



BANK OF ENGLAND

December 2015

Stress testing the UK banking system: 2015 results



BANK OF ENGLAND

December 2015

Stress testing the UK banking system: 2015 results

Background information on the FPC and the PRA

The Financial Policy Committee (FPC) was established under the Bank of England Act 1998, in amendments made to that Act by the Financial Services Act 2012. The legislation establishing the FPC came into force on 1 April 2013. The objectives of the Committee are to exercise its functions with a view to contributing to the achievement by the Bank of England of its Financial Stability Objective and, subject to that, supporting the economic policy of Her Majesty's Government, including its objectives for growth and employment. The responsibility of the Committee, with regard to the Financial Stability Objective, relates primarily to the identification of, monitoring of, and taking of action to remove or reduce, systemic risks with a view to protecting and enhancing the resilience of the UK financial system. The FPC is accountable to Parliament.

The Prudential Regulation Authority (PRA) is a part of the Bank of England and responsible for the prudential regulation and supervision of banks, building societies, credit unions, insurers and major investment firms. It sets standards and supervises financial institutions at the level of the individual firm. The PRA has two primary objectives: to promote the safety and soundness of these firms and, specifically for insurers, to contribute to the securing of an appropriate degree of protection for policyholders. The PRA also has a secondary objective to facilitate effective competition. The PRA's most significant supervisory decisions are taken by its Board. The PRA Board is accountable to Parliament.

This document has been produced by Bank staff under the guidance of the FPC and PRA Board. It serves three purposes. First, it sets out the Bank's approach to conducting the second concurrent stress test of the UK banking system. Second, it presents and explains the results of the exercise. Third, it sets out the judgements and actions taken by the PRA Board and FPC that were informed by the stress-test results and analysis. The annexes to this report, setting out the individual bank results and supervisory stance with respect to those banks have been formally approved by the PRA Board.

The Financial Policy Committee:

Mark Carney, Governor
Jon Cunliffe, Deputy Governor responsible for financial stability
Andrew Bailey, Deputy Governor responsible for prudential regulation
Ben Broadbent, Deputy Governor responsible for monetary policy
Tracey McDermott, Acting Chief Executive of the Financial Conduct Authority
Alex Brazier, Executive Director, Financial Stability Strategy and Risk
Clara Furse
Donald Kohn
Richard Sharp
Martin Taylor
Charles Roxburgh attends as the Treasury member in a non-voting capacity.

The Prudential Regulation Authority Board:

Mark Carney, Governor
Andrew Bailey, Deputy Governor responsible for prudential regulation
Jon Cunliffe, Deputy Governor responsible for financial stability
Nemat Shafik, Deputy Governor responsible for markets and banking
Tracey McDermott, Acting Chief Executive of the Financial Conduct Authority
Paul Fisher, Deputy Head of the Prudential Regulation Authority
David Belsham
Sandra Boss
Norval Bryson
Charles Randell
David Thorburn
Mark Yallop

This paper was finalised on 30 November 2015.

Contents

	Executive summary	5
1	Introduction	11
2	Key features of the 2015 stress scenario	12
3	Approach to generating stress-test results and link to policy deliberations	13
4	Projections of capital adequacy	14
Box 1	International aspects of the 2015 stress	20
Box 2	Comparing the results of the 2015 stress test with the 2014 stress test	23
Box 3	The 2015 traded risk stress	28
Box 4	Misconduct costs	30
5	Qualitative review of banks' stress-testing frameworks	31
6	Actions taken in response to the stress test	33
Box 5	Ensuring that the banking system is sufficiently capitalised to maintain the supply of lending in the stress	35
7	Next steps	36
	Annex 1: Bank-specific results	38
	Annex 2: Bank-specific projected impairment charges and traded risk losses	45

Stress testing the UK banking system: 2015 results

Executive summary

- The Financial Policy Committee (FPC) judged that no macroprudential actions on bank capital were required in response to the 2015 stress test. The stress-test results suggest that the banking system is capitalised to support the real economy in a severe global stress scenario, which adversely affects the United Kingdom. The capitalisation of the system has improved further over the course of 2015.
- The Prudential Regulation Authority (PRA) Board judged that:
 - This stress test did not reveal capital inadequacies for five out of the seven participating banks, based on their balance sheets at end-2014 (Barclays, HSBC, Lloyds Banking Group, Nationwide Building Society and Santander UK).
 - The Royal Bank of Scotland Group did not meet its individual capital guidance after management actions in this scenario. In light of the steps that The Royal Bank of Scotland Group has already taken to strengthen its capital position, coupled with its plans for future additional Tier 1 (AT1) issuance, the PRA Board did not require The Royal Bank of Scotland Group to submit a revised capital plan.
 - Standard Chartered did not meet its Tier 1 minimum capital requirement of 6% after management actions in this scenario. In light of Standard Chartered's recent strategy review and the associated steps taken to strengthen its capital position, the PRA Board did not require Standard Chartered to submit a revised capital plan.

Background

In March 2015, the Bank of England launched its second concurrent stress test of the UK banking system.⁽¹⁾ The 2015 stress test covered seven major UK banks and building societies (hereafter referred to as 'banks'). Between them, these banks account for over 80% of PRA-regulated banks' lending to the UK real economy.⁽²⁾

Stress tests examine the potential impact of a hypothetical adverse scenario on the health of the banking system and individual institutions within it. Stress tests allow policymakers to assess banks' resilience to a range of adverse shocks and to assess their capital adequacy, not just to withstand those shocks, but also to support the real economy if a stress does materialise. Indeed, the results of the 2015 stress test assume a restriction on the ability of lenders to preserve their capital ratios by cutting the supply of credit to the UK real economy in the stress.

Stress tests contribute to the FPC's ability to fulfil its statutory responsibility to identify, monitor and take action to remove or reduce systemic risks with a view to protecting and enhancing the resilience of the UK financial system. They also contribute to the PRA's ability to advance its general objective to promote the safety and soundness of the banks it regulates.

The 2015 stress scenario

The stress scenario is not a forecast of macroeconomic and financial conditions. It does not encapsulate a set of events that is expected, or likely, to materialise. Rather, it represents a coherent tail-risk scenario designed specifically to assess the resilience of UK banks.

The design of the 2015 stress scenario reflects the judgement made by the FPC in December 2014 that global economic and financial risks had increased during 2014.⁽³⁾ In the 2015 macroeconomic stress scenario, global growth is materially lower than expectations incorporated in the baseline scenario, with the level of world GDP falling short of the October 2014 IMF *World Economic Outlook* forecast by almost 7% during the third year of the stress. In China, policy is assumed to support a rebalancing of the economy towards consumption, but that takes time to take effect and annual growth slows to a low point of 1.7%. Oil prices fall to a low of US\$38 per barrel and other commodity prices also fall sharply in the scenario. In the

(1) Unless otherwise stated, references to the Bank of England throughout this document include the PRA.

(2) The seven participating banks and building societies are: Barclays, HSBC, Lloyds Banking Group, Nationwide, The Royal Bank of Scotland Group, Santander UK and Standard Chartered. Given Nationwide's different reporting date, the stress test used an estimated 4 April 2015 balance sheet as the starting point of the analysis. Throughout this document the term 'banks' is used to refer to the seven participating banks and building societies.

(3) See 'Key elements of the 2015 stress test'; www.bankofengland.co.uk/financialstability/Documents/stresstesting/2015/keyelements.pdf.

euro area, weaker domestic demand, world trade and commodity prices are assumed to lead to further disinflationary pressures and deflation which persists for more than three years.

Financial market sentiment is assumed to deteriorate rapidly and safe-haven capital flows to high-quality US assets are generated. Volatility in financial markets ensues, with the VIX index peaking at 46 percentage points in the second half of 2015, compared with a peak of around 60 percentage points in 2008. The dollar appreciates against a wide range of currencies, with emerging market economy (EME) exchange rates particularly affected, depreciating on average by more than 25% peak-to-trough against the US dollar during the stress.⁽¹⁾ Liquidity in some markets is assumed to become seriously impaired and credit risk premia rise sharply. These movements in financial market prices are embodied in a traded risk stress scenario designed to be congruent with the macroeconomic stress (see Box 3 on pages 28–29 for further details).

In addition to the macroeconomic and traded risk elements of the stress, the 2015 stress test also incorporates stressed projections, generated by Bank staff, for potential misconduct costs and fines beyond those paid or provided for by the end of 2014 — the start point of the scenario.

These stressed misconduct cost projections are not a central forecast of misconduct provisions and costs during the period covered by the stress test. Their inclusion in the test means that the 2015 stress-test results incorporate simultaneous and unrelated stresses for banks: a macroeconomic and traded risk stress along with a misconduct cost stress.

At end-2014 banks had paid just under £30 billion in misconduct fines and other costs since 2009, and had provided for a further £13 billion. Under current accounting standards, provisions are made where an obligation exists only once settlement is considered probable and the amount can be estimated reliably.

There remains a very high degree of uncertainty around any approach to quantifying misconduct cost risks facing UK banks. The stressed projections for misconduct costs over and above those incurred or provided for at end-2014 relate to known misconduct issues, such as mis-selling of payment protection insurance and misconduct in wholesale markets, and are assumed to be independent of the macroeconomic element of the test.

The stressed projections have been calibrated by Bank staff to have a low likelihood of being exceeded.⁽²⁾ They are therefore, by design, much larger than the amounts that had already been provided for by banks at end-2014. Partly because they

relate only to known issues, however, they cannot be considered a 'worst case' scenario (see Box 4 on pages 30–31 for further details). Over the five years of the stress scenario stressed misconduct costs are assumed to reduce banks' pre-tax profits by around £40 billion.

Projections of bank capital adequacy in the stress scenario

Performance in the stress was assessed against two metrics of capital adequacy. As in the 2014 test, banks were assessed against a common equity Tier 1 (CET1) capital ratio of 4.5% of risk-weighted assets. For the 2015 test, an additional leverage ratio threshold has been introduced. This was set at 3% of the Leverage Exposure Measure, to be met with Tier 1 capital.⁽³⁾

To derive the projections of bank capital adequacy in the stress scenario, Bank staff used banks' own models, in-house models, sectoral analysis and peer comparison. Bank staff made judgements in producing the final projections, under the guidance of the FPC and the PRA Board. The bank-specific results have been approved by the PRA Board.

Table 1 Contributions to the shortfall in the aggregate CET1 capital ratio and Tier 1 leverage ratio at the low point of the stress in 2016 relative to the baseline projection

	CET1 ratio ^(a)	Leverage ratio ^(b)
Actual end-2014	11.2%	4.4%
Baseline end-2016	12.0%	4.9%
Impairments	-1.8 pp	-0.6 pp
Traded risk losses ^(c)	-1.6 pp	-0.6 pp
Net interest income	-0.3 pp	-0.1 pp
Misconduct costs	-1.4 pp	-0.5 pp
Risk-weighted assets/leverage exposure measure ^(d)	-1.2 pp	0.2 pp
Dividends	1.0 pp	0.4 pp
Expenses and taxes	0.7 pp	0.2 pp
Other (including reduced AT1 issuance) ^(e)	0.2 pp	-0.3 pp
Stress end-2016	7.6%	3.5%

Sources: Participating banks' published accounts and Firm Data Submission Framework (FDSF) data submissions, Bank analysis and calculations.

- (a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets, where these are defined in line with the UK implementation of the CRR via the PRA Rulebook.
- (b) The end-point Tier 1 leverage ratio as defined in the FPC's leverage ratio review, taking into account the European Commission Delegated Act on the leverage ratio.
- (c) Traded risk losses comprise: market risk, counterparty credit risk, credit valuation adjustment (CVA), prudential valuation adjustment (PVA), estimates for investment banking revenues net of costs; and available-for-sale (AFS) and fair value option (FVO) parts of the banking book. The aggregate proportion of banks' total revenues less costs allocated to investment banking has been estimated by the Bank.
- (d) Changes in risk-weighted assets impact the CET1 ratio, whereas changes in the leverage exposure measure impact the Tier 1 leverage ratio.
- (e) Other comprises other profit and loss and other capital movements. Other profit and loss includes other provisions, fees and commissions and other income. In addition to reduced AT1 issuance, other capital movements include exchange rate movements, pension assets devaluation, deferred tax assets, prudential filters, and actuarial gain from defined benefits.

(1) This group of EMEs comprises Argentina, Brazil, China, Indonesia, Mexico, Russia, Saudi Arabia, South Africa and Turkey.

(2) This marks a change relative to the Bank's treatment of misconduct costs in the 2014 stress test.

(3) Relevant AT1 instruments are permitted to comprise up to 25% of this requirement.

Based on the Bank's final projections, the stress scenario would reduce the aggregate CET1 ratio across the seven banks from 11.2% at the end of 2014 to a low point of 7.6% in 2016 (Table 1).⁽¹⁾ The aggregate Tier 1 leverage ratio falls from 4.4% at the end of 2014 to a low point of 3.5% in 2016, after 'strategic' management actions.

The severity of the impact of the stress can also be measured by comparing the stress projection with the aggregate projection of banks' capital adequacy in the baseline scenario. The baseline path of the aggregate CET1 ratio is projected to rise from 11.2% at the end of 2014 to 12% in 2016. This measure of the impact of the stress is therefore the difference between the 7.6% stress low point and this baseline path. That is 4.4 percentage points in 2016.

Most banks are projected to incur substantial pre-tax losses in the first two years of the stress scenario. These losses total £37 billion, equivalent to around two thirds of the reduction in CET1 capital over that period. And relative to projected aggregate profits in the baseline, profits in the stress are down by almost £100 billion by the end-2016 low point. The shortfall in aggregate profits relative to base is driven by:

- Falling global GDP and rising unemployment, which reduce borrowers' ability to service debts and contribute to material increases in loan impairment charges. In line with the macroeconomic scenario, which focuses on vulnerabilities related to the global economic environment, impairment rates are projected to be particularly elevated in emerging economies and euro-area periphery countries (see Box 1 on pages 20–21).
- Sharp movements in market prices and increased counterparty credit risk, which lead to material traded risk losses. These losses are concentrated in 2015. By the end-2016 low point of the stress, traded risk losses, including an estimate of the decline in projected net investment banking revenues in the stress relative to banks' baseline projections, reduce bank capital by £34 billion.
- Lower net interest income, reflecting weaker loan growth in the United Kingdom and the lower path for Bank Rate, which falls to and remains at zero in the stress scenario. This lower path for Bank Rate and lower lending volumes prevent banks from increasing their net interest income as they expect to do in the baseline scenario in which Bank Rate rises gradually.
- Stressed projections for misconduct fines and other costs beyond those provided for at the end of 2014. The 2015 stress-test exercise examines banks' resilience to a much higher level of misconduct costs than UK banks had provided for as at the end of 2014. Around £30 billion of these misconduct costs are projected to be realised by the end of 2016 (see Box 4 on pages 30–31).

The headline stress-test results include projected reductions in banks' dividend payments to shareholders. These reductions partially offset the impact of the stress scenario on banks' capital adequacy. In total, reductions in dividends of around £21 billion mitigate the fall in the aggregate CET1 ratio by 1 percentage point at the low point of the stress in 2016. Planned and mandated reductions account for almost all of these cuts, which come about either as a result of banks' publicly stated payout rules or because they would be mandated as capital ratios fall into the capital buffers that will be phased in under the Capital Requirements Directive IV⁽²⁾ (see Annex 1). In a real stress, which had a significant impact on banks' profits, investors should expect banks to cut dividends materially, in line with published dividend policies and the operation of the capital conservation buffer.

Lower taxes and reductions in expenses also mitigate the impact of the stress on banks' capital positions relative to the baseline. Reductions in expenses — attributable to cuts in staff costs — are largely classified as 'strategic' management actions. In aggregate, these lower taxes and reductions in expenses mitigate the fall in banks' CET1 ratios by around 0.4 percentage points and 0.3 percentage points, respectively, at the low point of the stress.

All of these factors determining the magnitude of the fall in banks' CET1 ratios also affect Tier 1 leverage ratios in the stress (Table 1). An additional factor weighing on aggregate Tier 1 capital in the stress is that some banks do not issue AT1 capital instruments they had planned to issue in the baseline. This lack of AT1 issuance reduces banks' aggregate Tier 1 leverage ratio by 0.3 percentage points at the low point of the stress in 2016.

Overall, risk-weighted capital ratios fall proportionately more than leverage ratios, in part because aggregate risk-weighted assets (RWAs) rise materially in the stress. This rise in RWAs reduces the aggregate CET1 ratio by 1.2 percentage points relative to baseline at the low point of the stress. Both the macroeconomic and traded risk stresses contribute to the rise in RWAs in the stress, with average risk weights rising by 7 percentage points, from 36% to 43% between end-2014 and end-2016.

As at the end of 2014, UK banks had issued just under £16 billion of AT1 capital instruments, for which conversion to CET1 would be triggered if their CET1 ratios fell below 7%. Further issuance during 2015 meant that all stress-test

(1) Aggregate CET1 capital ratios calculated as the sum of CET1 capital over the sum of RWAs. Aggregate leverage ratios are the sum of eligible Tier 1 capital over the sum of leverage exposure measure.

(2) Under the Capital Requirements Directive IV, banks that fail to meet their combined buffer are subject to automatic restrictions on distributions of dividends and bonuses. Stress-test results for banks projected not to meet their combined buffer during the stress scenario include the impact of these restrictions. Reductions to dividends account for the majority of these mandated cuts. For further details see page 27.

Table 2 Projected CET1 capital ratios and Tier 1 leverage ratios in the stress scenario^{(a)(b)}

Per cent	Actual (end-2014)	Minimum stressed ratio (before the impact of 'strategic' management actions or AT1 conversion) ^(c)	Minimum stressed ratio (after the impact of 'strategic' management actions and before AT1 conversion) ^(c)	Minimum stressed ratio (after the impact of 'strategic' management actions and conversion of AT1) ^(c)	Actual (2015 Q3)
CET1 ratios					
Barclays	10.2	6.8	7.3	7.3	11.1
HSBC	10.9	7.0	7.7	7.7	11.8
Lloyds Banking Group	12.8	9.5	9.5	9.5	13.7
Nationwide ^(d)	19.8	19.1	19.1	19.1	21.9
The Royal Bank of Scotland Group	11.1	5.9	6.1	6.1	12.7
Santander UK	11.9	9.5	9.8	9.8	11.7
Standard Chartered	10.5	5.1	5.4	5.4	11.4
Aggregate^(e)	11.2	7.2	7.6	7.6	12.2
Leverage ratios					
Barclays	3.7	3.2	3.3	3.3	4.2
HSBC	4.8	3.5	3.7	3.7	5.0
Lloyds Banking Group	4.9	3.9	3.9	3.9	5.0
Nationwide ^(d)	4.1	4.1	4.1	4.1	4.2
The Royal Bank of Scotland Group	4.2	2.9	3.0	3.0	5.0
Santander UK	3.8	3.3	3.4	3.4	4.1
Standard Chartered	4.5	2.8	3.0	3.0	4.8
Aggregate^(e)	4.4	3.4	3.5	3.5	4.7

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

(a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets, where these are defined in line with the UK implementation of the CRR via the PRA Rulebook.

(b) The end-point Tier 1 leverage ratio as defined in the FPC's leverage ratio review, taking into account the European Commission Delegated Act on the leverage ratio.

(c) 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.

(d) For Nationwide the stress tests are based on an estimated 4 April 2015 balance sheet, rather than end-2014. See Annex 1 for more details.

(e) Aggregate CET1 ratios are calculated by dividing aggregate CET1 capital by aggregate risk-weighted assets. Aggregate leverage ratios are calculated by dividing aggregate Tier 1 capital by aggregate exposure measure.

participants had issued capital instruments of this type by 2015 Q4, although AT1 capital instruments issued after the end-2014 cut-off were not considered in the 2015 stress-test results. After dividend reductions and 'strategic' management actions, all banks that had AT1 capital instruments in issuance at end-2014 had projected CET1 ratios that remained above 7% in the stress (Table 2). Therefore no AT1 instruments were assumed to convert into equity in the stress scenario.

The impact of the scenario differs substantially across banks (Table 2). In part this is due to differences between banks' business models and the geographic distribution of their exposures, in light of the Asia and emerging markets focus of the stress. Non-UK impairment charges are projected to rise sharply in the stress, which particularly impacts the profitability of the least UK-focused lenders, Standard Chartered and HSBC. Traded risk losses are also material, with universal banks, HSBC, Barclays, Standard Chartered and the Royal Bank of Scotland Group bearing the vast majority of these losses.

Impairments on UK mortgage lending are not projected to become particularly elevated in the stress. In this respect, the results differ from those of the 2014 stress scenario, which incorporated larger shocks to UK property prices and unemployment. As a consequence the 2014 stress was more

severe for banks with significant exposures to the UK residential and commercial property markets.

FPC and PRA Board actions taken in response to the stress test

The PRA Board and the FPC use the results of the stress test as part of their respective evaluations of the capital adequacy of individual institutions and the resilience of the system as a whole. The overall 'hurdle rate' framework was agreed by the FPC and the PRA Board earlier in the year. This is not a mechanistic 'pass-fail' test and there is, therefore, no automatic link between stress-test results and capital actions required. Although the exercise only assessed the impact of a single stress scenario, it allowed policymakers to form judgements on the resilience of the UK banking system to a severe macroeconomic downturn, which could be a feature of different possible stressed states.

The banking system in aggregate

An important macroprudential goal of stress testing is to help the FPC assess whether the banking system is sufficiently well capitalised to maintain the supply of credit in the face of adverse shocks. To that end, banks were restricted in their ability to cut the supply of lending to the UK real economy in the stress. The Bank prescribed an aggregate lending path in the stress, in which lending to the UK real economy expanded by 9% over the five years of the stress, in line with Bank staff's

projection of the demand for credit over that period. It also ensured that banks' projections for lending to the UK real economy were consistent, in aggregate, with this path for lending in the stress.

The FPC noted that in the stress, in aggregate, the risk-weighted CET1 capital and Tier 1 leverage ratios of UK banks were 7.6% and 3.5% respectively at the low point, after 'strategic' management actions. The FPC also noted that the capitalisation of the system had improved further over the course of 2015. Moreover, as described above, the stress-test results and banks' capital plans, taken together, indicated that the banking system would have the capacity to maintain its core functions in a stress scenario such as the one in the 2015 stress test.

The FPC considered the information from the 2015 stress test, alongside other indicators and analysis, including the 2014 stress test, in assessing the overall capital adequacy of the UK banking system. UK banks continue to strengthen their balance sheets and improve their capital positions. Other things being equal, this suggests that UK banks would now be more resilient in the face of the macroeconomic stress scenario in the 2014 stress test.

The FPC judged that no macroprudential actions on bank capital were required in response to the 2015 stress test. The stress-test results suggested that the banking system was capitalised to support the real economy in a global stress scenario which adversely impacts the United Kingdom, such as that incorporated in the 2015 stress scenario.

Some banks have issued high-trigger AT1 capital instruments since the balance sheet cut-off date of 31 December 2014 for the 2015 stress test. As described above, none of banks' AT1 capital instruments as at end-2014 would have converted to equity in this particular scenario. But the FPC and PRA Board noted that the conversion of these instruments to equity would act to support the resilience of the banking system, as well as individual banks within it, in future stresses. They emphasised that investors in these instruments should be aware that this would happen should a stress materialise in which banks' CET1 ratios fell below these instruments' trigger points.

Individual institutions

In determining whether an individual bank's capital needed to be strengthened further, the PRA Board considered a number of factors, including whether a bank's CET1 ratio was projected to fall below the 4.5% CET1 threshold, or its Tier 1 leverage ratio was projected to fall below the 3% Tier 1 leverage threshold. Where individual banks' CET1 and Tier 1 leverage ratios were close to these thresholds, the PRA Board also considered other factors. These included, but were not limited to, whether banks' capital resources in the stress were

sufficient to cover their Pillar 1 capital requirements on a CET1, Tier 1 and Total capital basis, and their individual capital guidance, which includes Pillar 2A capital requirements.⁽¹⁾ These Pillar 2A capital requirements relate to risks not adequately captured under the common minimum requirements of the Pillar 1 regime, including, for example, pension risk, concentration risk and interest rate risk in the banking book. The PRA Board was also mindful of the extent to which vulnerabilities in banks' business models were tested by this particular stress scenario.

The PRA Board judged that this stress test did not reveal capital inadequacies for five of the seven banks, given their balance sheets at end-2014 (Barclays, HSBC, Lloyds Banking Group, Nationwide Building Society, Santander UK). For the other two banks (The Royal Bank of Scotland Group (RBS) and Standard Chartered) the PRA Board decided that, given continuing improvements to their resilience over the course of 2015 and plans to increase capital, these banks were not required to submit a revised capital plan.

- The Royal Bank of Scotland Group (RBS)**: The results show that RBS's capital position remains above the threshold CET1 ratio of 4.5% and meets the leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 6.1% CET1 ratio and 3.0% leverage ratio after 'strategic' management actions. **The PRA Board judged that The Royal Bank of Scotland Group did not meet its individual capital guidance after management actions in this scenario.** Since December 2014, RBS has taken actions to improve its capital position. During the course of 2015, RBS issued £2 billion of AT1. The Interim Management Statement published on 30 October 2015 showed that the Group's CET1 ratio and Tier 1 leverage ratio have increased to 12.7% and 5.0% respectively since 31 December 2014. In addition, RBS's capital plan includes plans to issue further AT1 in 2016. The AT1 will insure against risk over the next few years, during which time the bank is expected to strengthen its capital position further. **In light of the steps that The Royal Bank of Scotland Group has already taken to strengthen its capital position, coupled with its plans for future AT1 issuance, the PRA Board did not require The Royal Bank of Scotland Group to submit a revised capital plan.**
- Standard Chartered**: The results show that Standard Chartered's capital position remains above the threshold CET1 ratio of 4.5% and meets the leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 5.4%

(1) Internationally agreed Pillar 1 capital requirements include minimum ratios for risk-weighted CET1 capital set at 4.5%, risk-weighted Tier 1 (CET1 and AT1) capital set at 6%, and risk-weighted total capital (Tier 1 and Tier 2), set at 8%. Pillar 2A risk-weighted capital requirements are additional requirements that are set by the PRA for individual banks. For further details see *PRA Policy Statement PS17/15*, 'Assessing capital adequacy under Pillar 2'; www.bankofengland.co.uk/pradocuments/publications/ps/2015/ps1715.pdf.

CET1 ratio and 3.0% leverage ratio after 'strategic' management actions. **The PRA Board judged that Standard Chartered did not meet its Tier 1 minimum capital requirement of 6% after management actions in this scenario.** During 2015 the Standard Chartered Board undertook a number of capital strengthening actions as well as a strategic review. The Standard Chartered Board concluded that its balance sheet needed to be strengthened and announced a plan that included a rights issue and a reduction in risk-weighted assets. Since December 2014, Standard Chartered has taken action to strengthen its capital position. In March 2015, Standard Chartered issued US\$2 billion of AT1. Standard Chartered's Interim Management Statement published on 3 November showed CET1 and leverage ratios of 11.4% and 4.8%, respectively. The bank also announced a revised strategy, including a fully-underwritten capital issuance of US\$5.1 billion which is due to complete on 10 December. **In light of Standard Chartered's recent strategy review and the associated steps taken to strengthen its capital position, the PRA Board did not require Standard Chartered to submit a revised capital plan.**

Next steps

The concurrent stress tests conducted by the Bank in 2014 and 2015 constitute important steps towards the development of a stress-testing framework for the UK banking system.

In October 2015 the Bank released 'The Bank of England's approach to stress testing the UK banking system', which sets out the main features of the Bank's stress-testing framework to 2018.⁽¹⁾ This framework has been shaped both by lessons learnt during the 2014 and 2015 tests, and feedback to the 2013 Discussion Paper.⁽²⁾ Over the next three years, the Bank is planning to:

- develop an approach to stress testing that is explicitly countercyclical, with the severity of the test, and associated regulatory capital buffers, varying systematically with the level of risk;
- improve the consistency between the concurrent stress test and the overall capital framework, including by ensuring that systemically important banks are held to higher standards; and
- enhance its own modelling capability, while ensuring that banks continue to play an important role in producing their own projections of the impact of the stress.

As part of the new framework, the Bank will design and run a scenario that is intended to assess the risks to the banking system emanating from the financial cycle each year — the 'annual cyclical scenario'. The severity of this scenario will increase as risks build up and decrease as those risks crystallise or abate. In addition, every other year, the annual cyclical scenario will be complemented by an additional scenario intended to probe the resilience of the system to risks that may not be neatly linked to the financial cycle — the 'biennial exploratory scenario'. This scenario will explore emerging or latent threats to financial stability. It will not be used to change the Bank's risk tolerance, but will aim to explore risks that are not captured by the annual cyclical scenario.

The Bank's intention to run the exploratory scenario biennially will ensure that the burden on banks remains reasonable and proportionate. In 2016, the European Banking Authority (EBA) intends to run a stress test, and the Bank will run the cyclical scenario only. In 2017, the Bank intends to run both the cyclical and exploratory scenarios together for the first time. In 2018, the Bank intends to run the cyclical scenario only.

(1) See www.bankofengland.co.uk/financialstability/Documents/stresstesting/2015/approach.pdf.

(2) See www.bankofengland.co.uk/financialstability/fsc/Documents/discussionpaper1013.pdf.

1 Introduction

The 2015 stress test is the Bank's second annual concurrent stress test.

This document sets out and explains the results of the Bank's 2015 stress test of the UK banking system. It also describes the judgements and actions taken by the PRA Board and FPC that were informed by the stress-test results and analysis. The 2015 stress test is the Bank's second concurrent test. It covers seven banks, which together account for over 80% of PRA-regulated banks' lending to the UK real economy.⁽¹⁾

The Bank's concurrent stress-testing framework was established following a Recommendation from the FPC in March 2013.⁽²⁾ The framework builds on the previous approach taken by the PRA (and the Financial Services Authority (FSA) before that), under which supervisory stress tests had been conducted sequentially on individual banks. The concurrent approach provides policymakers with a better understanding of the resilience of the UK banking system as a whole — helping to inform both the FPC and PRA Board. The PRA continues to conduct sequential stress tests for firms that are outside the scope of the concurrent exercise.

Concurrent stress testing serves the needs of the FPC and PRA.

The main purpose of the stress-testing framework is to provide a forward-looking, quantitative assessment of the capital adequacy of the UK banking system as a whole, and individual institutions within it. In doing so, it aims to support both the FPC and the PRA in meeting their statutory objectives.

The framework delivers an integrated process for deliberations around bank capital, both at a system-wide and an individual-institution level, helping co-ordinate the conduct of macroprudential and microprudential policy, allowing policymakers to be clear about the resilience standards against which they hold the banking system. The stress-testing framework also provides a device through which the Bank can be held accountable to Parliament, and the wider public, on its financial stability objective.

The Bank launched its 'Approach to stress testing the UK banking sector' in October 2015.

The Bank intends to develop its stress-testing framework further in 2016 and beyond, as set out in 'The Bank of England's approach to stress testing the UK banking sector'.⁽³⁾ In particular, the Bank intends to run two different types of scenario from 2016 onwards in the form of an annual cyclical scenario, which will be used to assess risks to the banking system associated with the state of the financial cycle, and a biennial exploratory scenario, which will probe the resilience of the system to risks that policymakers judge to be emerging threats to financial stability but may not be linked directly to the state of the cycle.

The remainder of this document is structured as follows:

- Section 2 sets out the key features of the scenario explored by the Bank's 2015 stress test.
- Section 3 explains the link between stress-test results and the FPC and PRA Board's policy deliberations, it also outlines the Bank's approach to generating stress-test results.
- Section 4 outlines the quantitative projections of capital adequacy, both in the baseline and the stress scenario.
- Section 5 provides a summary of the qualitative assessment of participating banks' stress-testing and capital-management processes.
- Section 6 explains the judgements and actions taken by the PRA Board and FPC in response to the results of the stress test.
- Section 7 concludes with a description of next steps for the development of the concurrent stress-testing framework. This draws heavily on the 'Bank of England's approach to stress testing'.

The annexes to this document provide more detailed information on bank-specific results — and associated supervisory responses by the PRA Board.

(1) The seven participating banks and building societies are: Barclays, HSBC, Lloyds Banking Group, Nationwide, The Royal Bank of Scotland Group, Santander UK and Standard Chartered. Given Nationwide's different reporting date, the stress test used an estimated 4 April 2015 balance sheet as the starting point of the analysis. Throughout this document the term 'banks' is used to refer to the seven participating banks and building societies.

(2) See www.bankofengland.co.uk/publications/pages/news/2013/013.aspx.

(3) See 'The Bank of England's approach to stress testing the UK banking system'; www.bankofengland.co.uk/financialstability/Documents/stresstesting/2015/approach.pdf.

2 Key features of the 2015 stress scenario

The Bank's 2015 stress scenario has several new features.

The 2015 stress test builds on the approach taken in 2014, and extends it in several important respects. A key difference is that unlike the 2014 test, which utilised aspects of the European Banking Authority's (EBA's) EU-wide stress test, the 2015 stress and baseline scenarios were fully designed and calibrated by Bank staff. The time span of the test has also been expanded from three to five years, so that the 2015 test covers the period from end-2014 to 2019. Expanding the time span to five years allows the Bank to judge how stress factors that might be longer lasting than typical recessions or financial market shocks might impact the UK banking sector, as well as providing information on how the UK banking system might be expected to recover from a stress.

The design of the 2015 stress scenario reflects, in part, Bank staff analysis in the December 2014 *Financial Stability Report* and the judgement made by the FPC in December 2014 that the potential for the global economic and financial environment to expose vulnerabilities for UK financial stability had grown. The 2015 test incorporates a more severe global slowdown but less severe UK economic shocks than the 2014 test. It also incorporates a very different path for interest rates, which are assumed to fall further and remain exceptionally low in the 2015 test. In the 2014 test, they were assumed to rise sharply.

In addition to the macroeconomic and related traded risk elements of the stress test, the 2015 stress test also incorporates stressed projections for additional misconduct fines and other costs over and above the level of banks' provisions for misconduct costs as at the end of 2014. This misconduct element of the stress test is independent of the macroeconomic part of the test (see Box 4 on pages 30–31 for further details).

It is important to note, however, that as in 2014, the stress scenario is not a forecast of macroeconomic and financial conditions in the United Kingdom or other countries. It is not a set of events that is expected, or likely, to materialise. Rather, it is a coherent 'tail-risk' scenario that has been designed specifically to assess the resilience of UK banks and building societies to a deterioration in global economic conditions. Likewise, stressed projections for misconduct costs are calibrated to be much greater than a central projection for future costs.

The stress scenario focuses on exploring the vulnerabilities of UK banks to a global stress.

In the 2015 macroeconomic stress scenario, global growth is materially lower than expectations incorporated in the baseline scenario, with the level of world GDP falling short of the October 2014 IMF *World Economic Outlook* forecast by

almost 7% during the third year of the stress. In China, policy is assumed to support a rebalancing of the economy towards consumption, but that takes time to take effect and growth slows materially. Oil prices fall to a low of US\$38 per barrel and other commodity prices also fall sharply in the scenario. In the euro area, weaker domestic demand, world trade and commodity prices are assumed to lead to further disinflationary pressures and deflation, which persists for more than three years.

Financial market sentiment is assumed to deteriorate rapidly in the 2015 stress scenario and safe-haven capital flows to high-quality US assets are generated. Volatility in financial markets ensues, with the VIX index peaking at 46 percentage points in the second half of 2015, compared with a peak of around 60 percentage points in 2008. The dollar appreciates against a wide range of currencies, with emerging market economy (EME) exchange rates particularly affected, depreciating on average by more than 25% peak-to-trough during the stress.⁽¹⁾ Liquidity in some markets is assumed to become seriously impaired and credit risk premia rise sharply. These movements in financial market prices are embodied in a traded risk stress scenario, designed to be congruent with the macroeconomic stress (see Box 3 on pages 28–29 for further details).

An important macroprudential goal of stress testing is to help the FPC assess whether the banking system is adequately capitalised to maintain the supply of financial services under adverse conditions, and the 2015 stress test has been designed with this aim in mind. The results of the 2015 stress test assume a restriction on the ability of lenders to preserve their capital ratios by cutting the supply of credit to the UK real economy in the stress. To this end, the Bank published paths for aggregate bank lending to the UK real economy under the baseline and stress scenarios, calibrated so that the difference between these lending paths reflected the estimated impact of the stress on credit demand. Banks' capital projections are consistent with the published aggregate lending path under the stress (see Box 5 on page 35).

⁽¹⁾ The 25% depreciation is based on a GDP-weighted EME currency index. This group of EMEs comprises Argentina, Brazil, China, Indonesia, Mexico, Russia, Saudi Arabia, South Africa and Turkey.

3 Approach to generating stress-test results and link to policy deliberations

Bank staff used participating banks' own projections as a starting point and used a range of analysis to make adjustments to banks' projections.

As in 2014, the first step in deriving projections of capital adequacy was for participating banks to provide detailed projections for a range of income statement and balance sheet items, supported by additional information on the underpinning methodologies and assumptions. Bank staff assessed these methodologies, focusing particularly on those portfolios that were most likely to be affected by the stress scenario. In some cases, participating banks were required to revise submissions where they had not followed the prescribed methodology accurately.

Bank staff used in-house models to provide independent benchmarks against which to judge the information provided by banks. As a result of ongoing model development work, analysis based on in-house modelling played a greater role in informing staff judgements in 2015 than was possible in 2014. The Bank plans to develop its own modelling capability further, with plans to focus on enhancing the Bank's ability to

model feedback and amplification mechanisms associated with stress scenarios, as explained in 'The Bank of England's approach to stress testing the UK banking system'.

In addition to analysis based on in-house quantitative models, the final results were also informed by comparing banks' projections with those of their peers.

Bank staff made judgements in producing the final projections under the guidance of the FPC and the PRA Board. The bank-specific results have been approved by the PRA Board.

A leverage threshold has been added to the hurdle rate framework.

The hurdle rate framework provides an important benchmark to help the FPC and PRA assess the capital adequacy of the banking system and individual institutions within it, in light of the projections generated by the stress test. An important development for the 2015 stress test is the introduction of a leverage threshold as part of the hurdle rate framework. This is set at 3% of the Leverage Exposure Measure, to be met with Tier 1 capital⁽¹⁾ and complements the pre-existing hurdle rate set at 4.5% of risk-weighted assets, to be met with CET1 capital in the stress.

(1) Relevant AT1 instruments would be permitted to comprise up to 25% of the Tier 1 leverage ratio.

4 Projections of capital adequacy

This section outlines the Bank's final projections of stress-test participants' capital ratios. Section 4.1 summarises projections under the baseline scenario, noting the important drivers. Section 4.2 sets out the Bank's view of the impact of the stress scenario on banks' CET1 risk-weighted capital ratios and Tier 1 leverage ratios. It highlights the key factors reducing banks' capital in the stress, as well as describing the ways that banks are able to cushion the impact of the stress, including through 'strategic' management actions.

4.1 Baseline projections

The baseline projections in the Bank of England's stress test can be thought of as a representation of participating banks' business plans, conditional on the set of baseline scenario variables published by the Bank. This set of variables includes paths for domestic GDP growth, inflation, lending growth, and Bank Rate, which are broadly consistent with the Monetary Policy Committee's February 2015 *Inflation Report*. A range of international variables were also published consistent with the October 2014 IMF *World Economic Outlook (WEO)*.

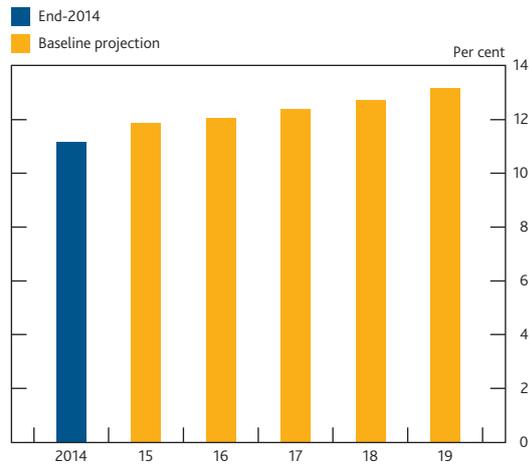
In aggregate, UK banks have improved their capital positions through a combination of reducing RWAs and increasing capital over recent years. As a result, at the end of 2015 H1, the aggregate Basel III CET1 capital ratio for major UK banks had increased from 7.2% in 2011 to 11.9%.⁽¹⁾ That said, some banks remain in recovery or in the process of restructuring their balance sheets following the crisis, and this is reflected in their baseline projections, which in some cases include further major asset sales. Meanwhile, as the final elements of the Basel III capital rules are phased in between 2016 and 2019, minimum capital buffers will continue to increase.

Under the baseline scenario, in aggregate, stress-test participants' capital positions continue to improve (Charts 1 and 2). The aggregate CET1 ratio increases by 2 percentage points from 11.2% at the end of 2014 to 13.2% by 2019. Over the same period the aggregate leverage ratio of the system is projected to rise from 4.4% to 5.4% in the baseline projection.

In the baseline, the most important expected contributor to the gradual further improvement in banks' capital positions over the coming years is retained earnings. **Banks' baseline projections do not include misconduct costs beyond those already paid and provided for at end-2014.**

Although some banks continue to reduce RWAs over the early years of the projection as they implement their corporate plans, aggregate RWAs are projected to increase by around 8.4% between end-2014 and 2019.

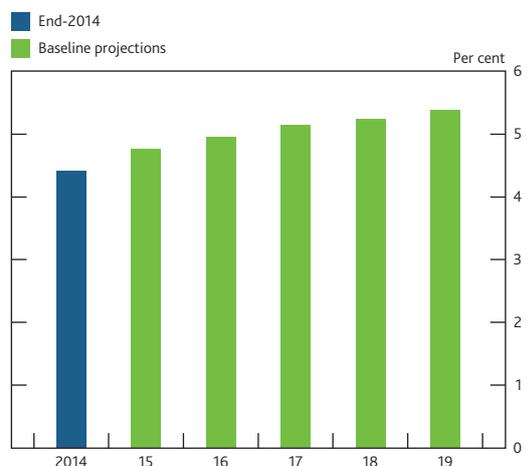
Chart 1 Aggregate CET1 capital ratio projections in the baseline^{(a)(b)(c)}



Sources: Participating banks' Firm Data Submission Framework (FDSF) data submissions, Bank analysis and calculations.

- (a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets, where these are defined in line with the UK implementation of the CRR via the PRA Rulebook.
- (b) For Nationwide the stress tests are based on an estimated 4 April 2015 balance sheet, rather than end-2014. See Annex 1 for more details.
- (c) Banks' baseline projections do not include misconduct costs beyond those already paid and provisioned at end-2014.

Chart 2 Aggregate Tier 1 leverage ratio projections in the baseline^{(a)(b)(c)}



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

- (a) The end-point Tier 1 leverage ratio as defined in the FPC's leverage ratio review, taking into account the European Commission Delegated Act on the leverage ratio.
- (b) For Nationwide the stress tests are based on an estimated 4 April 2015 balance sheet, rather than end-2014. See Annex 1 for more details.
- (c) Banks' baseline projections do not include misconduct costs beyond those already paid and provisioned at end-2014.

In line with the expectation set out in the March 2015 scenario, all banks had projected CET1 capital ratios exceeding 7% in the baseline, and Tier 1 leverage ratios which exceeded 3%.⁽²⁾

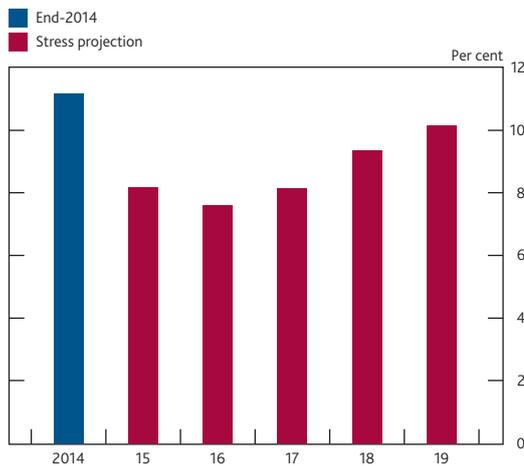
- (1) 2011 is the first year for which Basel III consistent regulatory data are available. See 'FPC's core indicators' for a list of Major UK banks, which includes The Co-operative Bank but excludes Standard Chartered: www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx.
- (2) See 'Key elements of the 2015 stress test': www.bankofengland.co.uk/financialstability/Documents/stresstesting/2015/keyelements.pdf.

4.2 Projections of stressed Tier 1 leverage and CET1 ratios

Banks' CET1 capital ratios are severely affected by the stress...

Under the 2015 stress scenario, banks' aggregate risk-weighted CET1 capital ratio is projected to deteriorate significantly, with the trough in 2016 after 'strategic' management actions (Chart 3). The decrease in the aggregate CET1 ratio, which falls by 3.6 percentage points from 11.2% at end-2014 to 7.6% at end-2016, is driven by a fall in the aggregate amount of CET1 capital under the stress scenario (Table A). Around two thirds of this reduction in capital between end-2014 and end-2016 results from pre-tax losses totalling £37 billion in aggregate over the first two years of the stress (Chart 4).

Chart 3 Aggregate CET1 capital ratio projections in the stress, after the impact of 'strategic' management actions^{(a)(b)}



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

- (a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets, where these are defined in line with the UK implementation of the CRR via the PRA Rulebook.
 (b) For Nationwide the stress tests are based on an estimated 4 April 2015 balance sheet, rather than end-2014. See Annex 1 for more details.

Relative to projected pre-tax profits in the baseline, profits are down by almost £100 billion by the end-2016 low point of the stress. The shortfall in aggregate profits relative to base is driven by:

- Falling global GDP and rising unemployment, which reduce borrowers' ability to service debts, contribute to material increases in loan impairment charges. In line with the macroeconomic scenario, which focuses on vulnerabilities related to the global economic environment, impairment rates are projected to be particularly elevated in emerging economies and euro-area periphery countries (see Box 1 on pages 20–21).
- Sharp movements in market prices and increased counterparty credit risk, which lead to material traded risk losses. These losses are concentrated in 2015. Traded risk

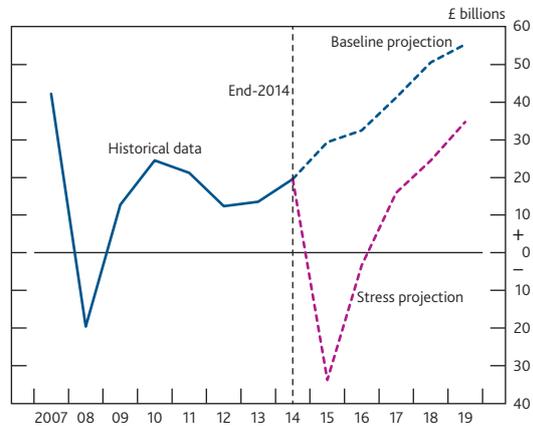
Table A Contributions to the shortfall in the aggregate CET1 capital ratio and Tier 1 leverage ratio at the low point of the stress in 2016 relative to the baseline projection

	CET1 ratio ^(a)	Leverage ratio ^(b)
Actual end-2014	11.2%	4.4%
Baseline end-2016	12.0%	4.9%
Impairments	-1.8 pp	-0.6 pp
Traded risk losses ^(c)	-1.6 pp	-0.6 pp
Net interest income	-0.3 pp	-0.1 pp
Misconduct costs	-1.4 pp	-0.5 pp
Risk-weighted assets/leverage exposure measure ^(d)	-1.2 pp	0.2 pp
Dividends	1.0 pp	0.4 pp
Expenses and taxes	0.7 pp	0.2 pp
Other (including reduced AT1 issuance) ^(e)	0.2 pp	-0.3 pp
Stress end-2016	7.6%	3.5%

Sources: Participating banks' published accounts and Firm Data Submission Framework (FDSF) data submissions, Bank analysis and calculations.

- (a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets, where these are defined in line with the UK implementation of the CRR via the PRA Rulebook.
 (b) The end-point Tier 1 leverage ratio as defined in the FPC's leverage ratio review, taking into account the European Commission Delegated Act on the leverage ratio.
 (c) Traded risk losses comprise: market risk, counterparty credit risk, credit valuation adjustment (CVA), prudential valuation adjustment (PVA), estimates for investment banking revenues net of costs; and available-for-sale (AFS) and fair value option (FVO) parts of the banking book. The aggregate proportion of banks' total revenues less costs allocated to investment banking has been estimated by the Bank.
 (d) Changes in risk-weighted assets impact the CET1 ratio, whereas changes in the leverage exposure measure impact the Tier 1 leverage ratio.
 (e) Other comprises other profit and loss and other capital movements. In addition to reduce AT1 issuance, other profit and loss includes other provisions, fees and commissions and other income. Other capital movements include exchange rate movements, pension assets devaluation, deferred tax assets, prudential filters, and actuarial gain from defined benefits.

Chart 4 Projections for aggregate profits before tax, after the impact of 'strategic' management actions^{(a)(b)}



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

- (a) For HSBC and Standard Chartered, annual profits are converted from USD to sterling using exchange rates consistent with the scenarios.
 (b) 2007 data include the profits before tax of Alliance & Leicester (subsequently reported as part of Santander UK). 2007 and 2008 data include the profits before tax of Lloyds TSB Group and HBOS (subsequently reported together as Lloyds Banking Group).

losses, including an estimate of the decline in projected net investment banking revenues in the stress relative to banks' baseline projections, reduce bank capital by £34 billion over the first two years of the stress (see Box 3 on pages 28–29).⁽¹⁾

(1) Traded risk losses comprise: market risk, counterparty credit risk, CVA, PVA, estimates for investment banking revenues net of costs; and AFS and FVO parts of the banking book. The aggregate proportion of banks' total revenues less costs allocated to investment banking has been estimated by the Bank.

- Lower net interest income, driven by the lower path for Bank Rate and weaker loan growth in the United Kingdom. The lower path of Bank rate and lower lending volumes prevent banks from increasing their net interest income as they expected to do under the baseline scenario in which Bank Rate rises gradually.
- Stressed projections for misconduct costs beyond those provided for at the end of 2014. The 2015 stress-test exercise examined banks' resilience to a much higher level of misconduct costs than UK banks had provisioned for as at the end of 2014 (see Box 4 on pages 30–31).

The headline stress-test results include projected reductions in banks' dividend payments to shareholders relative to the baseline. These reductions partially offset the impact of the stress scenario on banks' capital adequacy (Table A). Lower taxes as a result of lower profitability and reductions in expenses also act to mitigate the impact of the stress on banks' CET1 ratios.

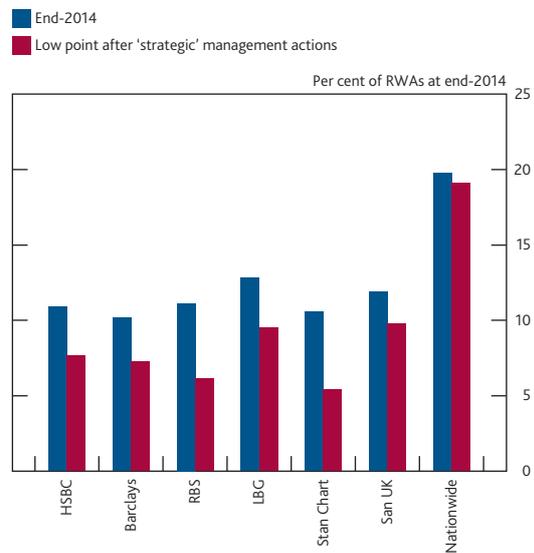
In addition to the reduction in banks' aggregate CET1 capital projected in the stress, their aggregate CET1 ratio is also depressed by a rise in risk-weighted assets. This rise in RWAs reduces the aggregate CET1 ratio by 1.2 percentage points relative to baseline at the low point of the stress. Both the macroeconomic and traded risk stresses contribute to the rise in RWAs in the stress, with average risk weights rising by 7 percentage points, from 36% to 43% between end-2014 and end-2016.

Reflecting the Asian and emerging markets focus of the 2015 stress scenario and differences between banks' balance sheets, there is significant variation in the impact of the stress on CET1 ratios across banks, with the least material reductions in CET1 capital (Charts 5 and 6) projected for the UK-focused banks with smaller trading operations (Chart 7). For example, the CET1 ratio of Nationwide, with its focus on UK household lending, is projected to fall to a trough just 0.7 percentage points below its end-2014 starting level. In contrast, with the majority of its exposures in Asia, Standard Chartered's CET1 ratio is projected to fall by 5.1 percentage points to its low point. These results differ from those of the 2014 stress scenario, which incorporated larger shocks to UK economic activity and house prices. As a consequence, the 2014 stress test had a greater impact on banks focused on lending to the UK real economy than the 2015 test (see Box 2 on pages 23–25).

...as are banks' Tier 1 leverage ratios.

Under the 2015 stress scenario, banks' aggregate Tier 1 leverage ratio is projected to deteriorate significantly, with the trough in 2016 after 'strategic' management actions (Chart 8). The decrease in the aggregate leverage ratio, which, after 'strategic' management actions falls by 0.9 percentage points

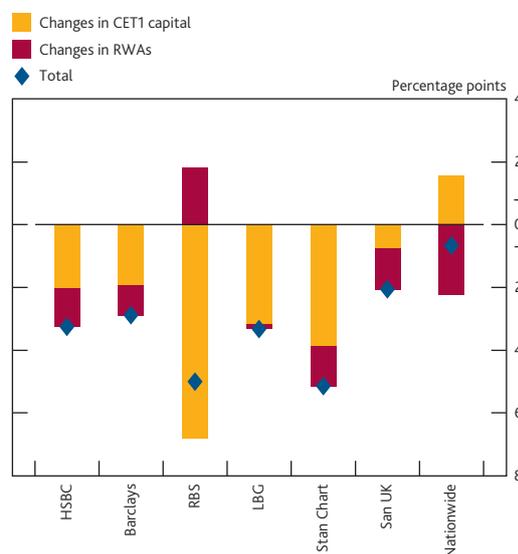
Chart 5 End-2014 and low-point CET1 capital ratios in the stress, after the impact of 'strategic' management actions^{(a)(b)(c)}



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

- The CET1 capital ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets, where these are defined in line with the UK implementation of the CRR via the PRA Rulebook.
- The year of the low point differs across banks.
- For Nationwide the stress tests are based on an estimated 4 April 2015 balance sheet, rather than end-2014. See Annex 1 for more details.

Chart 6 Contributions to the change in CET1 capital ratios in the stress relative to end-2014^{(a)(b)(c)(d)}

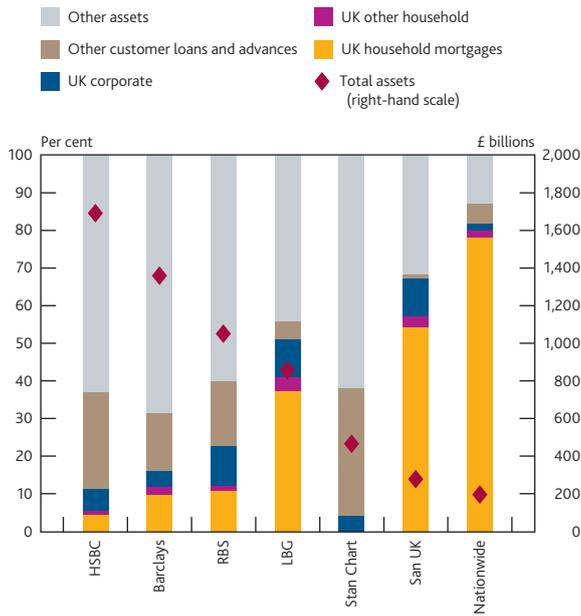


Sources: Participating banks' FDSF data submissions, Bank analysis and calculations.

- Changes are calculated from end-2014 to the lowest point in the stress, after the impact of 'strategic' management actions. The year of the low point differs across banks.
- The CET1 capital ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets, where these are defined in line with the UK implementation of the CRR via the PRA Rulebook.
- For Nationwide the stress tests are based on an estimated 4 April 2015 balance sheet, rather than end-2014. See Annex 1 for more details.
- RWAs fall for The Royal Bank of Scotland Group due to asset disposals, including the disposal of Citizens (and hence make a positive contribution in the chart above).

from 4.4% at end-2014 to 3.5% at end-2016, is driven by a fall in the aggregate amount of Tier 1 capital under the stress scenario.

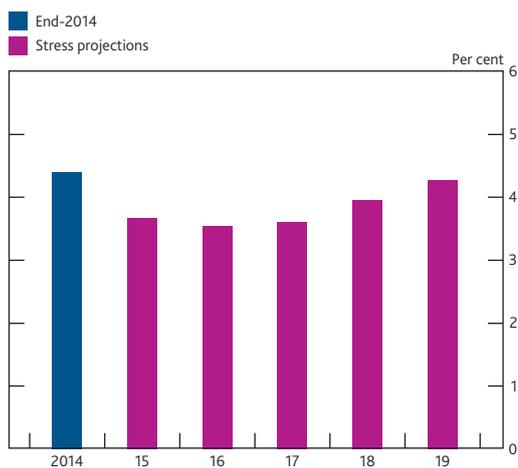
Chart 7 End-2014 balance sheet composition and total assets for participating banks^{(a)(b)(c)(d)(e)(f)}



Sources: Participating banks' annual accounts and Bank calculations.

- (a) UK exposures are net of impairments and exclude reverse repos.
- (b) UK corporate exposures exclude exposures to the public sector and financial institutions.
- (c) Total assets are as per end-2014 annual accounts except for Nationwide, whose total assets figure is as per 4 April 2015 annual accounts.
- (d) The method for determining geography of exposures may differ across participating banks.
- (e) HSBC and Standard Chartered's total assets have been converted to sterling using end-2014 exchange rates.
- (f) Other customer loans and advances are net of impairments, exclude reverse repos, include UK exposures to the public sector and non-bank financial institutions, and all non-UK loans and advances to customers.

Chart 8 Aggregate Tier 1 leverage ratio projections in the stress, after the impact of 'strategic' management actions^{(a)(b)}

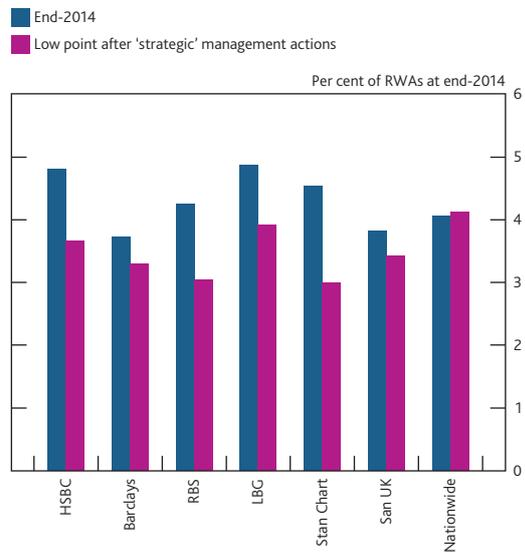


Sources: Participating banks' FDSF data submissions, Bank analysis and calculations.

- (a) The end-point Tier 1 leverage ratio as defined in the FPC's leverage ratio review, taking into account the European Commission Delegated Act on the leverage ratio.
- (b) For Nationwide the stress tests are based on an estimated 4 April 2015 balance sheet, rather than end-2014. See Annex 1 for more details.

At the low point of the stress in 2016, banks' aggregate leverage exposure measure is 3.3% lower than in the baseline, boosting the aggregate Tier 1 leverage ratio (Table A). But this boost is more than offset by differences between banks' Tier 1 capital issuance assumptions under base and stress. Whereas

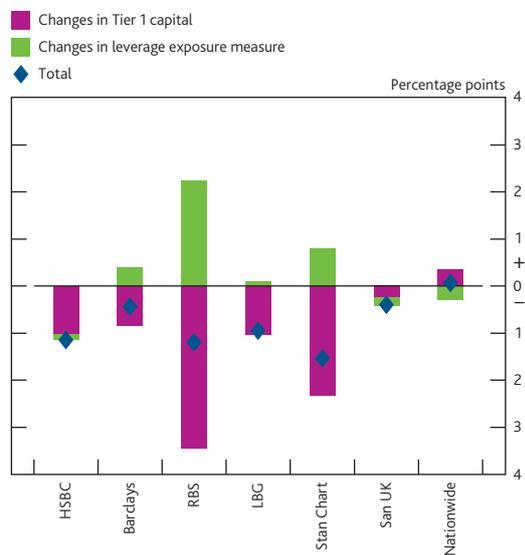
Chart 9 End-2014 and low-point Tier 1 leverage ratios in the stress, after the impact of 'strategic' management actions^{(a)(b)(c)}



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

- (a) The end-point Tier 1 leverage ratio as defined in the FPC's leverage ratio review, taking into account the European Commission Delegated Act on the leverage ratio.
- (b) The year of the low point differs across banks.
- (c) For Nationwide the stress tests are based on an estimated 4 April 2015 balance sheet, rather than end-2014. See Annex 1 for more details.

Chart 10 Contributions to the change in the Tier 1 leverage ratios in the stress relative to end-2014^{(a)(b)(c)(d)}



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

- (a) Changes are calculated from end-2014 to the lowest point in the stress, after the impact of 'strategic' management actions. The year of the low point differs across banks.
- (b) The end-point Tier 1 leverage ratio as defined in the FPC's leverage ratio review, taking into account the European Commission Delegated Act on the leverage ratio.
- (c) For Nationwide the stress tests are based on an estimated 4 April 2015 balance sheet, rather than end-2014. See Annex 1 for more details.
- (d) The total leverage exposure measure falls for The Royal Bank of Scotland Group due to asset disposals, including the disposal of Citizens (and hence make a positive contribution in the chart above).

in the baseline some banks assumed that they would issue AT1 capital during the first three years of the stress, which would have increased their Tier 1 leverage ratios, in the stress they assumed no issuance over that period.

The projected impact of the stress on Tier 1 leverage ratios across individual banks differs markedly, with the banks most focused on UK lending least affected (**Charts 9 and 10**). Projections for The Royal Bank of Scotland Group embody a large reduction in both its eligible Tier 1 capital and leverage exposure measure in the stress. In part the reduction in The Royal Bank of Scotland Group's capital reflects the significant impact of the stress on the bank. The bank had also planned to reduce the size of its balance sheet in both the baseline and stress scenarios, which reduces its leverage exposure measure. Primarily, this reflects the sale of US bank Citizens Financial Group, which it has now completed. Standard Chartered, a universal bank, with the majority of its exposures in Asia experiences the largest proportionate reduction in its Tier 1 leverage ratio under the stress. HSBC, a global, universal bank with significant exposures in Asia as well as EMEs in other regions also experiences a material reduction in its Tier 1 leverage ratio in the stress.

Factors weighing on banks' capital positions under the stress

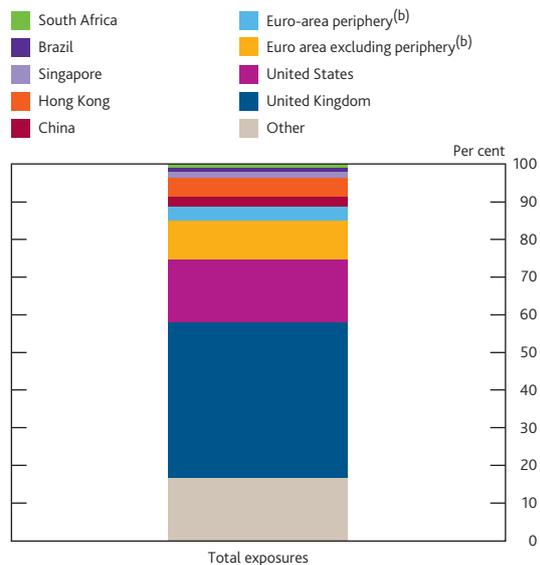
Non-UK impairments account for the majority of credit losses under the stress...

The 2015 stress test is designed to explore the vulnerability of UK banks to a stress relating to the global macroeconomic environment, with a particular focus on emerging economies and the euro area. UK banks have significant exposures to these economies, and in particular to Hong Kong and China (**Chart 11**). Under the stress scenario, these economies suffer from sharp reductions in GDP growth and from rises in unemployment, as well as large falls in property and equity prices. For example, in China, annual real GDP growth slows from just under 7.5% in 2014 to a low point of 1.7%, while house prices fall by 35% in the stress scenario. In Hong Kong, commercial real estate prices fall by 45%.

The 2015 stress test also embodies a significant deterioration in economic conditions in the United Kingdom. For example, the UK unemployment rate rises to over 9%, a level last observed in the aftermath of the early 1990s recession. UK residential and commercial property prices are projected to fall by 20% and 35% respectively under the stress scenario.

These macroeconomic stress factors reduce borrowers' ability to repay debt, and the value of collateral to which banks may have recourse in the event of default. The aggregate impact is an increase in both default rates and in the losses banks face in the event of default, leading to global impairment charges on lending totalling £58 billion to the end-2016 low point of the stress after 'strategic' management actions — around £37 billion higher than under the baseline projection.⁽¹⁾ This cumulative difference over two years between base and stress projections is worth 1.8% of aggregate RWAs as at the end of 2014.

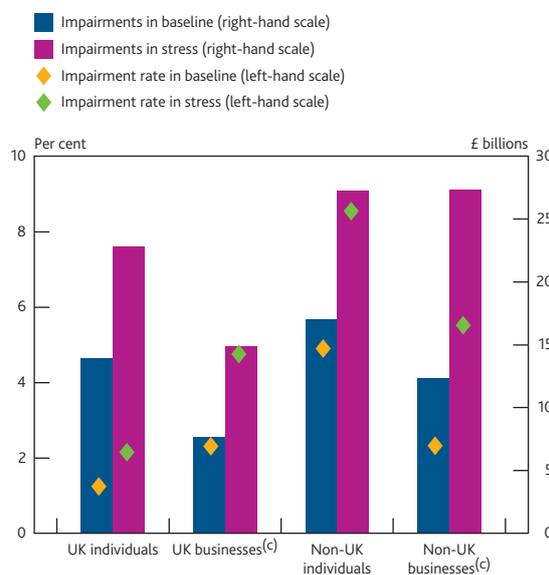
Chart 11 Geographical composition of participating banks' exposures^(a)



Sources: Bank of England and Bank calculations.

- (a) Data are as at end-2014. Geographical exposures are based on residence of immediate counterparty. Exposures includes loans and advances, claims under sale and repurchase agreements, long and short-term debt securities and claims under financial derivatives.
 (b) Euro-area periphery is defined as Cyprus, Greece, Ireland, Italy, Portugal and Spain.

Chart 12 Projected cumulative five-year impairment charges on lending to individuals and businesses^{(a)(b)}



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

- (a) Cumulative impairment charge rates = (five-year total impairment charge)/(average gross on balance sheet exposure), where the denominator is a simple average of 2014, 2015, 2016, 2017, 2018 year-end positions. This calculation may result in a lower impairment rate for those banks that expand balances significantly late in the stress as the economy starts to approach recovery. The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rates consistent with the stress scenario.
 (b) Data exclude material associates.
 (c) Businesses are non-financial businesses.

Projected impairment rates on non-UK lending are higher than those for UK lending in the 2015 stress test (**Chart 12**). As a result, despite non-UK advances to households and companies

(1) This is the total of impairments on retail and wholesale loans; residual impairments on structured finance and other impairments are not included in this figure.

totalling less than 40% of aggregate lending to households and non-financial businesses by participating banks at end-2014, these loans account for around 60% of total impairment charges incurred by banks under the stress.

Retail impairments account for around half of non-UK impairment charges in the stress (**Chart 12**). These are spread across a range of geographies, and are heavily concentrated in unsecured household lending, as opposed to secured, despite the large falls in residential property prices in several geographies embodied in the stress scenario. Unsecured lending by its nature, involves more risk than secured lending, so impairment charges are generally expected to be more sensitive to a deterioration in macroeconomic conditions. That said, given the large residential property price falls in the stress scenario, the results of the stress test also emphasise that the current value of collateral held against UK banks' non-UK secured household loans provides a substantial cushion against a future potential stress.

... with non-UK corporate impairments concentrated in Asia. Non-UK corporate impairment charges incurred under the stress are heavily concentrated in Asia, and are £15 billion higher than they are in banks' baseline projections over the five years of the stress test. The rise in impairments relative to base is equivalent to around 0.7% of aggregate RWAs as at end-2014 over the five years of the stress.

The ability of Asian corporates to repay debt comes under pressure in the stress scenario as growth in these countries slows, and exchange rates in many emerging Asian economies depreciate by 10% or more against the US dollar, raising the cost of servicing any US dollar denominated debt. In line with expectations, the most heavily Asia-focused UK banks incur the largest impairment charges in relation to Asian corporate exposures. (For more detail on impairments projections for Hong Kong and China, see pages 20–21 for a box on the international aspects of the stress.)

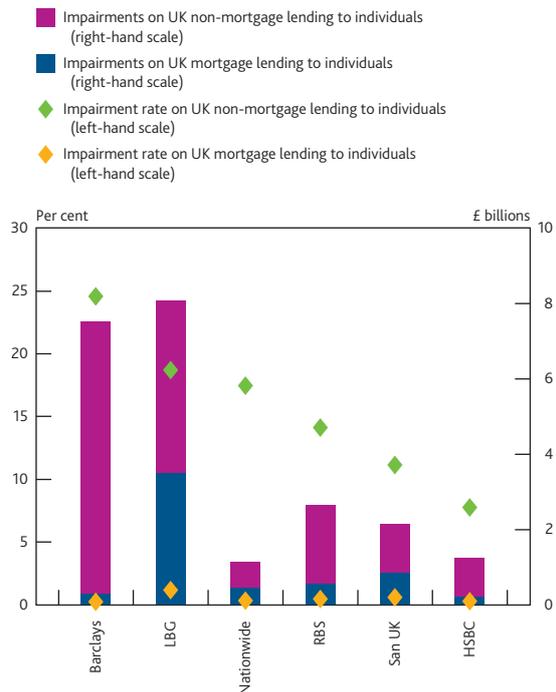
A less severe house price scenario and low interest rates mean the impact of the stress on UK impairments is relatively benign.

The primary factor reducing UK households' ability to service their debt under the 2015 stress scenario was higher unemployment. Lower commodity and other import prices, however, offset the negative impact of higher unemployment on real household incomes to some extent.

Unsecured impairments account for just under 75% of total UK retail impairments realised during the stress (**Chart 13**), with the majority accounted for by credit cards. The overall unsecured impairment rate was around 17% on a cumulative basis over the five years of the stress.

UK mortgage impairment rates are projected to be much lower than those on unsecured household lending, at under

Chart 13 Projected cumulative five-year impairment charges on UK lending to individuals in the stress^{(a)(b)}



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

- (a) Cumulative impairment charge rates = (five-year total impairment charge)/(average gross on balance sheet exposure), where the denominator is a simple average of 2014, 2015, 2016, 2017, 2018 year-end positions. This calculation may result in a lower impairment rate for those banks that expand balances significantly in the later years of the scenario as the economy recovers. The HSBC impairment charge is calculated by first converting each component to sterling using exchange rates consistent with the stress scenario.
 (b) Standard Chartered is excluded as it has minimal UK lending exposures.

1% in aggregate on a cumulative five-year basis, despite the 20% fall in residential property prices specified in the 2015 stress test (**Chart 13**). That relatively low projected impairment rate reflects, in part, the value of the collateral backing these secured loans at the start of the stress test. UK house prices increased by 16% in the two years prior to the start of the scenario, which will mechanically have reduced the average loan to value ratios on lenders' existing mortgage books. In addition, the proportion of new mortgage lending conducted at high loan-to-value ratios (LTVs) has remained much smaller than in the run-up to the crisis (**Chart 14**). The small reduction in Bank Rate embodied in the stress also reduces mortgage payments for borrowers with interest rates linked to the Bank's policy rate and improves borrowers' ability to service their debts.

The buy-to-let subsector of the UK mortgage market has continued to grow rapidly since the end of 2013, with the outstanding stock of buy-to-let mortgage lending increasing by almost 6% a year on average since 2008. The results of the Bank's 2014 stress test, which featured a 35% fall in residential house prices and an increase in Bank Rate, indicated that UK banks would face significant increases in buy-to-let impairment charges under such a scenario. But overall, the results of that test had confirmed the resilience of the core banking system to losses on buy-to-let mortgage lending on

Box 1

International aspects of the 2015 stress

A key aspect of the 2015 stress scenario is that it examines the resilience of UK banks to a further deterioration in global nominal growth prospects, which results in a rapid deterioration in market sentiment globally and triggers latent vulnerabilities in Asia and the euro area in particular.

Since publication of the 2015 stress scenario in March, there has been marked volatility in some global financial markets. These have been particularly concentrated in emerging economies, with significant volatility in Chinese equity prices and sharp falls in some currencies. In some respects, these developments resemble elements of the 2015 traded risk stress scenario, albeit broadly less pronounced. But as yet, the impact of financial market turbulence on economic activity in most of these countries has been much less material than the slowdown embodied in the scenario. That is, in general, the scale of the macroeconomic shocks in the stress scenario are much larger than those observed in the activity data for emerging market economies.

China and Hong Kong

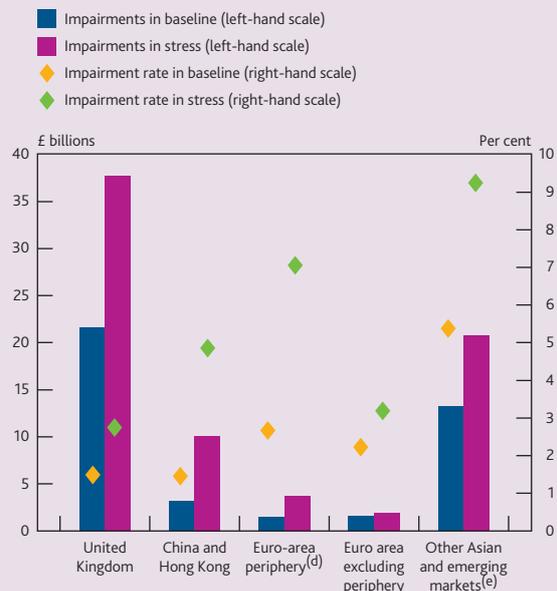
China and Hong Kong together account for more than 10% of the impairment charges faced by UK banks under the 2015 stress scenario (Chart A).⁽¹⁾ This is a particularly concentrated source of non-UK impairments for those UK banks with large Asian exposures.

Rapid credit growth in China and Hong Kong over recent years makes projecting impairment rates under stress more difficult (Chart B). As a result, this has been an area of particular focus for Bank staff. There are particular uncertainties around projecting Chinese corporate impairments under the stress scenario. Historic loss rates on corporate loans in China have been low relative to the worst affected emerging economies during previous crises. But the scale and speed of recent credit growth and the slowing of GDP growth in the stress, both unprecedented in recent history, limit the usefulness of comparisons with banks' impairments during previous episodes of stress.

Bank staff judged that market-wide corporate impairment rates in China and Hong Kong would be higher in the stress scenario than those experienced during either the 2007–08 financial crisis or the 1998 Asia crisis. This partly reflects a rapid rise in corporate leverage since the financial crisis and that many corporates face a higher debt burden.

Bank staff judged that across lenders in China, corporate default rates could rise to 15% whereas following the Asia crisis and the financial crisis they are estimated to have peaked at around 10% and 5% respectively. Relative to that market

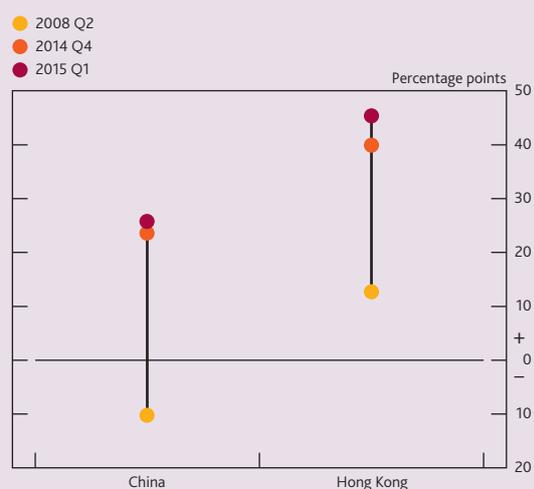
Chart A Projected cumulative five-year impairment charges on loans to individuals and businesses in selected regions^{(a)(b)(c)}



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

- (a) Cumulative impairment charge rates = (five-year total impairment charge)/(average gross on balance sheet exposure), where the denominator is a simple average of 2014, 2015, 2016, 2017, 2018 year-end positions. This calculation may result in a lower impairment rate for those banks that expand balances significantly in the later years of the scenario as the economy recovers. The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rate consistent with the stress scenario.
- (b) Data exclude material associates.
- (c) Includes mortgages (including buy-to-let), other loans to individuals and loans to businesses.
- (d) Euro-area periphery is defined as Cyprus, Greece, Ireland, Italy, Portugal and Spain.
- (e) Other Asian and emerging markets include Korea, Singapore, Taiwan Province of China and emerging market economies defined as countries not included in the IMF's group of Advanced Economies (Table B, page 148 of the IMF's October 2015 *World Economic Outlook*) to which UK banks had gross exposures greater than £10 billion as at end-2014. These include Brazil, India, Indonesia, Malaysia, Mexico, South Africa, Turkey and the United Arab Emirates.

Chart B Deviation of credit to GDP ratio from long-term trend in China and Hong Kong^(a)



Sources: BIS total credit statistics and Bank calculations.

- (a) Credit to GDP gaps use a one-sided HP filter with a (BIS-consistent) smoothing parameter of 400,000. Credit by all creditors to domestic private non-financial sector.

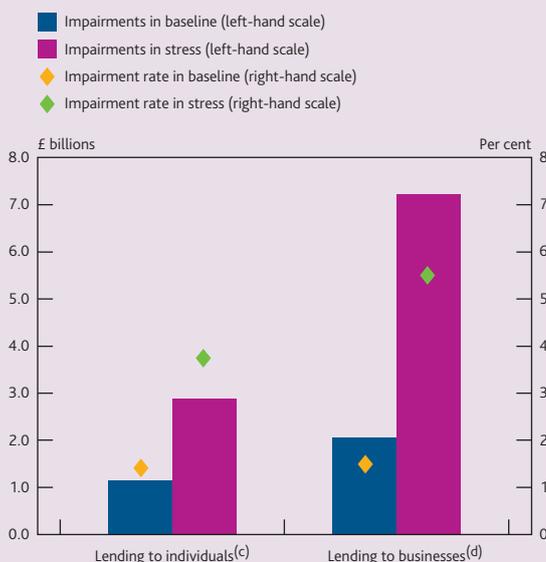
(1) The impairments figures in this box only relate to banks' direct exposures, ie they exclude those incurred by material associates.

average, however, Bank staff analysis suggested that Chinese corporate defaults would be less elevated for UK banks. That includes analysis suggesting that UK banks' Chinese corporate customers tend to be more internationally focused than the market average, which mitigates some of the risks associated with corporate lending in China in the stress scenario. UK banks also apply their group-wide risk policies and procedures in China, which are well established and tested within the context of downturns in other countries.

Taking Hong Kong and China together, the corporate impairment rate for UK banks' direct exposures in these markets is projected to roughly triple between baseline and stress to 5.5%.

UK banks' direct lending to households in China is limited, accounting for just 0.2% of RWAs at the end of 2014, and Bank staff analysis suggests that retail losses are likely to be low under the stress (**Chart C**). In Hong Kong, UK banks have more significant household exposures, but impairment rates are also projected to remain low, particularly on secured lending. The primary explanation for low impairment rates on mortgage lending in Hong Kong is the existence of conservative rules and practices around household borrowing, limiting household loan to value ratios. Low loan to value ratios on residential lending mean that the large falls in house prices assumed in the stress scenario have a limited impact on banks' projected losses in the event of default.

Chart C Projected cumulative five-year impairment charges in China and Hong Kong^{(a)(b)}



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

(a) Cumulative impairment charge rates = (five-year total impairment charge)/(average gross on balance sheet exposure), where the denominator is a simple average of 2014, 2015, 2016, 2017, 2018 year-end positions. This calculation may result in a lower impairment rate for those banks that expand balances significantly in the later years of the scenario as the economy recovers. The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rates consistent with the stress scenario.

(b) Data exclude material associates.

(c) Includes mortgages (including buy-to-let) and other loans to individuals.

(d) Business are non-financial businesses.

Historically, secured household default rates in both Hong Kong and China have been low, even during previous stress periods. But an important uncertainty is whether this pattern of very low mortgage default rates during stresses will continue in the future, given the backdrop of rapid credit expansion in these economies since the financial crisis.

Emerging markets stress

UK banks have exposures across several emerging market economies, and in particular have large exposures in India, South Africa and Brazil, which together account for around half of the projected other Asian and EME impairment charges over the course of the stress. Each country and loan portfolio has its own idiosyncratic features, which were considered by Bank staff in their review of banks' own projections.

In aggregate, other Asian and EME impairment rates rise by around 50% under stress (**Chart A**). High stressed impairment rates are projected to materialise in both Asian and other EMEs and as a consequence these losses are somewhat more broadly spread across UK banks than those relating to China and Hong Kong.

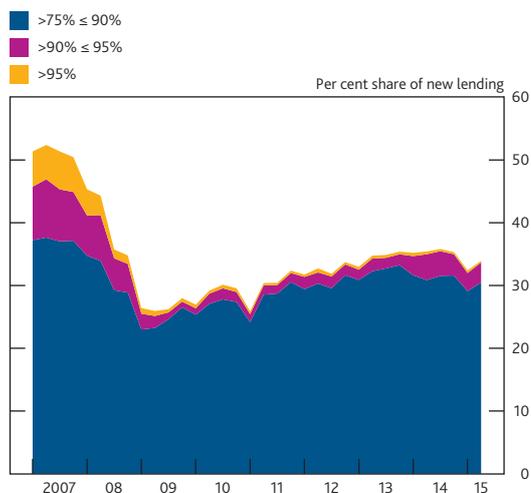
Euro-area stress

The 2015 stress scenario incorporates a significant fall in both economic activity and prices in the euro area. These moves are accompanied by persistently elevated unemployment and increases in the real value of debt, with these stress factors particularly apparent in euro-area periphery countries. Reflecting this, credit impairment rates in the euro area are significantly higher in the stress scenario than in banks' baseline projections, with impairment rates in euro-area periphery countries rising particularly sharply (**Chart A**).

The exposures of UK banks to households and companies in the euro area are, however, relatively small compared to their aggregate loan books, with lending to euro-area households and businesses accounting for 4% of aggregate RWAs at end-2014. UK banks have reduced their exposures to euro-area periphery countries materially in recent years; between end-2011 and end-2014 UK-owned banks had reduced their exposures to these countries by 27%.⁽¹⁾ Consequently, the magnitude of euro-area losses faced by UK banks under the stress are fairly limited at around £6 billion in aggregate (6% of total impairments under the stress scenario), equivalent to 0.3% of banks' aggregate RWAs as at the end of 2014.

(1) Based on consolidated external claims and unused commitments of UK-owned monetary financial institutions (excluding central bank) and their branches and subsidiaries worldwide. Euro-area periphery is as described in footnote (d), **Chart A**. For more details see www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/consolidated_foreign_claims.aspx.

Chart 14 Distribution of new UK mortgage lending by loan to value ratio^(a)



Sources: Bank of England and FCA.

(a) Residential loans to individuals by PRA and FCA-regulated mortgage lenders. Latest data point 2015 Q2.

the basis of end-2013 portfolios. Given that the Bank's 2015 stress test features a less severe trough in house prices, and a much lower path for Bank Rate, projected buy-to-let impairments under the 2015 stress scenario are much lower than for the 2014 stress test. That said, the FPC remains alert to the rapid growth of the UK buy-to-let market, and potential developments in underwriting standards as the sector could pose a risk to broader financial stability (see the December 2015 *Financial Stability Report*).

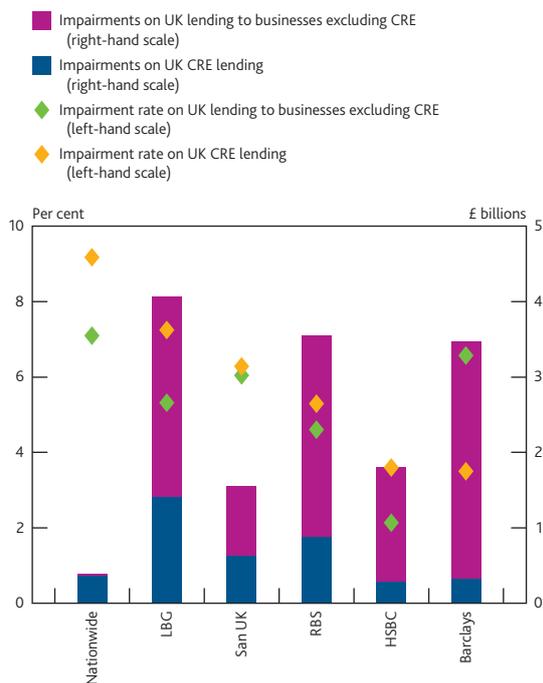
Commercial real estate losses are also projected to be more limited than in the 2014 stress test.

UK commercial property prices have historically been highly cyclical and more volatile than residential property prices. Following the financial crisis, UK commercial real estate (CRE) prices fell by 44%, peak-to-trough, and financial institutions suffered significant losses on their CRE exposure.

In the two years before the start of the stress scenario, CRE prices had risen, reducing loan to value ratios. Stress-test participants have also been disposing of non-performing loans as well as reducing the size of their CRE books more generally since the financial crisis, with non-UK banks and non-banks accounting for the majority of new CRE lending since 2008.

These factors mean that impairment charges on UK CRE portfolios remain lower under the stress than they were following the financial crisis (**Chart 15**). And UK CRE impairment rates over the first three years of the stress are projected to be materially lower than they were in the 2014 stress test (see Annex 2). That is consistent with UK CRE prices being 13% higher at the low point of the stress than they were in the 2014 test.

Chart 15 Projected cumulative five-year impairment charges on UK lending to businesses in the stress^{(a)(b)(c)}



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

- (a) Cumulative impairment charge rates = (five-year total impairment charge)/(average gross on balance sheet exposure), where the denominator is a simple average of 2014, 2015, 2016, 2017, 2018 year-end positions. This calculation may result in a lower impairment rate for those banks that expand balances significantly in the later years of the scenario as the economy recovers. The HSBC impairment charge is calculated by first converting each component to sterling using exchange rate consistent with the stress scenario.
 (b) Standard Chartered is excluded as it has minimal UK lending exposures.
 (c) Lending to non-financial businesses.

Risks in the CRE sector remain. In particular, recent increases in prices may signal a greater risk that CRE prices could fall further in future. This is an example of one of the risks the Bank of England's annual cyclical stress-test scenario, which will be run in 2016, may be calibrated to take account of.

Impairments on lending to UK businesses are projected to remain modest despite a sharp assumed squeeze in corporate profitability in the stress.

The 2015 stress scenario includes a sharp fall in corporate profits. Cumulative UK non-CRE corporate impairments of around £11 billion are incurred by UK banks during the stress, equivalent to around 0.5% of aggregate RWAs at end-2014.

Most banks' stress-test projections did not include a significant impact from weaker corporate profits on impairments, above and beyond the fall in GDP growth embodied in the stress scenario. While some Bank staff analysis suggested this fall in corporate profits did represent a severe shock to UK corporates, although not as severe as the rise in interest rates incorporated in the 2014 stress scenario. Bank staff analysis was not conclusive in this area, however, so there remains uncertainty around the likely impact a sharp fall in corporate profits might have, over and above a fall in GDP growth during a stress.

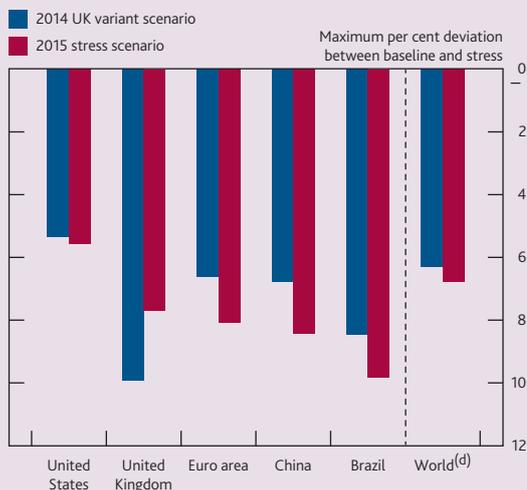
Box 2 Comparing the results of the 2015 stress test with the 2014 stress test

The Bank's 2015 stress test embodies a severe stress both in the United Kingdom and globally. But in contrast to the 2014 test, which focused on testing the vulnerability of banks' UK exposures, the 2015 stress test focuses on exploring risks to UK banks' business outside the United Kingdom. This box explains the differences between the results of the Bank's 2014 and 2015 stress test.

The focus of the 2014 and 2015 stress tests differed substantially.

The 2014 and 2015 stress scenarios were based on similar-sized reductions in global GDP growth, although the focus of the two stress tests differs substantially (Chart A). Reflecting the judgement of the FPC at the time of the December 2014 *Financial Stability Report* about the risks posed by the global economy, the 2015 scenario was designed to test the vulnerability of the UK banking system to a global stress which adversely affects the United Kingdom, along with a congruent stress in financial markets. Additional monetary policy stimulus is pursued and the longer-term interest rates are subdued for the duration of the scenario.

Chart A Differences in severity of GDP shocks between the 2014 and 2015 stress tests^{(a)(b)(c)}

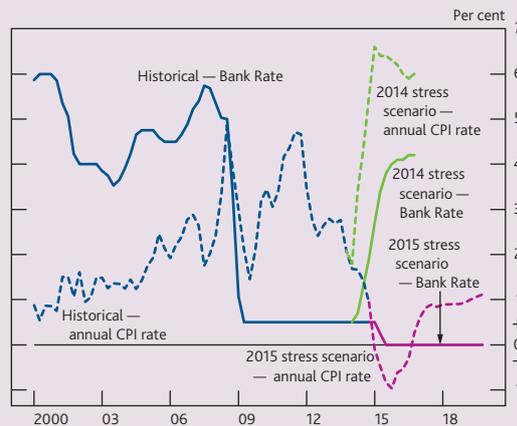


Sources: Bank of England, European Banking Authority (EBA), European Commission, IMF October 2014 *World Economic Outlook* and Bank calculations.

- (a) Chart shows the maximum deviation between calendar-year real GDP in the stress and baseline scenarios, over the three-year (2014 scenario) and five-year (2015 scenario) horizons. The date of the maximum difference can differ for each bar. For example, the maximum difference between stress and baseline in the 2015 scenario occurs in the euro area in 2019, but for world GDP this occurs in 2017.
- (b) The 2014 bars are calculated from: (i) the 2014 UK variant scenario (for the UK) and the 2014 EBA scenario (for foreign economies) in the stress, and (ii) the projections of the MPC as communicated in the February 2014 *Inflation Report* (for the UK) and the European Commission's Winter 2014 forecast (for foreign economies) in the baseline.
- (c) Baseline projections in 2015, other than for the UK, are consistent with the IMF's projections in the October 2014 *World Economic Outlook*. Bank staff have quarterly interpolated the original annual series.
- (d) The calculation for the world GDP bar in 2014 is an estimate. World GDP is weighted by purchasing power parity.

In contrast, the UK element of the 2014 scenario was designed by the Bank to test the resilience of the UK banking system to a stress particularly affecting UK households and domestic asset prices. In the 2014 stress scenario, weakness in UK productivity growth raised concerns over debt sustainability, which produced a pronounced fall in house prices, a large depreciation of sterling, higher inflation, and resulted in a higher path for Bank Rate (Chart B).

Chart B Consumer price inflation and Bank Rate in the United Kingdom in the 2014 and 2015 stress scenarios



Sources: Bank of England, ONS and Bank calculations.

In aggregate banks have strengthened their balance sheets since the 2014 test.

Most banks started the 2015 stress test in a stronger position than the 2014 exercise, having continued to improve their capital positions during 2014 (Table 1). In aggregate, this strengthening came about via improvements in profitability, driven in part by reductions in credit impairments. Banks' Tier 1 leverage ratios were also boosted by the issuance of AT1 capital instruments. These factors more than offset the negative impact on banks' capital from the further £10 billion of misconduct costs provisions they made during the year.

In aggregate, average risk weights attached to UK banks' exposures fell during 2014, as some banks continued to restructure their balance sheets. This balance sheet strengthening also boosted capital ratios. Other things being equal, this suggests that UK banks would now be more resilient in the face of the macroeconomic stress scenario embodied in the 2014 stress test.

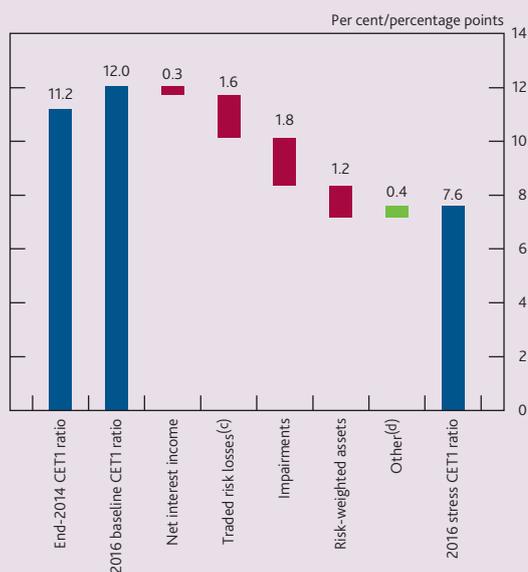
The aggregate CET1 capital ratio for banks at end-2014 was 11.2%, up by 1.2 percentage points from 10% at the end of 2013 (Charts C and D). And broadly speaking, this rise translated into higher capital ratios in the baseline projection at the low point of the 2015 stress.

Table 1 Changes in banks' capital positions during 2014

Per cent	CET1 ratio actuals ^(a)		Tier 1 leverage ratio actuals ^(b)	
	End-2013	End-2014	End-2013	End-2014
	Barclays	9.1	10.2	2.9
HSBC	10.8	10.9	4.1	4.8
Lloyds Banking Group	10.1	12.8	3.7	4.9
Nationwide ^(c)	14.3	19.8	3.4	4.1
RBS	8.6	11.1	3.4	4.2
Santander UK	11.6	11.9	3.3	3.8
Standard Chartered	10.6	10.5	4.6	4.5
Aggregate	10.0	11.2	3.6	4.4

Sources: Participating banks' FDSF data submissions and Bank calculations.

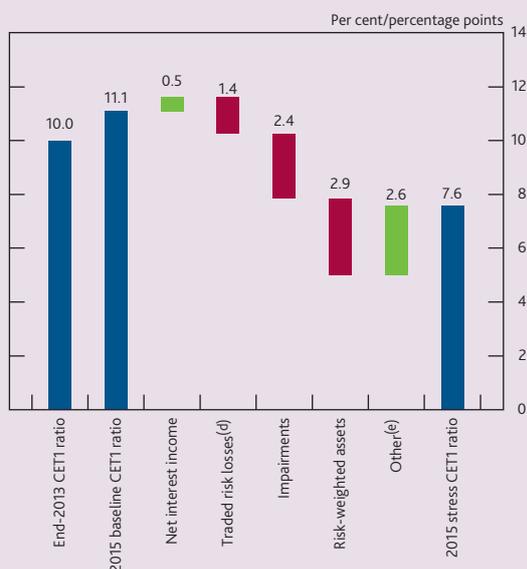
- (a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets, where these are defined in line with the UK implementation of the CRR via the PRA Rulebook.
 (b) The end-2013 leverage ratio is defined as the sum of CET1 capital and additional Tier 1 capital using the end-point definition of additional Tier 1 capital as set out in the final 30 November 2013 CRR text expressed as a percentage of leverage exposure where leverage exposure is defined in line with the Basel 2014 definition. The end-2014 leverage ratio is the end-point Tier 1 leverage ratio as defined in the FPC's leverage ratio review, taking into account the European Commission Delegated Act on the leverage ratio.
 (c) For Nationwide the stress tests are based on an estimated 4 April balance sheet, rather than end-year. See Annex 1 for more details.

Chart C 2015 stress test: contributions to the difference between the aggregate CET1 capital ratio in the baseline and stress, after the impact of 'strategic' management actions^{(a)(b)}

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

- (a) The 2014 stress test incorporated projections for further misconduct costs in both the baseline and the stress. See 'Stress testing the UK banking system: 2014 results', for further details on the 2014 misconduct cost numbers embodied in the stress-test results.
 (b) For HSBC and Standard Chartered, figures are converted from US dollars to sterling using exchange rates consistent with the scenario.
 (c) Traded risk losses comprise: market risk, counterparty credit risk, CVA, PVA, estimates for investment banking revenues net of costs; and AFS and FVO parts of the banking book. The aggregate proportion of banks' total revenues less costs allocated to investment banking has been estimated by the Bank.
 (d) Other includes provisions other than misconduct provisions, fees and commissions, other income, capital movements and additional misconduct cost provisions.

The base to stress impact at the low point of the Bank's 2015 stress test was 4.4 percentage points, 0.9 percentage points larger than that of the 2014 stress test. Several offsetting factors drive this net difference.

Chart D 2014 stress test: contributions to the difference between the aggregate CET1 capital ratio in the baseline and stress, after the impact of 'strategic' management actions^{(a)(b)(c)}

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

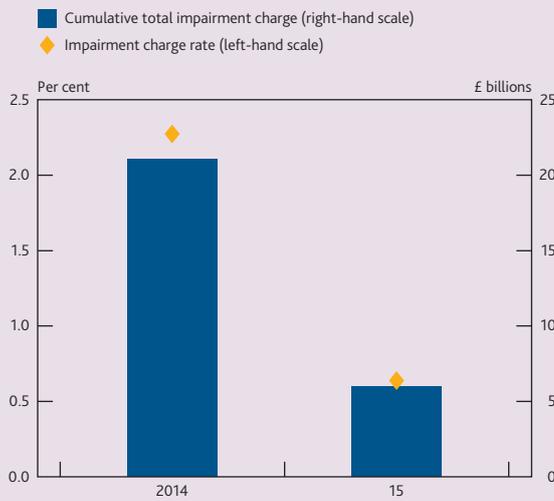
- (a) Does not include The Co-operative Bank for consistency of comparison.
 (b) The 2014 stress test incorporated projections for further misconduct costs in both the baseline and the stress. See 'Stress testing the UK banking system: 2014 results', for further details on the 2014 misconduct cost numbers embodied in the stress-test results.
 (c) For HSBC and Standard Chartered, figures are converted from USD to sterling using exchange rates consistent with the scenario.
 (d) Traded risk stress-test results from 2014 are based on the 2014 EBA stress test methodology (see www.eba.europa.eu/-/eba-publishes-common-methodology-and-scenario-for-2014-eu-banks-stress-test). Traded risk losses comprise: market risk, counterparty credit risk, CVA, PVA, and AFS and FVO parts of the banking book. Investment banking revenues net of costs are included within 'Other' in this chart.
 (e) Other includes provisions other than misconduct provisions, fees and commissions, other income, capital movements and additional misconduct cost provisions.

Net interest income: In the 2015 stress, net interest income is projected to be lower than in the baseline, whereas in the 2014 test it was greater than in the baseline. The different paths for Bank Rate under the two scenarios, which are in part linked to the divergent assumptions about inflation, help to explain this result (**Chart B**).

Traded risk losses: The 2014 stress incorporated the traded risk methodology based on the 2014 EBA stress test. In contrast, the 2015 stress scenario embodies a traded risk stress designed by the Bank to be congruent with the macroeconomic stress, in which banks' emerging markets financial markets exposures were particularly stressed. This change in methodology makes it difficult to compare traded risk losses across the two tests in a meaningful way but traded risk losses were material in both exercises.

Impairments: Projected increases in credit impairment charges relative to the baseline are materially smaller in the 2015 stress than they were in the 2014 test, particularly for UK mortgages (**Chart E**). In large part this reflects the more benign scenario for UK households in the 2015 stress, with lower unemployment and stronger real household income

Chart E Comparing cumulative three-year UK mortgage impairment charges in the 2014 and 2015 stress scenarios^{(a)(b)}



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

(a) Cumulative impairment charge rates are calculated as (three-year total impairment charge) divided by (average gross on balance sheet exposure), where the denominators are a simple average of 2013, 2014 and 2015 and 2014, 2015 and 2016 year-end positions, respectively.
 (b) 2014 numbers do not include The Co-operative Bank for consistency of comparison.

than in the 2014 stress exercise. UK residential and commercial property prices are substantially higher at the trough of the stress than they were in the 2014 stress, limiting the loss given default faced by banks (**Chart F**). Overall, projected cumulative three-year non-UK impairments were broadly similar in magnitude in the 2014 and 2015 stresses, as lower impairments in some regions offset higher impairments in Asia and emerging markets more generally.

Chart F UK residential property price index and commercial real estate index in the 2014 and 2015 stress scenarios



Sources: Halifax, Investment Property Databank, Nationwide and Bank calculations.

RWAs: RWAs associated with UK mortgages are projected to rise in the 2015 stress but they do so much less significantly than in the 2014 test. In part, that reflects the more benign shock to the level of UK house prices embodied in the 2015 stress scenario, which dampens the projected loss given default (**Chart F**). It also reflects the lower projected probability of default on UK mortgages, in line with the less adverse household credit risk environment.

Other factors: Several factors mitigate the projected impact of the 2015 stress on banks, including the fact that banks cut dividends, staff costs and pay lower taxes when their profits fall. Reducing profits further, however, are stressed projections of additional misconduct costs, which do not feature in baseline projections. The net impact of other factors such as these at the low point of the 2015 stress is 0.4 percentage points of banks' aggregate end-2014 RWAs. In contrast, in the 2014 stress test, other factors were projected to raise the aggregate CET1 capital ratio at the low point of the stress by 2.6 percentage points. The 2014 test also incorporated the impact of cuts in staff costs, dividends and tax but did not include material differences between misconduct costs in the baseline and stress. In addition, in the 2014 stress, exchange rate moves in the stress boosted UK banks' capital positions.

Taken together, the results of the 2015 and 2014 stress tests suggest that broadly speaking, the UK banking system has sufficient capital, distributed across major institutions, to absorb the impact of two quite different types of stress. Overall stress-test participants appear to be more resilient in 2015 to a given set of macroeconomic stresses, predominantly as a result of strengthening their capital positions during 2014.

As with UK households, the rise in the rate at which UK corporates can borrow in the stress scenario is offset in part by the projected fall in Bank Rate which is passed through into lending rates. This is an important factor limiting the extent to which UK impairments are projected to rise under the stress.

The 2015 stress test incorporates the Bank's own traded risk methodology.

The traded risk methodology adopted for the 2015 stress test differed substantially from the EBA methodology used in the Bank's 2014 stress test (see Box 3 on pages 28–29). In particular, the 2015 traded risk scenario is designed to reflect the macroeconomic stress, involving sharp movements in several market prices, including interest rates, exchange rates, volatility measures, credit spreads and equity indices. These movements are particularly pronounced in Asian markets.⁽¹⁾ The scenario also involved testing banks' ability to withstand the default of several large counterparties.

Traded risk losses materially reduce banks' projected capital positions.

The crystallisation of traded risks under the stress was another important factor depressing banks' projected capital positions, reducing banks' aggregate CET1 ratio by 1.6 percentage points by the low point of the stress (Table A). Due to the design of the stress scenario, under which changes in market prices happened rapidly at the outset and occurred only during the first year of the stress, traded risk losses were concentrated in 2015.

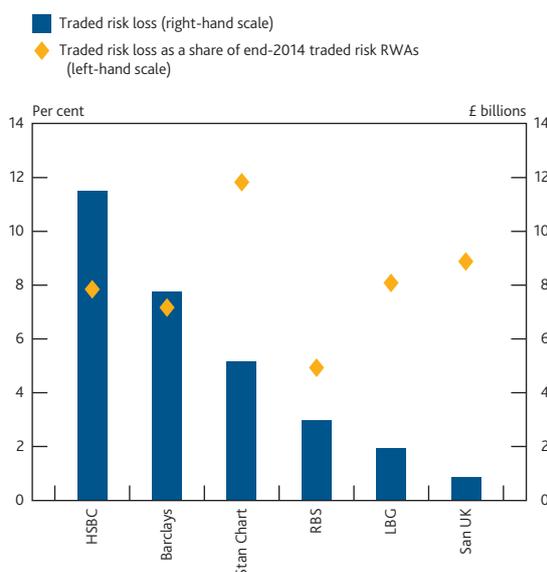
Broadly, the traded risk stress had its most significant impact on those banks most exposed to Asian financial markets, in line with the focus of the 2015 stress scenario (Chart 16). Indeed, the impact for these banks would have been more adverse were it not for positive contributions from investment banking income.

Despite the fact that the global traded risk scenario was weighted somewhat towards stressing Asian financial markets, stress-test participants without large Asian operations also suffer material traded risk losses (Chart 16). In part, that reflects the fact that some banks are projected to incur large losses in the stress related to prudent valuation adjustments to illiquid legacy positions and private equity assets (see Table 1 in Box 3 on page 28).

Deterioration of credit quality under the stress increases risk weights.

Higher projected RWAs are another significant factor driving the overall deterioration in the aggregate CET1 ratio in the stress. Between end-2014 and end-2016 aggregate RWAs are projected to rise 11%, with higher RWAs in the stress accounting for 1.2 percentage points of the 4.4 percentage point reduction in the aggregate CET1 ratio relative to the

Chart 16 Traded risk losses under the stress scenario in 2015^{(a)(b)}



Sources: Participating banks' FDSF data submissions, traded risk stress-testing submissions, Bank analysis and calculations.

- (a) Traded risk losses comprise: market risk, counterparty credit risk, CVA and PVA; and AFS and FVO parts of the banking book. Traded risk losses do not include investment banking revenues net of costs, to aid comparability between banks (for example allocation of costs to business lines may differ across banks).
- (b) Nationwide is excluded as it has minimal traded risk exposures.

baseline at the end-2016 low point. At that end-2016 low point, average risk weights are projected to be around 4 percentage points higher than they are in the baseline, while aggregate total assets are broadly similar in base and stress projections.

Both the macroeconomic and traded risk stresses contribute to the rise in RWAs in the stress, where movements in RWAs are a product of changes in both exposures and risk weights. In aggregate, RWAs associated with counterparty credit risk and credit valuation adjustments increase by more than 60% over the first two years of the stress, with increases in RWAs of this type contributing most heavily to the difference between projected RWAs in the base and stress at the end of 2016 (Chart 17).

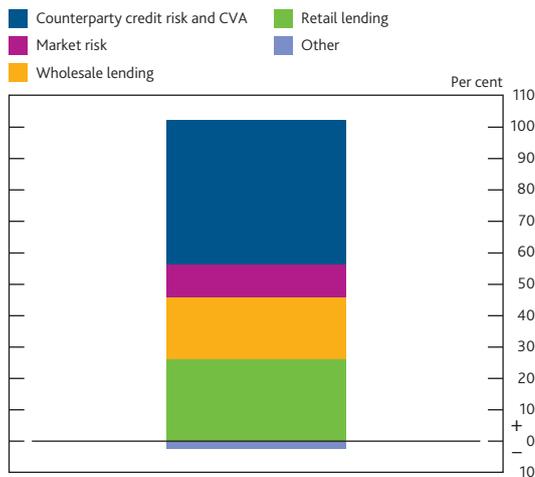
Risk weights associated with UK mortgages are also projected to rise in the 2015 stress but they do so much less significantly than in the 2014 test, reflecting more benign assumptions about the UK credit environment in the 2015 stress scenario (see Box 2 on pages 23–25), as well as changes in the way some banks have stressed risk weights.⁽²⁾

There are several idiosyncratic factors affecting individual banks' projected RWAs in the stress. For example, certain

(1) For details of the movements in market prices in the stress scenario see www.bankofengland.co.uk/financialstability/Documents/stresstesting/2015/tradedrisk2015.xlsx.

(2) For more detail on banks' risk-weight modelling see the box on page 15 in 'Stress testing the UK banking system: 2014 results'; www.bankofengland.co.uk/financialstability/Documents/fpc/results161214.pdf.

Chart 17 Contributions to the increase in risk-weighted assets in the stress relative to the baseline, end-2016^(a)



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

(a) Other includes AFS/FVO, structured finance, operational risk and other residual items.

banks predominantly model their risk weights on a through-the-cycle basis, which means their RWAs are less sensitive to cyclical movements in expected loss given default and probability of default, than for banks that make greater use of point-in-time models.

Some banks also expect to make material adjustments to the size of their balance sheets during the stress-test period, including by reducing their exposures via the sale of parts of their business during the stress. Some of these asset sales reflect large-scale pre-planned restructuring, so also feature in banks' baseline projections. In aggregate, banks' total assets fall by 6% over the five years of the test.

Lower net interest income reflects weaker UK loan growth and a lower path for Bank Rate.

Overall net interest income remains positive in the stress, as would be expected, but it is lower than under banks' baseline projections. In aggregate it reduces the projected aggregate CET1 ratio by 0.3 percentage points at the low point of the stress, relative to the base.

In the baseline, aggregate net interest income rises for UK-focused banks as lending grows consistent with the Bank's published UK real economy lending paths. Under the stress scenario, Bank Rate falls to and stays at zero, compressing interest margins, as the implicit floors on interest rates associated with some savings products limit the extent to which lower rates can be passed on to customers. The stress scenario also embodies lower UK loan growth, in line with the Bank's published lending path for the stress scenario (see Box 5 on page 35).

Banks' funding costs are projected to rise relative to risk-free rates in the first half of the 2015 stress scenario. But these projected increases are much less severe than those

experienced during 2011–12. Projections for banks' net interest income are based on the judgement that, broadly speaking, UK lenders are able to pass through these short-term increases in funding spreads to new and existing floating-rate borrowers.

Bank staff applied a range of quantitative models and macroeconomic judgements when assessing the net interest income projections supplied by stress-test participants. This analysis resulted in broadly similar profiles for net interest income in aggregate to those submitted by banks.

Automatic and strategic mitigating responses to the stress

Banks can choose, and in some cases are mandated to take, a range of actions which help to mitigate the deterioration in their capital positions under the stress scenario. These actions fall into three broad categories: (1) mandatory actions triggered by falls in banks' capital ratios (for example, dividend restrictions); (2) 'business-as-usual' actions that would be a natural response to weakening economic conditions (for example, reducing staff bonuses); and (3) 'strategic' management actions where decision-making would be likely to entail a significant involvement from banks' Boards (for example, reducing staff numbers). Strategic management actions were only accepted if they were judged as plausible and, where taken, they have been recorded in banks' results. The overall impact of 'strategic' management actions on the aggregate CET1 ratio of stress-test participants is to increase the 2016 low point by around 0.4 percentage points.

Dividend reductions help to mitigate the impact of the stress on banks' capital positions.

For banks planning to pay dividends, reductions in dividend payments to ordinary shareholders are an important element in the range of possible responses to a stress. The projected profitability of banks in the baseline scenario means that in the stress scenario, over the two years to the end-2016 low point, banks are able to cut aggregate dividend payments by £21.2 billion relative to the base case, equivalent to around 1% of RWAs as at the end of 2014 (Table A). Of this reduction, £20.7 billion has been driven by banks' adherence to publicly quantified dividend policies or automatic dividend restrictions, which come about as a result of some banks' projections implying that they will use at least part of their CRD IV capital buffers.⁽¹⁾ The remaining £0.5 billion of the reduction relates to additional discretionary reductions in dividends. These reductions have been classified as strategic management actions within banks' results, in line with the published guidance on permissible strategic management actions.⁽²⁾

(1) Mandated reductions in dividends and bonuses will arise if banks enter their Capital Requirements Directive IV buffers, which are due to be phased in between 2016 and 2019. Stress-test results for banks projected to enter their combined buffer during the stress scenario include the impact of these restrictions.

(2) See www.bankofengland.co.uk/financialstability/Documents/stresstesting/2015/guidance.pdf.

Box 3

The 2015 traded risk stress

The Bank has introduced a new traded risk methodology.

The Bank's 2015 stress test incorporated a traded risk scenario designed by the Bank, marking a change relative to the 2014 test, which adopted the EBA's methodology to stressing banks' trading books and other fair valued positions.⁽¹⁾⁽²⁾ This box explains the key features of the 2015 traded risk stress, as well as providing more detail on its impact.

The Bank's traded risk scenario was designed to be consistent with the macroeconomic scenario in terms of the broad movements in market risk factors, the types of counterparties affected, and the geographic impact of the stress.

Under the stress, financial market sentiment deteriorates rapidly as investors seek to reduce more risky exposures. Equity and other risky asset prices fall and credit spreads rise, particularly in Asia. Market volatility ensues, safe-haven capital flows to high-quality US assets are generated and the VIX volatility index peaks at 46 percentage points in the second half of 2015, compared with a peak of around 60 percentage points in 2008. The US dollar appreciates against a wide range of currencies, with emerging market economy (EME) exchange rates particularly affected, depreciating on average by around 25% peak-to-trough during the stress. Liquidity in some markets becomes seriously impaired.

Specific innovations embodied in the Bank's approach to stress testing traded risk include:

- Calibrating market risk factors to past periods of financial market turbulence which were judged to be broadly consistent with the macroeconomic scenario. For example, financial market movements specific to Europe have been calibrated to the 2011–12 period during which some European sovereign debt spreads reached record highs.
- Taking account of different liquidity horizons of banks' traded risk positions by calibrating the size of the shock to the time it would take banks to close out their positions.
- Testing banks' ability to withstand the default of a number of counterparties that would be vulnerable under the stress scenario.

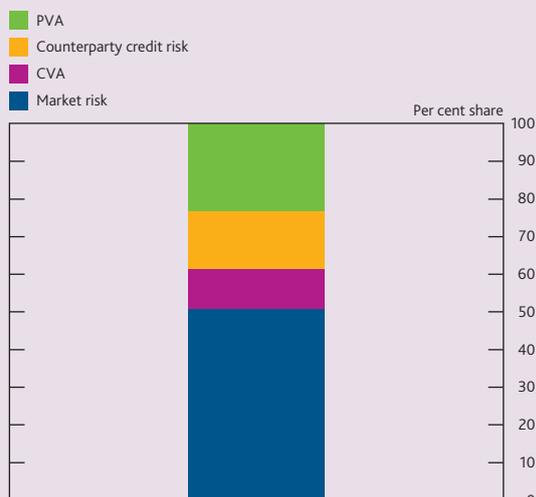
Market risk and counterparty credit risk are only two elements among several facets of traded risk faced by banks. **Table 1** summarises the key aspects of traded risk covered by the Bank's 2015 traded risk methodology.

Market risk losses spread across trading book and AFS/FVO portfolios account for around half of overall projected traded

Table 1 Elements of traded risk stressed under the Bank's traded risk approach

Traded risk element	Description
Market risk on the trading book	Losses associated with the change in value of traded positions, ie price risk of derivatives and securities. The 2015 stress test is designed to differentiate between the liquidation costs associated with managing more and less liquid positions under stress, with less liquid positions attracting larger costs.
Counterparty credit risk	Credit risk associated with derivatives and repo transactions. If a derivative counterparty defaults, this may be associated with the loss of profit, as well as losses associated with the cost of closing out any open market risk that the defaulted position may have been hedging.
Credit valuation adjustment (CVA)	A derivative contract has a theoretical value based on market prices, but to take into account the creditworthiness of the counterparty the value is adjusted downwards from the risk-free value. The CVA effectively reflects the cost of selling on a derivative position to a third party. As the credit quality of counterparties falls during the stress scenario, CVA costs rise.
Investment banking revenues less costs	Net value of revenues earned in the course of investment banking activities and the costs incurred.
Available-for-sale (AFS) and fair value option (FVO)	AFS assets include high-quality government bonds held for liquidity purposes, while FVO assets include specifically designated loan portfolios. These assets form part of the banking book, so are considered credit assets for regulatory capital purposes, but are marked to market and so give rise to losses when the market value of these assets is impacted by the stress.
Prudent valuation adjustment (PVA)	In general, PVA applies a degree of prudence where uncertainty in valuation exists. The stress scenario required participants to stress their PVA associated with investing and funding costs, stressing funding spreads where that would impact the valuation of a position.

Chart A Decomposition of traded risk losses under the stress scenario in 2015^{(a)(b)}



Sources: Participating banks' traded risk stress-testing submissions, Bank analysis and calculations.

- (a) Traded risk losses comprise: market risk, counterparty credit risk, CVA and PVA; and AFS and FVO parts of the banking book. Traded risk losses do not include investment banking revenues net of costs, to aid comparability between banks (for example allocation of costs to business lines may differ across banks).
- (b) Nationwide is excluded as it has minimal traded risk exposures.

(1) The Bank's traded risk methodology is informed by the Basel Committee on Banking Supervision's *Fundamental review of the trading book*. For more detail see www.bis.org/publ/bcb265.htm.

(2) For more details on the EBA approach in 2014 see <https://www.eba.europa.eu/-/eba-publishes-common-methodology-and-scenario-for-2014-eu-banks-stress-test>.

risk losses in 2015 (**Chart A**). Counterparty credit risk losses, relating to the default of large counterparties, and stressed PVA, are also projected to account for significant shares of total losses.

In addition to the traded risk losses incurred in 2015 in the stress, between 2016 and 2019 banks' investment banking revenues are lower than in the baseline. This is offset in part by further PVA and AFS/FVO movements.

In a real stress, which had a significant impact on banks' profits, investors should expect banks to cut their dividends materially, in line with published dividend policies and the operation of the capital conservation buffer.

Banks also cut costs further in the stress.

Participating banks' baseline projections embody substantial reductions in expenses reflecting the implementation of banks' corporate plans and ongoing restructuring at some banks. In addition, banks have projected a further £6 billion reduction to the low point of the stress, equivalent to 0.3% of RWAs at end-2014.

The key driver of this further reduction in expenses is reductions in staff costs. Staff cost reductions include both automatic restrictions on some banks' ability to pay bonuses, resulting from the fact that they are projected to use part of their CRD IV capital buffers, and strategic management actions to reduce staff costs that were judged plausible by Bank staff in light of cost cutting already planned in banks' baseline projections and in line with the guidance provided.

One key area of uncertainty for Bank staff when assessing stressed traded risk projections was around the valuation of banks' legacy assets, which attracted significant PVA costs. Another important uncertainty was how best to forecast investment banking revenues in the stress.

No conversion of additional Tier 1 instruments to equity was triggered by the stress.

AT1 instruments issued by banks, with the potential to convert into common equity in adverse conditions provide additional resilience against stress. As at the end of 2014, UK banks had issued just under £16 billion of AT1 capital instruments, for which conversion to CET1 would be triggered if their CET1 capital ratio fell below 7%. Further issuance during 2015 meant that all stress-test participants had issued capital instruments of this type by 2015 Q4, although AT1 capital instruments issued after the end-2014 cut-off were not considered in the 2015 stress-test results. After dividend reductions and 'strategic' management actions, all banks that had AT1 capital instruments in issuance at end-2014 had projected CET1 ratios that remained above 7% in the stress (**Table 2**). Therefore no AT1 instruments were assumed to convert into equity in the stress scenario.

Box 4

Misconduct costs

Over the past six years many examples of misconduct by banks and their employees have been uncovered (such as mis-selling of retail financial products, mis-selling of wholesale financial products, and violations of regulations and laws). Since 2009, the participating UK banks have faced material costs associated with misconduct.

Misconduct fines and other costs have been a significant headwind to capital accretion for the banking system. In aggregate, the banks undertaking the stress test paid almost £30 billion in fines and other related misconduct costs between 2009 and 2014, inclusive. As at the end of 2014, they had also made provisions for further likely misconduct costs of just under £13 billion. In total, stress-test participants had, at the end of 2014 set aside around £42 billion to deal with past misconduct issues, more than the private capital raised over that period.

In addition to these significant misconduct costs already realised and provided for, banks face further potential costs related to past misconduct. The accounting rules require provisions to be raised where an obligation exists only once settlement is considered probable and where a reliable estimate of the amount can be made. This explains why accounting provisions at end-2014 did not cover all potential misconduct costs in 2015 and beyond.

The approach adopted in the 2015 stress test has been to assess whether banks would be resilient to a much higher level of misconduct costs, well beyond current provisions. The stress test therefore includes stressed projections generated by Bank staff for additional misconduct costs and fines over and above the level of banks' provisions as at the end of 2014.

The stressed projections have been calibrated by Bank staff to have a low likelihood of being exceeded. This marks a change relative to the 2014 stress test. They are not, therefore, a central projection for future misconduct costs. The aggregate stressed projection for misconduct costs above those provided for at end-2014 is around £40 billion over the five years of the stress scenario, of which £30 billion is assumed to be realised in the first two years of the stress scenario as banks make provisions for these costs. This £30 billion figure is equivalent to 1.4% of aggregate risk-weighted assets at the end of 2014 (see **Table A**).

Bank staff have generated these stressed estimates for additional misconduct costs drawing on information provided by participating banks as well as other sources, including, for example, public reports of legal proceedings involving potential bank misconduct issues.

These stressed estimates for additional misconduct costs **relate to known issues around past misconduct**. The stressed estimates do not anticipate issues around past misconduct that have not yet been identified and they do not factor in the risk of misconduct in the future. Partly because the stressed projections relate only to known issues, and partly because they are only unlikely, not impossible, to be exceeded with respect to those known issues, **they cannot be considered a 'worst-case scenario'**.

The stressed projections do not assume that misconduct costs will be greater because of the macroeconomic stress. The stress test can therefore be considered to embody two separate and unrelated stresses: to misconduct costs and to the macroeconomic and financial environment.

There **remains a very high degree of uncertainty** around any approach to quantifying misconduct cost risks. Even in cases where misconduct risks have already crystallised or have a high likelihood of crystallising (for example, payment protection insurance (PPI) mis-selling, US mortgage bonds mis-selling and manipulation of foreign exchange benchmarks), there is a wide range of possible cost outcomes. Banks are also facing potential legacy misconduct issues that are in the early stages of evaluation (for example, violations of US antitrust laws in relation to trading of credit default swaps and Plevin⁽¹⁾). It is very hard to quantify the outcome of such cases with any certainty.

Reflecting the high degree of uncertainty around the stressed misconduct projections and the fact that there are ongoing legal actions and regulatory investigations relating to specific misconduct issues, the **Bank is not disclosing stressed projections for misconduct costs for individual participating banks**.⁽²⁾

Given the Bank's approach to producing stressed projections for additional misconduct costs outlined above, these stressed misconduct cost projections cannot be considered to be a central case for future misconduct costs so they have not been included in the baseline projections of banks' capital.⁽³⁾ Neither the Bank nor the participating banks have produced a central estimate of future costs.

(1) In November 2014, the UK Supreme Court (Plevin -v- Paragon Personal Finance Limited) found that a failure to disclose the high commission on a PPI contract created an unfair relationship between the lender and the consumer. This could potentially broaden the grounds for claiming redress on previously sold PPI policies. On 26 November 2015 the Financial Conduct Authority launched a consultation on proposed guidance for how firms should handle related PPI claims, see www.fca.org.uk/news/consultation-on-ppi-complaint-handling-rules.

(2) In addition, the Bank has not informed individual stress-test participants about the magnitude of stressed projections for misconduct costs relating to their own institutions.

(3) This is a departure from the approach envisaged in the guidance provided for the 2015 stress test, which had indicated that misconduct costs would be incorporated in both the base case and the stress scenario. In the 2015 stress test, no additional misconduct costs beyond end-2014 provisions have been included in the baseline projections.

In reality, banks are likely to incur additional misconduct costs over the coming years even if the stressed misconduct cost projections do not materialise. This will detract from their capital resources relative to the baseline projections. Indeed, relative to the end-2014 start point of the stress test, banks'

2015 H1 published accounts show that they had already taken an extra £6 billion of provisions against misconduct costs. These additional provisions made after the start of the stress test are not included in banks' baseline projections, in line with the Bank's approach in other areas.

5 Qualitative review of banks' stress-testing frameworks

An important objective of the concurrent stress-testing framework is to support a continued improvement in banks' own risk management and capital planning capabilities. Strengthening banks' own stress-testing capabilities better enables them to assess potential risks to their businesses, both as part of the concurrent stress test and beyond it. This should support the resilience of both individual institutions and the system as a whole.

Based on the 2015 stress test, the Bank undertook a qualitative review of banks' stress-testing capabilities, as it did as part of the 2014 exercise.

There has been significant improvement since the 2014 review. That said, the Bank's review identified considerable variation across banks and highlighted areas where stress-testing and capital planning frameworks need to be strengthened further.

The Bank's qualitative review highlighted clear improvement in some areas for most banks, although performance was mixed...

Senior management oversight and governance was an area where the majority of banks had made significant progress in 2015. This is an area where the Bank has observed continued improvement over time. In 2015, Senior Executive and Board Members were engaged more frequently and from an earlier stage of the process for most banks. They took a more active role in challenging results and understanding important assumptions. The Bank recognises the progress made by banks and encourages banks to strengthen their stress-testing frameworks and internal controls further to ensure that the results and supporting information provided to governance bodies are of high quality.

For the majority of banks, the overall data quality and accuracy of results submitted to the Bank also represented an improvement relative to the 2014 exercise. For those banks that performed best, data submissions contained no material omissions, were accurate and required fewer clarifications.

In order to incorporate elements of the scenario narrative not captured by models, banks needed to use expert judgement. Several banks did this well, most notably for wholesale credit where accurate modelling can be difficult due to data

limitations. That said, there were features of the scenario, such as falling corporate profits in the United Kingdom, that the Bank had expected banks to consider separately through the use of judgement and quantitative analysis. Such analysis was not evident in banks' submissions.

...and progress but room for improvement in others...

In 2015, the Bank undertook a review of banks' stress-testing model management frameworks having found that they were weak during the 2014 exercise. For some banks, the coverage, scope and adequacy of model management standards were found to have improved. But others needed to make considerable improvements, including implementing and embedding model management policies more fully. Some banks lacked formal processes to approve stress-testing models and had weak model governance. While the Bank recognises that improvements take time, banks are expected to continue to invest significantly to implement model development standards, maintain robust model inventories and strengthen their independent model review frameworks.

While overall data quality was generally improved, there were three areas where banks' data quality was generally poorer: net interest income, traded risk and structured finance. Given the materiality of net interest income projections, the variability in data quality was notable. In addition, as the Bank highlighted in 2014, methodologies used to support assumptions and modelling decisions were less good than in other areas, such as credit risk, for example.

A number of banks still had governance processes around net interest income projections that were identified as weaker than other areas and the Bank considered this an area in need of improvement. The relatively poor data quality for traded risk and structured finance can be partly attributed to significant changes in the data required from banks for the 2015 stress test. As described in Section 4.2, the 2014 stress test had used the EBA market risk methodology and templates.

Standards of documentation were also variable. Some banks had documented their approaches with sufficient detail and had, in general, engaged effectively with Bank staff to explain key assumptions. Other banks had not documented their approaches adequately, particularly for net interest income and traded risk. The Bank expects improvements in documentation in next year's exercise.

In 2015, Bank staff undertook more detailed analysis of banks' scenario expansions to cover relevant economies in more detail than was set out in the published scenario. Banks need to improve how they draw out the Bank's macroeconomic scenario across their businesses, particularly in countries where they have material exposures. Banks should use historical precedents and data where these are available. But where experience is less relevant, for example where the structure of a market has changed fundamentally, banks should use their accumulated experience in these economies to produce plausible scenario expansions and accompanying narratives.

...with further embedding needed.

In 2014, the Bank set out its expectation that over time, banks' stress-testing processes and frameworks would become more embedded. While the Bank notes the progress that all banks have made in this regard, the expectation is that they should continue to improve over time. The Bank will continue to work with each of the participating banks to set out areas for them to focus on ahead of the 2016 stress test. The Bank is considering the publication of further guidance to clarify its expectations.

6 Actions taken in response to the stress test

Stress-test results are not mechanically linked to policy responses. They are one input into the FPC's judgement around system-wide resilience and the PRA Board's assessment of individual banks' capital adequacy. This section starts by setting out the standards against which banks were assessed in the stress test — the 'hurdle rate' framework — as agreed by the FPC and the PRA Board earlier this year. It then outlines the supervisory and policy responses of the PRA Board and the FPC to the stress-test results.

Stress-test results informed the PRA Board's judgement around capital adequacy of individual institutions...

In determining whether an individual bank's capital needed to be strengthened further, the PRA Board considered a number of factors, including whether a bank's CET1 ratio was projected to fall below the 4.5% CET1 threshold, or its Tier 1 leverage ratio was projected to fall below the 3% Tier 1 leverage threshold. Where individual banks' CET1 and Tier 1 leverage ratios were close to these thresholds, the PRA Board also considered other factors. These included, but were not limited to, whether banks' capital resources in the stress were sufficient to cover their Pillar 1 capital requirements on a CET1, Tier 1 and Total capital basis, and their individual capital guidance, which includes Pillar 2A capital requirements.⁽¹⁾ The Pillar 2A capital requirements relate to risks not adequately captured under the common minimum requirements of the Pillar 1 regime, including, for example, pension risk, concentration risk and interest rate risk in the banking book. The PRA Board was also mindful of the extent to which vulnerabilities in banks' business models were tested by this particular stress scenario.

The PRA Board also considered progress that banks had already made over the course of 2015 to bolster their capital positions — including the extent to which these exceeded baseline projections. It assessed the robustness of banks' capital plans and any associated vulnerabilities that could impact their ability to execute these plans. In assessing capital plans, the PRA Board placed more reliance on a bank's ability to generate retained earnings than it did on situations where continued restructuring underpinned a bank's capital plan. This is because of the generally higher execution risks associated with the latter.

The PRA noted that in the baseline projections, all banks maintained CET1 capital ratios higher than 7% and leverage ratios greater than 3% using a Tier 1 definition of capital.

The stress-test results will be used by the PRA Board to inform its judgement around the setting of participating banks' PRA buffers. The results are only one input into that judgement, and are taken together with a range of other considerations,

including the extent to which this particular scenario adequately tested banks' business models.

The PRA Board judged that this stress test did not reveal capital inadequacies for five of the seven banks, given their balance sheets at end-2014 (Barclays, HSBC, Lloyds Banking Group, Nationwide Building Society, Santander UK). For the other two banks (The Royal Bank of Scotland Group and Standard Chartered) the PRA Board decided that, given continuing improvements to their resilience over the course of 2015 and plans to increase capital, they were not required to submit a revised capital plan.

- The Royal Bank of Scotland Group:** The results show that RBS's capital position remains above the threshold CET1 ratio of 4.5% and meets the leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 6.1% CET1 ratio and 3.0% leverage ratio after 'strategic' management actions. **The PRA Board judged that The Royal Bank of Scotland Group did not meet its individual capital guidance after management actions in this scenario.** Since December 2014, RBS has taken actions to improve its capital position. During the course of 2015, RBS issued £2 billion of AT1. The Interim Management Statement published on 30 October 2015 showed that the Group's CET1 ratio and Tier 1 leverage ratio have increased to 12.7% and 5.0% respectively since 31 December 2014. In addition, The Royal Bank of Scotland Group's capital plan includes plans to issue further AT1 in 2016. The AT1 will insure against risk over the next few years, during which time the bank is expected to strengthen its capital position further. **In light of the steps that The Royal Bank of Scotland Group has already taken to strengthen its capital position, coupled with its plans for future AT1 issuance, the PRA Board did not require The Royal Bank of Scotland Group to submit a revised capital plan.**
- Standard Chartered:** The results show that Standard Chartered's capital position remains above the threshold CET1 ratio of 4.5% and meets the leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 5.4% CET1 ratio and 3.0% leverage ratio after 'strategic' management actions. **The PRA Board judged that Standard Chartered did not meet its Tier 1 minimum capital requirement of 6% after management actions in this scenario.** During 2015 the Standard Chartered Board undertook a number of capital strengthening actions as well as a strategic review. The Standard Chartered Board concluded that its balance sheet needed to be strengthened

(1) Internationally agreed Pillar 1 capital requirements include minimum ratios for risk-weighted common equity Tier 1 (CET1) capital set at 4.5%, risk-weighted Tier 1 (CET1 and additional Tier 1) capital set at 6%, and risk-weighted total capital (Tier 1 and Tier 2), set at 8%. Pillar 2A risk-weighted capital requirements are additional requirements that are set by the PRA for individual banks. For further details see *PRA Policy Statement PS17/15*, 'Assessing capital adequacy under Pillar 2'; www.bankofengland.co.uk/pradocuments/publications/ps/2015/ps1715.pdf.

and announced a plan that included a rights issue and a reduction in risk-weighted assets. Since December 2014, Standard Chartered has taken action to strengthen its capital position. In March 2015, Standard Chartered issued US\$2 billion of AT1. Standard Chartered's Interim Management Statement published on 3 November showed CET1 and leverage ratios of 11.4% and 4.8%, respectively. The bank also announced a revised strategy, including a fully-underwritten capital issuance of US\$5.1 billion which is due to complete on 10 December. **In light of Standard Chartered's recent strategy review and the associated steps taken to strengthen its capital position, the PRA Board did not to require Standard Chartered to submit a revised capital plan.**

...and the FPC's assessment of the extent to which potential macroprudential interventions were warranted.

The FPC considered the stress-test results as part of its evaluation of the overall capital adequacy and resilience of the UK financial system, taking into account the severity of the scenario and the particular combination of shocks it entailed.

In evaluating the resilience of the banking system, the FPC looked at, among other things, the number of institutions that suffered sharp declines or low capital ratios post stress; indications that system-wide bank behaviour in the stress could adversely affect the macroeconomy or the stability of other parts of the financial system; and sectoral concentrations in losses. The FPC also weighed the uncertainties identified in the projections in forming its judgements.

An important macroprudential goal of stress testing is to help the FPC assess whether the banking system is sufficiently well capitalised to maintain the supply of financial services in the face of adverse shocks. To that end, banks were required to assume that, even under stress, lending to the UK real economy expanded by 9% over the five years of the stress scenario to meet the demand for borrowing. The Bank ensured that banks' projections for lending to the UK real economy were consistent, in aggregate, with this published path for lending in the stress (see Box 5 on page 35).

The FPC noted that no banks fell below the 3% Tier 1 leverage or 4.5% CET1 ratio thresholds at the trough of the stress scenario, and that the capitalisation of the system had improved further over the course of 2015. Moreover, as noted above, the stress-test results and banks' capital plans, taken together, indicated that the banking system would have the capacity to maintain its core functions in a stress scenario such as the one embodied in the 2015 stress test.

The FPC considered the information from the 2015 stress test, alongside other indicators and analysis, including the 2014 stress test, in forming its judgements on the overall capital adequacy of the UK banking system. UK banks continued to strengthen their balance sheets and improve their capital positions during 2014. Other things equal, this suggests that UK banks would be more resilient in the face of the macroeconomic stress scenario embodied in the 2014 stress test, which was more focused on exploring the risks posed by banks' UK exposures.

The FPC judged that no macroprudential actions on bank capital were required in response to the 2015 stress test. The stress-test results suggested that the banking system was capitalised to support the real economy in a global stress scenario which adversely impacts the United Kingdom, such as that incorporated in the 2015 stress scenario.

Some banks have issued high-trigger AT1 instruments since the balance sheet cut-off date for this stress test. As described in Section 4.2, none of banks' AT1 instruments as at end-2014 would have converted to equity in this particular scenario. The FPC and PRA Board further noted that the conversion to equity of these instruments could act to support the resilience of the banking system and individual banks within it in future stresses. The FPC and PRA Board emphasised that investors in these instruments should be aware that they could be converted to equity in a real stress.

The FPC judged that banks would remain adequately capitalised under the stress to continue providing financial services to the real economy (see Box 5 on page 35).

Box 5

Ensuring that the banking system is sufficiently capitalised to maintain the supply of lending in the stress

In the 2014 stress test the FPC agreed a general principle that banks' proposed management actions to change the size of their loan books would not be accepted, unless driven by changes in credit demand that would be expected to occur in the stress scenario. This reflected a key macroprudential goal of stress testing which is to ensure that the banking system is sufficiently capitalised to maintain the supply of financial services in the face of adverse shocks.

This box explains how the Bank's 2015 stress test is designed to help meet that goal, along with the FPC's judgement on what the results of the 2015 stress test reveal about UK banks' ability to continue lending to the real economy in adverse conditions.

Design features

In line with the FPC's general principle around maintaining the supply of financial services, the 2015 stress test incorporates three features:

- The FPC's general principle is reflected in the calibration of the macroeconomic stress scenario. Although the price of credit faced by households and business rises in the stress, which dampens the demand for credit, this just reflects short-term increases in bank funding costs. The calibration of the scenario is based on the assumption that banks do not reduce the availability of credit independent of passing through these funding cost increases.
- The paths published for the base and stress scenarios include aggregate bank lending to the UK real economy. Reflecting the assumption that banks do not reduce credit availability, the stress scenario is one in which UK real economy lending growth remains broadly positive, increasing by 9% over the five years of the stress, in line with demand for credit. The Bank committed to ensuring that banks' own projections for lending were consistent, in aggregate, with the published stress scenario lending path.
- Banks were asked to identify any proposed deviations from the FPC's principle in their balance sheet projections.

Results of the 2015 stress test

The Bank assessed banks' projections for lending in the stress against its guidance. Where banks' projections were found to be inconsistent, in aggregate, with the Bank's published lending paths, adjustments were made, and in some cases, resubmissions were required.

The aggregate CET1 capital ratio of stress-test participants decreases to 7.6% in the 2015 stress, which is in line with the trough in the 2014 test, and well above the CET1 hurdle rate.⁽¹⁾ And on a UK lending weighted aggregate basis, this trough is higher at 9.7%.⁽²⁾ Based on the impact of the 2015 stress on banks' capital positions alone, the results suggest that UK banks could continue to increase their lending in a scenario similar to that embodied in the 2015 stress test.

The FPC also considered whether, if banks were to continue to expand their lending in a stress, this might raise their funding costs to a level that might make further lending unprofitable. The Committee judged, however, that overall, banks would be able to retain access to funding markets at rates below such elevated levels.

Having noted that banks' balance sheet projections were consistent with the Bank's published lending paths the FPC judged that the stress-test results and banks' capital plans, taken together, indicated that the banking system would have the capacity to maintain its core functions under a stress similar to the 2015 scenario in which global economic conditions deteriorated. This conclusion was reinforced by the relatively strong performance of UK-focused banks.

Ensuring that banks have capacity to maintain lending under a hypothetical stress does not guarantee that banks will continue to increase their lending during an actual stress. But it ensures that lack of capital is not a constraint.

Chart A Lending to UK individuals and PNFCS^(a)



Sources: Bank of England and Bank calculations.

(a) To the right of the vertical line, the solid line represents the stress projection. The dashed line represents the baseline projection. These projections have been produced by Bank staff. The baseline projection is designed to be broadly consistent with the forecasts published in the February 2015 *Inflation Report*.

(1) 7.6% is the aggregate risk-weighted CET1 ratio low point under the 2015 stress, after taking account of 'strategic' management actions. 7.6% is also the aggregate CET1 ratio low point in the 2014 stress test, after taking account of strategic management actions, for the banks taking part in the 2015 stress test.

(2) Weighted by shares in UK retail and wholesale lending at the end of 2014.

7 Next steps

The concurrent stress tests conducted by the Bank in 2014 and 2015 constitute important steps towards the development of a stress-testing framework in the United Kingdom.

In October 2015 the Bank released 'The Bank of England's approach to stress testing the UK banking system', which set out the main features of the Bank's stress-testing framework to 2018.⁽¹⁾ This framework has been shaped both by lessons learnt during the 2014 and 2015 tests, and feedback to the 2013 Discussion Paper.⁽²⁾

Over the next three years, the Bank is aiming to:

- Develop an approach to stress testing that is explicitly countercyclical, with the severity of the test, and associated regulatory capital buffers, varying systematically with the state of the financial cycle.
- Improve the consistency between the concurrent stress test and the overall capital framework, including by ensuring that systemically important banks are held to higher standards.
- Enhance its own modelling capability, while ensuring that participating banks continue to play an important role in producing their own projections of the impact of the stress.

Introducing an annual cyclical scenario and a biennial exploratory scenario

Every year, the Bank will design and run a scenario intended to assess the risks to the banking system emanating from the financial cycle — the 'annual cyclical scenario'. The severity of this scenario will increase as risks build up and decrease after those risks crystallise or abate. The scenario might therefore be most severe during a period of exuberance — for example, when credit and asset prices are growing rapidly and risk premia are compressed. That might well be the point when markets and financial institutions consider risks to be lowest. And severity will be lower when exuberance has corrected — often the time at which markets assess risks to be largest. In leaning against these tendencies, the stress-testing framework will lean against the cyclical nature of risk-taking: it will be countercyclical.

Markets and banks should, over time, be able to anticipate broad movements in the scenario. But its precise calibration will not be mechanical — it will reflect policymakers' judgements over the magnitude of prevailing imbalances. The assessment of imbalances will be based on a wide range of indicators, both domestic and global. Policymakers will form a view of imbalances across a range of markets and sectors, for example: in property and asset prices, in the pricing of risk in financial markets, and in the level and growth rate of credit

extended by the banking system. Many of these are captured by the FPC's 'core indicators'.⁽³⁾

The results of this scenario will help inform the setting of countercyclical capital buffers by the FPC, as well as any additional individual bank capital buffers set by the PRA.

Every other year, the annual cyclical scenario will be complemented by an additional scenario intended to probe the resilience of the system to risks that may not be neatly linked to the financial cycle — the 'biennial exploratory scenario'.

This scenario will explore emerging or latent threats to financial stability. It will not be used to change the Bank's risk tolerance, but will aim to explore risks that are not captured by the annual cyclical scenario. For example, it could explore a set of structural macroeconomic developments that are unusual from a historical perspective, such as the persistent deflationary pressures that were a feature of the 2015 scenario. Or it could be used for a more detailed test of the asset quality of particular sectors. While the annual cyclical scenario will be expected to evolve systematically with indicators of the financial cycle, the biennial exploratory scenario will vary in nature from exercise to exercise.

The Bank's intention to run the exploratory scenario biennially will ensure that the burden on participating banks remains reasonable and proportionate. In 2016, the EBA intends to run a stress test and the Bank will run the cyclical scenario only.⁽⁴⁾ In 2017, the Bank intends to run both the cyclical and exploratory scenarios for the first time. In 2018, the Bank intends to run the cyclical scenario only.

A framework for co-ordinated policy decisions, and an enhanced hurdle rate framework consistent with bank capital rules

The results of the annual cyclical and biennial exploratory scenarios, together with the results of the stress tests that banks conduct as part of the Individual Capital Adequacy Assessment Process, will provide the FPC and the PRA with a rich information set. This information, along with other indicators and analysis, will help the FPC and the PRA co-ordinate their policy responses to ensure that the banking system as a whole, and individual banks within it, have sufficient capital buffers to be able to withstand a future stress. They can do so by adjusting a range of regulatory capital buffers, including the UK countercyclical capital buffer

(1) See www.bankofengland.co.uk/financialstability/Documents/stresstesting/2015/approach.pdf.

(2) See www.bankofengland.co.uk/financialstability/fsc/Documents/discussionpaper1013.pdf.

(3) For more detail on the FPC's 'core indicators' see www.bankofengland.co.uk/financialstability/pages/fpc/coreindicators.aspx.

(4) The EBA intends to publish the results of its stress test in early 2016 Q3. For further details on the EBA test see <https://www.eba.europa.eu/-/eba-announces-details-of-2016-eu-wide-stress-test>.

(CCyB), sectoral capital requirements (SCRs) and the PRA buffer.

Should the FPC and the PRA decide to change capital buffers following the stress test, the FPC will move first. It will consider the case for adjusting system-wide capital buffers through a combination of the CCyB and SCRs. The PRA will then consider setting additional buffers for individual banks, taking into account any system-wide buffer that has already been set.

As well as informing the appropriate size of regulatory capital buffers, the stress-test framework also examines whether a bank currently has enough capital resources. If it does not, it will have to take action to strengthen its capital position over an appropriate time frame.

To improve the consistency between the concurrent stress test and the regulatory capital framework, the hurdle rate framework will evolve in two ways.

First, each bank will be expected to meet all of its minimum risk-based CET1 capital requirements in the stress scenario. These comprise both the internationally agreed minima ('Pillar 1') and additional requirements that are set by the PRA ('Pillar 2A'). Pillar 2A requirements are intended to correct for risks that are not captured (or not adequately captured) in Pillar 1, such as risks associated with banks' own pension schemes. Given that, the Bank judges that Pillar 2A CET1 requirements should be treated in the same way as Pillar 1 CET1 requirements, and therefore be explicitly and transparently included in the hurdle rate. As in 2015, each bank will continue to be expected to meet its minimum leverage ratio requirements.

Second, consistent with the overall capital framework, systemically important banks will be held to higher standards. For example, Barclays, HSBC, The Royal Bank of Scotland Group and Standard Chartered have been designated as global systemically important banks (G-SIBs), with associated G-SIB buffers ranging from 1% to 2.5% of CET1 capital.⁽¹⁾ These buffers will start transitioning in from 2016. In order to be consistent with the internationally agreed desire to hold systemically important banks to higher standards, G-SIB buffers will also be included in the hurdle rate framework.

An enhanced role for Bank of England modelling, with a focus on system-wide dynamics

The final stress-test projections for the 2015 stress test are informed by a range of models and analysis, including models developed by both participating banks and in-house by Bank of England staff. In the future, the Bank intends to enhance the role that its own models play in the stress test.

The Bank continues to believe that there is merit in requesting participating banks to model the impact of stress scenarios themselves. Doing so allows participants and regulators alike to gain an insight into the strengths and weaknesses of banks' models. And these insights should spur improvements in banks' risk management capabilities, which in turn will improve the quality of their stress testing, both within and outside of the concurrent stress-testing framework. At the same time, modelling performed by the Bank of England can act as an important cross-check on banks' own projections, and help ensure consistency in the overall results of the stress test. In order to realise these benefits, the Bank will develop its modelling capability further.

Moreover, the Bank plans to develop its capability to model system-wide dynamics, including feedback and amplification mechanisms. Including these dynamics — which can magnify the effects of any initial stress — will better exploit the potential of a concurrent stress test to assess the resilience of the banking system. For example, in the recent financial crisis, uncertainty over the solvency of different banks led to strains in funding markets, which in turn impaired banks' ability to provide credit to households and businesses. The Bank is better placed than participants to coherently and consistently model such risks because it has the ability to view data and projections across participating banks.

Timeline for the 2016 test

In 2016, the Bank will run its first annual cyclical scenario style concurrent stress test. Consistent with previous concurrent stress tests, the balance sheet cut-off date for the 2016 test will be end-2015. The Bank will publish the quantitative data associated with the 2016 scenario on its website, along with an explanatory 'Key elements' document around the end of 2016 Q1. The Bank intends to publish the results of the 2016 exercise in 2016 Q4.

(1) For more detail on these capital buffers see www.bankofengland.co.uk/pradocuments/publications/ps/2014/ps314.pdf. Also see www.bankofengland.co.uk/financialstability/Pages/fpc/policystatements.aspx.

Annex 1: Bank-specific results

Barclays plc

Table 1A Projected consolidated solvency ratios in the stress scenario

	Actual (end-2014)	Minimum stressed ratio (<i>before</i> the impact of 'strategic' management actions or AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and <i>before</i> AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and conversion of AT1)	Actual (2015 Q3)	Submit revised capital plan?
Common equity Tier 1 ratio ^{(a)(b)}	10.2%	6.8%	7.3%	7.3%	11.1%	Not required
Tier 1 capital ratio ^(c)	13.0%	9.0% ^(f)	9.6% ^(f)	9.6% ^(f)	14.2%	
Total capital ratio ^(d)	16.5%	12.2% ^(f)	12.8% ^(f)	12.8% ^(f)	17.7%	
Memo: risk-weighted assets (£ billion)	402	453 ^(f)	444 ^(f)	444 ^(f)	382	
Memo: CET1 (£ billion)	41	31 ^(f)	32 ^(f)	32 ^(f)	42	
Tier 1 leverage ratio ^{(a)(e)}	3.7%	3.2%	3.3%	3.3%	4.2%	
Memo: leverage exposure (£ billion)	1,233 ^(g)	1,128 ^(h)	1,128 ^(h)	1,128 ^(h)	1,141	

(a) The low points for the common equity Tier 1 (CET1) ratio and leverage ratio shown in the table do not necessarily occur in the same year of the stress scenario and correspond to the year where the minimum stressed ratio is calculated after 'strategic' management actions.

(b) The CET1 ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets (RWAs) where CET1 capital is defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and in *Supervisory Statement SS7/13, 'CRD IV and capital'*, December 2013, and RWAs are defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and relevant Supervisory Statements, December 2013.

(c) Tier 1 capital ratio is defined as Tier 1 capital expressed as a percentage of RWAs where Tier 1 capital is defined as the sum of CET1 capital and additional Tier 1 capital in line with the UK implementation of CRD IV.

(d) Total capital ratio is defined as total capital expressed as a percentage of RWAs where total capital is defined as the sum of Tier 1 capital and Tier 2 capital in line with the UK implementation of CRD IV.

(e) The leverage ratio is calculated in line with the Policy Statement 'The Financial Policy Committee's powers over leverage ratio tools', July 2015.

(f) Corresponds to the same year as the minimum CET1 ratio over the stress scenario.

(g) Leverage exposure measure taken from the bank's annual accounts.

(h) Corresponds to the same year as the minimum leverage ratio over the stress scenario.

Barclays is a universal bank, with operations focused in the United Kingdom and United States. The results show that Barclays' capital position remains above the threshold CET1 ratio of 4.5% and leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 6.8% CET1 ratio in 2016 and 3.2% leverage ratio in 2015 before the implementation of 'strategic' management actions and 7.3% CET1 ratio and 3.3% leverage ratio after 'strategic' management actions. **The PRA Board judged that this stress test did not reveal capital inadequacies for Barclays given its balance sheet at end-2014.** The effects of the traded risk scenario contribute to the projected deterioration in Barclays' capital position through reductions in investment banking income, market and counterparty credit risk losses and an increase in prudent valuation adjustments made to illiquid assets, the latter mainly driven by higher bank funding costs. An increase in credit impairment charges, particularly in Barclays' credit card portfolios, also contributes to the deterioration. In addition to this, risk-weighted assets increase, driven by credit, market and counterparty credit risk. The assessment includes stressed projections of misconduct costs. Barclays does not pay ordinary share dividends in 2015 and 2016. The analysis also incorporates the impact of 'strategic' management actions that the PRA Board judged Barclays could realistically take in the stress scenario, which primarily relate to further reductions to variable remuneration and other discretionary costs. The impact of these 'strategic' management actions means that AT1 conversion is not triggered. Since December 2014, Barclays has taken a number of steps to improve its CET1 and leverage ratios, including reducing risk-weighted assets and leverage exposure. It also issued an additional £1 billion of AT1. The Interim Management Statement published on 29 October 2015 showed CET1 and leverage ratios of 11.1% and 4.2%, respectively. **The PRA Board did not require Barclays to submit a revised capital plan.**

HSBC Holdings plc

Table 1B Projected consolidated solvency ratios in the stress scenario

	Actual (end-2014)	Minimum stressed ratio (<i>before</i> the impact of 'strategic' management actions or AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and <i>before</i> AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and conversion of AT1)	Actual (2015 Q3)	Submit revised capital plan?
Common equity Tier 1 ratio ^{(a)(b)}	10.9%	7.0%	7.7%	7.7%	11.8%	Not required
Tier 1 capital ratio ^(c)	12.5%	8.0% ^(f)	8.7% ^(f)	8.7% ^(f)	13.8%	
Total capital ratio ^(d)	15.6%	10.9% ^(f)	11.8% ^(f)	11.8% ^(f)	17.0%	
Memo: risk-weighted assets (US\$ billion)	1,220	1,439 ^(f)	1,373 ^(f)	1,373 ^(f)	1,143	
Memo: CET1 (US\$ billion)	133	101 ^(f)	105 ^(f)	105 ^(f)	135	
Tier 1 leverage ratio ^{(a)(e)}	4.8%	3.5%	3.7%	3.7%	5.0%	
Memo: leverage exposure (US\$ billion)	2,953 ^(g)	3,055 ^(h)	3,055 ^(h)	3,055 ^(h)	2,899	

(a) The low points for the common equity Tier 1 (CET1) ratio and leverage ratio shown in the table do not necessarily occur in the same year of the stress scenario and correspond to the year where the minimum stressed ratio is calculated after 'strategic' management actions.

(b) The CET1 ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets (RWAs) where CET1 capital is defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and in *Supervisory Statement SS7/13, 'CRD IV and capital'*, December 2013, and RWAs are defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and relevant Supervisory Statements, December 2013.

(c) Tier 1 capital ratio is defined as Tier 1 capital expressed as a percentage of RWAs where Tier 1 capital is defined as the sum of CET1 capital and additional Tier 1 capital in line with the UK implementation of CRD IV.

(d) Total capital ratio is defined as total capital expressed as a percentage of RWAs where total capital is defined as the sum of Tier 1 capital and Tier 2 capital in line with the UK implementation of CRD IV.

(e) The leverage ratio is calculated in line with the Policy Statement 'The Financial Policy Committee's powers over leverage ratio tools', July 2015.

(f) Corresponds to the same year as the minimum CET1 ratio over the stress scenario.

(g) Leverage exposure measure taken from the bank's annual accounts.

(h) Corresponds to the same year as the minimum leverage ratio over the stress scenario.

HSBC is a global, universal bank, the largest bank in Hong Kong and the largest foreign bank in China, where it focuses on financing international trade and investment flows for larger state-owned, private and foreign companies. The results show that HSBC's capital position remains above the threshold CET1 ratio of 4.5% and leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 7.0% CET1 ratio in 2016 and 3.5% leverage ratio in 2016 before the implementation of 'strategic' management actions, and 7.7% CET1 ratio and 3.7% leverage ratio after 'strategic' management actions. **The PRA Board judged that this stress test did not reveal capital inadequacies for HSBC given its balance sheet at end-2014.** The scenario for the 2015 stress test includes macrofinancial stresses in many of the economies where HSBC operates, including Asia, Latin America and the euro area, as well as a traded risk stress. The hypothetical scenario stresses retail and corporate exposures in China and Hong Kong as well as other Asian economies, leading to increased impairments of retail and corporate exposures and increased risk weights on retail, wholesale and counterparty credit exposures. Market risk losses arise from the hypothetical traded risk scenario which impacts HSBC's trading business. The assessment includes stressed projections of misconduct costs. HSBC makes significant reductions to its dividends in line with its stated policy such that AT1 conversion is not triggered. The assessment also incorporates the impact of 'strategic' management actions that the PRA Board judged HSBC could realistically take in the stress scenario, including cost and pay reductions and disposal of some legacy portfolio assets. Since December 2014, HSBC has issued US\$3.5 billion of AT1. In addition, HSBC announced a revised group strategy on 9 June, which included significant disposals and RWA reductions by the end of 2017. HSBC's Interim Management Statement published on 2 November 2015 showed CET1 and leverage ratios of 11.8% of 5.0%, respectively. **The PRA Board did not require HSBC to submit a revised capital plan.**

Lloyds Banking Group plc

Table 1C Projected consolidated solvency ratios in the stress scenario

	Actual (end-2014)	Minimum stressed ratio (<i>before</i> the impact of 'strategic' management actions or AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and <i>before</i> AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and conversion of AT1)	Actual (2015 Q3)	Submit revised capital plan?
Common equity Tier 1 ratio ^{(a)(b)}	12.8%	9.5%	9.5%	9.5%	13.7%	Not required
Tier 1 capital ratio ^(c)	16.5%	12.5% ^(f)	12.5% ^(f)	12.5% ^(f)	17.2%	
Total capital ratio ^(d)	22.0%	16.7% ^(f)	16.7% ^(f)	16.7% ^(f)	22.2%	
Memo: risk-weighted assets (£ billion)	240	242 ^(f)	242 ^(f)	242 ^(f)	225	
Memo: CET1 (£ billion)	31	23 ^(f)	23 ^(f)	23 ^(f)	31	
Tier 1 leverage ratio ^{(a)(e)}	4.9%	3.9%	3.9%	3.9%	5.0%	
Memo: leverage exposure (£ billion)	740 ^(g)	738 ^(h)	738 ^(h)	738 ^(h)	723	

(a) The low points for the common equity Tier 1 (CET1) ratio and leverage ratio shown in the table do not necessarily occur in the same year of the stress scenario and correspond to the year where the minimum stressed ratio is calculated after 'strategic' management actions.

(b) The CET1 ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets (RWAs) where CET1 capital is defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and in *Supervisory Statement SS7/13, 'CRD IV and capital'*, December 2013, and RWAs are defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and relevant Supervisory Statements, December 2013.

(c) Tier 1 capital ratio is defined as Tier 1 capital expressed as a percentage of RWAs where Tier 1 capital is defined as the sum of CET1 capital and additional Tier 1 capital in line with the UK implementation of CRD IV.

(d) Total capital ratio is defined as total capital expressed as a percentage of RWAs where total capital is defined as the sum of Tier 1 capital and Tier 2 capital in line with the UK implementation of CRD IV.

(e) The leverage ratio is calculated in line with the Policy Statement 'The Financial Policy Committee's powers over leverage ratio tools', July 2015.

(f) Corresponds to the same year as the minimum CET1 ratio over the stress scenario.

(g) Leverage exposure measure taken from the bank's annual accounts.

(h) Corresponds to the same year as the minimum leverage ratio over the stress scenario.

Lloyds Banking Group (LBG) is a UK retail and commercial bank with modest international exposures and trading business. The results show that LBG's capital position remains above the threshold CET1 ratio of 4.5% and leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 9.5% CET1 ratio in 2016 and 3.9% leverage ratio in 2016. LBG did not submit any 'strategic' management actions for inclusion in the Bank's analysis of this stress test. **The PRA Board judged that this stress test did not reveal capital inadequacies for Lloyds Banking Group given its balance sheet at end-2014.** Compared to some other banks taking part in this exercise, LBG is impacted to a lesser extent by the scenario explored in the 2015 stress test, primarily due to its UK-centric business model. The reduction in the CET1 position partly arises from lower income during the stress as a result of lower interest rates in the scenario. In addition, LBG also experiences increasing credit impairments in the mortgage book and its commercial banking operations in the UK and Ireland. Risk-weight increases are offset by asset disposals, including the sale of TSB, mandated under the State Aid Agreement. The assessment includes stressed projections of misconduct costs. LBG does not pay ordinary dividends in the first four years of the stress scenario in line with their approach to dividend payments. The Interim Management Statement published on 29 October 2015 showed CET1 and leverage ratios of 13.7% and 5.0%, respectively. **The PRA Board did not require Lloyds Banking Group to submit a revised capital plan.**

Nationwide Building Society

Table 1D Projected consolidated solvency ratios in the stress scenario

	Actual (4 April 2015)	Minimum stressed ratio (<i>before</i> the impact of 'strategic' management actions or AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and <i>before</i> AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and conversion of AT1)	Actual (2015 Q2)	Submit revised capital plan?
Common equity Tier 1 ratio ^{(a)(b)}	19.8%	19.1%	19.1%	19.1%	21.9%	Not required
Tier 1 capital ratio ^(c)	23.6%	22.1% ^(f)	22.1% ^(f)	22.1% ^(f)	25.8%	
Total capital ratio ^(d)	28.6%	25.7% ^(f)	25.7% ^(f)	25.7% ^(f)	30.8%	
Memo: risk-weighted assets (£ billion)	37	42 ^(f)	42 ^(f)	42 ^(f)	36	
Memo: CET1 (£ billion)	7.3	7.9 ^(f)	7.9 ^(f)	7.9 ^(f)	7.8	
Tier 1 leverage ratio ^{(a)(e)}	4.1%	4.1%	4.1%	4.1%	4.2%	
Memo: leverage exposure (£ billion)	201 ^(g)	221 ^(h)	221 ^(h)	221 ^(h)	209	

Note: As a result of Nationwide's reporting date, the Bank used an estimated 4 April 2015 balance sheet as the start point of the stress analysis. This results in differences between that balance sheet and its annual accounts.

- (a) The low points for the common equity Tier 1 (CET1) ratio and leverage ratio shown in the table do not necessarily occur in the same year of the stress scenario and correspond to the year where the minimum stressed ratio is calculated after 'strategic' management actions.
- (b) The CET1 ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets (RWAs) where CET1 capital is defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and in *Supervisory Statement SS7/13, 'CRD IV and capital'*, December 2013, and RWAs are defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and relevant Supervisory Statements, December 2013.
- (c) Tier 1 capital ratio is defined as Tier 1 capital expressed as a percentage of RWAs where Tier 1 capital is defined as the sum of CET1 capital and additional Tier 1 capital in line with the UK implementation of CRD IV.
- (d) Total capital ratio is defined as total capital expressed as a percentage of RWAs where total capital is defined as the sum of Tier 1 capital and Tier 2 capital in line with the UK implementation of CRD IV.
- (e) The leverage ratio is calculated in line with the Policy Statement 'The Financial Policy Committee's powers over leverage ratio tools', July 2015.
- (f) Corresponds to the same year as the minimum CET1 ratio over the stress scenario.
- (g) Leverage exposure measure taken from the bank's annual accounts.
- (h) Corresponds to the same year as the minimum leverage ratio over the stress scenario.

Nationwide is a UK building society with no trading business. The results show that Nationwide's capital position remains above the threshold CET1 ratio of 4.5% and leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 19.1% CET1 ratio in 2016 and 4.1% leverage ratio in 2017. Nationwide did not submit any 'strategic' management actions for inclusion in the Bank's analysis of this stress test. **The PRA Board judged that this stress test did not reveal capital inadequacies for Nationwide given its balance sheet at end-2014.** Compared to some other banks taking part in this exercise, Nationwide is impacted to a lesser extent by the scenario explored in the 2015 stress test, primarily due to its UK-centric business model. In this scenario, Nationwide's balance sheet continues to grow but lower interest rates reduce its net interest income, although it remains profitable in each year of the stress. In addition to this, Nationwide experiences some increase in impairments across its mortgage, buy-to-let, personal lending and commercial real estate books. Risk weights on some portfolios also increase, particularly in its buy-to-let mortgage book. The assessment includes stressed projections of misconduct costs. The half-year results published on 20 November 2015 showed CET1 and leverage ratios of 21.9% and 4.2% respectively. **The PRA Board did not require Nationwide to submit a revised capital plan.**

The Royal Bank of Scotland Group plc

Table 1E Projected consolidated solvency ratios in the stress scenario

	Actual (end-2014)	Minimum stressed ratio (<i>before</i> the impact of 'strategic' management actions or AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and <i>before</i> AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and conversion of AT1)	Actual (2015 Q3)	Submit revised capital plan?
Common equity Tier 1 ratio ^{(a)(b)}	11.1%	5.9%	6.1%	6.1%	12.7%	Not required
Tier 1 capital ratio ^(c)	13.2%	7.8% ^(f)	8.0% ^(f)	8.0% ^(f)	15.5%	
Total capital ratio ^(d)	17.1%	12.1% ^(f)	12.3% ^(f)	12.3% ^(f)	19.8%	
Memo: risk-weighted assets (£ billion)	356	306 ^(f)	306 ^(f)	306 ^(f)	316	
Memo: CET1 (£ billion)	40	18 ^(f)	19 ^(f)	19 ^(f)	40	
Tier 1 leverage ratio ^{(a)(e)}	4.2%	2.9%	3.0%	3.0%	5.0%	
Memo: leverage exposure (£ billion)	940 ^(g)	615 ^(h)	615 ^(h)	615 ^(h)	847	

(a) The low points for the common equity Tier 1 (CET1) ratio and leverage ratio shown in the table do not necessarily occur in the same year of the stress scenario and correspond to the year where the minimum stressed ratio is calculated after 'strategic' management actions.

(b) The CET1 ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets (RWAs) where CET1 capital is defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and in *Supervisory Statement SS7/13, 'CRD IV and capital'*, December 2013, and RWAs are defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and relevant Supervisory Statements, December 2013.

(c) Tier 1 capital ratio is defined as Tier 1 capital expressed as a percentage of RWAs where Tier 1 capital is defined as the sum of CET1 capital and additional Tier 1 capital in line with the UK implementation of CRD IV.

(d) Total capital ratio is defined as total capital expressed as a percentage of RWAs where total capital is defined as the sum of Tier 1 capital and Tier 2 capital in line with the UK implementation of CRD IV.

(e) The leverage ratio is calculated in line with the Policy Statement 'The Financial Policy Committee's powers over leverage ratio tools', July 2015.

(f) Corresponds to the same year as the minimum CET1 ratio over the stress scenario.

(g) Leverage exposure measure taken from the bank's annual accounts.

(h) Corresponds to the same year as the minimum leverage ratio over the stress scenario.

The Royal Bank of Scotland Group (RBS) had retail, commercial and trading businesses in the United Kingdom and the United States at the start of the stress. The results show that RBS's capital position remains above the threshold CET1 ratio of 4.5% and meets the leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 5.9% CET1 ratio in 2016 and 2.9% leverage ratio in 2016 before the implementation of 'strategic' management actions and 6.1% CET1 ratio and 3.0% leverage ratio after 'strategic' management actions. **The PRA Board judged that The Royal Bank of Scotland Group did not meet its CET1 individual capital guidance after management actions in this scenario.** The scenario has a series of impacts on its business model which show that it remains susceptible to financial and economic stress. Potential downside risks relate to the Group's corporate lending book. This assessment includes stressed projections of misconduct costs. The analysis takes into account disposals mandated under the State Aid Agreement, notably the sale of Citizens Financial Group and Williams & Glyn business, as well as ongoing rundown plans for RBS capital resolution. Account has also been taken of the Group's strategic plans for its Corporate and Institutional Banking business. It is also assumed that, in the stress scenario, ordinary share dividend payments would not be made over the period modelled. The analysis includes the impact of 'strategic' management actions that the PRA Board judged RBS could realistically take in this stress scenario. These increase the CET1 ratio by 20 basis points under stress and relate to further measures that the Group could take to reduce costs. Since December 2014, RBS has taken actions to improve its capital position. During the course of 2015, RBS issued £2 billion of AT1. The Interim Management Statement published on 30 October 2015 showed that the Group's CET1 ratio and Tier 1 leverage ratio have increased to 12.7% and 5.0% respectively. In addition, RBS's capital plan includes plans to issue further AT1 in 2016. The AT1 will insure against risk over the next few years, during which time the bank is expected to strengthen its capital position further. **In light of the steps that The Royal Bank of Scotland Group has already taken to strengthen its capital position, coupled with its plans for future AT1 issuance, the PRA Board did not require The Royal Bank of Scotland Group to submit a revised capital plan.**

Santander UK plc

Table 1F Projected consolidated solvency ratios in the stress scenario

	Actual (end-2014)	Minimum stressed ratio (<i>before</i> the impact of 'strategic' management actions or AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and <i>before</i> AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and conversion of AT1)	Actual (2015 Q3)	Submit revised capital plan?
Common equity Tier 1 ratio ^{(a)(b)}	11.9%	9.5%	9.8%	9.8%	11.7%	Not required
Tier 1 capital ratio ^(c)	14.0%	10.9% ^(f)	11.2% ^(f)	11.2% ^(f)	14.1%	
Total capital ratio ^(d)	17.3%	12.9% ^(f)	13.2% ^(f)	13.2% ^(f)	17.4%	
Memo: risk-weighted assets (£ billion)	82	93 ^(f)	93 ^(f)	93 ^(f)	86	
Memo: CET1 (£ billion)	9.8	8.7 ^(f)	9.1 ^(f)	9.1 ^(f)	10.0	
Tier 1 leverage ratio ^{(a)(e)}	3.8%	3.3%	3.4%	3.4%	4.1%	
Memo: leverage exposure (£ billion)	276 ^(g)	289 ^(h)	289 ^(h)	289 ^(h)	284	

(a) The low points for the common equity Tier 1 (CET1) ratio and leverage ratio shown in the table do not necessarily occur in the same year of the stress scenario and correspond to the year where the minimum stressed ratio is calculated after 'strategic' management actions.

(b) The CET1 ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets (RWAs) where CET1 capital is defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and in *Supervisory Statement SS7/13, 'CRD IV and capital'*, December 2013, and RWAs are defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and relevant Supervisory Statements, December 2013.

(c) Tier 1 capital ratio is defined as Tier 1 capital expressed as a percentage of RWAs where Tier 1 capital is defined as the sum of CET1 capital and additional Tier 1 capital in line with the UK implementation of CRD IV.

(d) Total capital ratio is defined as total capital expressed as a percentage of RWAs where total capital is defined as the sum of Tier 1 capital and Tier 2 capital in line with the UK implementation of CRD IV.

(e) The leverage ratio is calculated in line with the Policy Statement 'The Financial Policy Committee's powers over leverage ratio tools', July 2015.

(f) Corresponds to the same year as the minimum CET1 ratio over the stress scenario.

(g) Leverage exposure measure taken from the bank's annual accounts.

(h) Corresponds to the same year as the minimum leverage ratio over the stress scenario.

Santander UK is the UK subsidiary of a Spanish parent, it is a retail bank with a small trading business. The results show that Santander UK's capital position remains above the threshold CET1 ratio of 4.5% and leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 9.5% CET1 ratio in 2017 and 3.3% leverage ratio in 2017 before the implementation of 'strategic' management actions and 9.8% CET1 ratio and 3.4% leverage ratio after 'strategic' management actions. **The PRA Board judged that this stress test did not reveal capital inadequacies for Santander UK given its balance sheet at end-2014.** Compared to some other banks taking part in this exercise, Santander UK is impacted to a lesser extent by the scenario explored in the 2015 stress test, primarily due to its UK-centric business model. Customer margins were reduced in the stress as a result of low interest rates and higher funding costs, primarily for retail funding. In this scenario, Santander UK's risk-weighted assets continue to grow and impairments in both the mortgage and commercial lending books increase in the stress. The assessment includes stressed projections of misconduct costs. The analysis assumes that Santander UK would maintain its dividend policy and, as such no ordinary dividends are paid in the first two years of the stress. The assessment also incorporates the impact of 'strategic' management actions that the PRA Board judged Santander UK could realistically take in the stress scenario. These relate to further reductions in costs. In June 2015, the bank issued £750 million of AT1. The Interim Management Statement published on 29 October 2015 showed CET1 and leverage ratios of 11.7% and 4.1%, respectively. **The PRA Board did not require Santander UK to submit a revised capital plan.**

Standard Chartered plc

Table 1G Projected consolidated solvency ratios in the stress scenario

	Actual (end-2014)	Minimum stressed ratio (<i>before</i> the impact of 'strategic' management actions or AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and <i>before</i> AT1 conversion)	Minimum stressed ratio (<i>after</i> the impact of 'strategic' management actions and conversion of AT1)	Actual (2015 Q3)	Submit revised capital plan?
Common equity Tier 1 ratio ^{(a)(b)}	10.5%	5.1%	5.4%	5.4%	11.4%	Not required
Tier 1 capital ratio ^(c)	11.4%	5.5% ^(f)	5.9% ^(f)	5.9% ^(f)	12.8%	
Total capital ratio ^(d)	16.7%	9.3% ^(f)	9.9% ^(f)	9.9% ^(f)	18.2%	
Memo: risk-weighted assets (US\$ billion)	342	409 ^(f)	389 ^(f)	389 ^(f)	315	
Memo: CET1 (US\$ billion)	36	21 ^(f)	21 ^(f)	21 ^(f)	36	
Tier 1 leverage ratio ^{(a)(e)}	4.5%	2.8%	3.0%	3.0%	4.8%	
Memo: leverage exposure (US\$ billion)	803 ^(g)	726 ^(h)	691 ^(h)	691 ^(h)	782	

(a) The low points for the common equity Tier 1 (CET1) ratio and leverage ratio shown in the table do not necessarily occur in the same year of the stress scenario and correspond to the year where the minimum stressed ratio is calculated after 'strategic' management actions.

(b) The CET1 ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets (RWAs) where CET1 capital is defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and in *Supervisory Statement SS7/13, 'CRD IV and capital'*, December 2013, and RWAs are defined in line with the UK implementation of CRD IV as set out in the PRA Rulebook and relevant Supervisory Statements, December 2013.

(c) Tier 1 capital ratio is defined as Tier 1 capital expressed as a percentage of RWAs where Tier 1 capital is defined as the sum of CET1 capital and additional Tier 1 capital in line with the UK implementation of CRD IV.

(d) Total capital ratio is defined as total capital expressed as a percentage of RWAs where total capital is defined as the sum of Tier 1 capital and Tier 2 capital in line with the UK implementation of CRD IV.

(e) The leverage ratio is calculated in line with the Policy Statement 'The Financial Policy Committee's powers over leverage ratio tools', July 2015.

(f) Corresponds to the same year as the minimum CET1 ratio over the stress scenario.

(g) Leverage exposure measure taken from the bank's annual accounts.

(h) Corresponds to the same year as the minimum leverage ratio over the stress scenario.

Standard Chartered is a universal bank, operating across many economies and markets in Asia, Africa and the Middle East. The results show that Standard Chartered's capital position remains above the threshold CET1 ratio of 4.5% and meets the leverage ratio of 3.0% in the hypothetical stress scenario with a low point of 5.1% CET1 ratio in 2016 and 2.8% leverage ratio in 2015 before the implementation of 'strategic' management actions and 5.4% CET1 ratio and 3.0% leverage ratio after 'strategic' management actions. **The PRA Board judged that Standard Chartered did not meet its Tier 1 minimum capital requirement of 6% after management actions in this scenario.** During 2015 the Standard Chartered Board undertook a number of capital strengthening actions as well as a strategic review. The Standard Chartered Board concluded that its balance sheet needed to be strengthened and announced a plan that included a rights issue and a reduction in risk-weighted assets. The scenario for the 2015 stress test includes macrofinancial stresses in many of the key economies and markets in which Standard Chartered operates. As a result, impairments rise, particularly to corporates in India and the Greater China region and risk weights increase significantly. Market risk losses also arise from the traded risk scenario which impacts Standard Chartered's Financial Markets business. The assessment includes stressed projections of misconduct costs. An assumption that Standard Chartered does not pay ordinary dividends in 2015 and 2016 is built into the results. The impact of 'strategic' management actions that the PRA Board judged Standard Chartered could realistically take in the stress scenario is also incorporated: these include cost reductions, reduced bonus payments and deleveraging of assets in line with reduced economic activity in key markets. Since December 2014, Standard Chartered has taken action to strengthen its capital position. In March 2015, Standard Chartered issued US\$2 billion of AT1. Standard Chartered's Interim Management Statement published on 3 November showed CET1 and leverage ratios of 11.4% and 4.8%, respectively. The bank also announced a revised strategy, including a fully underwritten capital issuance of US\$5.1 billion which is due to complete on 10 December. **In light of Standard Chartered's recent strategy review and the associated steps taken to strengthen its capital position, the PRA Board did not require Standard Chartered to submit a revised capital plan.**

Annex 2: Bank-specific projected impairment charges and traded risk losses

Table 2A Projected cumulative five-year impairment charge rates on UK lending in the stress scenario^{(a)(b)}

Per cent	Mortgage lending to individuals	Non-mortgage lending to individuals	Commercial real estate lending	Lending to businesses excluding commercial real estate
Barclays	0.2	24.6	3.5	6.6
HSBC	0.3	7.7	3.6	2.1
Lloyds Banking Group	1.2	18.7	7.2	5.3
Nationwide	0.3	17.4	9.2	–
The Royal Bank of Scotland Group	0.4	14.1	5.3	4.6
Santander UK	0.6	11.1	6.3	6.0
Standard Chartered	–	–	–	2.0

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

(a) Cumulative impairment charge rates = (five-year total impairment charge)/(average gross on balance sheet exposure), where the denominator is a simple average of 2014, 2015, 2016, 2017, 2018 year-end positions. This calculation may result in a lower impairment rate for those banks that expand balances significantly in the later years of the scenario as the economy recovers. The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rates consistent with the stress scenario.

(b) Portfolios with cumulative impairments of £0.0 billion (ie lower than £0.05 billion) are excluded.

Table 2B Projected cumulative five-year impairment charges on UK lending in the stress scenario^{(a)(b)}

£ billions	Mortgage lending to individuals	Non-mortgage lending to individuals	Commercial real estate lending	Lending to businesses excluding commercial real estate
Barclays	0.3	7.2	0.3	3.1
HSBC	0.2	1.0	0.3	1.5
Lloyds Banking Group	3.5	4.6	1.4	2.7
Nationwide	0.5	0.7	0.4	–
The Royal Bank of Scotland Group	0.6	2.1	0.9	2.7
Santander UK	0.9	1.3	0.6	0.9
Standard Chartered	–	–	–	0.1

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

(a) The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rates consistent with the stress scenario.

(b) Portfolios with cumulative impairments of £0.0 billion (ie lower than £0.05 billion) are excluded.

Table 2C Projected cumulative three-year impairment charge rates on UK lending in the stress scenario^{(a)(b)(c)(d)(e)}

Per cent	Mortgage lending to individuals	Non-mortgage lending to individuals	Commercial real estate lending	Lending to businesses excluding commercial real estate
Barclays	0.3	16.9	2.7	5.0
HSBC	0.4	4.5	3.3	1.6
Lloyds Banking Group	1.1	12.5	6.7	4.1
Nationwide	0.3	11.1	8.8	–
The Royal Bank of Scotland Group	0.5	10.8	5.1	3.2
Santander UK	0.6	7.9	5.3	4.8
Standard Chartered	–	–	–	1.6

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

(a) The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rates consistent with the stress scenario.

(b) Cumulative impairment charge rates = (three-year total impairment charge)/(average gross on balance sheet exposure), where the denominator is a simple average of 2014, 2015, 2016 year-end positions. This calculation may result in a lower impairment rate for those banks that expand balances significantly in the later years of the scenario as the economy recovers.

(c) Three-year cumulative impairment charges may be larger than five-year cumulative impairment charges if a bank releases provisions in the later years of the scenario as the economy recovers.

(d) Portfolios with cumulative impairments of £0.0 billion (ie lower than £0.05 billion) are excluded.

(e) For ease of comparison with the tables in Annex 2 of the 2014 publication, Tables 2C and 2D show cumulative three-year impairment charges.

Table 2D Projected cumulative three-year impairment charges on UK lending in the stress scenario^{(a)(b)(c)(d)(e)}

£ billions	Mortgage lending to individuals	Non-mortgage lending to individuals	Commercial real estate lending	Lending to businesses excluding commercial real estate
Barclays	0.4	4.9	0.2	2.4
HSBC	0.3	0.6	0.3	1.1
Lloyds Banking Group	3.5	3.0	1.3	2.1
Nationwide	0.4	0.4	0.3	–
The Royal Bank of Scotland Group	0.6	1.5	0.9	1.9
Santander UK	0.8	0.8	0.5	0.7
Standard Chartered	–	–	–	0.1

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

(a) The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rates consistent with the stress scenario.

(b) The cumulative three-year impairment charge on HSBC's non-mortgage lending to individuals was reported as £1 billion in the 2014 stress test, as it was converted from dollars to sterling using year-end exchange rates. This impairment charge would be £0.9 billion based on year-average exchange rates, which are used for impairment charges in this publication.

(c) Three-year cumulative impairment charges may be larger than five-year cumulative impairment charges if a bank releases provisions in the later years of the scenario as the economy recovers.

(d) Portfolios with cumulative impairments of £0.0 billion (ie lower than £0.05 billion) are excluded.

(e) For ease of comparison with the tables in Annex 2 of the 2014 publication, Tables 2C and 2D show cumulative three-year impairment charges.

Table 2E Projected cumulative five-year impairment charge rates on Hong Kong and China lending in the stress scenario^{(a)(b)}

Per cent	Lending to individuals		Lending to businesses	
Barclays	–	–	–	–
HSBC ^(c)	4.0	–	5.1	–
Lloyds Banking Group	–	–	–	–
Nationwide	–	–	–	–
The Royal Bank of Scotland Group	–	–	–	–
Santander UK	–	–	–	–
Standard Chartered	3.1	–	7.3	–

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

(a) Cumulative impairment charge rates = (five-year total impairment charge)/(average gross on balance sheet exposure), where the denominator is a simple average of 2014, 2015, 2016, 2017, 2018 year-end positions. This calculation may result in a lower impairment rate for those banks that expand balances significantly in the later years of the scenario as the economy recovers. The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rates consistent with the stress scenario.

(b) Portfolios with cumulative impairments of £0.0 billion (ie lower than £0.05 billion) are excluded.

(c) Data exclude material associates.

Table 2G Projected cumulative five-year impairment charge rates on euro-area lending in the stress scenario^{(a)(b)}

Per cent	Lending to individuals		Lending to businesses	
Barclays	7.1	–	4.0	–
HSBC	0.7	–	3.6	–
Lloyds Banking Group	4.3	–	10.4	–
Nationwide	–	–	–	–
The Royal Bank of Scotland Group	5.7	–	8.4	–
Santander UK	–	–	18.1	–
Standard Chartered	–	–	6.4	–

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

(a) Cumulative impairment charge rates = (five-year total impairment charge)/(average gross on balance sheet exposure), where the denominator is a simple average of 2014, 2015, 2016, 2017, 2018 year-end positions. This calculation may result in a lower impairment rate for those banks that expand balances significantly in the later years of the scenario as the economy recovers. The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rate consistent with the stress scenario.

(b) Portfolios with cumulative impairments of £0.0 billion (ie lower than £0.05 billion) are excluded.

Table 2I Projected traded risk losses in 2015 of the stress scenario^{(a)(b)}

	£ billions
Barclays	7.8
HSBC	11.5
Lloyds Banking Group	1.9
The Royal Bank of Scotland Group	3.0
Santander UK	0.9
Standard Chartered	5.2

Sources: Participating banks' FDSF data submissions, trading risk stress-test submissions, Bank analysis and calculations.

(a) Traded risk losses comprise: market risk, counterparty credit risk, CVA and PVA; and AFS and FVO parts of the banking book. Traded risk losses do not include investment banking revenues net of costs, to aid comparability between banks (for example allocation of costs to business lines may differ across banks).

(b) Nationwide is excluded as it has minimal traded risk exposures.

Table 2F Projected cumulative five-year impairment charges on Hong Kong and China lending in the stress scenario^{(a)(b)}

£ billions	Lending to individuals		Lending to businesses	
Barclays	–	–	–	–
HSBC ^(c)	2.1	–	5.3	–
Lloyds Banking Group	–	–	–	–
Nationwide	–	–	–	–
The Royal Bank of Scotland Group	–	–	–	–
Santander UK	–	–	–	–
Standard Chartered	0.7	–	1.9	–

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

(a) The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rates consistent with the stress scenario.

(b) Portfolios with cumulative impairments of £0.0 billion (ie lower than £0.05 billion) are excluded.

(c) Data exclude material associates.

Table 2H Projected cumulative five-year impairment charges on euro-area lending in the stress scenario^{(a)(b)}

£ billions	Lending to individuals		Lending to businesses	
Barclays	1.4	–	0.1	–
HSBC	0.1	–	1.2	–
Lloyds Banking Group	0.4	–	0.4	–
Nationwide	–	–	–	–
The Royal Bank of Scotland Group	0.7	–	1.0	–
Santander UK	–	–	0.1	–
Standard Chartered	–	–	0.2	–

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

(a) The HSBC and Standard Chartered impairment charge is calculated by first converting each component to sterling using exchange rate consistent with the stress scenario.

(b) Portfolios with cumulative impairments of £0.0 billion (ie lower than £0.05 billion) are excluded.

Table 2J Projected traded risk losses in 2015 of the stress scenario as a percentage of traded risk RWAs at end-2014^{(a)(b)}

	Per cent
Barclays	7.2
HSBC	7.8
Lloyds Banking Group	8.1
The Royal Bank of Scotland Group	4.9
Santander UK	8.9
Standard Chartered	11.8

Sources: Participating banks' FDSF data submissions, trading risk stress-test submissions, Bank analysis and calculations.

(a) Traded risk losses comprise: market risk, counterparty credit risk, CVA and PVA; and AFS and FVO parts of the banking book. Traded risk losses do not include investment banking revenues net of costs, to aid comparability between banks (for example allocation of costs to business lines may differ across banks).

(b) Nationwide is excluded as it has minimal traded risk exposures.

