been designed in line with international standards and applied to all UK banks and building societies. This includes the LCR and Net Stable Funding Ratio (NSFR).^[14]

Regulatory liquidity requirements are supplemented by a range of supervisory practices such as the Liquidity Supervisory Review and Evaluation Process, which: reviews the arrangements, strategies, and processes implemented by a bank to comply with liquidity standards; evaluates the liquidity and funding risks to which the bank is or might be exposed; assesses the further liquidity and funding risks revealed by stress testing; and examines whether the level and composition of the bank's liquidity resources are adequate to meet its liquidity needs over different time horizons.

| ...major UK banks have substantial liquidity buffers on which they could draw during the 2022/23 ACS.

The major UK banks hold combined high-quality liquid assets with a market value of £1.4 trillion, an aggregate LCR of 146% in April 2023, and an NSFR of 137% in 2023 Q1. Of their high-quality liquid assets, around two thirds is in cash or central bank reserves, and a total of 90% is held at fair value meaning any change in the value of those assets arising from changes in

interest rates in the scenario is reflected in banks' capital positions in the test. Assets held on a hold-to-collect basis make up around 10% of high-quality liquid assets in aggregate. The banks in the ACS also have collateral pre-positioned in the Bank of England that would allow them to undertake £250 billion of borrowing. As such the major UK banks have substantial liquidity buffers on which they could draw were a significant liquidity stress to materialise alongside the scenario in the 2022/23 ACS.

UK banks' interest rate risk is regulated and supervised by the PRA.

The PRA assesses all UK banks on their need to have capital against the interest rate risk on their banking book assets, including assets held at amortised cost or fair value. As set out in the [July 2023 Financial Stability Report](#), this is done via an explicit capital requirement in the Pillar 2A part of the capital framework, against 'interest rate risk in the banking book' (IRRBB). This is calibrated on forward-looking estimates of the impact of large shocks to interest rates on banking books.

Considering interest rate risk as part of Pillar 2A calibration and the ACS stress-testing framework serves different purposes. Pillar 2A is used to set minimum capital requirements, whereas the ACS informs capital buffers that are used to, among other things, reduce the risk of banks breaching their minimum capital requirements.

The UK banking system has the capacity to support households and businesses through a period of higher interest rates.

The results of 2022/23 stress test indicates that the major UK banks would be resilient to a severe stress scenario that incorporated sharply increasing global interest rates as a result of persistently higher advanced-economy inflation, alongside deep and simultaneous recessions in the UK and global economies with materially higher unemployment, as well as sharp falls in asset prices. As such, the results of the 2022/23 ACS support the FPC's judgement that the UK banking system is well placed to continue supporting households and businesses throughout a wide range of economic scenarios, including in a period of higher interest rates.

Box B: Developments in banks' balance sheets since the 2019 ACS

The level of severity of the macroeconomic scenario in the 2022/23 ACS scenario is broadly comparable to that of the 2019 scenario. However, banks' balance sheets changed in a number of important ways in the three and a half years between the respective starting points for the 2019 and 2022/23 ACS.

Asset quality on banks' balance sheets has improved since the end of 2018.

Banks have seen improvements in the quality of assets on their balance sheets since the end of 2018, reflecting a number of factors. Residential property prices rose by around 20% in the UK between the end of 2018 and the middle of 2022 (and also rose in the US and euro area over the same period), resulting in lower loan to value (LTV) ratios and proportionately smaller bank losses for any given defaults on mortgage lending. Residential property prices in the UK continued to increase for a period after mid-2022, but have since declined somewhat and are currently around the same level as the start point of the 2022/23 ACS.^[15]

CRE prices also rose by 7% between 2018 Q4 and 2022 Q2, the starting point of the 2022/23 ACS. In isolation this would have resulted in lower impairments on CRE loan portfolios relative to the 2019 ACS. However, banks judged that the greater decline in CRE prices in the 2022/23 ACS scenario (which fall by 45%) was such that the overall rate of impairment is higher than in 2019. UK CRE prices have since declined by 18% relative to the start point in the 2022/23 ACS.

There is also evidence of improved asset quality on car finance, on account of higher observed used car prices. And the Financial Conduct Authority (FCA) introduced new rules on credit card lending in 2018, helping credit card customers to get out of persistent debt, thereby resulting in smaller pockets of high-risk borrowers in banks' credit card portfolios.

Lending standards also tightened during the Covid pandemic. There was a reduction in LTV ratios for new mortgage lending, and in unsecured lending credit limits were lowered and minimum credit score requirements increased.

Banks' corporate portfolios expanded during the Covid pandemic, following the introduction of Government support schemes. These included the Bounce Back Loans Scheme (BBLs), Coronavirus Business Interruption Loan Scheme (CBILS) and a similar scheme for larger corporates (CLBILS). [16] Their inclusion in banks' corporate portfolios in the 2022/23 test has contributed to a lower corporate impairment rate in the stress (see Section 3.1).

There have also been improvements in the mix of assets held on banks' balance sheets.

There have been improvements in the composition of loan portfolios. For instance, there has been a continued reduction in higher-risk pre-GFC mortgages, as legacy portfolios have matured.

Banks have actively undertaken changes to their business models that have in some cases been simplified, and in other cases have marked a shift towards less risky products, for instance less credit card lending outside the UK. And there have been withdrawals from certain geographies that were less profitable that have also helped to improve banks' balance sheet positions.

Taking together all of the above, these have resulted in lower credit impairments in the 2022/23 ACS, despite similarly deep recessions and a higher cost of living and interest rates relative to the 2019 test.

Regulatory actions have also contributed to less risk-weighted asset inflation in stress.

In addition, changes to regulatory requirements for internal credit capital models have resulted in higher starting average risk weights for some banks. Temporary post-model adjustments^[17] have been included at the start of the 2022/23 ACS for some banks, ahead of future model changes, which has

raised the RWA starting points for these banks. This has led to lower RWA inflation during the 2022/23 ACS stress (as RWAs are starting from a higher base), and hence a smaller impact on CET1 capital ratios.

| Banks' loan to deposit ratios have also decreased in aggregate.

Some banks saw large deposit inflows during the Covid pandemic. In aggregate, Major UK banks deposits increased by 26% between the end of 2018 and mid-2022, which led to lower loan to deposit ratios and greater holdings of liquid assets. As set out in Box A, rising interest rates can lead to higher net interest income if the return on those assets increases more quickly than the rate paid on the liabilities.

Box C: Inclusion of ring-fenced banks in the 2022/23 ACS

Ring-fencing was one of the major reforms to UK banking regulation following the GFC.

Ring-fencing was introduced in the UK^[18] following the recommendation of the Independent Commission on Banking in 2011, as one of a package of reforms to banking regulations following the GFC, including substantial increases to capital and liquidity requirements and a more robust approach to supervision.

The objective of ring-fencing was the separation of core retail banking services, such as deposits from individuals and small businesses and associated payment services and overdrafts, from investment and international activities.

UK banks within the scope of ring-fencing were required to restructure their businesses to meet the ring-fencing requirements by 1 January 2019. Banks in scope of ring-fencing have each established a subgroup in which all core retail activity is located. Core retail activity takes place in this ring-fenced sub-group (RFB) and prohibited activity takes place in other group entities outside of this subgroup. The RFB stress-testing results are consolidated in the whole group results.

This ACS represents the first time that RFBs for Barclays, HSBC, NatWest and Lloyds have made separate submissions, enabling the effect of the stress on the RFB to be analysed separately to the whole group. Two RFBs were not in scope of the 2022/23 ACS because their UK groups were judged not to have material activities outside of the ring-fence: Santander UK's RFB represents 98.3% of the RWAs of Santander UK Holdings plc (the parent group of the UK-headquartered entities ie excluding the UK branch of Banco Santander SA).^[19] Virgin Money's RFB represents 99.9% of the RWAs of the Virgin Money group.^[20]

Banks have chosen a variety of ways of structuring their businesses to meet ring-fencing requirements.

Banks differ in the level of investment banking they undertake and so there are material differences in the size of RFBs compared to the groups in which they sit. Furthermore, some activities such as corporate lending can be undertaken on either side of the ring-fence and banking groups subject to ring-fencing have made different choices as to how extensive the range of activities that are placed within the ring-fence (Table 1). For Lloyds and NatWest, the majority of the business undertaken by the group sits within the RFB; for Barclays and HSBC, the RFB comprises a smaller proportion of the group's business. These differences between RFBs, including whether business lines such as corporate lending are included within the RFBs, drive differences in the response to the stress.

Table 1: RFB RWAs as a proportion of Group RWAs at the start point of the 2022/23 ACS (a)

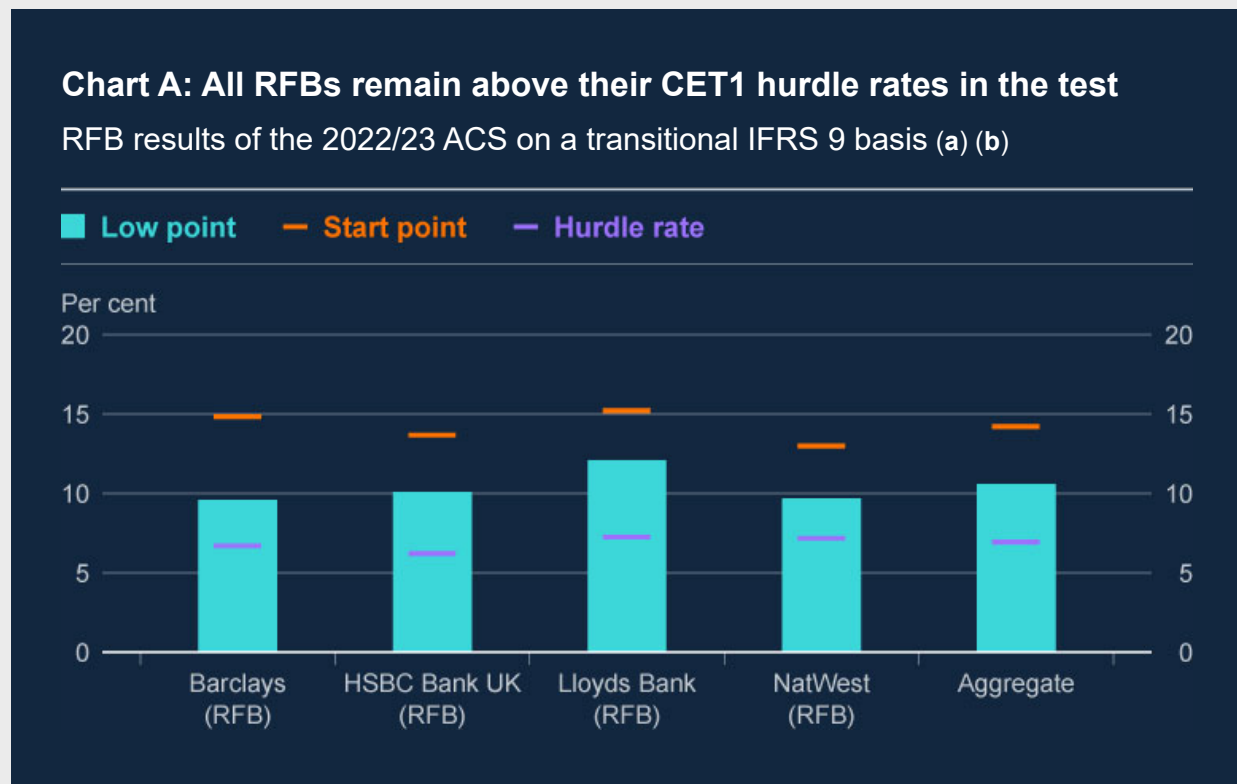
Bank	Total RWAs (£ billions)		
	RFB	Group	RFB RWAs as a percentage of Group RWAs
Barclays	71.1	344.5	20.6%
HSBC ^(a)	90.2	701.4	12.9%
Lloyds	173.8	209.6	82.9%
NatWest	144.5	179.8	80.3%

Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

(a) To produce aggregate results in a single currency, the Bank converts the results of HSBC Group – which reports in US dollars – into sterling at a rate consistent with the scenario. RWAs have been converted to sterling using a rate consistent with the scenario.

The results of the 2022/23 ACS indicate that all RFBs would be resilient to the scenario and do not indicate any specific vulnerabilities of RFBs.

As shown in Chart A and Table 2, each of the RFBs remains well above its hurdle rate on an IFRS 9 transitional basis at the low point of the scenario after applying strategic management actions. The test therefore indicates that RFBs would be resilient to the scenario on a standalone basis, a key objective of the ring-fencing regime. The test does not indicate any particular vulnerabilities of RFBs to the scenario over and above those of the whole groups.



Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

(a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of RWAs, where CET1 capital and RWAs are determined in accordance with the CRR.

(b) The aggregate RFB low point occurs in Y2 of the scenario.

Table 2: All RFBs remain above their CET1 hurdle rates in the test

RFB results of the 2022/23 ACS on a transitional IFRS 9 basis (a) (b) (c) (d) (e)

Stress results: CET1 ratios (per cent)

Bank	Start point	Low point	Hurdle rate	Drawdown
Barclays	13.6%	8.5%	6.8%	5.1%
Barclays Bank UK	14.8%	9.6%	6.7%	5.2%
HSBC	13.6%	10.7%	7.0%	2.9%
HSBC Bank UK	13.7%	10.1%	6.2%	3.6%
Lloyds	14.7%	11.6%	6.6%	3.1%
Lloyds Bank	15.2%	12.1%	7.2%	3.1%
NatWest	14.3%	11.1%	7.0%	3.2%
NatWest Holdings	13.0%	9.7%	7.2%	3.3%

Stress results: Tier 1 leverage ratios (per cent)

Bank	Start point	Low point	Hurdle rate	Drawdown
Barclays	5.1%	3.7%	3.3%	1.4%
Barclays Bank UK	5.3%	4.6%	3.3%	0.7%
HSBC	5.5%	5.0%	3.6%	0.5%
HSBC Bank UK	5.8%	5.4%	3.3%	0.4%
Lloyds	5.3%	4.5%	3.5%	0.8%
Lloyds Bank	5.4%	4.8%	3.6%	0.6%
NatWest	5.2%	5.2%	3.7%	0.0%
NatWest Holdings	5.3%	5.2%	3.8%	0.1%

Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

(a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of the total risk exposure amount (risk-weighted assets or RWAs), where CET1 capital and RWAs are determined in accordance with the CRR.

(b) Tier 1 capital is defined as the sum of CET1 capital and Additional Tier 1 capital determined in accordance with the CRR.

(c) The Tier 1 leverage ratio is Tier 1 capital expressed as a percentage of the leverage exposure measure, as defined in Article 429(2) of the Leverage Ratio (CRR) part of the PRA Rulebook. If a firm does not have sufficient CET1 capital to meet 75% of the leverage ratio minimum requirement and 100% of its leverage ratio buffers (as required by PRA rules), Additional Tier 1 capital has been capped at 25% of the leverage ratio minimum requirement for the purpose of calculating the Tier 1 leverage ratio.

(d) Low point provided is after the application of strategic management actions.

(e) To produce aggregate results in a single currency, the Bank converts the results of HSBC Group – which reports in US dollars – into sterling at a rate consistent with the scenario.

Including RFBs in the 2022/23 ACS has supported risk management processes and better understanding of the suite of strategic management actions available.

By participating in the ACS on a standalone basis in the 2022/23 ACS, RFBs demonstrated the progress made in developing risk management as a result of ring-fencing, such as being able to run the stress scenario independently of the groups in which they sit. The test has also provided insight into the range of management actions available to groups and to RFBs, where these differ and where these must interact with ring-fencing restrictions.

Including RFBs in the 2022/23 stress test has enabled more in-depth considerations of the interactions between RFBs and their parent groups – including management actions, capital injections from the group to the RFB or internal dividends paid from the RFB to group. The RFB's board must act independently of the group and have procedures in place where the interest of the RFB is deemed to differ from the interests of the group. In the event that the group would want to undertake a management action that is located within the RFB, it would need to be approved by the RFB's board as being in the interest of the RFB. Bank analysis of proposed management actions in the stress scenarios considers their credibility and appropriateness, as set out in Box D. The management actions undertaken by RFBs in this ACS were judged to be in the interests of the RFB.

Box D: Banks' responses to the stress scenario

As in previous tests, banks are able to take actions in the stress to support their capital position. Such actions must meet criteria set out by the Bank in the [ACS guidance](#). The Bank assesses the credibility and appropriateness of all proposed management actions, taking into account the specific stress scenario, whether the actions bring a material capital benefit without impediments envisaged, and their consistency with decisions taken by peers.

There are two types of decisions, or 'management actions' banks can report that they would undertake in the stress scenario. The first are 'business-as-usual management actions', which represent decisions taken within banks' business lines in the usual course of managing to economic conditions.

The other type of management actions are strategic management actions. These are defined as extraordinary actions taken in response to the stress scenario. Typically, the Bank would expect these to be any actions that require board sign-off before they can be undertaken. They must also be aligned to the bank's recovery plan.^[21]

| Some banks restricted distributions in response to the stress.

As part of their business, banks make several types of distributions, including dividends to shareholders, variable remuneration payments to employees and coupons on Additional Tier 1 (AT1) capital instruments to institutional investors. As a bank's capital position deteriorates in a stress, banks are able to take action to cut these distributions to support their capital position.

One of the main types of action banks undertake to support their capital position is to reduce dividends. In the year up to the start point of the 2022/23 ACS, in aggregate banks paid £8.9 billion in dividends; in the year to the low point of the scenario, in aggregate banks paid £0.1 billion in dividends.

For some banks, this is in line with established policies such as to reduce dividends in line with profits, as set out in some banks' ordinary dividend pay-out policies. As well as applying published policies, banks are allowed to propose changes to their distribution plans that they project their boards would approve in the stress scenario as per the Bank's guidance.

Banks' resilience relies in part on their ability in a stress to cut distributions. Investors should be aware that banks would take such actions as necessary if a stress were to materialise.

Some mandatory restrictions in distributions also apply, as in previous years.

Some distribution restrictions are mandatory. Under UK capital regulations, if a bank's capital position falls into its combined capital buffer (ie the capital required to meet Pillar 1 requirements, P2A requirements, the Capital Conservation Buffer, the Countercyclical Buffer and systemic risk buffers if applicable), it is subject to a limit on the proportion of profits it is allowed to distribute. The total amount it is allowed to distribute is known as the maximum distributable amount, which is a share of banks' earnings. Should the bank's capital position reduce further into its regulatory buffer, this maximum share of earnings eventually decreases to zero.

Banks' AT1 capital instruments may convert into CET1 capital during the stress. The conversion is based on the specific contractual terms of the AT1 instruments currently in issue. When AT1 instruments convert into CET1, bondholders become shareholders and are no longer eligible to receive coupons, instead receiving ordinary dividends alongside other shareholders. No bank is required to convert AT1 instruments in this test.

Banks are able to propose other management actions outside those relating to distributions.

Actions taken by banks in the stress are not limited to reductions in distributions. Banks may propose management actions that include reductions in lending or making asset disposals. Some actions can be applied as a combination of business-as-usual and strategic management actions. For example, to reduce expenses bank might make some cost

reductions as part of their internal risk management but then make a Board-level extraordinary decision to make further reductions. The Bank assesses all proposals against its published guidance, including the lending and deposit paths guidance, and considers whether the proposed action is credible in the specific scenario and consistent with decisions taken by peers, as well as whether the proposed action would bring a material capital benefit.

Box E: Comparing the results to the 2019 ACS

The reduction in banks' CET1 capital ratios is smaller in the 2022/23 ACS than in the 2019 ACS.

Banks' aggregate CET1 capital ratio falls by less in the low-point year of the 2022/23 ACS (year 1) relative to the low-point year in the 2019 test (year 2). For comparability, Table 1 provides a breakdown of contributions to the changes in the aggregate CET1 capital ratio between the starting point and year 1 of both the 2022/23 and 2019 ACS tests.

As a result of asset quality improvements, credit impairments are lower in the 2022/23 ACS.

The smaller drawdown is in part due to improvements in asset quality on banks' balance sheets over the three and a half years between the respective starting points of the 2019 and 2022/23 tests (end-2018 and end-June 2022). These reflect an increase in residential property prices since the end of 2018, changes in banks' business models, tighter lending standards, and legacy portfolios maturing (see Box B). These result in a reduction in retail credit impairments in the 2022/23 test. Corporate impairments are also lower in the 2022/23 test, however after excluding the impact of Government support schemes related to Covid, the impairment charge is broadly the same.

These asset quality improvements more than offset the increased impairments that would arise from additional cost of living effects and higher interest rates in the 2022/23 scenario compared to the 2019 scenario. Impairments are lower than the 2019 stress by around £26 billion. However, some of the increase in impairments in 2019 was driven by a depreciation in sterling which boosted the sterling value of impairments incurred outside the UK in the 2019 ACS. Measured on a constant currency basis (using the fixed rate from the 2022/23 ACS), impairments are £9 billion lower in the 2022/23 ACS compared to the 2019 ACS.

The total five-year UK impairment rate is 3.9% (5.3% in 2019). The total five-year non-UK impairment rate is also lower than the 2019 rate at 6.1% (6.5% in 2019).[22]

Adjusting for exchange rate effects, net interest income increases by more in the 2022/23 ACS.

Net interest income is broadly similar in the 2019 and 2022/23 ACS. However, some of the increase in net interest income in 2019 was driven by a depreciation in sterling which boosted the sterling value of income earned outside the UK. Measured on a constant currency basis, net interest income is £16 billion higher in the first two years of the 2022/23 ACS compared to the 2019 ACS.

Banks begin this stress test with large deposit balances – which increased by 26% following the Covid pandemic – and a historically low spread between the yield on their assets and their liabilities. As such, net interest income increases as UK and overseas interest rates rise – which they do in the 2022/23 ACS by more than in the 2019 test.

Additional factors are also driving differences between the 2019 and 2022/23 ACS results.

Additional factors result in differences between the 2019 and 2022/23 results. For instance, RWAs rise by less in the 2022/23 stress, due to both asset quality improvements and the inclusion of RWA adjustments in 2022/23 (see Section 3.2).

In the other direction, banks receive less benefit from IFRS 9 transitional relief at the capital low point of the 2022/23 ACS, relative to the 2019 test, due to the planned phasing out of these arrangements (see Section 1.3).

Table 1: The reduction in banks' CET1 capital ratios is smaller in the 2022/23 test relative to 2019

Contributions to the changes in the aggregate CET1 capital ratio between the starting point and Year 1 of both the 2022/23 and 2019 ACS tests (percentage points, unless otherwise stated) (a) (b) (c) (d) (e) (f) (g) (h) (i) (j)

	2022/23 ACS	2019 ACS
2022 Q2/2018 Q4 starting point	14.2%	14.5%
Impairments	-4.1	-5.2
of which mortgages	-0.5	-0.9
of which consumer credit	-1.3	-1.5
of which lending to businesses (excluding CRE)	-1.8	-2.3
of which lending to businesses (CRE only)	-0.3	-0.2
of which other impairments	-0.2	-0.2
IFRS 9 transitional relief	0.7	1.6
Traded risk losses	-1.5	-2.1
Risk-weighted assets	-0.3	-2.0
Misconduct costs	-0.2	-0.6
Net interest income	4.6	4.6
Net fee and commission income	1.3	1.6
Discretionary distributions	-0.3	-0.1
of which dividends	0.0	0.0
of which variable remuneration	-0.1	0.0
of which AT1 coupons and other distributions	-0.2	0.0
Operating expenses and taxes	-4.0	-3.7
Other	0.4	1.3
Year 1 of stress	10.8%	9.7%

Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

- (a) In the 2022/23 ACS, the aggregate CET1 ratio low point is in year 1. However, in the 2019 ACS, it is in year 2.
- (b) This decomposition differs from the way the Bank has presented results of previous ACS exercises, which showed the difference in capital impact for each line item, from the start point to the stressed low point year, in the stress scenario relative to the baseline scenario. When presented based on the difference between the start and low point of the stress instead, a number of components in Table 1, in particular net interest income and expenses, appear larger than on the usual baseline-to-stress basis. That is because they present banks' underlying revenues and costs in the year between the start and low points.
- (c) Trading operations comprises investment banking revenues net of costs, market risk losses, counterparty credit risk losses, losses arising from changes in banks' fair-value adjustments, prudential valuation adjustments and losses on fair-value positions not held for trading.
- (d) Lending to businesses is used throughout the publication and includes lending to corporates, SMEs, retail SMEs and CRE.
- (e) Changes in RWAs impact the CET1 ratio.
- (f) To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario. For the 2019 'Risk-weighted assets' row alone, the impact is calculated on a constant exchange-rate basis, ie based on exchange rates prevailing at the start of the test.
- (g) Expenses comprise administrative and staff expenses, excluding upfront variable remuneration which is included in discretionary distributions.
- (h) 'Other' comprises other profit and loss and other capital movements. Non-exhaustively, other profit and loss includes share of profit/loss of investment in associates and other income, and other capital movements include pension assets devaluation, prudential filters, accumulated other comprehensive income, internal ratings-based shortfall of credit risk adjustments to expected losses, and actuarial gain/loss from defined-benefit pension schemes.
- (i) The 2019 ACS figures include the effect of the large depreciation in sterling in that exercise, which raised the nominal value and therefore CET1 impact of various line items when translated from other currencies (such as USD) into sterling terms. This limits the direct comparability between figures in the 2019 and 2022/23 ACS.
- (j) The 2019 ACS figures do not include any impact of AT1 conversion.

3: Key drivers of the results

3.1: Credit impairments

| Banks incur credit impairment charges of £125 billion over the test.

Impairments are the main driver of capital depletion in this stress scenario, driven by affordability pressures from inflation, higher interest rates, unemployment and lower GDP. Impairments have been assessed to ensure they appropriately reflect the pressures on household incomes from the higher cost of living (see Box F) and the losses associated with the higher Bank Rate path (see Box A). Analysis also sought to ensure sufficient conservatism is reflected in impairments from corporate sectors judged to be vulnerable to the stress. These upward pressures on impairments are tempered, however, by changes to portfolios seen in recent years, such as improved asset quality, the impact of Covid support schemes and regulatory developments (see Box B).

Credit impairments reduce the aggregate CET1 capital ratio by 4.1 percentage points^[23] at the low point (year 1). Impairments over the five years of the stress scenario total £125 billion, with an aggregate impairment rate on their loans of 4.7%.^[24] This is £26 billion less than the 2019 test. On a constant currency basis, this is £9 billion less than in 2019, reflecting the sterling depreciation in the 2019 ACS scenario which increased the published values of impairments and income. Table C provides a breakdown of these impairments by asset class. (See Box E for a comparison to the 2019 ACS results).

The split between lending to individuals and lending to corporates and the split between lending in the UK and non-UK lending is broadly even in each case, similar to previous stress tests. Over half of impairments on UK exposures are incurred on lending to individuals (mortgages and consumer credit) with the rest made up of lending to corporates.

Retail impairments reflect cost of living pressures, partially offset by improvements in portfolios.

In assessing the level of retail impairments in the stress, a key focus for Bank staff and participating banks has been judging the impact of higher inflation and higher Bank Rate in this stress scenario. Assessing how portfolios will respond to these macroeconomic conditions is made difficult by such conditions not having been experienced in the period over which most models are calibrated. On the basis of affordability analysis, it was judged that, holding all else equal, the higher cost of living in this stress scenario would typically increase banks' impairments on mortgages by 15% and increase impairments on unsecured lending by 30%, relative to if there had not been a cost of living shock.

It was also judged that the direct effect of households and businesses facing higher repayments as a result of higher interest rates in this scenario relative to the 2019 ACS would, holding all else equal, typically increase impairments on mortgages by 15%, and impairments on unsecured lending by 5%.

The impact for individual banks would vary, reflecting the differences in their business models and lending portfolios.

Despite this upward pressure on impairments, the improvements in asset quality in recent years (set out in Box B) provide a partial offset. As set out in Table C, these result in UK mortgages impairment charge rate of 0.9%, lower than the 2019 ACS rate of 1.6%. In a similar approach to previous years, the impairment rate for buy-to-let mortgages is judged to be worse than that of owner-occupier mortgages in the stress.

The increase in residential property prices, tightening of lending criteria and reduction in higher-risk legacy mortgages since the 2019 stress test mean that banks begin this stress test with significantly lower LTVs. In turn, this limits losses should those properties need to be sold.

UK unsecured lending impairment rates are broadly in line with the 2019 ACS, at 27.2% as improvements in asset quality since 2019 broadly offset the impact of a higher cost of living. Credit cards and personal loans have seen improved asset

quality reflecting smaller pockets of high-risk borrowers due to the FCA persistent debt rules, credit tightening during Covid and evidence of lower arrears.

Table C: Impairments are estimated at £125 billion over the five years of the 2022/23 ACS

Aggregate cumulative impairment charges and rates over the five years of the stress (a)
(b) (c)

Lending portfolio	Impairment charge	Rate
UK: Lending to business	£21.6 billion	8.3%
of which leveraged lending	£2.4 billion	
UK: Lending to individuals	£41.4 billion	3.0%
of which UK consumer credit	£29.8 billion	27.2%
of which UK Mortgages	£11.6 billion	0.9%
Total UK	£63.1 billion	3.9%
Non-UK: Lending to business	£33.3 billion	5.9%
of which leveraged lending	£6.7 billion	
Non-UK: Lending to individuals	£23.2 billion	6.3%
Total non-UK	£56.5 billion	6.1%

Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

(a) Cumulative impairment charge rates = (five-year total impairment charge)/(average gross on balance sheet exposures), where the denominator is a simple average of 2022, 2023, 2024, 2025 and 2026 year-end of projection positions.

(b) Other wholesale lending is excluded in Table C. Other wholesale lending consists of lending to financial institutions, housing associations, sovereigns, quasi-sovereigns and other wholesale counterparties.

(c) To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario.

Non-UK mortgage impairment rates of 1% are lower than in the 2019 ACS. This is driven by improvements in asset quality in Hong Kong and China, such as lower LTVs, which more than offsets the negative impact of the macroeconomic conditions in these jurisdictions (ie the combined effect of risks crystallising as well as the scenario impact). The non-UK unsecured lending impairment rate of 20.3%

is similar to that seen in 2019. Banks' mix of lending has changed, notably driving up impairments for higher-risk US lending. However, this is offset by changes in the lending profile in other jurisdictions, reducing impairments in the rest of world.

Similarly corporate impairments reflect higher interest rates but also changes to banks' asset mix.

At £22 billion (8.3%), UK five-year corporate impairments are lower than the £27 billion (9.5%) in the 2019 ACS. This includes the impact of Government support schemes related to Covid, which helped to bring down the impairment rate. Excluding such schemes, the corporate impairment charge is broadly the same.

The test has found a change in the composition of UK losses compared to the 2019 ACS however. Bank analysis has considered UK mid-corporate and small and medium-sized enterprises (SMEs) separately. Mid-corporates receive less government support and have lower levels of collateral supporting their lending, and as such mid-corporates are judged to have a higher loss rate.

70% of the impairments that banks reported in this scenario were from sectors that they identified as vulnerable to the scenario features of higher interest rates, inflation, cost of living pressures and supply-chain issues (as set out in more detail in Box F).

Recent years have seen a decrease in the size of participating banks' UK CRE lending. UK CRE is therefore a smaller asset class for participating banks than seen in previous years. The impairment rate on those exposures (7.5%) is broadly similar to the 2019 ACS, reflecting lower starting LTVs reflecting the increase in CRE prices up to June 2022, offset by higher interest rates and a larger decline in CRE prices in the scenario. As noted in Box B, CRE prices have declined more recently, leaving them 18% below their level at the start of the 2022/23 ACS.

Non-UK corporate impairments are broadly the same as the 2019 ACS, with comparatively smaller sterling impairments as result of the sharp sterling depreciation in the 2019 test. This ACS is the first to incorporate materially higher global interest rates. However, the impact on impairments is dampened in some countries whose economies benefit from high oil and gas prices in the scenario. In addition, there are examples of asset quality improvements since the end of 2018 as banks have actively undertaken changes to their business models.

In line with the FPC's countercyclical approach to setting the stress-test scenario, the stress start to trough decline in property prices in Hong Kong and China is smaller than in the 2019 stress, reflecting that some risks have started to materialise in these jurisdictions already. Despite this, the lending to business impairment rate in Hong Kong and China is a little higher than in the 2019 ACS (7.3% versus 6.8%) as a result of banks projecting a higher CRE impairment rate than in the 2019 ACS.

The results of the test continue to include banks' exposures to leveraged lending.

The test continues to capture the main risks to participating banks from leveraged lending. The projected five-year impairment rate for UK, US and Europe is 10.5%. By comparison, actual aggregate impairment rates on US and European leveraged loans in the GFC were 8%. A large proportion of leveraged loan exposures are in the form of revolving credit facilities (RCF). During downturns, corporates may increase their usage of credit lines thereby increasing the exposures at risk of default. In the ACS it is assumed that 80% of RCFs are drawn down throughout the scenario.

3.2: Risk-weighted assets

Rising risk-weighted assets reduce banks' CET1 ratios, albeit by less than in the 2019 ACS.

Banks' CET1 capital ratios – ie CET1 capital as a percentage of total RWAs – fall when RWAs increase. This may occur either due to an increase in banks' assets, or (as is more common during a stress) due to an increase in the average risk weights associated with those assets.

By the CET1 capital low point of the stress in year 1, average risk weights for credit exposures increase from 34% to 39%, as these exposures become riskier during the stress.

Stressed credit risk weights are however lower than in the 2019 ACS in which they reached 46% after the first year of the scenario. This reflects both lower starting risk weights in the 2022/23 ACS following improvements in asset quality since end-2018 as banks have de-risked their credit portfolios, and smaller RWA increases under stress relative to 2019. Furthermore, temporary post model adjustments

were included at the start of the test for some banks, ahead of future changes to credit capital models. This has increased the RWA starting points for these banks. These act as a floor for the RWA projections and further mute the stressed impact. See Box B for more information.

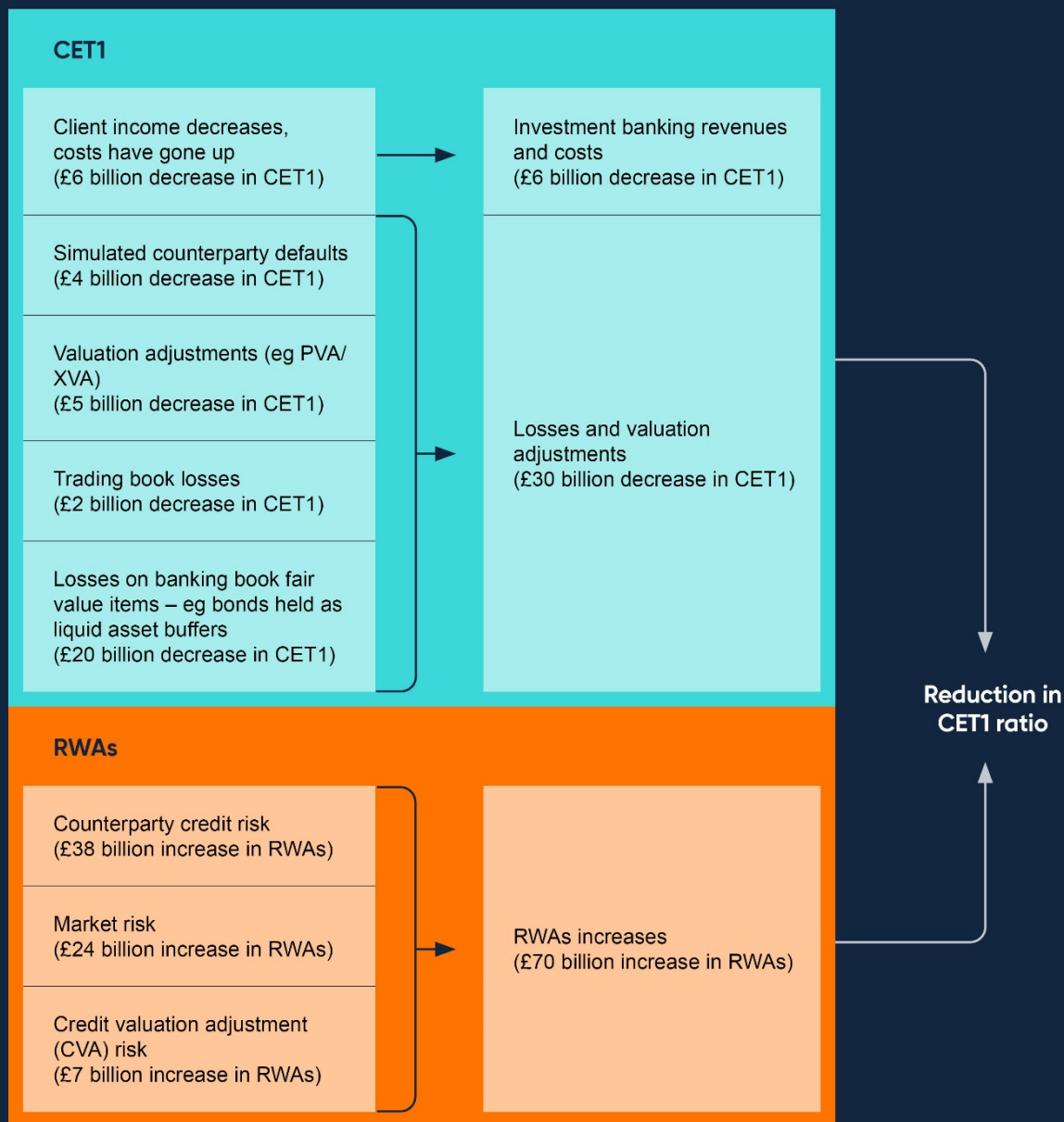
3.3: Traded risk

The traded risk scenario reduces banks' capital by around 1.5 percentage points in the first year of the stress.

The scenario sees equity prices fall and corporate bond spreads rise in the stress. Equity prices in the UK and US fall by 42% and 49% respectively over 2022–23. The spread between the yield on investment-grade corporate bonds and risk-free interest rates increases sharply from 141 basis points to 574 basis points in the US. For high-yield corporate bonds, spreads increase from 434 basis points to 1,695 basis points in the US. Measures of market-implied volatility also rise, with the Chicago Board Options Exchange Volatility Index (VIX) increasing to 45% from its 2022 Q2 level of 27.3%.

Overall this scenario has led to a reduction in banks' CET1 capital ratios through three main channels: lower investment banking income, trading book stress losses and valuation adjustments, and an increase in stressed RWAs (Figure 1). Overall traded risk in the scenario reduces banks' capital positions to a similar degree as in the 2019 ACS, with the aggregate capital position falling by 1.5 percentage points in the first year of the stress.

Figure 1: The traded scenario impacts on banks' CET1 ratios through three channels (a)



Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

(a) Numbers are relative to firm reported values in the year preceding the start of the scenario in 2022 Q2. To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario.

Investment banking income is reduced in year 1 compared to the start point, including on account of lower revenues from advisory business, but remains relatively robust. Banks expected traded revenue to be robust under the stress, supported by their experience during the Covid stress period, and it has been judged that these more recent data points can be incorporated in the projection models to some extent. This revenue is however offset by trading book losses such as syndicated loan underwriting and counterparty default losses. Stress losses are comparable to those observed in the 2019 ACS stress test.

Stressed traded risk RWAs increasing in the scenario continues to contribute significantly to the aggregate results but to a less extent than in the 2019 ACS. This is partly driven by the timing of the starting point of the scenario: RWAs are already at a heightened level at the June 2022 starting point resulting in a smaller incremental stress impact over the first year of the stress.

Fair value assets on the banking book decline in value with higher interest rates.

The increase in interest rates in the ACS scenario causes the value of fixed-rate assets held on the banking book to decline. The change in the value of those held at fair value feeds through to lower capital, reducing the aggregate CET1 ratio by 0.8 percentage points.^[25] This includes fair value assets held as part of banks' liquid asset buffers. Most of this loss arises on banks' holdings of fair valued bonds held in currencies other than sterling. The proportion of sterling bonds held by banks on a fair value basis is small and typically hedged with interest rate swaps, such that the impact of higher sterling interest rates on losses through this channel is also small. Box A provides more information on the various channels through which higher interest rates affect banks in this scenario.

3.4: Net interest income

Net interest income increases over the stress.

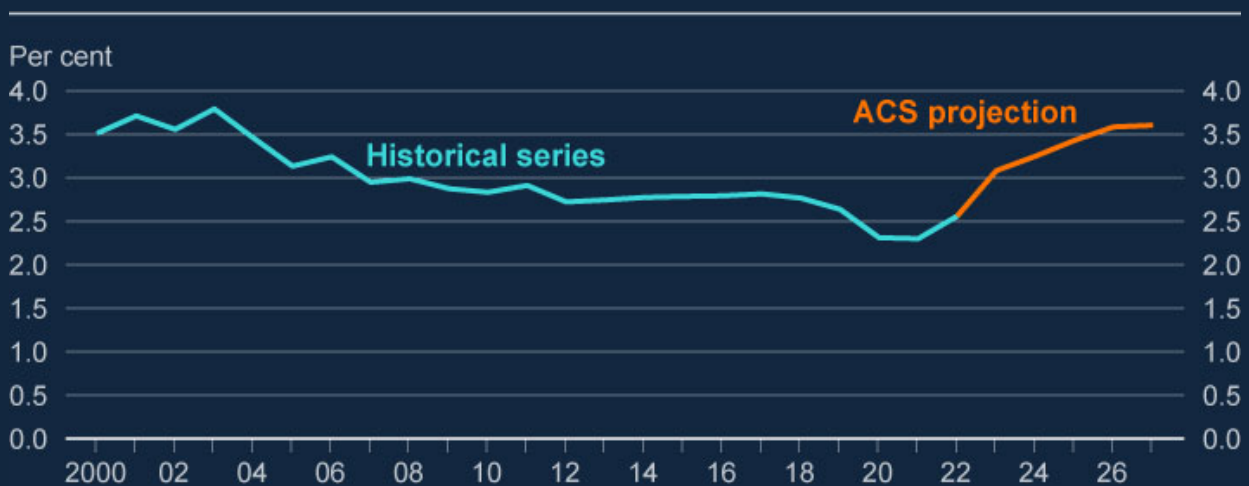
NII is the difference between what banks earn on their assets and what they pay on their funding. It is an important source of income for banks and a means through which they can rebuild capital resilience and their capacity to support households and businesses through a stress. Banks' loan margin, calculated as NII divided by

total lending, is affected by both the asset spread and the deposit spread to appropriate risk-free rates, and their ability to invest non interest bearing liabilities and equity in interest-bearing assets.

Banks begin the 2022/23 ACS with large UK customer deposit balances in aggregate, and with loan margins at historically low levels (Chart 5). Rising interest rates in the stress scenario lead to higher NII and rising loan margins for banks in aggregate over the scenario horizon. This is driven by banks' ability to deploy their non interest bearing liabilities (such as zero-interest current account deposits and equity) to assets with increasing interest rates, and by banks increasing the spread between the rates paid on their deposits and the yield they can earn on their assets. Loan margins^[26] continue to increase over most of the scenario as investments in longer-term assets funded by zero-interest liabilities mature and are replaced with assets with a higher yield.

Chart 5: Loan margins have been compressed in recent years, but rise over the stress scenario

Loan margins in the 2022/23 ACS (a) (b)



Sources: Participating banks' STDF data submissions and published accounts, Bank analysis and calculations.

(a) Loan margin is calculated as net interest income divided by total lending. Loan margins in this chart are calculated across all currencies. Net interest income is interest income minus interest expense.

(b) To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario.

While NII increases in aggregate in the 2022/23 test, the impact differs for individual banks. As set out in Box B, some banks had seen large deposit inflows during the Covid pandemic. These banks therefore enter the stress with lower funding costs than those that are more reliant on wholesale funding, as well as a stock of low-yielding assets that reprice higher as interest rates increase in the scenario. Banks that did not see as large deposit inflows during Covid have more stable NII over the scenario.

A number of judgements have been taken that constrain the benefit banks receive from higher NII in the 2022/23 ACS stress.

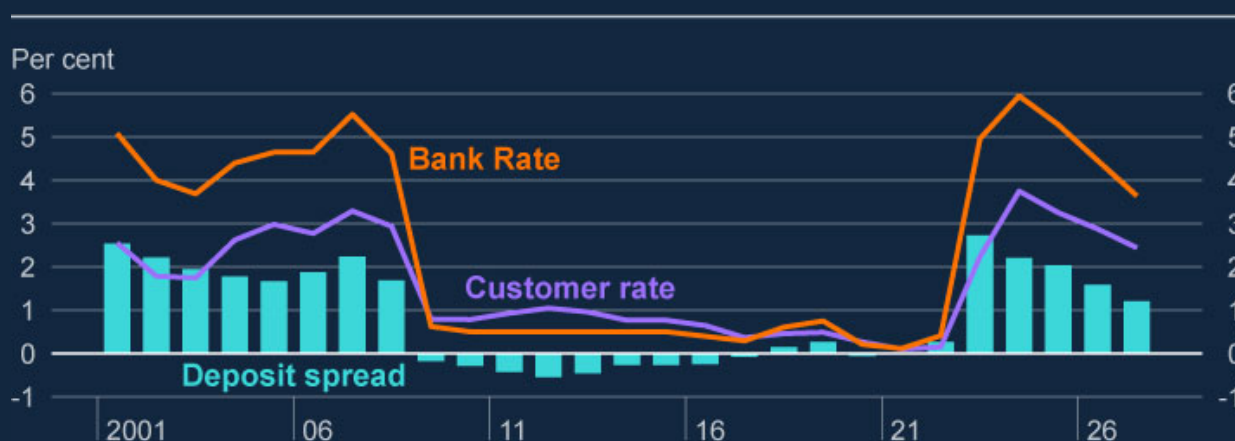
The evolution of deposit margins following an increase in interest rates is driven by factors including customer behaviour and competitive pressures. With this in mind, several judgements have been taken to limit the benefit of higher NII as the effect of rising interest rates and the higher cost of living on households and businesses in the scenario is assumed to result in competitive pressure in deposit markets. These assumptions led to some adjustments to banks' submitted projections, which are reflected in the results.

First, it is assumed that many customers would move deposits from accounts that pay no interest to deposit accounts that do pay interest. As a result, in aggregate the share of deposit balances that are non interest bearing is assumed to decline by 15 percentage points over the five years of the scenario. This results in a higher proportion of deposit balances on which banks are required to pay interest to depositors.

Second, it is assumed that banks pass changes in risk-free rates through to deposit rates to a greater degree than observed over the recent period. In the second year of the scenario, the spread between the rate on household interest-bearing sight deposits and Bank Rate is around 220 basis points (Chart 6). That is consistent with its average over 2000–07, and is lower than recent levels.

Chart 6: Deposit spreads return to a level comparable to historical levels in the second year of the scenario

Historical and projected deposit spreads in the scenario (a)



Sources: Participating banks' STDF data submissions, Household and private non-financial corporation interest-bearing sight deposits data, Bank analysis and calculations.

(a) To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario.

A judgement was also made to harmonise banks' assumptions around competition in the UK mortgage market. This resulted in adjustments to the mortgage rates offered by some banks and the range of customer mortgage rates available.

3.5: Expenses

Reflecting higher inflation, banks' expenses increase over the scenario horizon.

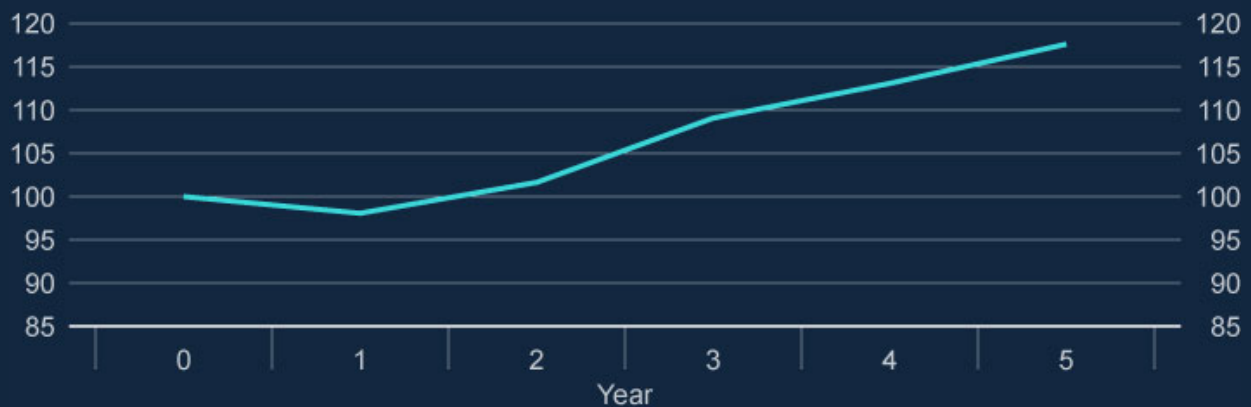
This test features high advanced-economy inflation that is initially driven by commodity and supply-chain shocks but persists in part because of expectations of higher inflation in the future. As a result there is upward pressure on banks' expenses. In the early years of the scenario this is to some extent mitigated by banks having fixed-term contracts and pay deals in place, cost-saving programs already underway, and their ability to reduce variable pay as their profitability falls. However, banks' expenses increase materially in later years, as the effect of higher inflation feeds through to a rise in staff and non-staff costs (Chart 7).

Bank analysis considered participating banks' submissions and management actions – including cost saving actions – in the context of the overall macroeconomic scenario, and for consistency with peers. Although many of the factors underlying the initial increase in consumer price inflation would play a relatively small role in banks' direct costs, it is nevertheless assumed that operating expenses at each bank rise by more than half of the cumulative increase in inflation over the five-year horizon. In aggregate costs increase by 18% over the scenario, compared to a 36% increase in UK CPI inflation over the same period.[27]

Chart 7: Banks' operating expenses rise significantly during the scenario

Banks' operating expenses in the 2022/23 ACS (a) (b) (c)

Index: Year 0 = 100



Sources: Participating banks' STDF data submissions, Bank analysis and calculations.

(a) Chart shows aggregate nominal operating expenses, in sterling, for each year of projection period divided by year zero value.

(b) To produce aggregate results in a single currency, the Bank converts the results of HSBC and Standard Chartered – which report in US dollars – into sterling at a rate consistent with the scenario.

(c) Total operating expenses in this chart include administrative expenses and staff expenses including variable compensation.

3.6: Misconduct costs

■ Misconduct costs are lower than in previous tests.

As in previous years, the stress test includes stressed projections for misconduct costs – beyond those paid or provided for by June 2022 – that relate to known misconduct issues for which a stressed projection with a low likelihood of being

exceeded can be estimated. In the 2022/23 ACS, the aggregate stressed projection for such additional conduct costs is £11.1 billion over the five years of the stress. Around £4 billion of these are realised in the first year.

3.7: Feedback and amplification effects

The GFC highlighted the need to place stronger emphasis on mitigating systemic risks in the banking system. This includes understanding how feedback and amplification channels during a stress can drive contagion losses and exacerbate the impact of an initial shock.

In the event of a stress to the banking system, a shock to a particular bank's assets causes the value of its capital position to deteriorate, increasing its probability of default, and in turn affecting the value of other banks' claims vis-à-vis the weakened bank, causing their own capital position to deteriorate. These subsequent reductions in bank capital may lead to further rounds of potential contagion as losses spread through the system.

The Bank assesses these potential contagion effects by applying a solvency contagion methodology to the UK network of interbank exposures, covering exposures among ACS and non-ACS banks. The results show that the solvency contagion risk through this channel for participating banks is low and well below its peak experienced during the GFC.

The Bank's solvency contagion model captures only one, partial, source of feedback and amplification. The Bank remains committed to further work to monitor and assess systemic risks.

Box F: Impact of cost of living pressures and higher repayments on credit impairments

A key challenge of this stress test has been to reflect the impact of higher inflation and higher Bank Rate on individuals' and corporates' ability to service debt.

Assessing how portfolios will respond to these macroeconomic conditions is made difficult by such conditions not having been experienced in the period over which most models are calibrated. Banks therefore used expert judgement and additional analysis to ensure that the impacts of interest rates and cost of living pressures were incorporated into their submitted results. In turn these judgements have been compared to Bank staff's own analysis, and adjusted as appropriate, taking into account that the impact for individual banks would vary, reflecting the differences in their business models and lending portfolios.

On the basis of affordability analysis, Bank staff judged that, holding all else equal, the higher cost of living in this stress scenario would typically increase banks' impairments on mortgages by 15% and increase impairments on unsecured lending by 30% relative to if there had not been a cost of living shock.

It was also judged that the direct effect of households and businesses facing higher repayments as a result of higher interest rates in this scenario relative to the 2019 ACS would, holding all else equal, typically increase impairments on mortgages by 15%, and impairments on unsecured lending by 5%. Note this estimate does not capture the impact of higher Bank Rate on impairments arising from the effect on broader macroeconomic variables (as discussed in Box A). The impact is smaller for unsecured lending as Bank Rate makes up a smaller component of the overall borrowing rate faced by consumers.

Given the lack of data from comparable historical episodes, there is considerable uncertainty about such estimates.

The impact of sectoral vulnerabilities to the scenario was captured in corporate impairments.

To reflect the effect of rising costs and increased interest rates on corporates, Bank staff took an approach based on analysis of particularly vulnerable sectors. This approach follows that taken in previous years. Seventy per cent of banks' aggregate submitted impairments are from sectors identified as vulnerable in this scenario, including manufacturing, wholesale and retail trade, real estate and construction.

Box G: Key judgements in the 2022/23 ACS

A wide range of judgements about what would happen in the stress scenario underpin the results of the 2022/23 ACS. This box summarises the most significant of these judgements, and explains the rationale for taking them, to provide clarity around the way the FPC and PRC approach the stress test and assess key risks.

The Bank makes adjustments to the participating banks' submitted results, many of which relate to the key judgements. In the 2022/23 ACS, as in previous years, Bank staff made adjustments to participating banks' submitted projections for their capital ratios in the stress scenario. In the 2022/23 test, these adjustments decreased the projected CET1 capital ratio at the low point by around 0.8 percentage points in aggregate.

Key judgements underpinning the 2022/23 ACS results

Cost-of-living pressures in mortgage and unsecured lending

impairments – Based on affordability analysis, Bank staff judged that the higher cost of living would increase impairments by 15% for mortgages and 30% for unsecured lending, varying by bank reflecting differences in business models and lending portfolios, relative to if there had not been a cost of living shock.

Higher repayments on mortgage and unsecured lending losses – Bank staff judged that the direct effect of households and businesses facing higher repayments as a result of higher interest rates in this scenario relative to the 2019 ACS would typically increase impairments on mortgages by 15% and on unsecured lending by 5%. As set out in Box A, this does not include the effect of Bank Rate on impairments through its effect on broader macroeconomic variables such as GDP, unemployment and residential property prices.

Buy-to-let mortgages – In a similar approach to previous years, it was judged that buy-to-let mortgages perform worse than owner-occupied in the stress.

Bank Rate to deposit rate pass-through – The effect of rising interest rates and the higher cost of living on households and businesses are assumed in the scenario to result in competitive pressure in deposit markets. As a result, it is assumed in the scenario that the interest paid on UK deposit accounts increases by more than recent experience. In the second year of the scenario, the deposit spread – ie the spread between the effective rate on household interest bearing UK sight deposits and Bank Rate – is 220 basis points. That is lower than recent levels, and consistent with its average over 2000–07.

Non interest bearing current accounts – The effect of rising interest rates and the higher cost of living on households and businesses are assumed in the scenario to result in competitive pressure in deposit markets. In aggregate the share of deposit balances that are non interest bearing is assumed to decline by 15 percentage points over the five years of the scenario.

Bank mortgage rates – In banks' submissions, there was a wide dispersion of mortgage rates reflecting different assumptions about the competitiveness of the mortgage market. A judgement has been made to increase coherence across banks.

Effect of inflation on Banks' expenses – Although many of the factors underlying the initial increase in consumer price inflation would play a relatively small role in banks' direct costs, it is nevertheless assumed that operating expenses at each bank rise by more than half of the cumulative increase in consumer prices over the five-year horizon.

4: Uses of the findings of the 2022/23 ACS stress test

4.1: Setting UK Buffers

| The stress-test results inform the setting of regulatory capital buffers.

The FPC and PRC use the results of the ACS, along with other relevant information, to help inform the setting of banks' regulatory capital buffers.

In setting the UK countercyclical capital buffer rate, the FPC takes into account the extent of financial vulnerabilities and the risk that the banking system could experience losses on its UK exposures arising from those vulnerabilities that may result in a restriction in credit supply that is not warranted by the macroeconomic outlook. The ACS informs the Committee's view of the resilience of the banking system to cyclical risks.

The PRC sets individual banks' additional PRA buffers which some banks are expected to hold in addition to the combined capital buffer. The results of the ACS provides information on the appropriate balance between system-wide and individual bank resilience.

4.2: Qualitative review

| The Bank has undertaken a qualitative review, as in previous years.

Continuous improvement in banks' own risk management and capital planning activities remains an important objective of the Bank's stress-testing framework. The Bank therefore continues to undertake a qualitative review of banks' stress-testing capabilities as part of the stress test.

This year the review found continued improvements in the quality of data provided and analysis across a number of areas. This was encouraging as the Bank recognises the challenges that banks faced in modelling certain aspects of this year's scenario, not having been experienced in the period over which most models are calibrated. Notable improvements were made in the submission of strategic management actions and capital templates, after taking into account the extensive

changes to the latter. This reflects progress against previous feedback and the impact of updated guidance. In some areas, however, the review found a deterioration in quality compared to previous tests, highlighting that banks should continue to strengthen abilities to assess the impact of the stress across all workstreams. Again this year the Bank will use formal feedback to engage with banks where it has identified that improvements can be made.

The Committees

The Financial Policy Committee

Andrew Bailey, Governor

Jon Cunliffe, Deputy Governor responsible for financial stability

Ben Broadbent, Deputy Governor responsible for monetary policy

Dave Ramsden, Deputy Governor responsible for markets and banking

Sam Woods, Deputy Governor responsible for prudential regulation

Nikhil Rathi, Chief Executive of the Financial Conduct Authority

Sarah Breeden, Executive Director for Financial Stability Strategy and Risk

Colette Bowe

Jon Hall

Randall Kroszner

Elisabeth Stheeman

Carolyn A. Wilkins

Gwyneth Nurse attends as the Treasury member in a non-voting capacity.

The Prudential Regulation Committee

Andrew Bailey, Governor

Jon Cunliffe, Deputy Governor responsible for financial stability

Ben Broadbent, Deputy Governor responsible for monetary policy

Dave Ramsden, Deputy Governor responsible for markets and banking

Sam Woods, Deputy Governor responsible for prudential regulation

Nikhil Rathi, Chief Executive of the Financial Conduct Authority

Julia Black

Tanya Castell

Antony Jenkins

Jill May

Margorie Ngwenya

John Taylor

Glossary

ACS – annual cyclical scenario.

AT1 – Additional Tier 1.

BBLS – Bounce Back Loans Scheme.

CBILS – Coronavirus Business Interruption Loan Scheme.

CET1 – Common Equity Tier 1.

CLBILS – Coronavirus Large Business Interruption Loan Scheme.

CPI – Consumer Prices Index.

CRE – commercial real estate.

CRR – Capital Requirements Regulation.

ECB – European Central Bank.

FCA – Financial Conduct Authority.

FPC – Financial Policy Committee.

GDP – gross domestic product.

GFC – global financial crisis.

IFRS 9 – International Financial Reporting Standard 9.

LCR – Liquidity Coverage Ratio.

LTV – loan to value.

MDA – maximum distributable amount.

NII – net interest income.

NSFR – Net Stable Funding Ratio.

PNFC – private non-financial corporation.

PRA – Prudential Regulation Authority.

PRC – Prudential Regulation Committee.

RCF – revolving capital facility.

RFB – ring-fenced subgroup.

RWA – risk-weighted asset.

SMA – strategic management action.

SME – small and medium-sized enterprise.

SST – solvency stress test.

STDF – Stress Test Data Framework.

VIX – Chicago Board Options Exchange Volatility Index.

Annex

The results of the 2022/23 ACS stress test of the UK banking system: Annex

1. Hurdle rates are the sum of banks' minimum capital requirements and systemic buffers, adjusted to take into account the IFRS 9 accounting standard.
2. The participating banks and building societies are: Barclays, HSBC, Lloyds Banking Group, Nationwide, NatWest Group, Santander UK Group Holdings plc, Standard Chartered, and Virgin Money UK. This test also includes four ring-fenced subgroups that sit within the participating banks: HSBC UK Bank, Lloyds Bank, Barclays Bank UK, and NatWest Holdings.
3. Unlike previous stress tests, this scenario has a mid-year rather than a year-end start point, reflecting the Bank's decision to postpone its launch from March to September 2022 following Russia's invasion of Ukraine. Given that the start point of the stress scenario is 30 June 2022 and the stress-test results are being published in 2023, the stress test is here referred to as the '2022/23 ACS'. In previous publications it was referred to as the 2022 ACS.
4. His Majesty's Treasury publishes a comparison of independent forecasts on a monthly basis. The latest set of projections were published on 21 June 2023, and include independent forecasts received until 16 June. See [Annex 1 of the report](#) for the list of forecasting institutions.
5. Unlike in the 2022/23 ACS scenario in which UK residential property prices fall by 31% relative to the June 2022 starting point, ONS UK House Price Index was in fact 2% higher in April 2023 relative to June 2022.
6. Non-transitional numbers provided assume the removal of IFRS 9 transitional relief but do continue to include the IFRS 9 adjustments to the hurdle rate.
7. Banks' CET1 capital ratios are CET1 capital as a percentage of total risk-weighted assets (RWAs).
8. Banks Tier 1 leverage ratios are the Tier 1 capital as a percentage of total leverage exposure measure.
9. Aggregate figures provided refer to the sum of the consolidated group positions ie incorporating the capital positions of the ring-fenced subgroups.
10. This is a regulatory concept that weights the accounting value of a bank's assets and credit exposures according to an assessment of each exposure's potential to suffer loss.
11. See [Q&A on the use of Liquidity and Capital Buffers](#).
12. Unlike in previous ACS tests, the requirement to submit baseline projections was removed for the 2022/23 ACS test.
13. The LCR promotes the short-term resilience of the liquidity risk profile of banks, by requiring them to hold a large stock of high-quality liquid assets sufficient to meet their payment obligations in the case of a severe short-term stress.

14. The NSFR intends to ensure that banks maintain a stable funding profile in relation to the composition of their assets and off-balance sheet activities. The NSFR focuses on protecting against liquidity risks over a longer horizon than the LCR metric.
15. The ONS UK House Price Index was 2% higher in April 2023 relative to June 2022.
16. The BBLS offered 100% Government-backed loans of up to £50,000 to SMEs (resulting in over £47 billion in loans made). The CBILS offered 80% Government-backed loans of up to £5 million for SMEs (£26 billion in loans made), and the CLBILS resulted in £5 billion in loans made. Note that these figures refer to loans made across the UK banking sector, including by non-ACS banks.
17. Post-model adjustments refer to model overlays, management overlays, model overrides, or any other adjustments made to model output where risks and uncertainties are not adequately reflected in existing models.
18. Enacted by the Financial Services (Banking Reform) Act 2013.
19. International banks can have a PRA-authorised bank registered in the UK, or a branch. Banco Santander SA has both, which means that its UK footprint includes both Santander UK Holdings plc (the UK-registered entity) and Banco Santander London Branch (the UK branch).
20. Standard Chartered and Nationwide are not in scope of the ring-fencing regime; Nationwide is excluded as it is a building society and SCB because SCB does not have a ring-fenced bank.
21. See [Recovery planning](#).
22. Figures for both 2022/23 and 2019 exclude other wholesale portfolios.
23. Excluding IFRS 9 relief.
24. Aggregate impairment rate of 4.7% excludes 'other wholesale' which consists of lending to financial institutions, housing associations, sovereigns, quasi-sovereigns and other wholesale counterparties.
25. Excludes syndicated loans.
26. Refers to a weighted average of sterling and non-sterling loan margins.
27. This judgement was applied to individual banks and was based on operating expenses excluding exceptional items (rather than costs). For banks operating outside the UK, a weighted average of UK and non-UK cumulative five-year CPI inflation was used as a comparator.