BANK OF ENGLAND

December 2014

Stress testing the UK banking system: 2014 results

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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 is 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 promote effective competition in the markets for services provided by PRA-authorised firms. 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 first 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-firm results and supervisory stance with respect to those firms, have been formally approved by the PRA Board.

The Financial Policy Committee:

Mark Carney, Governor
Jon Cunliffe, Deputy Governor responsible for financial stability
Ben Broadbent, Deputy Governor responsible for monetary policy
Andrew Bailey, Deputy Governor responsible for prudential regulation
Martin Wheatley, Chief Executive of the Financial Conduct Authority
Clara Furse, external member
Donald Kohn, external member
Richard Sharp, external member
Martin Taylor, external member
Charles Roxburgh attends as the Treasury member in a non-voting capacity.

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Stress testing the UK banking system: 2014 results

Executive summary

Earlier this year, the Bank announced the first concurrent stress test of the UK banking system.(1) This built on the common, EU-wide exercise co-ordinated by the European Banking Authority (EBA). The 2014 UK stress test covered eight major UK banks and building societies (hereafter referred to as 'banks') and assessed the impact of a variant of the EU-wide stress scenario on end-2013 balance sheets.(2) The 2014 UK stress test explored vulnerabilities stemming from the UK household sector in particular, reflecting the Financial Policy Committee's (FPC's) assessment of the main domestic risks to financial stability.

To derive final projections of bank capital ratios in the stress scenario, Bank staff used an analytical framework that made use of a range of tools. These included banks' own models, in-house models, sectoral analysis and peer comparison. Key judgements to arrive at the final projections were taken by Bank staff, under the guidance of the FPC and the Prudential Regulation Authority (PRA) Board. The bank-specific results have been approved by the PRA Board.

Projections of bank capital ratios in the stress scenario

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

Based on the Bank's final projections, the stress scenario would reduce the aggregate common equity Tier 1 (CET1) ratio across the eight participating banks from 10.0% in 2013 to a low point of 7.3% in 2015. This does not account for the effect of potential 'strategic' management actions that banks could take to cushion the effect of the stress on their balance sheets. Considered together with banks' plans to build capital further, the stress-test results indicate that the banking system would have the capacity to maintain its core functions in a stress scenario. The fall in CET1 ratios is driven by two factors. First, most banks make losses, eroding their CET1 resources (the numerator of the ratio). Second, for most banks, risk-weighted assets (the denominator of the ratio) increase sharply over the scenario period. The latter is due to a rise in average risk weights in the scenario.

There is substantial variation across participating banks in terms of the impact of the stress scenario (**Table A**). This is partly due to their different business models and geographic footprints. But it also reflects that some banks are still in recovery or in the process of restructuring their balance sheets.

There are two key factors that drive banks' projected profitability in the stress, which act in opposite directions. First, impairments rise sharply as macroeconomic conditions deteriorate and an increasing number of borrowers face financial difficulties. Second, banks can widen their net interest margins between sterling assets and sterling liabilities as Bank Rate rises in the stress scenario, generating additional income that offsets some of the credit impairments. In part, this is because about 20% of banks' sterling retail deposits are current accounts. Interest expense on these liabilities would be expected to remain low as Bank Rate rises due to the transactional nature of these deposits, thereby widening the gap between interest earned on assets relative to that paid on liabilities. In aggregate, the eight participating banks are projected to make £13 billion of cumulative losses in the first two years of the stress scenario, before returning to profitability in the third year.

Bank staff analysis also took into account the extent to which banks could take certain 'strategic' management actions to cushion the impact of the stress scenario on their balance sheets. These related mostly to cutting staff costs and dividend payouts. Some of the proposed management actions also related to banks' lending behaviour in the stress. A core objective of capital regulation from a macroprudential perspective is to ensure that the banking system is sufficiently capitalised to be able to maintain the supply of bank lending in the face of adverse shocks. The FPC agreed a general principle that management actions proposed by banks to reduce the size of their loan books would not be accepted, unless these were driven by changes in credit demand that would be

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

(2) The eight participating banks and building societies are: Barclays, The Co-operative Bank, 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 2014 balance sheet as the starting point of the analysis. Throughout this document the term 'banks' is used to refer to the eight participating banks and building societies.

Table A Projected CET1 capital ratios in the stress scenario

Per cent

	Actual (end-2013)	Minimum stressed ratio (*before* the impact of management actions)[a][b]	Minimum stressed ratio (*after* the impact of management actions)[a][b]	Latest actuals[c]
Barclays	9.1	7.0	7.5	10.0
The Co-operative Bank	7.2	-2.6	-2.6	11.5
HSBC	10.8	8.7	8.7	11.2
Lloyds Banking Group	10.1	5.0	5.3	12.0
Nationwide	14.3[d]	6.1	6.7	17.6
The Royal Bank of Scotland Group	8.6	4.6	5.2	10.8
Santander UK	11.6	7.6	7.9	11.8
Standard Chartered	10.5	7.1	8.1	10.5

(a) The minimum CET1 ratios shown in the table do not necessarily occur in the same year of the stress scenario for all banks.
(b) The definitions of CET1 and risk-weighted assets are set out in Annex 1.
(c) Actuals are in 2014 Q2 for The Co-operative Bank, Santander UK and Standard Chartered; 2014 Q3 for Barclays, HSBC, Lloyds Banking Group and The Royal Bank of Scotland Group; and September 2014 for Nationwide.
(d) As a result of Nationwide's different reporting date, the Bank used an estimated 4 April 2014 balance sheet as the start point of the stress-testing analysis. This results in the difference between the CET1 ratio quoted in this table and that reported in Nationwide's annual accounts. See Annex 1 for more details.

expected to occur in the stress scenario. This is consistent with the FPC's objective to protect and enhance the financial stability of the United Kingdom and, subject to that, support the economic policy of the Government, including its objectives for growth and employment. Although identifying the purely demand-driven change in credit quantities is difficult to do precisely, for the 2014 stress test the FPC judged that it would be appropriate to reject any management actions that implied a fall in the stock of lending relative to end-2013. The FPC also noted that it may be appropriate for the PRA Board to depart from that general principle in idiosyncratic cases. Overall, after taking into account accepted 'strategic' management actions, the aggregate CET1 ratio falls to a low point of 7.5% in the stress scenario.

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

The stress-test results were used by the PRA Board and the FPC as part of their evaluation of the capital adequacy of individual institutions and the resilience of the system as a whole. The overall 'hurdle rate' framework had been 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.

From an individual-institution perspective, the PRA Board judged that this stress test did not reveal capital inadequacies for five out of the eight participating banks, given their balance sheets at end-2013 (Barclays, HSBC, Nationwide, Santander UK and Standard Chartered). The PRA Board did not require these banks to submit revised capital plans.

The PRA Board judged that, as at end-2013, three of the eight participating banks needed to strengthen their capital position further. But, given continuing improvements to banks' resilience over the course of 2014 and concrete plans to build capital further going forward, only one of these banks was required to submit a revised capital plan. More specifically:

- **The Co-operative Bank**: The Co-operative Bank's CET1 capital resources are projected to be exhausted in the hypothetical stress scenario. The Co-operative Bank is currently delivering a recovery plan that has built resilience in light of current economic conditions. The bank's CET1 ratio improved from 7.2% at end-2013 to 11.5% at end-June 2014, materially above baseline projections. The Co-operative Bank has achieved the targets set over the past 18 months in terms of building its capital base. The PRA expects all firms to maintain capital buffers that provide insulation against stress scenarios. The results of this exercise provide an updated quantitative estimate of the bank's vulnerability to a severe housing-related stress. The PRA Board's expectation of The Co-operative Bank's capital buffer is being re-set to take into account the additional assessment provided by the stress test. In light of that, the PRA Board has required The Co-operative Bank to submit a revised capital plan, which has been accepted by the PRA Board. That plan envisages a reduction in the risk profile and size of the bank's balance sheet, as a means of reducing its capital requirements. If executed, the plan will deliver a level of resilience commensurate with a bank of its future size and business model. The PRA Board will continue to monitor The Co-operative Bank's progress against the plan.

- **The Royal Bank of Scotland Group**: The Royal Bank of Scotland Group's projected CET1 ratio remains above the 4.5% CET1 threshold in the stress scenario. The PRA Board has, however, judged that, as at December 2013, the bank's capital position needed to be strengthened further. The PRA Board noted that, since end-2013, The Royal Bank of Scotland Group has taken actions to do so. The bank's 2014 Q3 Interim Management Statement demonstrated the continued improvement in the CET1 capital ratio (increasing

by 2.2 percentage points since end-2013), which is on track to exceed baseline projections. In addition, The Royal Bank of Scotland Group has updated its capital plan, adding a high-trigger additional Tier 1 (AT1) issuance programme, including plans to issue £2 billion of AT1 in 2015. These instruments will insure against risks over the next few years, during which time the bank is expected to rebuild CET1 capital further. The PRA Board would ordinarily have required The Royal Bank of Scotland Group to submit a revised capital plan in light of the stress-test results. However, given the progress already made and the capital strengthening actions that the bank has incorporated into its updated capital plan, which has been accepted by the PRA Board, an additional plan was judged not to be necessary.

- **Lloyds Banking Group**: Lloyds Banking Group's projected CET1 capital ratio remains above the 4.5% CET1 threshold in the stress scenario. The PRA Board has, however, judged that, as at December 2013, the bank's capital position needed to be strengthened further. The PRA Board noted that, since end-2013, Lloyds Banking Group has delivered positive financial results and is continuing to take steps to strengthen and de-risk the balance sheet, ahead of baseline projections. In April 2014, the bank also exchanged certain Tier 2 capital instruments into £5.3 billion of high-trigger AT1 securities. In light of the measures that Lloyds Banking Group already has in train to augment capital, the PRA Board did not require the bank to submit a revised capital plan.

The FPC considered the information provided by the stress-test results from the perspective of the resilience of the UK banking system as a whole:

- The FPC noted that only one bank fell below the 4.5% threshold at the trough of the stress scenario, that the capitalisation of the system had improved further over the course of 2014 and that the PRA Board had agreed plans with banks to build capital further. Overall, the FPC judged that the resilience of the system had improved significantly since the capital shortfall exercise in 2013. Moreover, 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. Therefore, the FPC judged that no system-wide, macroprudential actions were needed in response to the stress test.

- The FPC noted that a number of banks have issued high-trigger AT1 instruments since the balance sheet cut-off date for this stress test. As a number of banks saw their CET1 ratios fall below 7% in the stress, some of these instruments would have triggered in this particular scenario. The FPC noted that this would act to support the resilience of the banking system in the stress. The FPC emphasised that investors in these instruments should be aware of the possibility that this would happen in a real stress.

- The FPC and the PRA Board identified the behaviour of risk weights in the stress scenario as a potential structural issue, as it reflected the inherent procyclicality built into the system. Some banks' modelling approaches also led to significantly greater volatility than others. While there may be macroprudential benefits to diversity in modelling approaches, this would also result in significant variation in capital requirements against similar portfolios, making it harder for market participants to compare capital positions. Bank staff will be undertaking further work to explore these issues in more depth.

- The FPC and the PRA Board also noted that, in future years, banks are likely to be assessed in the stress test against an explicit leverage ratio threshold, as well as a risk-based capital ratio, and banks would need to have plans in place to meet these requirements.

The FPC also considered the information from the stress test and the PRA Board's actions, alongside other indicators and analysis, in forming its judgements on overall capital adequacy of the UK banking system. The FPC's overall judgement is described in Section 5.1 of the December 2014 *Financial Stability Report*.

Next steps

The 2014 test was the first step towards the Bank's medium-term stress-testing framework. It has provided a forward-looking assessment of capital adequacy, demonstrating the substantial improvement in resilience of participating banks collectively in recent years. The exercise has also shed light on banks' behaviour under stress, including the actions they would take to conserve capital in such scenarios, such as cutting dividend payments to shareholders. And, by setting out the Bank's analysis in public, it also provides greater transparency over, and reduces uncertainty about, the capital standards to which banks are being held.

The Bank will continue to build its own stress-testing capabilities and expects banks to do the same. From a qualitative perspective, the test revealed a number of areas of weakness in banks' approach to stress testing and capital planning, including weak stress-testing model management frameworks and difficulties in providing accurate data.

More broadly, the design of the overall stress-testing framework will also evolve over time. For example, as the stress-testing framework is used to inform a set of potential policy tools by the FPC and the PRA Board, the regime may need to adapt to provide sufficient information to calibrate those different tools.

The Bank will seek feedback from a range of stakeholders on the lessons learned from the 2014 exercise. This will include both participating banks and broader stakeholders — including investors in banks and other regulators. The Bank expects that many of these lessons will be reflected in the design and execution of the 2015 and future stress tests. Next year, the Bank is also planning to publish a document setting out its intended path towards the medium-term stress-testing framework.

1 Background

Concurrent stress testing is a new element of the financial policy framework in the United Kingdom…

The Financial Policy Committee (FPC) recommended in March 2013 that, 'looking to 2014 and beyond, the Bank and Prudential Regulation Authority (PRA) should develop proposals for regular stress testing of the UK banking system. The purpose of those tests would be to assess the system's capital adequacy'.(1)

In October 2013, the Bank published a Discussion Paper that set out the main features of the proposed stress-testing framework over the medium term.(2)(3) Annual stress tests of the UK banking system form one part of the overall capital adequacy framework, alongside risk-weighted capital requirements and the PRA's expectation that major UK banks meet a 3% Tier 1 leverage ratio.(4) Together, these three elements form the overall framework for assessing capital adequacy on a forward-looking basis in the United Kingdom.

The new stress-testing framework builds on the previous approach taken by the PRA (and the Financial Services Authority (FSA) before that). A key difference is that, historically, supervisory stress tests had been conducted sequentially on individual banks. The new, 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 the PRA Board. The PRA continues to conduct sequential stress tests for firms that are outside the scope of the concurrent exercise.

…and the 2014 test is the first step towards the Bank's medium-term stress-testing framework.

Earlier this year, the Bank announced the key elements of the first concurrent stress test of the UK banking system. The test covered eight major UK banks and building societies and explored particular macroeconomic vulnerabilities facing the UK banking system.

The UK stress test in 2014 built on the EU-wide exercise co-ordinated by the European Banking Authority (EBA). European stress-testing arrangements make provision for national sensitivities and variations to the common EU-wide test, allowing relevant authorities to explore country-specific risks using their own scenarios and methodologies. In line with those arrangements, the UK stress test in 2014 was conducted as a variant of the EBA test.

The 2014 stress test was the first step towards the Bank's medium-term stress-testing framework. As such, the scope of the analysis undertaken was more limited relative to the Bank's medium-term aspiration, covering a smaller number of institutions, being conducted over a longer time frame and assessing the impact of fewer scenarios. The Bank will continue to develop its stress-testing capabilities and the overall framework going forward, including in response to the lessons learned from the 2014 exercise. The Bank also intends to expand and improve the set of quantitative models it uses to assess the impact of stress scenarios, both to explore uncertainties around the projections and to capture potential system-wide amplification mechanisms more comprehensively.

Concurrent stress testing is intended to serve the needs of the FPC and the PRA Board…

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 annual stress tests deliver 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 in the United Kingdom. Stress tests also provide a device through which the Bank can be held accountable to Parliament, and the wider public, on its financial stability objective. They allow the FPC and the PRA Board to articulate the resilience standard against which they hold the banking system.

…by informing their judgements around capital adequacy.

Stress-test results are not mechanically linked to policy responses. This is not a simple 'pass-fail' exercise. The stress test is one input that informs the judgements of the FPC and the PRA Board. Both bodies use a range of analysis and information to assess the capital adequacy of the system as a whole and of individual institutions. The FPC and the

(1) Bank of England (2013), 'Financial Policy Committee statement from its policy meeting, 19 March 2013', available at www.bankofengland.co.uk/publications/pages/news/2013/013.aspx.
(2) Bank of England (2013), 'A framework for stress testing the UK banking system: a Discussion Paper', available at www.bankofengland.co.uk/financialstability/fsc/Documents/discussionpaper1013.pdf.
(3) Unless otherwise stated, references to stress testing and the Bank's stress-testing framework throughout this document relate specifically to concurrent stress testing of the UK banking system.
(4) www.bankofengland.co.uk/publications/Pages/news/2013/181.aspx. In addition, HM Treasury recently consulted on draft legislation granting the FPC powers of Direction over a leverage ratio framework: www.gov.uk/government/consultations/financial-policy-committees-leverage-ratio-framework.

PRA Board are accountable to Parliament for these judgements.

The remainder of this document is structured as follows:

- Section 2 sets out the Bank's overall approach to concurrent stress testing in 2014 — covering the scenario that was explored and the analytical framework used to translate the scenario into projections of banks' capital ratios.
- Section 3 outlines the quantitative projections of capital adequacy, both in the baseline and the stress scenario.
- Section 4 provides a summary of the qualitative assessment of participating banks' stress-testing and capital-management processes.
- Section 5 outlines the standards against which banks were assessed to reach a judgement on capital adequacy and the actions taken in response to the stress-test results by the PRA Board and the FPC.
- Section 6 concludes with a description of next steps for the development of the concurrent stress-testing framework.
- The annexes to this document provide more detailed information on bank-specific results — and associated supervisory responses by the PRA Board.

2 The Bank's approach to concurrent stress testing in 2014

This section summarises two key elements of the Bank's overall approach to conducting stress testing this year: the stress scenario explored (Section 2.1); and the approach used to translate the stress scenario into projections of bank profitability and capital ratios (Section 2.2). Box 1 outlines the similarities and differences between the UK stress test and the European-wide exercise co-ordinated by the EBA.

2.1 Risks explored through the 2014 stress scenario

The 2014 test explored risks to which the UK banking system is most exposed…

As set out in recent *Financial Stability Reports*, debt levels of households and non-financial companies in the United Kingdom remain high. The distribution of debt might also pose risks. For example, highly indebted households might react to shocks by cutting spending sharply, which would have knock-on effects for the rest of the economy.

At the time that the UK stress scenario was designed, house price growth had accelerated and become more widespread across regions. Since then, house price inflation has fallen, accompanied by a slowdown in housing market activity, but risks from UK household indebtedness remain. In the commercial real estate (CRE) market, activity has picked up further recently and has become more broad-based across regions.

These developments have taken place in the context of a prolonged period of low interest rates, both in the United Kingdom and globally. Low interest rates have eased debt-servicing costs and helped support economic activity. But the low interest rate environment can also pose risks to financial stability.

The combination of these factors means that household and corporate balance sheets in the United Kingdom could be sensitive to fluctuations in property prices and sharp rises in debt-servicing costs relative to incomes.

…through a scenario stressing the balance sheet of the UK household sector in particular.

The UK macroeconomic elements of the stress scenario for the 2014 stress test were specifically designed to assess those domestic risks. 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 stress scenario is not a forecast of macroeconomic and financial conditions in the United Kingdom. It is not a set of events that is expected, or likely, to materialise. Rather, it is a coherent, tail-risk scenario that was designed specifically to assess the resilience of UK banks.

The stress scenario featured an initial shock to productivity, which led to an abrupt reassessment of the prospects for the UK economy. This was associated with a sharp depreciation of sterling and a rise in inflationary pressures. Monetary policy was assumed to tighten in response to these inflationary pressures, with Bank Rate rising by about 4 percentage points. The downturn in economic activity led to a sharp rise in unemployment to around 12% and exposed vulnerabilities in the housing market. The stress scenario featured sharp falls in a range of asset prices, including a 35% fall in house prices.(1)

2.2 The Bank's approach to deriving projections of capital ratios

Bank staff used participating banks' own projections as a starting point…

The first step in deriving capital ratio projections was for Bank staff to understand, and interrogate, banks' own stress-testing submissions. Participating banks provided detailed projections for a range of income statement and balance sheet items, supported by additional information on the methodologies and assumptions underpinning these.

Bank staff assessed these methodologies, focusing particularly on those portfolios that were most likely to be affected by the stress scenario. In addition to highlighting areas where Bank staff took a different judgement from participating banks, that process also highlighted cases where banks had not followed the prescribed methodology accurately. Participating banks were required to correct these in revised submissions.

…and used a range of analysis to make adjustments to banks' projections…

Bank staff also used in-house models and additional analysis to provide independent benchmarks against which to judge banks' results. These were used to inform adjustments to banks' projections. Box 2 summarises the different inputs that were used to derive the final stress-test results. The outcome of this process was a final set of projections of bank capital ratios in the stress scenario, reflecting the judgements taken by Bank staff, under the guidance of the FPC and the PRA Board.

Bank staff made both upwards and downwards adjustments to banks' projections in some of the key risk areas. So the final capital ratio projections should not be interpreted as seeking to take the most pessimistic view of bank capitalisation in the

(1) More information on the UK variant scenario, including a high-level narrative, can be found in Bank of England (2014), 'Stress testing the UK banking system: key elements of the 2014 stress test', available at www.bankofengland.co.uk/financialstability/Documents/fpc/keyelements.pdf.

Box 1
Interaction between the EBA and UK stress tests in 2014

In 2014, the Bank of England conducted the first concurrent stress test of the UK banking system. In addition, the European Banking Authority (EBA) co-ordinated an EU-wide test. This box explains the interaction, similarities and differences between the two exercises.

The UK stress test in the context of the EU-wide test

EU-wide stress-testing arrangements make provision for relevant authorities to explore country-specific risks, using their own scenarios and methodologies. In line with those arrangements, the UK stress test was conducted as a variant of the EU-wide exercise, building on it in a number of areas. Specifically, it:

- covered a larger number of UK banks and building societies relative to the EU-wide stress test;
- assessed the impact of a variant of the EU-wide stress scenario, focused on exploring vulnerabilities stemming from the UK household sector in particular;
- used different methodologies to assess the impact of the stress scenario on bank capital ratios and profitability; and
- used a different hurdle rate framework to assess the need for supervisory and system-wide actions by the PRA Board and the FPC.

The remainder of this box provides more detail on the similarities and differences between the two tests across three key dimensions: the scenarios explored; the methodology used; and the hurdle rate framework.

Scenario design

Under the co-ordination arrangements with the EBA, the UK stress test in 2014 assessed the combined impact of (i) the global macroeconomic and market elements of the common, EU-wide stress scenario; and (ii) the UK macroeconomic elements of the stress scenario designed by the Bank of England. The UK test also assessed the impact of the same baseline macroeconomic scenario as the EBA test, albeit using a different methodology.

The stress scenario for the 2014 UK stress test examined the resilience of UK banks and building societies to a housing market shock and a sharp rise in interest rates in particular (see Section 2.1). A key feature of the UK mortgage market is the large proportion of floating-rate mortgages. This means that the level of Bank Rate is an important factor influencing household income gearing.

The EBA test was conducted under an explicit assumption of no changes to monetary policy in the stress scenario relative to the baseline. To explore interest rate risks more fully, the UK macroeconomic elements of the scenario for the UK stress test included a sharp rise in both short and long-term interest rates. In turn, this affected a range of asset values, including residential and commercial real estate prices (see Section 2.1).

Methodology

There were significant methodological differences between the two stress tests, in part reflecting the different objectives and scales of the exercises. These included:

- **Balance sheet assumptions**: the EBA test used a static balance sheet assumption. In the UK test, the size and composition of banks' balance sheets were allowed to evolve throughout the scenario.

- **Income and expense**: the EBA test applied income caps and expense floors. The UK exercise did not apply such constraints, in part to provide Bank staff with a richer understanding of how banks would expect to reprice assets and liabilities as Bank Rate rises in the stress.

- **Suite of models and analysis**: the Bank's stress test used a set of analytical tools in addition to participating banks' own projections to assess the impact of scenarios on banks' profitability and capital ratios.

There were also areas of commonality in terms of the methodology. For example, the EBA's approach to traded risk was applied as part of the UK stress test in 2014.

Hurdle rate framework

Both the methodological and scenario differences mean that the results of the EBA and UK variant tests are not directly comparable. Moreover, like the EBA test, the UK stress test is not a mechanistic, 'pass-fail' exercise. It is intended to inform PRA Board and FPC judgements on the capital adequacy of individual banks and the system as a whole. The PRA Board and FPC considered a range of factors when determining the need for potential policy interventions, including — but not limited to — whether banks' CET1 ratios fell below the 4.5% minimum threshold in the stress (see Section 5).

Box 2
Suite of analysis used in the 2014 stress test

This box summarises the different pieces of analysis used to arrive at the Bank's final projections of bank capital ratios in the stress.

- **Banks' own projections**: these were the starting point for the analysis. Bank staff scrutinised banks' assumptions and methodologies and adjusted projections where inconsistencies or unrealistic assumptions were identified.

- **In-house quantitative models**: for credit portfolios that were most significantly affected by the stress scenario, in-house models were used to produce independent projections for impairments. Bank staff also produced system-wide projections of capital ratios in the stress scenario to provide a further benchmark against which to evaluate banks' projections.

- **Sectoral analysis**: banks provided detailed, including loan-level, data for some portfolios, which Bank staff analysed to arrive at an independent view of the risk of those portfolios (see Box 4). Analysis of sectoral loss rates in historical stresses provided additional useful comparators against which to judge banks' projections.

- **Peer comparison**: the concurrent nature of the exercise made it possible to compare different banks' assumptions directly. This helped identify particular outliers relative to peers and allowed Bank staff to assess whether individual banks' assumptions were consistent with the assumptions made by banks in aggregate.

- **Supervisory input**: this ensured that adjustments made to banks' projections by Bank staff took into account the idiosyncrasies of individual banks' business models.

These different pieces of analysis were used for two main reasons:

- first, to make adjustments to banks' results to generate the final projections. These adjustments were applied by Bank staff under the guidance of the FPC and the PRA Board; and

- second, to highlight key areas of uncertainty in the projections. All projections are subject to inherent uncertainties, but this is particularly relevant when trying to forecast the impact of a 'tail-risk' scenario.

The Bank will continue to develop its own quantitative toolkit as it progresses towards the medium-term framework. As part of that, the Bank aspires to build further capacity to model system-wide feedback and amplification mechanisms, which by their nature cannot be captured by individual banks.

stress scenario. The fact that there is uncertainty around the final projections, even conditional on a particular stress scenario, is an important policy consideration.

…before considering the mitigating impact of credible 'strategic' management actions that banks could take in the stress.

The process discussed above produced projections of the unmitigated impact of the stress scenario on banks' balance sheets. Banks, though, could take 'strategic' management actions in a stress scenario to bolster their capital positions, such as cutting costs or dividends. Banks proposed a set of potential actions they would consider taking in the particular stress scenario. Bank staff considered whether or not to accept these, under the guidance of the FPC and the PRA Board (see Section 3.3).

3 Projections of capital adequacy

This section outlines the Bank's final projections of banks' capital ratios. Section 3.1 summarises projections under the baseline scenario. Section 3.2 sets out the Bank's view of the impact of the stress scenario on banks' CET1 ratios, as well as key uncertainties around these projections. Section 3.3 outlines how the analysis has incorporated potential 'strategic' management actions that banks could take in the stress scenario to minimise its impact on their balance sheets. Section 3.4 summarises the Bank's view of the impact of the stress scenario on banks' Tier 1 leverage ratios.

3.1 Baseline projections

The UK banking system as a whole has been undergoing a period of balance sheet repair since the crisis. In recent years, banks have made significant progress in rebuilding capital, although some remain in recovery or in the process of restructuring their balance sheets. In addition, the banking system is transitioning to higher levels of capitalisation, reflecting the changes in requirements introduced by a range of prudential reforms, including Basel III.

The baseline macroeconomic scenario used for the purposes of the 2014 UK stress test was the same as that used for the purposes of the EU-wide test, co-ordinated by the EBA. It is, therefore, not consistent with the Monetary Policy Committee's (MPC's) forecasts for the UK economy as communicated in the *Inflation Report*.

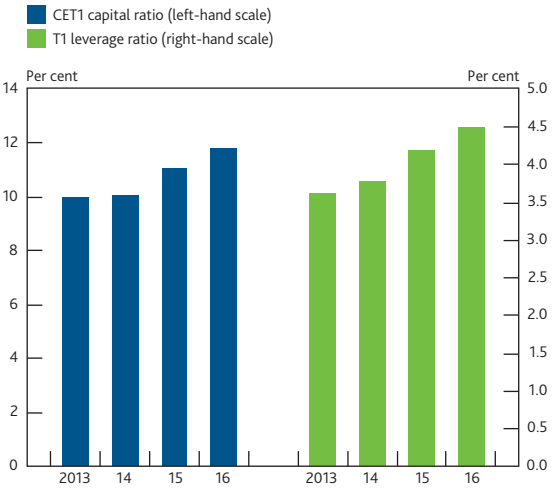
The baseline projections point to further strengthening of the capitalisation of the system. Aggregate capital and leverage ratios across the eight participating banks are projected to increase by 1.9 percentage points and 0.9 percentage points, respectively, relative to end-2013 (**Chart 1**). The rise in capital ratios is driven by a continued recovery in profitability, supported by a projected fall in impairments and an increase in net interest income, as Bank Rate begins to increase gradually over the period. All banks meet the 7% CET1 threshold in the baseline, while all banks except The Co-operative Bank also exceed the 3% leverage ratio threshold.

3.2 Projections of stressed CET1 ratios

This section outlines the Bank's final CET1 capital ratio projections in the stress scenario. The annexes provide more detail on the final, bank-specific projections. The projections are presented here before factoring in the impact of any 'strategic' management actions. The latter are discussed in more detail in Section 3.3, which also expands on how dividends have been treated in the projections, both before and after the impact of management actions.

All projections are subject to inherent uncertainties. This is particularly the case when seeking to assess the impact of a 'tail-risk' scenario that is unprecedented in certain respects,

Chart 1 Aggregate CET1 capital and T1 leverage ratio projections in the baseline[a][b][c]



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

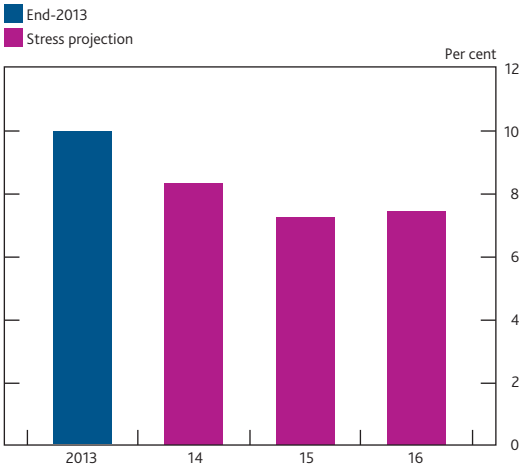
(a) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of risk-weighted assets, where these are defined in line with the UK implementation of CRD IV.
(b) The leverage ratio is defined as the sum of CET1 capital and additional Tier 1 capital using the end-point definition of additional 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.
(c) For Nationwide the stress tests are based on an estimated 4 April 2014 balance sheet, rather than end-2013. See Annex 1 for more details.

using models that have been calibrated to historical data. Bank staff highlighted some of these key uncertainties to the FPC and PRA Board to inform their policy deliberations. A subset of these is discussed in this document.

Banks' capital ratios are severely affected by the stress…

Banks' CET1 capital ratios in aggregate fall sharply in the stress (**Chart 2**). The aggregate CET1 ratio of the eight participating banks falls from 10.0% at end-2013 to a low point of 7.3% at end-2015, before accounting for the impact of management actions.

Chart 2 Aggregate CET1 capital ratio projections in the stress, before the impact of 'strategic' management actions[a][b]

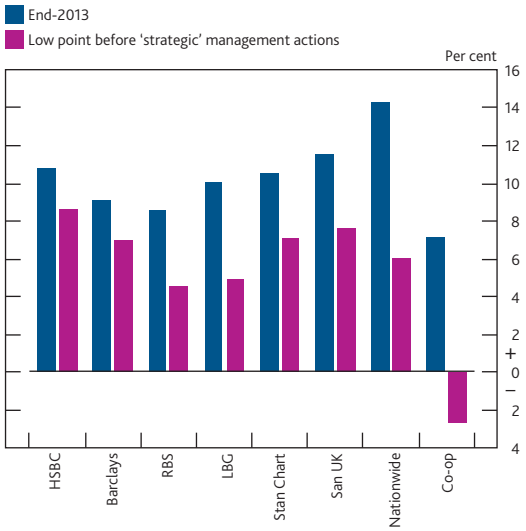


Sources: Participating banks' FDSF data submissions, Bank analysis and calculations.

(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 CRD IV.
(b) For Nationwide the stress tests are based on an estimated 4 April 2014 balance sheet, rather than end-2013. See Annex 1 for more details.

There is, however, substantial variation across participating banks (**Chart 3**). In part, this reflects the diversity of their business models and geographic footprint. The 2014 UK stress scenario was designed to be particularly stressful for UK exposures. **Chart 4** shows that UK, real-economy loan portfolios account for materially different shares of banks' total balance sheets.

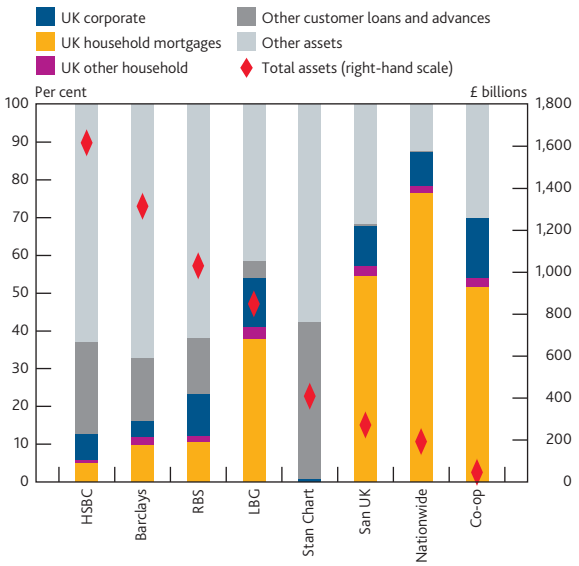
Chart 3 End-2013 and low-point CET1 capital ratios in the stress, before the impact of 'strategic' management actions(a)(b)(c)



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 CRD IV.
(b) The year of the low point differs across banks.
(c) For Nationwide the stress tests are based on an estimated 4 April 2014 balance sheet, rather than end-2013. See Annex 1 for more details.

Chart 4 End-2013 balance sheet composition and total assets for participating banks(a)(b)(c)(d)(e)(f)



Sources: Participating banks, annual accounts and Bank calculations.

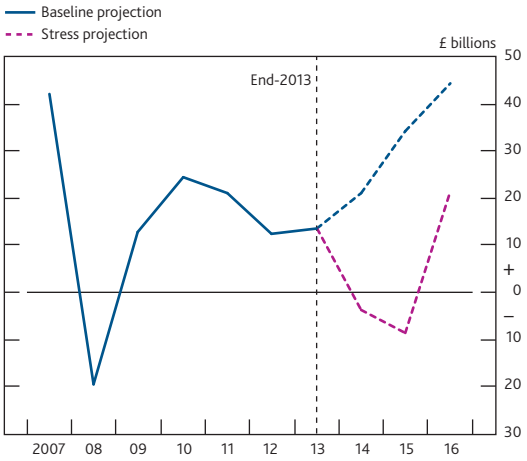
(a) UK loan book exposures are net of impairments and exclude reverse repos.
(b) UK corporate loan book exposures exclude exposures to the public sector and financial institutions.
(c) Total assets are as per end-2013 annual accounts except for Nationwide, whose total assets figure is as per 4 April 2014 annual accounts.
(d) The method for determining geography of exposures may differ across participating banks.
(e) HSBC's and Standard Chartered's total assets have been converted to sterling using end-2013 exchange rates.
(f) Other customer loans and advances are net of impairments, exclude reverse repos, include UK loan book exposures to the public sector and non-bank financial institutions, and all non-UK loans and advances to customers.

The stress reduces banks' capital ratios through two key channels. First, most banks make losses during the scenario, eroding their CET1 resources. Second, for most banks, risk-weighted assets (RWAs) are projected to increase significantly over the course of the scenario, putting further downward pressure on the risk-weighted capital ratio. Box 3 explores the observed procyclicality of risk weights revealed by the stress test in more detail.

…and the banking system sees a material fall in profitability in the stress.

Chart 5 shows the Bank's final projections for aggregate profitability in the stress over the forecast horizon, before the impact of management actions. In aggregate, the eight UK banks taking part in the stress test are projected to make around £13 billion of cumulative losses in the first two years of the stress scenario, before returning to profitability in the third year. Over the course of the three-year projection period, cumulative profits are projected to be around £9 billion. This compares with banks' cumulative profits of around £100 billion in the baseline projection between 2014 and 2016.

Chart 5 Projections for aggregate profits before tax, before 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) and Britannia (subsequently reported as part of The Co-operative Bank).

Given the nature of the macroeconomic scenario, two key factors drive banks' projected profitability in the stress, which act in opposite directions (**Chart 6**). First, impairments rise sharply as macroeconomic conditions deteriorate and as an increasing number of borrowers face financial difficulties. Second, banks can widen their net interest margins between sterling assets and sterling liabilities as Bank Rate rises and, so, generate additional income to offset some of the credit impairments. These two effects are discussed in more detail below. In keeping with the UK focus of the stress scenario, the analysis conducted by Bank staff concentrated particularly on

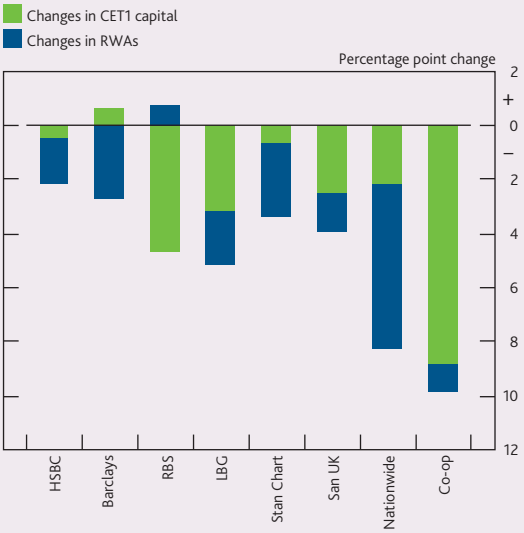
Box 3
Risk-weight procyclicality in the stress scenario

A key feature of the projections in the 2014 stress test is a significant contribution from the rise in risk-weighted assets (RWAs) to the change in CET1 ratios in the stress scenario. This box provides more detail around the observed procyclicality of risk weights and outlines the main reasons behind it.

Behaviour of RWAs in the 2014 stress test

The rise in RWAs in the stress scenario is a key driver of the projected fall in risk-based capital ratios for most banks (**Chart A**). RWAs, in turn, are driven by an increase in average risk weights, rather than nominal balance sheet growth.

Chart A Contributions to the change in CET1 capital ratios in the stress relative to end-2013[a][b][c][d]



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

(a) Changes are calculated from end-2013 to the lowest point in the stress, before the impact of 'strategic' management actions. The year of the low point differs across banks.
(b) The CET1 capital ratio is defined as CET1 capital expressed as a percentage of RWAs, where these are defined in line with the UK implementation of CRD IV.
(c) For Nationwide the stress tests are based on an estimated 4 April 2014 balance sheet, rather than end-2013. See Annex 1 for more details.
(d) RWAs fall for RBS due to asset disposals, including the disposal of Citizens (and hence make a positive contribution in the chart above).

Given the nature of the stress scenario modelled, the procyclicality of risk weights is particularly apparent for UK mortgage books. Average mortgage risk weights of the seven participating banks with UK mortgage portfolios rise from 14% at end-2013 to 30% at their peak in the stress scenario. Effectively, at the same time as the housing market stress materialises, regulatory capital requirements against UK mortgage exposures are projected to double.

There is also significant variation in the size of the change in RWAs across participating banks. This reflects, among other factors, differences in the modelling approach taken by banks to calculate RWAs for regulatory capital purposes.

Sources of procyclicality in projected risk weights

Participating banks use the internal ratings-based (IRB) approach to calculate regulatory capital requirements for the majority of their credit portfolios. This is particularly the case for UK mortgage exposures. The IRB approach is used to calculate capital requirements for over 95% of participating banks' UK mortgage books.

Under the IRB approach, banks use their own models to estimate the probability of default (PD), loss given default (LGD) and exposure at default (EAD) of an individual exposure. These three parameters feed into the RWA calculation. The way that risk weights behave under the stress scenario depends, to a large extent, on the way banks model PD and LGD.

A first key source of variability stems from the precise approach to modelling borrowers' PDs. Banks typically adopt one of the following three stylised approaches:

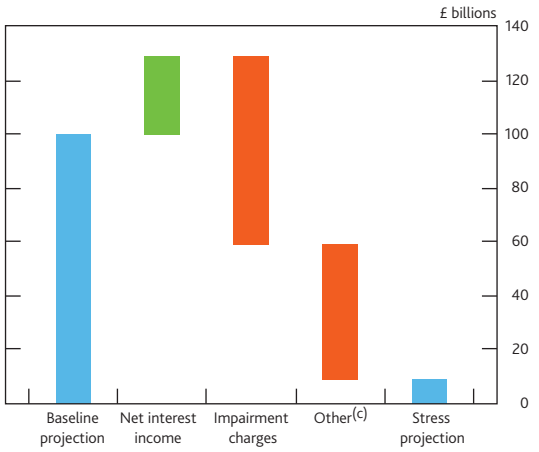
- **Point in time** — under this approach, banks seek to estimate default risk conditional on prevailing macroeconomic conditions. So, as economic and financial conditions improve, the estimated PD will typically fall and *vice versa*;
- **Through the cycle** — under this approach, banks seek to remove cyclical volatility from the estimation of default risk, by assessing borrowers' performance across the economic cycle. Therefore, the estimated PD is insensitive to changes in prevailing economic and financial conditions; and
- **Hybrid** — under this approach, the estimated PD reflects elements of both the 'point in time' and 'through the cycle' approaches. So some variability in PDs is observed over time, but not as much as with a purely 'point in time' approach.

All of these approaches have advantages and disadvantages. And there may be benefits from a macroprudential perspective to diversity in modelling approaches across the banking system. But these different approaches could lead to greater volatility in capital requirements for some banks relative to others.

A second key source of variability stems from the LGD component of the RWA calculation. A key input into the calculation of LGD for mortgages is a property price haircut. The latter is intended to reflect both a 'downturn' calibration of the market value of the property and an additional forced sale discount.

In several cases, the 35% house price fall assumed in the stress scenario exceeded those assumed in banks' LGD calculations currently used for regulatory capital purposes. This resulted in estimated LGDs increasing in the stress scenario. In turn, this was a further source of procyclicality in risk weights.

Chart 6 Contributions to the difference between cumulative aggregate profits in baseline and stress, before the impact of 'strategic' management actions[a][b]



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

(a) Cumulative projected profits before tax from 2014 to 2016.
(b) For HSBC and Standard Chartered, figures are converted from USD to sterling using exchange rates consistent with the scenarios.
(c) 'Other' includes net fee and commission income, administrative expenses, gains/losses on trading positions and other income.

participating banks' projections for profits and losses on UK portfolios.[1]

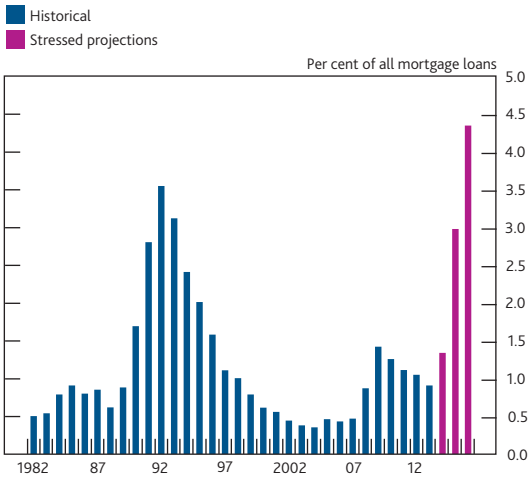
The final projections incorporate a sharp rise in UK mortgage impairments…

The stress scenario features a combination of shocks that is particularly stressful for UK households. After a prolonged period of low interest rates, the increase in Bank Rate leads to a rise in borrowing costs. At the same time, unemployment reaches levels last seen in the late 1980s and early 1990s. And inflation rises, putting further pressure on real incomes. As households face increasing financial difficulties, the arrears rate on UK mortgages is projected to increase to levels exceeding those seen in the early 1990s (**Chart 7**).

In addition to mortgagors facing repayment difficulties, property values fall precipitously in the stress scenario. The assumed 35% fall in nominal house prices results in an unprecedented scale — and depth — of negative equity in the United Kingdom (**Chart 8**).[2] Around a third of all mortgagors are projected to be in negative equity in the stress scenario, compared with around 10% in the early 1990s and the recent crisis. This increases loss given default on mortgage lending.

The combination of these two factors results in a significant rise in impairment charge rates on UK mortgage portfolios in the stress scenario, which are projected to exceed the Bank's best estimates of loss rates seen in the early 1990s. In total, projected impairments on UK mortgages account for around 60% of banks' total impairments on exposures to UK households in the stress scenario. **Chart 9** shows three-year cumulative impairment charge rates on UK mortgages over the stress scenario for each bank. The

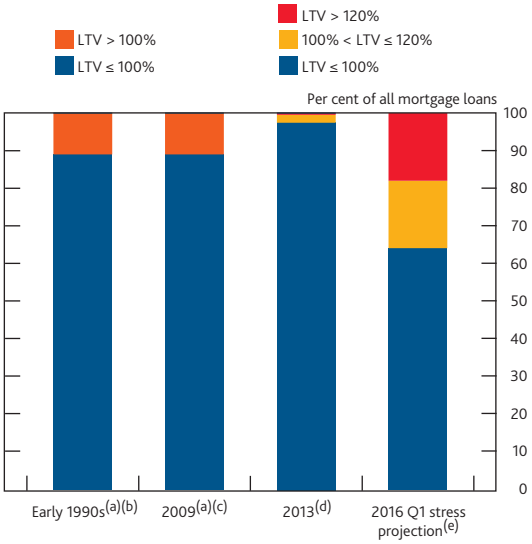
Chart 7 Household mortgage loans in arrears by six months or more[a][b][c]



Sources: Council of Mortgage Lenders, participating banks' FDSF data submissions, participating banks' submissions for the mortgage book thematic review and Bank calculations.

(a) Historical data are a weighted average for the whole banking system. Projected arrears rates are a weighted average for the seven participating banks with material UK mortgage exposures. Standard Chartered is excluded as it has minimal UK lending exposures.
(b) Includes buy-to-let lending.
(c) Participating banks' projections of arrears were provided on a best-effort basis. Several data sources were used to derive these projections.

Chart 8 Distribution of LTV ratios in the stress scenario compared to historical estimates

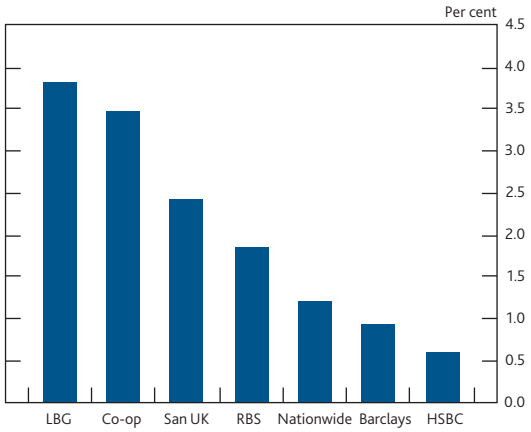


Sources: Data collected as part of the mortgage book thematic review, *Bank of England Quarterly Bulletins* and Bank calculations.

(a) Estimates for the early 1990s and 2009 only include information on whether LTVs are higher or lower than 100%.
(b) Upper estimate from Cutler, J (1995), 'The housing market and the economy', *Bank of England Quarterly Bulletin*, August, pages 260–69. Extent of negative equity was estimated as at 1995 Q2. House prices rose 1.5% between their trough in 1992 Q4 and 1995 Q2.
(c) Upper estimate from Hellebrandt, T, Kawar, S and Waldron, M (2009), 'The economics and estimation of negative equity', *Bank of England Quarterly Bulletin*, Vol. 49, No. 2, pages 110–21.
(d) Data submitted by banks as part of the mortgage book thematic review (see Box 4). Data are as at 2013 Q4 for six of the participating banks, and 2013 Q3 for one bank. Standard Chartered is excluded as it has minimal UK lending exposures.
(e) The 2016 Q1 estimate assumes a uniform house price fall across all mortgagors and does not account for changes in mortgage balances or new lending during the scenario. 2016 Q1 corresponds to the low point of the path for the nominal house price index in the scenario.

(1) In the UK-focused analysis that follows, Standard Chartered is excluded due to its minimal UK exposures.
(2) Mortgagors are in negative equity when their outstanding mortgage balance exceeds the current value of their house — that is, their loan to value ratio exceeds 100%.

Chart 9 Projected cumulative three-year impairment charge rates on UK household mortgage lending in the stress(a)(b)(c)



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

(a) Cumulative impairment charge rates = (three-year total impairment charge) / (average gross on balance sheet exposure), where the denominator is a simple average of 2013, 2014 and 2015 year-end positions. The HSBC impairment charge rate 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.
(c) Includes retail buy-to-let portfolios.

Bank's final projections were informed by a detailed review of participating banks' mortgage books. This is outlined in Box 4.

…although assessing the impact of an unprecedented shock to the UK housing market involved modelling challenges.

Assessing the effect of the stress scenario is subject to uncertainties, in part because quantitative models calibrated to historical data may not fully capture the effects of the stress scenario, which — in some respects — is unprecedented in a UK context. This was particularly relevant for analysis on mortgage arrears rates. For example, assessing the impact of the rise in interest rates required analysis at the disaggregated level of individual borrowers. Moreover, there are few historical episodes in the United Kingdom of large, unexpected shocks to debt-servicing costs and sharply falling house prices, especially in the context of high household indebtedness.

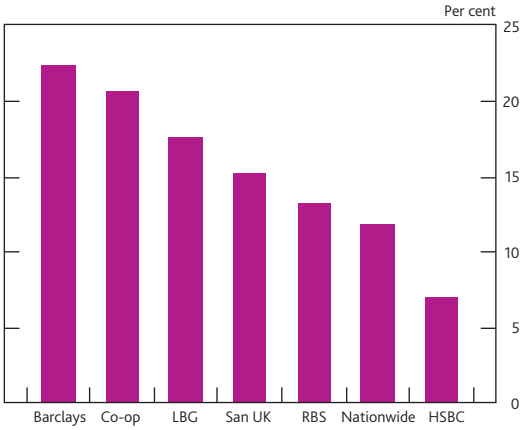
A key area of uncertainty identified by Bank staff was around the combined impact of affordability shocks and large house price falls on arrears. There is a risk that, in the face of an affordability shock, the scale and depth of negative equity in the stress scenario could lead to a larger proportion of borrowers defaulting than is incorporated in the final projections. This could be the case, for example, because — in the face of affordability shocks — borrowers deep in negative equity would not be able to avoid default by selling their properties.

There is, however, mixed evidence in existing literature as to whether high LTVs would have an amplifying impact on households' probability of default.(1) And there is limited granular data available from countries where the effects are likely to be similar to the United Kingdom. The FPC recognised this as a potential risk to the system-wide projections. But, given the available evidence, Bank staff — under the guidance of the FPC — did not make adjustments to the final projections to incorporate a potentially amplifying effect of high LTVs on arrears.

The hit to household finances also leads to an increase in losses on other household lending.

The squeeze on household finances also leads to a projected increase in impairments on banks' other UK household exposures, including — for example — credit cards and personal loans.(2) In aggregate, these account for around 40% of banks' total projected impairments on exposures to UK households. The projected impairment charge rates are broadly similar to loss rates observed during the recent crisis. This largely reflects two offsetting factors. First, the scenario is more stressful for household finances than the recent crisis, given the combination of shocks to both unemployment and interest rates. Second, across some of the lenders, there has been a tightening in underwriting standards relative to the practices observed in the 2000s and the final projections reflect a judgement that the quality of some of these books is now better than it was in the run-up to the recent crisis. **Chart 10** shows cumulative three-year impairment charge rates on UK non-mortgage lending over the stress scenario for each bank.

Chart 10 Projected cumulative three-year impairment charge rates on UK household non-mortgage lending in the stress(a)(b)



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

(a) Cumulative impairment charge rates = (three-year total impairment charge) / (average gross on balance sheet exposure), where the denominator is a simple average of 2013, 2014 and 2015 year-end positions. The HSBC impairment charge rate 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) See for example Whitley, J, Windram, R and Cox, P (2004), 'An empirical model of household arrears', *Bank of England Working Paper No. 214*; May, O and Tudela, M (2005), 'When is mortgage indebtedness a financial burden to British households? A dynamic probit approach', *Bank of England Working Paper No. 277*; McCarthy, Y (2014), 'Dis-entangling the mortgage arrears crisis: the role of the labour market, income volatility and housing equity', *Central Bank of Ireland Research Technical Paper No. 2/RT/14*; and McCann, F (2014), 'Modelling default transitions in the UK mortgage market', *Central Bank of Ireland Research Technical Paper No. 18/RT/14*.
(2) UK household non-mortgage lending includes all retail lending excluding mortgages loans and loans to retail SMEs.

Box 4
Thematic reviews of banks' UK CRE and mortgage portfolios

The Bank conducts thematic reviews of particular portfolios as part of its ongoing supervisory processes. These reviews can provide valuable information to support stress testing, both in identifying emerging risks, and in enabling Bank staff to produce in-house projections of impairments on those assets in a given stress scenario. This year's analysis benefited from two recent thematic reviews, on the UK CRE and mortgage markets.

Review of UK CRE portfolios

During 2014, Bank staff reviewed seven of the participating banks' UK CRE lending exposures as at end-2013.(1)(2) The review was conducted in two phases. In the first phase, the Bank requested banks to provide portfolio-level data and complete a qualitative questionnaire. In the second phase — on which this box focuses — the Bank requested detailed data on a sample of over 1,900 loans, representing around 50% of the seven UK banks' total UK CRE lending.

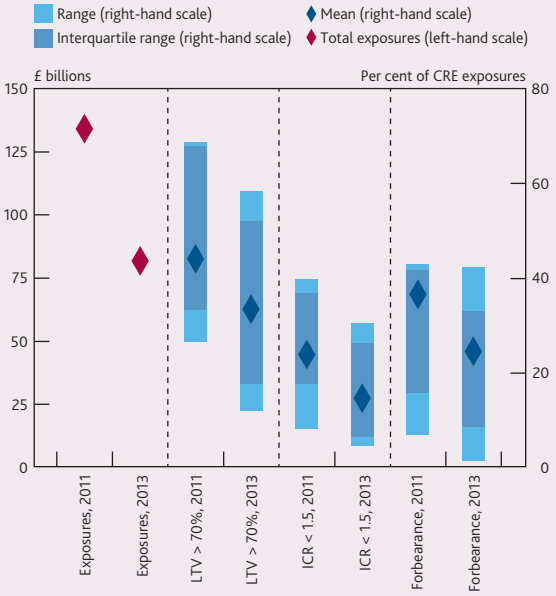
The analysis of the loan-level and portfolio-level data revealed that, across several metrics, there had been a marked improvement in the average quality of those books since the previous review carried out by the FSA in 2012 (on 2011 Q3 data) (**Chart A**). In addition, the size of CRE books of the seven banks had fallen by over a third over the same period.

This reduction in the amount of vulnerable loans is likely to reflect a mix of factors: an upturn in the UK CRE market, with capital values recovering and rental incomes stabilising; low interest rates improving debt affordability; write-offs and disposals of vulnerable loans; and relatively limited new lending, underwritten at stricter terms and conditions than loans originated prior to the recent crisis.

Notwithstanding the improvement in asset-quality metrics across nearly all banks, there was still considerable variation across banks. Bank staff used the loan-level data to test independently the resilience of banks' CRE portfolios — including the level of provisions held against non-performing loans — to the UK stress scenario. In addition, a range of sensitivities was also considered.

The analysis found that, in aggregate, projected impairment charges on banks' CRE portfolios in the stress were lower than during the recent crisis. This reflects, in part, the reduction in the size of these books and is also consistent with the improved quality of banks' portfolios, the significant impairments that banks have already taken on their legacy CRE portfolios and the smaller nominal CRE price fall in the UK stress scenario than that observed in the crisis. At the individual-bank level, the results were used to challenge and cross-check banks' projected CRE impairment charge rates.

Chart A UK CRE lending: exposures and indicators of asset quality(a)(b)(c)(d)



Sources: Bank of England CRE review, FSA surveys and Bank calculations.

(a) Characteristics of the distribution across banks of the share of CRE exposures with an LTV above 70%/ICR below 1.5/in forbearance, as at September 2011 and December 2013.
(b) ICR is the interest cover ratio — the ratio of net rental income to interest costs.
(c) Forbearance occurs when, for reasons relating to the actual or apparent financial stress of a borrower, a bank grants a temporary or permanent concession outside of normal market terms.
(d) Data on forbearance in 2011 do not include The Co-operative Bank.

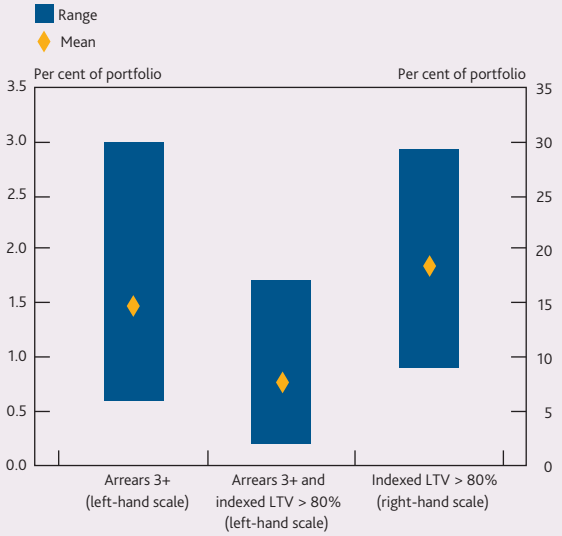
The value of the review of UK CRE books in supporting the stress test underscores the importance of loan-level data in informing the Bank's understanding of risks from the CRE market. The Bank is currently considering how best to gather and analyse such data in the future as part of a wider assessment that encompasses other asset types.(3)

Review of UK mortgage portfolios

In the first half of 2014, Bank staff gathered evidence on the credit quality of UK mortgage portfolios of seven of the banks involved in the UK stress test,(4) which collectively account for approximately 80% of the total UK mortgage market. In addition, Bank staff conducted in-depth, on-site interviews with these banks.

The review assessed recent and historical metrics of portfolio performance and considered, among other things, arrears rates, customer indebtedness, current loan to value ratios, forbearance and customer attrition. Bank staff also evaluated how banks' approaches to underwriting new business, managing customers and recovering arrears may impact on portfolio asset quality. **Chart B** shows that there is wide

Chart B UK mortgage lending: indicators of asset quality[a][b][c]



Sources: Data collected as part of the mortgage book thematic review and Bank calculations.

(a) Data are as at 2013 Q4 for six of the participating banks, and 2013 Q3 for one bank. Standard Chartered is excluded as it has minimal UK lending exposures.
(b) Indexed LTVs are mortgagors' up-to-date LTV ratios, as estimated by the banks. The arrears rate shown here represents the percentage of the value of the portfolio in arrears by three or more months. The means for all indicators are calculated as simple averages across participating banks.
(c) Data include retail buy-to-let portfolios.

variation in the risk profiles and asset quality between the seven participating banks.

The review afforded Bank staff a detailed picture of the asset quality of banks' mortgage portfolios, and information around how this would evolve in the stress scenario. It was a key input in forming the Bank's view of the relative riskiness of these books, which, in turn, fed into judgements around the final projections of impairments in the stress.

(1) The review excluded Standard Chartered, which does not have a UK CRE portfolio.
(2) The scope of this exercise excluded: social housing associations, lending secured on property to non-CRE corporates, unsecured lending to property companies and CRE in Northern Ireland.
(3) For instance, see Bank of England (2014), 'Should the availability of UK credit data be improved? A Discussion Paper', available at www.bankofengland.co.uk/publications/Documents/news/2014/dp300514.pdf; and the summary of feedback received, available at www.bankofengland.co.uk/financialstability/Documents/securitisation/responses281114.pdf.
(4) The review excluded Standard Chartered, which does not have material UK mortgage exposure.

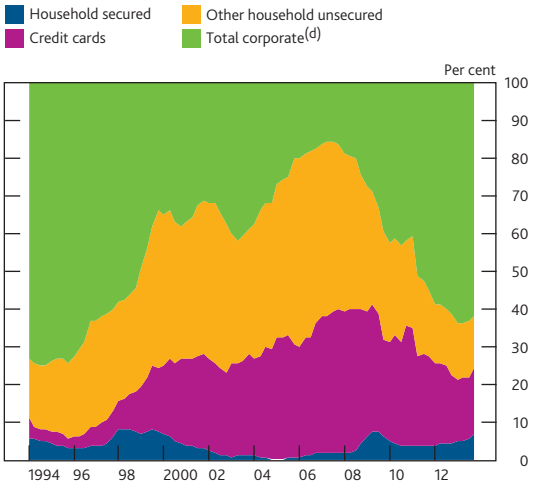
One particularly difficult area of modelling was around the extent to which an affordability stress for mortgagors might impact households' ability to service their non-mortgage debt. For example, household survey data suggest that around 40% of unsecured debt holders also have a mortgage.(1) Given the finances of some mortgagor households are expected to be stretched in the scenario, some of these households will also find it difficult to service their non-mortgage debt. These spillover effects are not well captured by standard models, so additional analysis had to be conducted by both Bank staff and by participating banks themselves. These spillover effects were captured to some extent in banks' projections and Bank staff judged that the evidence available did not warrant making additional adjustments.

The stress scenario has an adverse impact on corporate balance sheets…

UK corporate exposures were a key source of losses during the recent crisis and have accounted for a large share of the UK banking system's write-offs on domestic exposures during past episodes of banking system stress (**Chart 11**). Since the start of the crisis though, the UK banking system's exposure to UK private non-financial corporations has reduced significantly, both in nominal terms and as a share of total lending to the UK real economy.(2)

The UK variant scenario was designed to test corporate credit risk through a number of channels. The contraction in GDP and the significant rise in unemployment would be expected to represent a difficult operating environment for

Chart 11 Distribution of write-offs on UK real economy exposures[a][b][c]



Sources: Bank of England and Bank calculations.

(a) UK-resident monetary financial institutions' write-offs on sterling and foreign currency lending to UK residents.
(b) Building societies enter the data in 2008 Q1.
(c) Rolling one-year average of quarterly write-offs.
(d) Includes write-offs on lending to private non-financial corporations and unincorporated businesses.

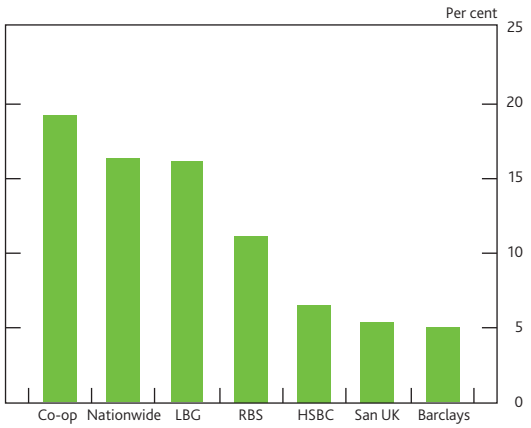
(1) For more details on the NMG survey of households see, for example, Anderson, G, Bunn, P, Pugh, A and Uluc, A (2014), 'The potential impact of higher interest rates on the household sector: evidence from the 2014 NMG Consulting survey', *Bank of England Quarterly Bulletin*, Vol. 54, No. 4, pages 419–33, available at www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q405.pdf.
(2) Between end-2007 and end-2013, UK-resident monetary financial institutions' stock of outstanding loans to UK-resident private non-financial corporations fell by around 20%. This represented a 9 percentage point fall as a share of total lending to corporations and households.

UK corporates. Coupled with the projected rise in interest rates over the course of the scenario, this would be expected to have a material impact on corporates' ability to service their bank debt in the stress scenario. The main focus of the Bank's corporate credit risk analysis was on UK CRE portfolios, which were stressed directly by the assumed 30% fall in nominal commercial property prices.

…leading to a rise in impairments on CRE exposures…

The Bank's projections for impairment charges on UK CRE portfolios were informed by a detailed review of these books conducted by Bank staff in early 2014, described in detail in Box 4. The review found that banks' CRE books are substantially less risky than they were in 2011.(1) In line with that, impairment charges were projected to be lower in the stress scenario than those seen during the recent crisis. **Chart 12** shows cumulative three-year impairment charge rates on UK CRE corporate lending over the stress scenario for each bank. These results, however, do not suggest that there are no potential risks in the CRE market. As outlined in the latest *Financial Stability Report*, the UK CRE market has seen strong price increases and rising activity since the 2014 UK stress test was initiated, and is an area that the Bank continues to monitor closely. As a result, risks to CRE portfolios are likely to be a feature of future stress-testing exercises.

Chart 12 Projected cumulative three-year impairment charge rates on UK commercial real estate lending in the stress(a)(b)



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

(a) Cumulative impairment charge rates = (three-year total impairment charge) / (average gross on balance sheet exposure), where the denominator is a simple average of 2013, 2014 and 2015 year-end positions. The HSBC impairment charge rate 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.

…and other corporate exposures.

For other (non-CRE) corporate portfolios, the three-year cumulative impairment charge rate is projected to be around 5.1% in aggregate over the scenario. Within that aggregate projection, though, there is substantial variation across banks. This reflects, in part, differences in the types of corporates to which different lenders are exposed.

One area of uncertainty that Bank staff identified in these projections related to the impact of rising interest rates on small and medium-sized companies in particular. In the recent crisis, company liquidations in the United Kingdom were lower than those seen in the early 1990s, despite the much larger fall in GDP growth. Recent Bank analysis suggests that this was partly due to the low interest rate environment.(2)(3) There is a risk that the combined effect of the contraction in economic activity and the sharp rise in Bank Rate in the stress scenario could have a greater impact on small and medium-sized companies than accounted for in the projections. For the 2015 stress test, the Bank intends to increase its focus on lenders' corporate exposures, with a view to exploring such uncertainties in more depth.

The rise in impairment charges is partially offset by increasing net interest margins (NIMs) as Bank Rate rises in the stress…

Net interest income (NII) is a key driver of profitability. The particular nature of the stress scenario, with Bank Rate rising sharply in the stress, involved a range of judgements around NII stemming from the sterling part of the balance sheet. These judgements focused on two key areas: first, the extent to which the rise in Bank Rate would pass through to products offered to customers; and second, relatedly, how changes in interest rates would affect the quantities of different types of loans and deposits.

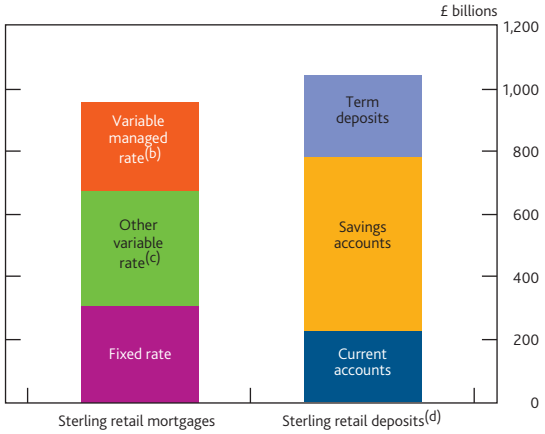
…in part due to the comparatively low interest rate sensitivity of current accounts.

Chart 13 shows the aggregate structure of banks' sterling retail deposit and mortgage portfolios. Current accounts represent around 20% of retail liabilities. Interest paid on current accounts is generally much less sensitive to changes in Bank Rate than term deposits or savings, due to the transactional nature of current accounts.(4) So, as Bank Rate increases, interest expense on a material proportion of sterling liabilities would be expected to remain low. Everything else equal, this acts to boost net interest margins in the scenario.

As interest rates rise, though, there is also a greater opportunity cost to customers of keeping funds in low interest rate current accounts. So current account balances would be expected to fall over the scenario period. In aggregate, banks' projections were consistent with this expectation. Where individual banks' projections for the evolution of current account balances were judged to be overly optimistic in the context of their business models, Bank staff made adjustments to the projections.

(1) The first review of banks' UK CRE portfolios was conducted in 2012 using 2011 Q3 data.
(2) In the recent crisis, HMRC's 'time to pay' scheme may also have reduced corporate liquidations relative to the 1990s.
(3) Arrowsmith *et al* (2013), 'SME forbearance and its implications for monetary and financial stability', *Bank of England Quarterly Bulletin*, Vol. 53, No. 4, pages 296–303, available at www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2013/qb130401.pdf.
(4) Similarly, interest rates on wholesale corporate deposit accounts of a transactional nature are less sensitive to changes in Bank Rate.

Chart 13 Structure of participating banks' sterling retail deposits and mortgages, end-2013[a]



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

(a) For HSBC and Standard Chartered, balances are converted to sterling using end-2013 exchange rates.
(b) Variable managed rate mortgages include those commonly known as 'standard variable rate (SVR)' mortgages.
(c) Other variable-rate mortgages include tracker mortgages.
(d) Retail deposits include SME deposits.

Modelling of NII is an area of the projections where banks took inconsistent approaches…

There is greater uncertainty over the extent to which interest rates on other assets and liabilities would adjust as Bank Rate rises in the stress. Products such as standard variable rate (SVR) mortgages and savings accounts were key areas of focus for Bank staff, both because they comprise a material portion of banks' retail books (**Chart 13**) and because of the particular nature of the stress scenario.[1]

Moreover, the behaviour of customers in response to changes in interest rates may depend on a number of factors. On the deposit side, these could include the amount of funds held in the accounts and the extent to which a depositor has an existing relationship with their bank. On the lending side, banks could find it difficult to pass on the full increase in Bank Rate to mortgagors with SVR mortgages, for example, if this were to amplify financial difficulties for customers; or if customers were able to switch to cheaper mortgage deals. All these factors will influence the extent to which banks could pass on changes in Bank Rate to customers in the stress scenario.

Banks took a wide range of views in their own projections on the extent to which they would pass on increases in Bank Rate to various customer asset and deposit products. For example, in their original submissions, banks' projected pass-through rates on retail savings products ranged from less than 70% to more than 110% over the scenario period.

…and Bank staff had the advantage of observing implied market dynamics in the stress…

Bank staff made a number of adjustments to banks' projections for interest rates, focusing on asset and liability products that were material in determining total sterling NII, across both retail and wholesale books. Adjustments were motivated by three factors:

- First, individual banks' interest rate projections were influenced by their own funding plans and strategies for individual products. Some banks also noted that their projections were based on assumptions about the rates their competitors would be offering. Bank staff had the advantage of observing the assumed responses of all participating banks and, so, observing market-wide dynamics.[2] Where banks took significantly different views to their peers that were not explained by their business models, Bank staff adjusted the projections — in both directions — to produce a more consistent system-wide response to the stress scenario.

- Second, Bank staff judged that participating banks would pass on a significant fraction of the increase in Bank Rate to non-current account depositors. This was informed by peer comparison and a judgement around the changing dynamics of the retail deposit market following the crisis.

- Third, Bank staff judged that it would, in general, be difficult for banks to pass on the full increase in Bank Rate to interest rates on SVR mortgages. SVR mortgage lending spreads to Bank Rate are at historically high levels, and Bank staff judged that it would be unlikely that they could increase further in the stress. Bank staff also ensured that any benefits due to the projected growth in SVR mortgage balances in the stress were not overly optimistic.

These judgements had the combined effect of constraining to some extent the expansion of net interest margins on sterling portfolios in the stress.

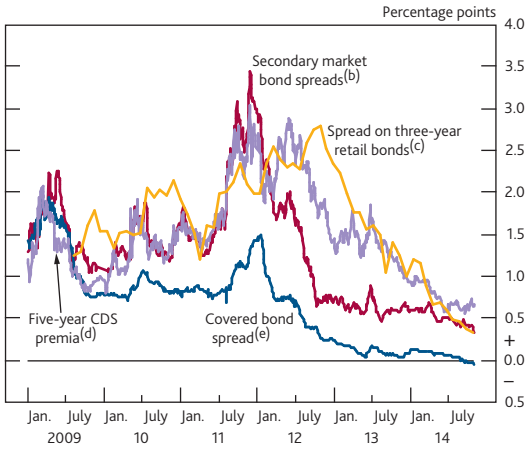
…although one area of uncertainty was around the impact of the stress on retail funding costs.

There is some evidence that wholesale and retail funding costs have been correlated at a system-wide level in recent years (**Chart 14**). Conceptually, this might be because as one source of funding becomes more expensive, a bank might increase its reliance on other funding sources, which would bid up their prices.[3]

But there is uncertainty around the extent to which this observed historical relationship will hold going forwards. For example, banks have significantly reduced their loan to deposit ratios in recent years. And recent changes to central bank

(1) SVR mortgages are included under 'variable managed rate mortgages' in **Chart 13**, and the term SVR is used henceforth as a shorthand for these mortgages.
(2) This information was limited to participating banks and so did not include, for example, information on how smaller, challenger banks would respond to the stress scenario.
(3) This is explored in a recent Bank *Bulletin* article 'Bank funding costs: what are they, what determines them and why do they matter?', *Bank of England Quarterly Bulletin*, Vol. 54, No. 4, pages 370–84, available at www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q401.pdf.

Chart 14 Long-term funding spreads for UK banks[a]



Sources: Bank of England, Bloomberg, Markit Group Limited and Bank calculations.

(a) Peer group is major UK lenders, including Barclays, HSBC, Lloyds Banking Group, Nationwide, The Royal Bank of Scotland and Santander UK.
(b) Constant-maturity unweighted average of secondary market spreads to mid-swaps for the major UK lenders' five-year euro senior unsecured bonds, where available. Where a five-year bond is unavailable, a proxy has been constructed based on the nearest maturity of bond available for a given institution.
(c) Spreads for sterling three-year fixed-rate retail bonds over equivalent-maturity swaps. Bond rates are end-month rates and swap rates are monthly averages of daily rates. The bond rates are weighted averages of rates advertised by the banks and building societies in the Bank of England's quoted rates sample, for products meeting the selection criteria (see www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/household_int.aspx).
(d) The data show an unweighted average of the five-year senior CDS premia for the major UK lenders, which provides an indicator of the spread on euro-denominated long-term wholesale bonds.
(e) Constant-maturity unweighted average of secondary market spreads to mid-swaps for the major UK lenders' five-year euro-denominated covered bonds, where available. Where a five-year covered bond is unavailable, a proxy has been constructed based on the nearest maturity of bond available for a given institution.

liquidity facilities or deposit insurance arrangements could affect the extent to which the observed historical relationship will hold in the future.

The stress scenario featured an increase in wholesale funding costs. But the Bank did not make adjustments to incorporate a potential correlation between retail and wholesale funding costs at a system-wide level. The potential impact of a wholesale market stress on dynamics in the retail deposit market is an area that the Bank intends to investigate further in the future.

Profitability is further depressed by global impairment charges…

For non-UK exposures, the global macroeconomic elements of the common, EU-wide stress scenario were used as part of the UK stress test. The downturn in economic activity in the rest of the world contributed to a rise in impairment charges on international credit exposures. But, given the focus of the UK stress test in 2014, risks stemming from non-EU jurisdictions were explored less comprehensively. For example, previous stress scenarios used for sequential stress testing by the PRA have tested the resilience of UK banks against more severe macroeconomic shocks in Asia than those featured in the EBA scenario. This meant that, for UK banks with significant exposures to Asian economies, the scenario was less stressful than for banks with primarily UK exposures. Risks from global credit exposures are expected to be an area of greater focus in the 2015 stress test.

…a fall in trading profits…

Risks from trading activities in the stress were assessed using the EBA's methodology. Under this approach, the starting point for net trading income (NTI) projections was banks' average NTIs from 2011 to 2013. This was then reduced by losses estimated by averaging the impact of the worst two of five scenarios: an adverse macroeconomic scenario and four historical financial market shocks.

For some banks, the current market projection is for their annual NTI to fall to end-2016, so using recent performance as a benchmark may not fully reflect risks to trading income. Taken as a whole, though, the total impact of the scenario for banks with large trading books represents a material hit to those banks' trading profits.

More broadly, given the focus on historical financial market shocks, this analysis did not consider how changes in the structure of markets could affect how initial shocks might be amplified in future episodes of stress (see, for example, the analysis on market liquidity in the latest *Financial Stability Report*).(1) Risks from trading activities are expected to be an area of greater focus in the 2015 stress test.

…and further provisions for misconduct costs.

Since the financial crisis, misconduct costs have increased significantly for the banking sector. The stress test incorporates projections of further misconduct costs in both the baseline and the stress.

Misconduct risks are very difficult to quantify. Even in cases where they have already crystallised or have a high likelihood of crystallising (for example, PPI mis-selling, US mortgage bonds mis-selling and manipulation of foreign exchange benchmarks), it is possible that actual outturns will be materially different to estimated costs.

Banks are also facing potential legacy misconduct issues that are in the early stages of investigation (for example, violations of US antitrust laws in relation to trading of credit default swaps). It is very hard to predict the outcome of such cases with any certainty. In its guidance for participating banks, the Bank set out that they should quantify misconduct costs, where possible, and provide 'most likely' estimates of misconduct costs that cannot be quantified easily, estimated as a probability-weighted expected cost.(2)

For those risks that have a high probability of crystallising, Bank staff reached an overall judgement around participating banks' projections by assessing them against available,

(1) See www.bankofengland.co.uk/publications/Documents/fsr/2014/fsrfull1412.pdf.
(2) Bank of England (2014), 'Stress testing the UK banking system: guidance for participating firms', available at www.bankofengland.co.uk/financialstability/Documents/fpc/guidance.pdf.

quantifiable benchmarks that could provide a guide as to future likely costs. Peer comparison was also used and the final projections sought to improve consistency across banks in quantifying the potential crystallisation of new misconduct risks.

3.3 Management actions

In a stress, banks will naturally take actions to reduce the impact of shocks to their profitability and capital ratios. The Bank's analysis took account of such potential actions. These were broadly divided into two categories. First, 'business as usual' actions that would be a natural response to weakening economic conditions (for example, changes in margins). Second, 'strategic' management actions where decision-making would be likely to entail a significant involvement from banks' Boards (for example, changes in staff remuneration). The latter were submitted separately by participating banks and considered on a case-by-case basis by Bank staff, under the guidance of the FPC and the PRA Board.

'Strategic' management actions were only accepted if they were judged to be plausible…

A high threshold was set for accepting 'strategic' management actions. The original guidance to banks had noted that such actions would only be permitted if they were considered to be plausible in stressed conditions and consistent with banks' recovery plans. This is because, from a prudential perspective, less weight can be attached to actions whose execution would be highly uncertain in a future episode of stress.

Two main tests of plausibility were considered. First, whether it was plausible that the action would be successful in a market-wide stress: for example, capital raising was deemed to be too challenging in a stress environment. Second, whether it was plausible that the bank would be able to execute the action in a real stress, given its capital position: for example, if an action's impact was judged to be disproportionately detrimental to a bank's reputation or long-term franchise, the execution risks were judged to be too material and the action was not accepted.

…and not to have an adverse impact on credit supply in the stress scenario.

Some of the actions proposed by banks related to a reduction in the size of their loan books in the stress scenario. The FPC agreed a general principle that banks' proposed management actions to change the size of their loan books would not be accepted, unless these were driven by changes in credit demand that would be expected to occur naturally in the macroeconomic scenario. Section 5 sets out in more detail the FPC's judgement in this area.

A key management action that was accepted by Bank staff was dividend reductions…

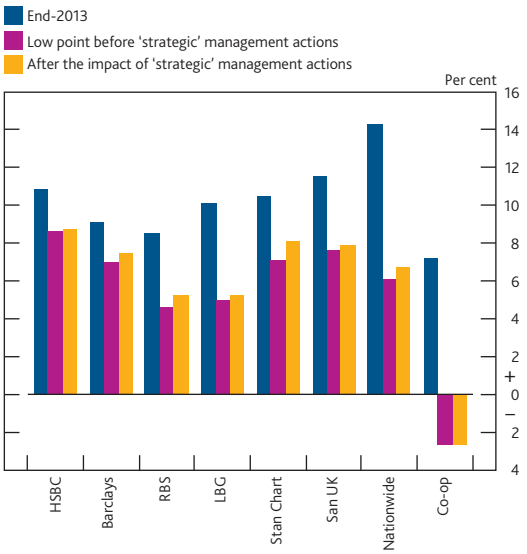
Before accounting for the impact of strategic management actions, the projections were derived based on a set of consistent assumptions around dividend payments. Specifically for the 2014 stress test, where banks had public dividend policies with a quantified payout ratio range, the projections assumed that dividend payments in the stress are consistent with that range. Where banks did not have a stated dividend policy, Bank staff assumed that nominal dividend payments would remain unchanged at their baseline-projected 2014 levels throughout the three-year projection period.

Banks' proposed management actions to change their dividend payments in response to the stress scenario were generally accepted. But the timing of any adjustments to dividends through the stress had to be plausible. For example, as a general rule, it was assumed that banks would pay their interim dividends in 2014, as they would not have had the foresight to expect the full magnitude of the stress scenario. Further detail on the approach to dividends is provided in the bank-specific commentary boxes in Annex 1.

…which, together with other management actions, improve banks' stressed capital ratios.

Cost-cutting management actions were also accepted, where these were considered to be plausible by Bank staff. These included cutting staff costs as well as a limited number of other reductions in expenses. **Chart 15** shows the impact of management actions on banks' capital ratios as incorporated in the Bank's final projections. Overall, after taking into

Chart 15 Impact of 'strategic' management actions on low-point CET1 capital ratios[a][b][c]



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 CRD IV.
(b) The year of the low point in the CET1 capital ratio before the impact of 'strategic' management actions differs across banks.
(c) For Nationwide the stress tests are based on an estimated 4 April 2014 balance sheet. See Annex 1 for more details.

account accepted 'strategic' management actions, the aggregate CET1 ratio low point increases to 7.5% in the stress scenario.

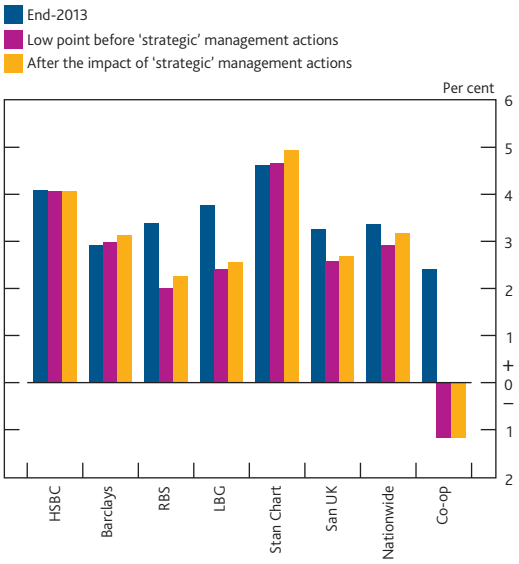
3.4 Projections of stressed T1 leverage ratios

The aggregate leverage ratio of the eight participating banks falls from 3.6% at end-2013 to a low point of 3.4%, before accounting for the impact of 'strategic' management actions. But there is substantial variation across banks (**Chart 16**).

Leverage ratios are generally less impacted than risk-based CET1 capital ratios. This is because the rise in RWAs affecting most banks' risk-based capital ratios is driven by an increase in average risk weights rather than nominal balance sheet growth. This channel does not affect leverage metrics, as the denominator of the ratio is not risk weighted.

Chart 16 shows the Bank's final projections of leverage ratios in the stress, both before and after accounting for the impact of 'strategic' management actions. Annex 1 provides more detail on the final, bank-specific projections.

Chart 16 Impact of 'strategic' management actions on low-point leverage ratios[a][b][c]



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

(a) The 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.
(b) The year of the low point in the CET1 capital ratio before the impact of 'strategic' management actions differs across banks.
(c) For Nationwide the stress tests are based on an estimated 4 April 2014 balance sheet. See Annex 1 for more details.

4 Qualitative review of banks' stress-testing frameworks

Bank staff undertook a qualitative review of banks' stress-testing and capital-planning frameworks. Overall, there has been an improvement relative to practices observed prior to the crisis. But the review identified considerable variation across banks and highlighted a number of areas where stress-testing and capital-planning frameworks will need to be strengthened. This section summarises some of the key findings of the Bank's qualitative review.

The Bank recognises that the timelines for the exercise this year were challenging and that the alignment with the EU-wide stress test generated added complexity for banks. As this is the first concurrent stress test, the Bank is using the qualitative review to establish the range of practices observed across the industry at the moment. The Bank will, however, be expecting improvements in subsequent exercises.

The Bank's qualitative review highlighted good practices in some areas…

For most banks, senior management and Board-level engagement with the stress-testing process was at a good level. This had been flagged as a key issue in the Discussion Paper on the new stress-testing framework published in October 2013. Most banks also had credible processes in place to expand the stress scenario to the range of variables relevant to their own business models, which incorporated a balance of modelled and judgemental inputs and considered key variables across the range of relevant business activities.

…and room for improvement in others…

There was a wide variation in banks' ability to provide accurate data and in the strength of banks' modelling approaches. Those banks with robust validation and reconciliation processes had few resubmission requests. And the quality of data submissions varied substantially by risk type, with credit risk data generally of a better standard than other areas.

Modelling of NII proved to be particularly challenging. With a few exceptions, the data in banks' initial submissions were poor. The methodologies used to model NII were less mature than in other areas (eg credit risk) and banks were not always able to support assumptions and modelling decisions taken. The better-performing banks were those that undertook analysis at a reasonably granular level, rather than at a more aggregated level. This provided a greater degree of control over the assumptions and transparency over the analysis. A number of banks had governance processes around NII projections that were identified as weaker than for other areas.

The standard of credit loss modelling varied across sectors. Retail credit loss modelling was of a broadly acceptable standard for the majority of banks, while wholesale credit loss forecasting was generally of a poorer standard. Overall, though, this is an area where banks have made progress since the crisis.

For some portfolios, notably UK mortgages, most banks considered a range of analyses to explore the particular features of the scenario. This was to compensate for known model weaknesses and to provide corroborating analysis to support forecasts. However, this corroborating analysis was not universally undertaken and the processes supporting the use of expert judgement were not demonstrably robust and frequently poorly documented.

All banks were significantly constrained by limitations in their infrastructure and resources, both in terms of IT infrastructure and personnel and these were exacerbated by the tight timelines of the exercise. Banks with more complex operations were particularly challenged in this area. Only one of the eight participating banks demonstrated that it had sufficiently mitigated these constraints.

In general, model management frameworks for stress-testing models lag behind those for regulatory models. The better performing banks had model inventories and clear, well-documented frameworks. At poorer performing banks, validation standards were not sufficiently robust, some key models were not validated and there were instances of models that had failed validation being used nonetheless.

Ongoing engagement from some banks with the stress-testing process was poor: answers to queries from Bank staff were often incomplete and, in a number of instances, the nature of the interactions fell below the standards set out in the Discussion Paper.

…which we would expect to see over time as stress-testing processes become embedded.

The Bank will work with each of the participating banks and their Boards to set out areas for them to focus on ahead of next year's stress test in order to improve the quality of their stress testing. The Bank will consider, as part of the 'lessons learned' process, whether it needs to provide further guidance in the future to clarify its expectations in this area.

5 Actions taken on the back of 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.

A key consideration was whether a bank's CET1 ratio was projected to fall below the 4.5% CET1 threshold. Where individual banks' CET1 ratios remained above, but close to, the 4.5% threshold, 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 Pillar 2A requirements. These relate to risks not adequately captured under 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 the particular stress scenario.

The PRA Board also considered progress that banks had already made over the course of 2014 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.

Finally, the PRA assessed the extent to which — in the baseline projections — banks met the capital standard set out in *PRA Supervisory Statement SS3/13*, 'Capital and leverage ratios for major UK banks and building societies'. That is, 7% of RWAs to be met with CET1 capital and a 3% leverage ratio using a Tier 1 definition of capital.

The stress-test results are used by the PRA Board to inform its judgement around the setting of participating banks' capital planning 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.

…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.

The PRA Board required one bank to submit a revised capital plan.
From the perspective of individual institutions, the PRA Board judged that this stress test did not reveal capital inadequacies for five of the eight participating banks (Barclays, HSBC, Nationwide, Santander UK and Standard Chartered), given their balance sheet structure at end-2013. The PRA Board did not require these banks to submit a revised capital plan.

The PRA Board judged that, as of end-2013, three of the eight participating banks needed to strengthen their capital position further. But, given developments over the course of 2014 and concrete plans to build capital further going forward, only one of these was required to submit a revised capital plan. More specifically:

- **The Co-operative Bank**: The Co-operative Bank's CET1 capital resources are projected to be exhausted in the hypothetical stress scenario. The Co-operative Bank is currently delivering a recovery plan that has built resilience in light of current economic conditions. The bank's CET1 ratio improved from 7.2% at end-2013 to 11.5% at end-June 2014, materially above baseline projections. The Co-operative Bank has achieved the targets set over the past 18 months in terms of building its capital base. The PRA expects all firms to maintain capital buffers that provide insulation against stress scenarios. The results of this exercise provide an updated quantitative estimate of the bank's vulnerability to a severe housing-related stress. The PRA Board's expectation of The Co-operative Bank's capital buffer is being re-set to take into account the additional assessment provided by the stress test. In light of that, the PRA Board has required The Co-operative Bank to submit a

revised capital plan, which has been accepted by the PRA Board. That plan envisages a reduction in the risk profile and size of the bank's balance sheet, as a means of reducing its capital requirements. If executed, the plan will deliver a level of resilience commensurate with a bank of its future size and business model. The PRA Board will continue to monitor The Co-operative Bank's progress against the plan.

- **The Royal Bank of Scotland Group**: The Royal Bank of Scotland Group's projected CET1 ratio remains above the 4.5% CET1 threshold in the stress scenario. The PRA Board has, however, judged that, as at December 2013, the bank's capital position needed to be strengthened further. The PRA Board noted that, since end-2013, The Royal Bank of Scotland Group has taken actions to do so. The bank's 2014 Q3 Interim Management Statement demonstrated the continued improvement in the CET1 capital ratio (increasing by 2.2 percentage points since end-2013), which is on track to exceed baseline projections. In addition, The Royal Bank of Scotland Group has updated its capital plan, adding a high-trigger additional Tier 1 (AT1) issuance programme, including plans to issue £2 billion of AT1 in 2015. These instruments will insure against risks over the next few years, during which time the bank is expected to rebuild CET1 capital further. The PRA Board would ordinarily have required The Royal Bank of Scotland Group to submit a revised capital plan in light of the stress-test results. However, given the progress already made and the capital strengthening actions that the bank has incorporated into its updated capital plan, which has been accepted by the PRA Board, an additional plan was judged not to be necessary.

- **Lloyds Banking Group**: Lloyds Banking Group's projected CET1 capital ratio remains above the 4.5% CET1 threshold in the stress scenario. The PRA Board has, however, judged that, as at December 2013, the bank's capital position needed to be strengthened further. The PRA Board noted that, since end-2013, Lloyds Banking Group has delivered positive financial results and is continuing to take steps to strengthen and de-risk the balance sheet, ahead of baseline projections. In April 2014, the bank also exchanged certain Tier 2 capital instruments into £5.3 billion of high-trigger AT1 securities. In light of the measures that Lloyds Banking Group already has in train to augment capital, the PRA Board did not require the bank to submit a revised capital plan.

The FPC judged that banks' proposed management actions with a potential impact on credit supply would not be accepted…

From a macroprudential perspective, the FPC noted that the system should be sufficiently capitalised to be able to maintain the supply of lending (and other financial services) in the face of adverse shocks. Reflecting that, the FPC agreed a general principle that banks' proposed management actions to change the size of their loan books would not be accepted, unless these were driven by changes in credit demand that would be expected to occur naturally in the stress scenario. This is consistent with the FPC's objective to protect and enhance the financial stability of the United Kingdom and, subject to that, support the economic policy of the Government, including its objectives for growth and employment.

The FPC noted that identifying the purely demand-driven change in credit quantities in the stressed projections is difficult to do precisely. Overall, though, the FPC judged that — for the 2014 stress test — it would be appropriate to reject proposed management actions that implied a fall in the stock of lending to the real economy relative to end-2013. This judgement is incorporated in the Bank's final projections of capital ratios in the stress.

The FPC also noted that it may be appropriate for the PRA Board to depart from that general principle in idiosyncratic cases. For example, this might be appropriate if the actions proposed by banks would (i) not have a material impact on the market as a whole and (ii) not be correlated with actions of other banks operating in the same market.

Box 5 sets outs some of the analysis that the FPC considered in reaching its overall judgement.

…and that system-wide actions on bank capital were not necessary in response to this stress test…

In considering the final results from a system-wide perspective, the FPC noted that only one bank's capital ratio is projected to fall below the 4.5% CET1 threshold at the trough of the stress. The FPC also took into consideration that the PRA Board had agreed plans with banks to build capital further and that the banking system as a whole is on a transition path to meet higher standards of loss-absorbing capacity. Overall, the FPC judged that the resilience of the system had improved significantly since the capital shortfall exercise in 2013. Moreover, the stress-test results and banks' capital plans, taken together, suggested that the banking system would have the capacity to maintain its core functions in a stress scenario. Therefore, the FPC judged that no system-wide, macroprudential actions on bank capital were needed in response to this stress test.

The FPC and the PRA Board also noted that, in future years, banks are likely to be assessed in the stress test against an explicit leverage ratio threshold, as well as a risk-based capital ratio, and banks would need to have plans in place to meet these requirements.

More broadly, the FPC considered the information from the stress test and the PRA Board's actions, alongside other

Box 5
The FPC's judgement on management actions with a potential impact on credit supply

As part of their stress-testing submissions, participating banks were asked to propose a range of 'strategic' management actions that they could take to mitigate the impact of the stress on their balance sheet. Some of these related to reducing the size of their loan books over the course of the stress scenario. This box summarises the analysis that the FPC considered in reaching a judgement around the treatment of these actions in the 2014 test.

Summary of banks' submissions

In aggregate, the eight banks taking part in the exercise proposed as management actions that they would reduce their loans to the real economy by over £75 billion in response to the stress scenario. This included both domestic and international loans. On the domestic front, the proposed reduction in the stock of bank loans was concentrated on mortgages, in line with the particular nature of the stress scenario.

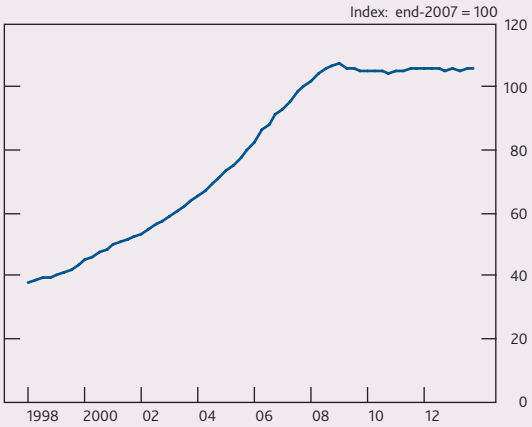
Disentangling credit demand from supply effects

The FPC agreed a general principle that banks' proposed management actions to change the size of their loan books would not be accepted, unless these were driven by changes in credit demand that would be expected to occur in the stress scenario. Applying that general principle in practice required reaching a judgement on the projected path for aggregate bank lending in the stress scenario, by only taking account of the expected change in credit demand.

To inform that judgement, the FPC considered the following pieces of evidence:

- **Model-based estimates in the stress scenario**: Bank staff used different models to strip out the effect of changes in the supply of bank lending in the stress scenario, with the intention of observing how the stock of bank loans would evolve in response to the change in credit demand only. None of these models suggested that the stock of bank loans would see outright falls purely due to a fall in credit demand in the stress. In part, this is due to the 'high inflation' nature of the stress scenario. With nominal GDP and nominal wages rising by 11% and 12% respectively over the three-year horizon, in-house models suggest that it is unlikely that credit demand effects, on their own, would cause the stock of bank loans to fall in the stress.
- **Evidence from this crisis**: **Chart A** shows that the stock of bank loans to the UK real economy stayed broadly flat during the recent crisis. This is despite the fact that there is considerable evidence, including from surveys of lenders, to suggest that there was a material tightening in the supply of bank lending in this crisis, as well as a reduction in demand growth. For example, one study suggests that more than half of the weakness in bank lending observed during the crisis in the United Kingdom can be attributed to supply constraints.(1)

Chart A Bank lending to the UK private sector(a)



Sources: Bank of England and Bank calculations.

(a) Quarterly break-adjusted level of UK-resident monetary financial institutions' sterling net lending excluding securitisations to the UK private sector, excluding intermediate other financial corporations.

(1) Bell, V and Young, G (2010), 'Understanding the weakness of bank lending', *Bank of England Quarterly Bulletin*, Vol. 50, No. 4, pages 311–20, available at www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb100406.pdf.

indicators and analysis, in forming its judgements on overall capital adequacy of the UK banking system. The FPC's overall judgement is described in Section 5.1 of the December 2014 *Financial Stability Report*.

…but identified the behaviour of risk weights as a potential structural vulnerability…

The FPC and PRA Board identified the behaviour of risk weights in the stress scenario as a potential structural vulnerability. A procyclical capital framework can exacerbate cyclicality in credit conditions, by encouraging credit exuberance in a boom and deleveraging in a downturn. The FPC and the PRA Board also noted that allowing different modelling approaches for different banks could result in significant variation in capital requirements against similar portfolios, with potentially adverse implications for market discipline. It would also lead to significantly increased volatility in some banks' capital requirements, making their capital planning more challenging. Going in the other direction, there may be benefits to diversity in models from a financial stability perspective. Bank staff will be undertaking further work to explore the issue of risk-weight procyclicality — and any inconsistencies in banks' modelling approaches — in more depth.

…and noted the role of AT1 instruments in supporting resilience in a stress.

The FPC noted that a number of banks have issued high-trigger AT1 instruments since the balance sheet cut-off date for this stress test. As a number of banks saw their CET1 ratios fall below 7% in the stress, some of these instruments would have triggered in this particular scenario. The FPC noted that this would act to support the resilience of the banking system in the stress. The FPC emphasised that investors in these instruments should be aware of the possibility that this would happen in a real stress. Any suspension of coupon payments would also support resilience.(1)

(1) See Annex 1 for further firm-specific details.

6 Next steps

Concurrent stress testing will continue to develop over time.
This was the first year that the Bank has conducted a concurrent stress test of the UK banking system. Delivering exercises that meet the medium-term aspiration set out in the Discussion Paper on stress testing in full is likely to take a number of years.

Both the Bank and participating banks will need to build their stress-testing infrastructure over time. The Bank is continuing to invest in its analytical capabilities, by collecting more data and building additional quantitative models. This will allow Bank staff to use a broader set of tools — as part of a 'suite of models' approach — to project different line items of banks' balance sheets and P&L. In addition, the Bank continues to invest in its ability to conduct system-wide analysis, intended to inform judgements around the potential scale of feedback and amplifications mechanisms that could operate at the level of the system through banks' responses to the stress. Similarly, as mentioned in Section 4, the Bank will be working with participating banks to ensure that weaknesses identified in their stress-testing and capital-planning processes are addressed. Strengthening risk management practices across the industry is a key objective of the stress-testing framework.

The Bank also expects that the overall stress-testing framework will evolve over time to meet the changing needs of policymakers in the United Kingdom. For example, as the stress-testing framework is used to inform a set of potential policy tools by the FPC and the PRA Board, the design of the regime may need to adapt to ensure it provides them with sufficient information to maximise its value in helping them to calibrate those tools. Among other things, this might involve considerations around the ways in which the state of the cycle is captured in stress scenarios and how this, then, interacts with tools designed specifically to address system-wide, cyclical concerns. Similarly, the framework for disclosing results is likely to evolve over time, including to reflect changes in the Bank's disclosure policy around other elements of the capital regime.

Several of the 'lessons learned' from 2014 will be reflected in the 2015 exercise…
The 2014 exercise has been instructive in many respects, both for the Bank as well as participating banks. Through the year, several lessons have been learned both around the stress-testing process (including the timetable, the Bank's interactions with the participating banks and the operational challenges related to co-ordination of the UK test with the EU-wide test) as well as the substance of conducting this exercise (including the specification of the scenarios, the strengths and weaknesses of different modelling approaches and the overall approach to disclosure).

The Bank plans to seek feedback from a range of stakeholders including participating banks, investors and other regulators on the lessons learned from the 2014 exercise. The Bank expects that many of these lessons will be reflected in the design and execution of the 2015 and future stress tests. But this is an evolving process — and the Bank is keen to receive ongoing feedback from interested parties on its approach to concurrent stress testing.

…and the Bank expects to publish material on the path towards the medium-term stress-testing framework next year.
The Bank wants to provide as much clarity as possible to key stakeholders over the evolution of the stress-testing framework over the next few years. In part, this is to ensure that participating banks, in particular, have sufficient advance notice to put in place plans and improve the quality of their stress-test submissions over time. Consistent with this aim, participation in the 2015 exercise will not be extended beyond those banks included in this year's exercise. Next year, the Bank is planning to publish a document setting out its intended path towards the medium-term stress-testing framework.

ANNEX 1: FIRM-SPECIFIC RESULTS

Barclays plc

Table 1: Projected consolidated solvency ratios in the stress scenario

	Actual (end-2013)	Minimum stressed ratio (before the impact of 'strategic' management actions)[a]	Minimum stressed ratio (after the impact of 'strategic' management actions)[a]	Actual (2014 Q3)	Submit revised capital plan?
Common Equity Tier 1 Ratio[b]	9.1%	7.0%	7.5%	10.0%	Not required
Tier 1 Capital Ratio[c]	11.3%	8.4%	8.9%	12.9%	
Total Capital Ratio[d]	15.0%	11.6%	12.0%	16.4%	
Leverage Ratio[e]	2.9%	3.0%	3.1%	3.5%	
Memo: Risk-weighted Assets (£bn)	442	611[f]	611[f]	413	
Memo: CET1 (£bn)	40	43[f]	46[f]	41	
Memo: Leverage Exposure (£bn)	1,464[g]	1,526[h]	1,526[h]	1,324	

(a) The minimum solvency ratios shown in the table do not necessarily occur in the same year of the stress scenario. (b) Common Equity Tier 1 (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 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. Note the 2014 Q3 numbers quoted above use an end-point definition of CET1 in the Leverage Ratio calculation. (f) Corresponds to the same year as the minimum Common Equity Tier 1 Ratio over the stress scenario. (g) Leverage Exposure based on the firm's stress-test data submissions. (h) Corresponds to the same year as the minimum Leverage Ratio over the stress scenario.

The results show that Barclays' capital position remains above the threshold CET1 ratio of 4.5% in the hypothetical stress scenario. **The PRA Board judged that this stress test did not reveal capital inadequacies for Barclays given its balance sheet at end-2013.** Compared to some other firms taking part in this exercise, Barclays is impacted to a lesser extent by the stress scenario explored in the 2014 UK stress test, partly due to its geographic footprint and business model. The stress scenario built on the global macroeconomic and market risk elements of the EBA test and explored, in particular, risks stemming from the UK housing market and a sharp rise in sterling interest rates. Barclays' significant international and trading operations were exposed to a comparatively lower level of stress than its UK business through this particular exercise. The projected fall in Barclays' CET1 ratio in the stress is driven by an increase in credit impairment charges, especially for retail lines, a significant increase in RWAs and an exposure to misconduct risks. The minimum stressed CET1 ratio, before taking into account management actions, and after accounting for ordinary share dividend payments in line with Barclays' dividend policy, fell to 7%. The analysis also incorporates the impact of 'strategic' management actions that the PRA Board judged Barclays could realistically take in the stress scenario. These include taking action to reduce costs further and a suspension of ordinary share dividend payments from, and including, its third quarter 2014 interim dividend. This results in a minimum stressed CET1 ratio of 7.5% after the impact of management actions. During 2014, Barclays has taken a number of steps to enhance its CET1 ratio and has reduced both RWAs and leverage exposure. As a result of these actions, the firm's CET1 ratio has continued to improve. Additionally, the firm has exchanged certain Tier 1 capital instruments for £2.3bn of AT1 securities with a 7% CET1 trigger. **The PRA Board did not require Barclays to submit a revised capital plan.**

The Co-operative Bank plc

Table 1: Projected consolidated solvency ratios in the stress scenario

	Actual (end-2013)	Minimum stressed ratio (before the impact of 'strategic' management actions)[a]	Minimum stressed ratio (after the impact of 'strategic' management actions)[a]	Actual (2014 Q2)	Submit revised capital plan?
Common Equity Tier 1 Ratio[b]	7.2%	-2.6%	-2.6%	11.5%	Revised capital plan required, received and accepted (For quantum of additional actions, see below)
Tier 1 Capital Ratio[c]	7.3%	-2.6%	-2.6%	11.6%	
Total Capital Ratio[d]	9.1%	-1.0%	-1.0%	13.5%	
Leverage Ratio[e]	2.4%	-1.2%	-1.2%	3.7%	
Memo: Risk-weighted Assets (£bn)	15.1	17.9[f]	17.9[f]	13.9	
Memo: CET1 (£bn)	1.1	-0.5[f]	-0.5[f]	1.6	
Memo: Leverage Exposure (£bn)	45.7[g]	40.5[h]	40.5[h]	42.8	

(a) The minimum solvency ratios shown in the table do not necessarily occur in the same year of the stress scenario. (b) Common Equity Tier 1 (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 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. Note the 2014 Q2 numbers quoted above use an end-point definition of CET1 in the Leverage Ratio calculation. (f) Corresponds to the same year as the minimum Common Equity Tier 1 Ratio over the stress scenario. (g) Leverage Exposure based on the firm's stress-test data submissions. (h) Corresponds to the same year as the minimum Leverage Ratio over the stress scenario.

The Co-operative Bank's CET1 capital resources are projected to be exhausted in the hypothetical stress scenario. Its leverage ratio is also projected to be below 3% in years two and three of the baseline scenario. The Co-operative Bank is currently delivering a recovery plan that has strengthened its capital and has built resilience in light of the current economic conditions. As part of this recovery plan, The Co-operative Bank raised £400m equity in May 2014, is receiving a £313m[1] capital injection provided by The Co-operative Group across the 2014 financial year, and has further de-risked its balance sheet. The Co-operative Bank's Interim Financial Statement published on 22 August 2014 showed that its CET1 ratio had improved from 7.2% at end-2013 to 11.5% at end-June 2014 and its leverage ratio had improved to 3.7%, materially above baseline projections. The Co-operative Bank has achieved the targets set over the last 18 months in terms of building its capital base. The PRA expects all firms to maintain capital buffers that provide insulation against stress scenarios. The results of this exercise provide an updated quantitative estimate of The Co-operative Bank's vulnerability to a severe housing-related stress scenario. A key source of vulnerability in the stress scenario stems from The Co-operative Bank's portfolio of historic, higher-risk residential mortgages and commercial real estate assets. The PRA Board's expectation for The Co-operative Bank's capital buffer is being re-set to take into account the additional analysis provided by the stress test. **In light of that assessment, the PRA Board has required The Co-operative Bank to submit a revised capital plan, which has been accepted by the PRA Board.** That plan envisages a reduction in the risk profile and size of the bank's balance sheet, as a means of reducing its capital requirements. This combination will reduce its RWAs by approximately £5.5bn by end-2018. If executed, the plan will deliver a level of resilience commensurate with a bank of its future size and business model. **The PRA will continue to monitor The Co-operative Bank's progress against it.**

[1] *The stress-test results take into account the £313m capital injection provided by Co-operative Group across the 2014 financial year, as this was a committed action agreed in 2013. But, consistent with other firms, they exclude the benefit of further actions taken in 2014, including the £400m equity raise in May 2014.*

HSBC Holdings plc

Table 1: Projected consolidated solvency ratios in the stress scenario

	Actual (end-2013)	Minimum stressed ratio (before the impact of 'strategic' management actions)[a]	Minimum stressed ratio (after the impact of 'strategic' management actions)[a]	Actual (2014 Q3)	Submit revised capital plan?
Common Equity Tier 1 Ratio[b]	10.8%	8.7%	8.7%	11.2%	Not required
Tier 1 Capital Ratio[c]	12.0%	9.4%	9.5%	12.8%	
Total Capital Ratio[d]	14.9%	11.4%	11.4%	15.9%	
Leverage Ratio[e]	4.1%	4.1%	4.1%	4.6%	
Memo: Risk-weighted Assets ($bn)	1,215	1,449[f]	1,435[f]	1,228	
Memo: CET1 ($bn)	131	126[f]	125[f]	138	
Memo: Leverage Exposure ($bn)	3,215[g]	3,061[h]	3,061[h]	3,149	

(a) The minimum solvency ratios shown in the table do not necessarily occur in the same year of the stress scenario. (b) Common Equity Tier 1 (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 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. Note the 2014 Q3 numbers quoted above use an end-point definition of CET1 in the Leverage Ratio calculation. (f) Corresponds to the same year as the minimum Common Equity Tier 1 Ratio over the stress scenario. (g) Leverage Exposure based on the firm's stress-test data submissions. (h) Corresponds to the same year as the minimum Leverage Ratio over the stress scenario.

The results show that HSBC's capital position remains above the threshold CET1 ratio of 4.5% in the hypothetical stress scenario. **The PRA Board judged that this stress test did not reveal capital inadequacies for HSBC given its balance sheet at end-2013**. Compared to some other firms taking part in this exercise, HSBC is impacted to a lesser extent by the stress scenario explored in the 2014 UK stress test, partly due to its geographic footprint and business model. The stress scenario built on the global macroeconomic and market risk elements of the EBA test and explored, in particular, risks stemming from the UK housing market and a sharp rise in sterling interest rates. HSBC's material international operations in regions such as Asia were exposed to a comparatively lower level of stress through this particular exercise. Key drivers of the stressed CET1 ratio are the deterioration in retail, wholesale and Global Banking and Markets portfolios, resulting in increased RWAs and impairment charges, together with an exposure to misconduct risks. The analysis incorporates the assumption that HSBC would continue to pay ordinary share dividends in line with its current policy, which in the first year of the stress are at levels lower than the guidance given in the firm's 2013 Annual Report and Accounts. The analysis also incorporates the impact of 'strategic' management actions that the PRA Board judged HSBC could realistically take in the stress scenario. These actions have a minimal impact on the firm's CET1 ratio. Since December 2013, HSBC's earnings have remained resilient and the firm has continued to build capital. The Interim Management Statement published on 3 November 2014 showed a CET1 ratio of 11.2%. In September 2014, the firm also issued $5.7bn-equivalent of AT1 securities with a 7% CET1 trigger. **The PRA Board did not require HSBC to submit a revised capital plan.**

Lloyds Banking Group plc

Table 1: Projected consolidated solvency ratios in the stress scenario

	Actual (end-2013)	Minimum stressed ratio (before the impact of 'strategic' management actions)[a]	Minimum stressed ratio (after the impact of 'strategic' management actions)[a]	Actual (2014 Q3)	Submit revised capital plan?
Common Equity Tier 1 Ratio[b]	10.1%	5.0%	5.3%	12.0%	Not required
Tier 1 Capital Ratio[c]	11.5%	5.8%	6.1%	15.6%	
Total Capital Ratio[d]	18.5%	10.7%	11.0%	21.0%	
Leverage Ratio[e]	3.8%	2.4%	2.6%	4.7%	
Memo: Risk-weighted Assets (£bn)	272	350[f]	350[f]	250	
Memo: CET1 (£bn)	27	17[f]	19[f]	30	
Memo: Leverage Exposure (£bn)	727[g]	699[h]	699[h]	Not pub.	

(a) The minimum solvency ratios shown in the table do not necessarily occur in the same year of the stress scenario. (b) Common Equity Tier 1 (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 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. Note the 2014 Q3 numbers quoted above use an end-point definition of CET1 in the Leverage Ratio calculation. (f) Corresponds to the same year as the minimum Common Equity Tier 1 Ratio over the stress scenario. (g) Leverage Exposure based on the firm's stress-test data submissions. (h) Corresponds to the same year as the minimum Leverage Ratio over the stress scenario.

The results show that Lloyds Banking Group's capital position remains above the threshold CET1 ratio of 4.5% in the hypothetical stress scenario. **The PRA Board has, however, judged that, as at December 2013, Lloyds Banking Group's capital position needed to be strengthened further.** The results demonstrate that Lloyds Banking Group remains susceptible to a severe economic downturn. In particular, the analysis highlights the potential downside risk which may stem from the Group's retail and commercial lending portfolios and an exposure to misconduct risks faced by the firm. The analysis already takes into account disposals mandated under the State Aid Agreement, notably the sale of TSB, and assumes that, in the stress scenario, ordinary share dividend payments would not be made over the period modelled. The analysis also incorporates the impact of 'strategic' management actions that the PRA Board judged Lloyds Banking Group could realistically take in the stress scenario. These increase the firm's CET1 ratio in the stress by 30 basis points and predominantly relate to actions to reduce costs further. Since December 2013, Lloyds Banking Group has delivered positive financial results and is continuing to take steps to strengthen and de-risk the balance sheet. The Interim Management Statement published on 28 October 2014 demonstrated the continued improvement in Lloyds Banking Group's CET1 capital ratio, ahead of baseline projections. In April 2014, Lloyds Banking Group exchanged certain Tier 2 capital instruments for £5.3bn of AT1 securities with a 7% CET1 trigger. In light of the measures that Lloyds Banking Group already has in train to augment capital, the PRA Board did not consider it necessary to require further actions to be taken beyond Lloyds Banking Group's current plans at this time. **The PRA Board did not require Lloyds Banking Group to submit a revised capital plan.**

Nationwide Building Society

Table 1: Projected consolidated solvency ratios in the stress scenario

	Actual (4 April 2014[1])	Minimum stressed ratio (before the impact of 'strategic' management actions)[(a)]	Minimum stressed ratio (after the impact of 'strategic' management actions)[(a)]	Actual (September 2014)	Submit revised capital plan?
Common Equity Tier 1 Ratio[(b)]	14.3%	6.1%	6.7%	17.6%	Not required
Tier 1 Capital Ratio[(c)]	18.2%	8.1%	8.8%	21.7%	
Total Capital Ratio[(d)]	23.8%	10.9%	11.5%	27.4%	
Leverage Ratio[(e)]	3.4%	2.9%	3.2%	3.8%	
Memo: Risk-weighted Assets (£bn)	40.6	78.6[(f)]	78.6[(f)]	38.1	
Memo: CET1 (£bn)	5.8	4.8[(f)]	5.3[(f)]	6.7	
Memo: Leverage Exposure (£bn)	202[(g)]	198[(h)]	198[(h)]	204	

(a) The minimum solvency ratios shown in the table do not necessarily occur in the same year of the stress scenario. (b) Common Equity Tier 1 (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 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. Note the September 2014 numbers quoted above use an end-point definition of CET1 in the Leverage Ratio calculation. (f) Corresponds to the same year as the minimum Common Equity Tier 1 Ratio over the stress scenario. (g) Leverage Exposure based on the firm's stress-test data submissions. (h) Corresponds to the same year as the minimum Leverage Ratio over the stress scenario.

The results show that Nationwide's capital position remains above the threshold CET1 ratio of 4.5% in the hypothetical stress scenario. **The PRA Board judged that this stress test did not reveal capital inadequacies for Nationwide given its balance sheet at 4 April 2014.** The main driver of the deterioration in the CET1 ratio over the stress horizon is the increase of the RWAs calculated by the firm's internal models for retail secured portfolios, due to the firm's 'point in time' modelling approach for these portfolios. Another factor is increased credit losses in the mortgage and commercial portfolios arising from the application of this scenario. The fall in Nationwide's CET1 ratio highlights the impact of this housing-focused stress on the firm's business model. This fall does not include the effect of the conversion of AT1 into CET1 resources which would result from breaching the 7% trigger, as this was issued after the December 2013 cut-off date for the stress test. The analysis assumes that Nationwide continues to make coupon payments on its Core Capital Deferred Shares and AT1 instruments, except in the low-point year of the stress. The analysis also incorporates the impact of 'strategic' management actions that the PRA Board judged Nationwide could realistically take in the stress scenario. These increase the firm's CET1 ratio in the stress by 60 basis points and predominantly relate to further reductions in costs. The Interim Results published on 25 November 2014 reported a CET1 Ratio of 17.6% for September 2014, which follow six months of additional profit and reduced exposure to legacy high risk weighted assets. As a result of these two factors, the resilience of the balance sheet has improved since the start date of the stress test. **The PRA Board did not require Nationwide to submit a revised capital plan.**

[1] *As a result of Nationwide's different reporting date, the Bank used an estimated 4 April 2014 balance sheet as the start point of this analysis. This results in differences between that balance sheet and the firm's annual accounts. The estimated balance sheet included £1bn of AT1 issued in March 2014. This contributed 2.5% of the starting Total and Tier 1 capital ratios and 0.5% of the leverage ratio as at 4 April 2014.*

The Royal Bank of Scotland Group plc

Table 1: Projected consolidated solvency ratios in the stress scenario

	Actual (end-2013)	Minimum stressed ratio (before the impact of 'strategic' management actions)[a]	Minimum stressed ratio (after the impact of 'strategic' management actions)[a]	Actual (2014 Q3)	Submit revised capital plan?
Common Equity Tier 1 Ratio[b]	8.6%	4.6%	5.2%	10.8%	Revised capital plan received and accepted (For quantum of additional actions, see below)
Tier 1 Capital Ratio[c]	10.3%	6.0%	6.7%	12.7%	
Total Capital Ratio[d]	13.6%	7.8%	8.3%	16.3%	
Leverage Ratio[e]	3.4%	2.0%	2.3%	3.9%	
Memo: Risk-weighted Assets (£bn)	429	399[f]	399[f]	382	
Memo: CET1 (£bn)	37	18[f]	21[f]	41	
Memo: Leverage Exposure (£bn)	1,082[g]	917[h]	917[h]	1,068	

(a) The minimum solvency ratios shown in the table do not necessarily occur in the same year of the stress scenario. (b) Common Equity Tier 1 (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 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. Note the 2014 Q3 numbers quoted above use an end-point definition of CET1 in the Leverage Ratio calculation. (f) Corresponds to the same year as the minimum Common Equity Tier 1 Ratio over the stress scenario. (g) Leverage Exposure based on the firm's stress-test data submissions. (h) Corresponds to the same year as the minimum Leverage Ratio over the stress scenario.

The results show that The Royal Bank of Scotland Group's capital position remains above the threshold CET1 ratio of 4.5% in the hypothetical stress scenario. **The PRA Board has, however, judged that, as at December 2013, the firm's capital position needed to be strengthened further.** The stress test demonstrates that The Royal Bank of Scotland Group remains susceptible to a severe economic downturn. In particular, the analysis highlights the potential downside risk which may stem from the Group's retail and corporate lending portfolios and an exposure to misconduct risks. The analysis takes into account disposals mandated under the State Aid Agreement, notably the sale of Citizens Financial Group, as well as the run down plans for RBS Capital Resolution and assumes that, in the stress scenario, ordinary share dividend payments would not be made over the period modelled. The analysis also incorporates the impact of 'strategic' management actions that the PRA Board judged The Royal Bank of Scotland Group could realistically take in the stress scenario. These increase the firm's CET1 ratio in the stress by 60 basis points and predominantly relate to additional measures that could be taken to reduce costs. The Royal Bank of Scotland Group provided assurance, independently verified by an external audit firm, regarding the treatment of deferred tax assets that would arise in the stress scenario. Since the stress-test submission, The Royal Bank of Scotland Group has taken action to strengthen its capital position. The Interim Management Statement published on 31 October 2014 demonstrated the continued improvement in The Royal Bank of Scotland Group's CET1 capital ratio (increasing by 2.2 percentage points to 10.8% over the nine-month period), which is on track to exceed baseline projections. In addition, The Royal Bank of Scotland Group has updated its capital plan, adding an AT1 issuance programme, including plans to issue £2bn of AT1 in 2015 with a 7% CET1 trigger. The AT1 issuance will insure against risks over the next few years, during which time the firm is expected to rebuild CET1 capital further. **The PRA Board would ordinarily have required The Royal Bank of Scotland Group to submit a revised capital plan in light of the stress-test results. However, given the progress already made and the capital strengthening actions that the bank has incorporated into its updated capital plan, which has been accepted by the PRA Board, an additional plan was judged not to be necessary.**

Santander UK plc

Table 1: Projected consolidated solvency ratios in the stress scenario

	Actual (end-2013)	Minimum stressed ratio (before the impact of 'strategic' management actions)[a]	Minimum stressed ratio (after the impact of 'strategic' management actions)[a]	Actual (2014 Q2)	Submit revised capital plan?
Common Equity Tier 1 Ratio[b]	11.6%	7.6%	7.9%	11.8%	Not required
Tier 1 Capital Ratio[c]	13.2%	8.7%	9.0%	14.1%	
Total Capital Ratio[d]	17.1%	12.7%	13.0%	17.8%	
Leverage Ratio[e]	3.3%	2.6%	2.7%	3.6%	
Memo: Risk-weighted Assets (£bn)	77.7	89.7[f]	89.7[f]	79.9	
Memo: CET1 (£bn)	9.0	6.8[f]	7.1[f]	9.5	
Memo: Leverage Exposure (£bn)	275[g]	265[h]	265[h]	273	

(a) The minimum solvency ratios shown in the table do not necessarily occur in the same year of the stress scenario. (b) Common Equity Tier 1 (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 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. Note the 2014 Q2 numbers quoted above use an end-point definition of CET1 in the Leverage Ratio calculation. (f) Corresponds to the same year as the minimum Common Equity Tier 1 Ratio over the stress scenario. (g) Leverage Exposure based on the firm's stress-test data submissions. (h) Corresponds to the same year as the minimum Leverage Ratio over the stress scenario.

The results show that Santander UK's capital position remains above the threshold CET1 ratio of 4.5% in the hypothetical stress scenario. **The PRA Board judged that this stress test did not reveal capital inadequacies for Santander UK given its balance sheet at end-2013.** A key driver of the stress results is the modelled significant increase in impairment charges, particularly in respect of the residential mortgage book. Increases in the firm's RWAs are relatively modest, particularly in respect of the firm's residential mortgage book, due to the firm's 'through the cycle' modelling approach for this portfolio. The analysis incorporates the assumption that Santander UK would maintain its ordinary share dividend policy and, as such, in periods which have been modelled as loss making during the stress scenario, no dividends would be paid. The analysis also incorporates the impact of 'strategic' management actions that the PRA Board judged Santander UK could realistically take in the stress scenario. These increase the firm's CET1 ratio in the stress by 30 basis points and predominantly relate to further reductions in costs. Since December 2013, Santander UK's earnings have remained positive. The Half Yearly Financial Report published on 14 August 2014 shows that the firm has increased marginally its CET1 ratio to 11.8%. In June 2014, the firm issued £500m of AT1 securities, with a 7% CET1 trigger. **The PRA Board did not require Santander UK to submit a revised capital plan.**

Standard Chartered plc

Table 1: Projected consolidated solvency ratios in the stress scenario

	Actual (end-2013)	Minimum stressed ratio (before the impact of 'strategic' management actions)[a]	Minimum stressed ratio (after the impact of 'strategic' management actions)[a]	Actual (2014 Q2)	Submit revised capital plan?
Common Equity Tier 1 Ratio[b]	10.5%	7.1%	8.1%	10.5%	
Tier 1 Capital Ratio[c]	11.9%	7.7%	8.8%	11.8%	
Total Capital Ratio[d]	16.7%	10.6%	11.8%	17.3%	
Leverage Ratio[e]	4.6%	4.7%	4.9%	4.8%	Not required
Memo: Risk-weighted Assets ($bn)	331	460[f]	409[f]	352	
Memo: CET1 ($bn)	35	33[f]	33[f]	37	
Memo: Leverage Exposure ($bn)	757[g]	700[h]	667[h]	786	

(a) The minimum solvency ratios shown in the table do not necessarily occur in the same year of the stress scenario. (b) Common Equity Tier 1 (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 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. Note the 2014 Q2 numbers quoted above use an end-point definition of CET1 in the Leverage Ratio calculation. (f) Corresponds to the same year as the minimum Common Equity Tier 1 Ratio over the stress scenario. (g) Leverage Exposure based on the firm's stress-test data submissions. (h) Corresponds to the same year as the minimum Leverage Ratio over the stress scenario.

The results show that Standard Chartered's capital position remains above the threshold CET1 ratio of 4.5% in the hypothetical stress scenario. **The PRA Board judged that this stress test did not reveal capital inadequacies for Standard Chartered given its balance sheet at end-2013.** Compared to some other firms taking part in this exercise, Standard Chartered is impacted to a lesser extent by the stress scenario explored in the 2014 UK stress test, partly due to its geographic footprint and business model. The stress scenario built on the global macroeconomic and market risk elements of the EBA test and explored, in particular, risks stemming from the UK housing market and a sharp rise in sterling interest rates. The majority of Standard Chartered's operations are based in Asia, Africa and the Middle East and were exposed to a comparatively lower level of stress through this particular exercise. The projected fall in Standard Chartered's CET1 ratio in the stress is driven by a combination of increases in RWAs, predominantly driven by credit quality deterioration across wholesale exposures, impairment charges on large single-name wholesale exposures and an exposure to misconduct risks. The minimum stressed ratios, before 'strategic' management actions, assume ordinary share dividend payments are maintained at 2014 levels as forecast in the firm's baseline projections. The ratios after management actions incorporate the impact of reducing and then suspending ordinary share dividend payments in the first two years of the stress scenario. The analysis also incorporates the impact of management actions that the PRA Board judged Standard Chartered could realistically take in the stress scenario, including a reduction in the stock of lending, where it was judged that the reduction would not have a material impact on the market or be correlated with the actions taken by other participating banks. Together with the suspension of ordinary share dividend payments in loss making periods, these actions increase the firm's CET1 ratio in the stress by 100 basis points. The Half Year Results, published on 6 August 2014, showed that market conditions are challenging for Standard Chartered, with year-to-date income and operating profit down compared with the same period last year, and the CET1 ratio remained at the end-2013 level of 10.5%. **The PRA Board did not require Standard Chartered to submit a revised capital plan.**

ANNEX 2: FIRM-SPECIFIC PROJECTED IMPAIRMENT CHARGES BY SECTOR

Table 1: Projected cumulative three-year impairment charge rates on UK lending in the stress scenario[a] [b]

	UK household mortgage lending[c]	UK household non-mortgage lending	UK commercial real estate lending
Barclays	0.9%	22.3%	5.0%
The Co-operative Bank	3.5%	20.6%	19.1%
HSBC	0.6%	7.0%	6.5%
Lloyds Banking Group	3.8%	17.7%	16.1%
Nationwide	1.2%	12.0%	16.3%
The Royal Bank of Scotland Group	1.9%	13.2%	11.2%
Santander UK	2.4%	15.3%	5.4%

Source: Participating banks' Firm Data Submissions Framework (FDSF) data submissions; Bank analysis and calculations
(a) Cumulative impairment charge rates = (three year total impairment charge) / (average gross on-balance-sheet exposure), where the denominator is a simple average of 2013, 2014 and 2015 year-end positions. The HSBC impairment charge rate 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.
(c) Includes retail buy-to-let portfolios.

Table 2: Projected cumulative three-year impairment charges on UK lending in the stress scenario[a]

	UK household mortgage lending[b]	UK household non-mortgage lending	UK commercial real estate lending
Barclays	£1.2bn	£6.0bn	£0.4bn
The Co-operative Bank	£0.8bn	£0.3bn	£0.4bn
HSBC	£0.5bn	£1.0bn	£0.5bn
Lloyds Banking Group	£12.0bn	£4.5bn	£3.1bn
Nationwide	£1.8bn	£0.4bn	£1.1bn
The Royal Bank of Scotland Group	£2.0bn	£2.4bn	£2.7bn
Santander UK	£3.6bn	£1.1bn	£0.5bn

Source: Participating banks' FDSF data submissions; Bank analysis and calculations
(a) Standard Chartered is excluded as it has minimal UK lending exposures.
(b) Includes retail buy-to-let portfolios.
(c) HSBC's impairment charges are calculated by converting to sterling using exchange rates consistent with the stress scenario.